Theſe 30 *Eons*, the *Valentinians* hold to have been figured by the thirty Years of our Saviour's private Life. See VALENTINIAN.

EPACTS, in Chronology, the Exceſſes of the Solar Month above the Lunar Synodical Month; and of the Solar Year above the Lunar Year, or 12 Synodical Months: Or of ſeveral Solar Months, above as many Synodical Months; and ſeveral Solar Years above as many Dozens of Synodical Months.

Whence, the *Epacts* are either *Annual* or *Menſtrual*.

Menſtrual EPACTS, are the Exceſſes of the Civil, or Calendar Month, above the Lunar Month. See MONTH.

Suppoſe, *e. gr.* it were New Moon on the firſt Day of *January*: Since the Lunar Month is 29 Days $12^h\ 44'\ 3''$; and the Month of *January* contains 31 Days: The Menſtrual *Epact* is 1 Day $11^h\ 15'\ 57''$.

Annual EPACTS, are the Exceſſes of the Solar Year above the Lunar. See YEAR.

Hence, as the *Julian* Year is 365 Days 6 Hours, and the *Julian* Lunar Year 354 Days $8^h\ 48'\ 38''$; the annual *Epact* will be 10 Days $12^h\ 11'\ 22''$; that is, nearly, 11 Days. Conſequently, the *Epact* of 2 Years, is 22 Days; of 3 Years, 33 Days; or rather 3, ſince 30 Days make an *Emboliſmic*, or Intercalary Month. See EMBOLISMIC.

Thus, the *Epact* of 4 Years are 14 Days, and ſo of the reſt: And thus, every 19th Year, the *Epact* becomes 30 or 0; conſequently the 20th Year the *Epact* is 11 again: And ſo the Cycle of *Epacts*, expires with the Golden Number, or Lunar Cycle of 19 Years, and begins again with the ſame, as in the following Table.

Gold. Numb.	*Epacts.*	*Gold. Numb.*	*Epacts.*	*Gold. Numb.*	*Epacts.*
1	XI	7	XVII	13	XXIII
2	XXII	8	XXVIII	14	IV
3	III	9	IX	15	XV
4	XIV	10	XX	16	XXVI
5	XXV	11	I	17	VIII
6	VI	12	XII	18	XIX
				19	XXX

Again, as the New Moons are the ſame, that is, fall on the ſame Day every 19 Years, ſo the Difference between the Lunar and Solar Year, is the ſame every 19 Years. And becauſe the ſaid Difference is always to be added to the Lunar Year, in Order to adjuſt, or make it equal to the Solar Year; hence the ſaid Difference reſpectirely belonging to each Year of the Moon's Cycle, is called the *Epact of the ſaid Year*, that is, the Number to be added to the ſaid Year to make it equal to the Solar Year; The Word being form'd from the *Greek*, επαγω, *induco*, *intercalo*.

Upon this mutual Reſpect, between the Cycle of the Moon, and the Cycle of the *Epacts*, is founded this Rule for finding the *Epact* belonging to any Year of the Moon's Cycle. Multiply the Year given of the Moon's Cycle into 11; if the Product be leſs than 30, it is the *Epact* ſought; if the Product be greater than 30, divide it by 30, and the Remainder of the Dividend is the *Epact*: For Inſtance, I would know the *Epact* for the Year 1712, which is the third Year of the Moon's Cycle. Wherefore 3 is the *Epact* for 1712: For $11 \times 3 = 33$, and 33 being divided by 30, there is left 3 of the Dividend for the *Epact*. See CYCLE.

By Help of the *Epact* may be found what Day of any Month in any Year the New Moon falls on, thus: To the Number of the Month, from *March* incluſively, add the *Epact* of the Year given; if the Sum be leſs than 30, ſubſtract it out of 30; if greater, ſubſtract it out of 60; and the Remainder will be the Day, whereon the New Moon will fall.

If the New Moon be ſought for in the Month of *January* or *March*, then nothing is to be added to the *Epact*; if for *February* or *April*, then only 1 is to be added.

For Example: I would know what Day of *December* the New Moon was on *A. D.* 1711, the *Epact* whereof is 22. By the aforeſaid Rule, I find it will be *December* the 28th; for $22 + 10 = 32$, and $60 - 32 = 28$. See MOON.

The Day whereon the New Moon falls, being thus found, it is eaſy to infer from thence what the Age of the Moon is on any Day given.

However, there is a peculiar Rule commonly made uſe of to this Purpoſe, which is this: Add the *Epact* of the Year, the Number of the Month, from *March* incluſively, and the given Day of the Month all into one Sum, which if it be leſs than 30, ſhews the Age of the Moon; if it be greater than 30, divide it by 30, and the Remainder of the Dividend ſhews the Age of the Moon, or how many Days it is from the laſt New Moon: This Method will never err a whole Day.

For Inſtance: What was the Age of the Moon on *December* 31ſt, *A. D.* 1711? By this Rule, I find, that the Moon will then be three Days old; that is, it will then be three Days from the laſt new Moon. For, $22 + 10 + 31 = 63$, and 63 being divided by 30, there will remain of the Dividend, 3. And this exactly agrees to the other foregoing Rule, whereby it was found that the New Moon was on *December* 28. 1711.

It muſt be obſerved, that as the Cycle of 19 Years, anticipates the new Moons by one Day in 312 Years; the ſame Cycle of *Epacts* will not always hold: The Moon's Anticipation leſſening the ſeveral *Epacts* by one, every 312 Years.

To have the *Epacts*, therefore, point out the New Moons perpetually; that *Epact* given in the Calendar is not ſufficient; but all the 30 *Epacts* ſhould be beſtowed throughout the whole Year, that the Calendar may exhibit all the Cycles of *Epacts*. See CALENDAR.

And, again, that as in 300 *Gregorian* Years, there is one Biſſextile Year dropp'd; the New Moons are thus thrown on the following Day. Conſequently, by the Moon's poſt-poſition there is one added to every *Epact*. See GREGORIAN.

EPANORTHOSIS, in Rhetoric, a Figure, whereby the Orator revokes and corrects ſomething before alledg'd, as too weak; and adds ſomething ſtronger, and more conformable to the Paſſion he is agitated by. See CORRECTION.

Such, *e. gr*, is that of *Cicero* for *Cœlius*: *O Stultitia! Stultitiam ne dicam*, an *Impudentiam Singularem*. Oh Folly! Folly ſhall I call it, or rather intolerable Impudence? And in the firſt *Catalinarian*: *Quamquam quid loquor! Te ut ulla res frangat? Tu ut unquam te corrigas? Tu ut ullam fugam meditere? Tu ut ullum exilium cogites? Utinam tibi iſtam Mentem Dii Immortales donarent.*

Thus alſo *Terence*, in the *Heautontimorumenos*, introduces his old Man *Mendemus*, ſaying,

Filium Unicum Adoleſcentulum
Habeo. Ah! quid dixi habere me? Imo habui, Chreme,
Nunc habeam nec ne, incertum eſt.

The Word is *Greek*, επανόρθωσις, form'd of ὀρθός, *Right*, *Straight*, whence ὀρθόω, *I ſtraighten*, ανορθόω, επανορθόω, *I redreſs*, *ſtraighten*, *correct*, and ἐπανόρθωσις, *Correction*.

The *Latins* call it *Correctio*, and *Emendatio*.

EPAULE, or ESPAULE, in Fortification, the *Shoulder* of the Baſtion; or the Angle made by the Face and Flank; whence that Angle is often called the *Angle of the Epaule*. See BASTION and SHOULDER.

The Word is pure *French*, and literally ſignifies *Shoulder*.

EPAULEMENT, in Fortification, a Side-Work haſtily thrown up, to cover the Canon, or the Men.

It is made either of Earth thrown up, of Bags of Earth, Gabions, or of Faſcines and Earth, of which latter make, the *Epaulements* of the Places of Arms, for the Cavalry, behind the Trenches are.

EPAULEMENT, is alſo uſed for a Demi-Baſtion, conſiſting of a Face and Flank, placed at the Point of a Horn- or Crown-Work. Alſo, for a little Flank, added to the Sides of Horn-Work, to defend them when too long. Alſo for the Redoubts made on a right Line, to fortifie it. And, laſtly, for a Square Orillon, which is a Maſs of Earth almoſt ſquare, faced and lined with a Wall, and deſigned to cover the Canon of a Caſement.

EPENTHESIS, in Grammar, the Addition, or Inſertion of a Letter, whether a Vowel, or Conſonant, in the Middle of a Word; as *Relligio* for *Religio*. See FIGURE.

The Word is *Greek*, ἐπένθεσις, form'd of ἐπὶ, ἐν, and τίθημι, *q. d.* επενπίθημι, *infero*, *immitto*.

EPHA, a dry Meaſure in Uſe among the *Hebrews*. See MEASURE.

The *Epha* was the moſt ordinary Meaſure they uſed; and that whereby the reſt were regulated. 'Tis commonly ſuppoſed that the *Epha*, reduced to *Roman Modius*, contain'd four *Modii* and a half. Now the *Roman Modius* of Grains, or Flower, contain'd 20 *Libræ*, or Pounds; conſequently the *Epha* weigh'd 90 Pounds. Dr. *Arbuthnot* reduces the *Epha* to 3 Pecks, 3 Pints, *Engl.*

The Hoſpitality of *Gideon* is prais'd for baking an *Epha* of Flower for a ſingle Angel. Which might have ſerved 45 Men a whole Day; the uſual Portion allow'd the Workmen being two Pound of Bread *per Diem*.

EPHEMERA, in Medicine, an Epithet applied to ſomething that only laſts one Day; particularly to a *Fever*, which terminates in the Compaſs of a Day, *i. e.* to an Acceſs of a Fever which returns no more, called by *Galen*, ἐφήμερος πυρετὸς, *Febris Ephemera*, and alſo *Diaria*. See FEVER.

The

The Word, and the following one, *Ephemerides*, are form'd of the Prepoſition ἐπὶ, *de, ſuper, apud, ob, in, præter*, in *Engliſh*, of, on, at, for, in, by, near; and ἡμέρα, *Dies*, Day.

EPHEMERA, on EPHEMERON, in Natural Hiſtory, an Animal that only lives five Hours: Within the Term whereof it is born, grows, and extends its Members, appears young, breeds Eggs, caſts Seed, grows old, and dies.

Ariſtotle, who gives the firſt Account thereof, in his Book *de Animal.* gave it the Name ἐφήμερον, becauſe its Life was bounded within the Day. *Aldrovandus*, *Jonſton* and *Cluſius*, furniſh us Accounts of the *Ephemeron*; and above all, *Swammerdam*, in an expreſs Work *de Ephem. Vitæ*.

He calls it *Ephemera*, *Hemerobios*, and in Latin *Diaria*.

The *Ephemeron* is of the winged, or fly Kind; and appears uſually about St. *John*'s Tide. It is born about Six a Clock in the Evening, and dies about Eleven.

It muſt be obſerved, however, that e're it aſſumes this Figure, it has lived three Years under that of a Worm, in a clay Cell, or Caſe.

It never eats from the Time of its Change to its Death; nor is it furniſh'd with the Parts neceſſary for the Reception and Concoction of Food. Its Change ſeems intended merely for the Sake of Generating and Multiplying its Kind.

Its Life is ſumm'd up in a few Words. In the Beginning, it ſheds his clay Coat; which done, and the poor little Animal thereby render'd light and agile, it ſpends the reſt of its ſhort Life in friſking over the Waters. During which, the Female drops her Egg on the Waters, and the Male his Sperm on them, to impregnate them. Theſe Eggs, thus impregnated, deſcend to the Bottom of the Water by their own Gravity, and are hatch'd by the Warmth of the Sun into little Worms, which make themſelves Caſes in the Clay, and feed on the ſame without any Need of parental Care: Till the Time of their Change, or Metempſychoſis come.

EPHEMERA, is alſo applied among Botaniſts, to a Kind of Flowers, which open, and expand themſelves at Sun-Riſing, and wither and fade away again at his Setting. Such are the *Dent de lion*, vulgarly Dandelion, and divers others.

The Travellers into *Arabia* tell us of ſeveral *Ephemeron Trees*, which grow every Day, from Morn to Noon, and then diſappear; tho' 'tis not known, whether they wither away entirely, or ſink back into the Sands among which they grow.

EPHEMERIDES, or EPHEMERIS, in Aſtronomy, Tables calculated by Aſtronomers, ſhewing the preſent State of the Heavens for every Day, at Noon; that is, the Places wherein all the Planets are found, at that Time. See PLANET, PLACE, and TABLE.

'Tis from theſe Tables, that the Eclipſes, Conjunctions, and Aſpects of the Planets, are determined; Horoſcopes, or Celeſtial Schemes conſtructed, &c. See CALENDAR.

The *Ephemerides* of *Origan*, *Kepler*, *Argoli*, *Heckerus*, *Mezzaracchis*, *Wing*, *de la Hire*, *Parker*, &c.

Sig. *Caſſini* has made *Ephemerides* of the *Sidera Medicæa*, or *Satellites* of *Jupiter*, which are of good Uſe in determining the Longitude. See SATELLITE, ECLIPSE.

EPHETA, in Antiquity, a Magiſtrate among the *Athenians*.

The *Ephetæ* were inſtituted by King *Demophon*, to take Cognizance of Murthers committed by Accident: Their Number was 100, whereof 50 were *Athenians*, and 50 *Argians*. They were not admitted to the Poſt till upwards of 60 Years of Age.

Draco extended their Authority. *Ubo Emmius*, *de Rep. Athen.* ſays, he transferr'd Part of the Juriſdiction of the *Areopagites* upon 'em.

EPHIALTES, in Medicine, a Diſeaſe, by the *Engliſh* call'd the *Night-Mare*, and the Latins *Incubus*; chiefly affecting Perſons aſleep, when laid on their Back, and having the Stomach loaded with Food of difficult Digeſtion. See INCUBUS.

In this State they are oppreſs'd, as it were, with a huge Weight on the Breaſt, and imagine ſome Spectre, or Demon, ſtopping their Breath.

This Diſeaſe does not ariſe, as was antiently imagined, from groſs Vapours filling the Ventricles of the Brain: But rather from a too great Repletion of the Stomach, which hinders the Motion of the Diaphragm, and of Conſequence, the Dilatation of the Breaſt neceſſary for Inſpiration. See RESPIRATION.

Etmuller obſerves, that they are but rarely affected with this Diſorder who uſe a laudable Diet, and ſup ſparingly: lying on the Side, with the Head pretty high, generally prevents it.

The *Arabs* call it, the *Nocturnal Epilepſy*, becauſe, when habitual, it uſually degenerates into the Epilepſy, being the uſual Forerunner thereof, eſpecially in young People. In old, it frequently terminates in an Apoplexy. See EPILEPSY, &c.

Menjoitius accounts for its being moſt uſual in Boys, from their being too voracious, and eating more than they can digeſt. *Aurelianus* aſſures us, it has kill'd ſeveral; adding from *Silimachus*, that there was a contagious, or epidemic *Incubus* at *Rome*, which over-run Numbers like a Plague.

EPHIPPIUM, in Anatomy, a Part of the *Sphenoides*, call'd alſo *Sella Equina*, and *Sella Turcica*. See SELLA *Equina*.

EPHOD, a Sacerdotal Garment, in Uſe among the antient *Jews*.

The *Ephod* is ſuppoſed to have been a Kind of Linnen Alb, or Surplice, by the *Latins* call'd *Super-humerale*: But 'tis very hard to ſay preciſely what it was; And there is Room enough for the Interpreters to be divided about it.

The only Point they are agreed upon is, that it was an upper Garment wore over all the reſt, immediately under the Pectoral, or Breaſt-plate. Some hold it had Sleeves; others deny it. The Generality agree it was very ſhort, tho' ſome hold, that it hung down to the Feet behind.

There were two Kinds of *Ephods*; the one, common to all who aſſiſted in the Temple; being only made of common Linnen, mention'd in the I*ſt* Book of *Samuel*, ii. 18. The other, peculiar to the High-Prieſt, mention'd *Exod.* xxviii. 6, 15. to be made of Gold, of blue, and of Purple, of Scarlet, and fine twined Linnen, with cunning Work; Having two Shoulder Pieces, with a curious Girdle of the ſame Matter, whereon were two Onyx's, with the Names of the Children of *Iſrael* engraven thereon.

It is alſo expreſs'd, in the II*d* Book of *Samuel*, vi. 14. that upon the Removal of the Ark of the Covenant from the Houſe of *Obed Edom*, that Prince danced for Joy, girded with a Linnen *Ephod*; whence ſome Authors have concluded, that the *Ephod* was alſo a Regal Garment on ſolemn Occaſions.

The Word אפד *Ephod*, is derived from אפד *Aphad*, a *Hebrew* Word, ſignifying *to cloath*.

EPHORI, Magiſtrates eſtabliſhed in ancient *Sparta*, to balance, and check the Power and Authority of the Kings; as, at *Rome*, there were Tribunes created to controul the Power of the Conſuls. See TRIBUNE.

Lycurgus, being ſenſible that a perfect Underſtanding between the Prince and the People, was the Baſis and Foundation of both their Happineſs; To maintain that good Underſtanding, eſtabliſh'd *Ephori*, or Inſpectors, as a Kind of Mediators, who ſhould have an Eye to the Meaſures and Conduct of both Sides, and preſerve ſo equal a Ballance between 'em, that the Regal Power ſhou'd never decline into Severity and Tyranny; nor the Liberty of the People run into Licenſe and Rebellion.

The Authority of the *Ephori* was very great: On certain Occaſions, they expell'd, and even put to Death, the Kings; and aboliſhed, or ſuſpended the Power of the other Magiſtrates; calling 'em to Account at Pleaſure. *Ageſilaus*, in the Height of all his Conqueſts, which even ſtruck Terror on the great King of *Perſia*; ſtopp'd, and turn'd back, out of Deference to the *Ephori*, when they recall'd him. Some Authors deny, that the *Ephori* were eſtabliſh'd by *Lycurgus*.

The Word is form'd of the *Greek* ἐφορᾶν, *intueri*, form'd of the Prepoſition ἐπὶ, and the Verb ὁρᾶν, *to ſee*; whence ἔφορος, *Inſpector*.

EPIBATERIAN, a Compoſition of Poetry, in Uſe among the ancient *Greeks*.

When any Perſon of Condition and Quality, return'd Home after a long Abſence, or Journey, into another Country; he call'd together his Friends, and Fellow-Citizens, and made 'em a Speech, or rehears'd them a Copy of Verſes, wherein he return'd ſolemn Thanks to the Immortal Gods, for his happy Return, and ended with an Addreſs, by way of Compliment, to his Fellow-Citizens.

This Copy of Verſes, is what the *Greeks* call Ἐπιβατήριον, *Epibaterium*, of ἐπιβαίνω, *I return*. At going away, they had another, call'd *Apobaterium*. See APOBATERIUM.

EPIC *Poem*, call'd alſo EPOPEA; an heroick Poem; or a Poem relating ſome great and ſignal Tranſaction of a Hero. See HERO, &c.

Such is the Iliad and Odyſſee of *Homer*, the Æneid of *Virgil*, the *Gieruſalemme* of *Taſſo*, and the Paradiſe loſt of *Milton*; which are the principal Poems of the *Epic* Kind. See ILIAD, ÆNEID, &c.

The *Epic* Poem, is more accurately and ſcientifically defined, by that excellent Critic, Fath. *Boſſu* in an expreſs Treatiſe on that Subject, to be a Diſcourſe invented with Art,

Art, to form the Manners by Inſtructions, diſguiſed under the Allegory of an important Action, related in Verſe, in a probable, entertaining, and ſurprizing Manner. See POEM.

The *Epopea* is diſtinguiſhed from the Comedy, in that the Action of the latter is not *important*, nor is it *related* by the Poet, but acted by the Perſons introduced for that Purpoſe; which Circumſtance, likewiſe, diſtinguiſhes it from a Tragedy. See COMEDY and TRAGEDY.

Nor is it a philoſophical Poem, as that of *Lucretius*, on the Creation of Sir *R. Blackmore*; nor a Treatiſe of Agriculture, or the like, as the Georgicks of *Virgil*; thoſe Poems not being intended to form the Manners: beſide, that the Inſtructions they contain are naked, ſimple, and direct, without any Diſguiſe, or Allegory. Which ſecond Circumſtance likewiſe diſtinguiſhes it from a Treatiſe of Morality, wrote in Verſe: Or a ſimple Hiſtory in Verſe, as the *Pharſalia* of *Lucan*; the Punic War of *Silius*; or the Civil Wars of *Sam. Daniel*; add, that its being confined to *one important Action*, diſtinguiſhes it from a Poem which relates all the Actions of a Perſon's Life; as the *Theſeid* and *Achilleid* of *Statius*, which are what we properly call *Heroic Poems*. See HEROIC.

Mon. *de la Motte*, indeed, in his Controverſy with Madam *Dacier*, on the Subject of *Homer*, maintains, that the whole Life of a Hero, may juſtly be made the Subject of an *Epic* Poem; and even, that the *Lutrin* of Mon. *Boileau*, might paſs for an *Epic Poem:* But he ſeem'd, afterwards, to return to the common Sentiment. In effect, the Queſtion is not as to the Senſe, which may be affected to the Words *Epic Poem*, but the Senſe which Cuſtom has actually affected to 'em.

If we had only Regard to the Etymology of the Word *Epic*, (of ἔπος, *Verſe*; *Poetry*, from ἔπω, *dico*, *I ſpeak*, *relate*) all Poems wherein the Poet ſpeaks, or rehearſes Things himſelf, without making the Perſons of his Poem ſpeak, except at ſecond hand, as he relates what they ſpoke on this or that Occaſion, wou'd be *Epic* Poems; and ſo, there's not an Epigram, Sonnet, or Madrigal, but wou'd come under this Denomination. But this were wild.

In Effect, the Term *Epic* Poem, is only attributed to a Compoſition, whoſe Subject is great, inſtructive, and ſerious; that only comprehends one ſingle principal Event, to which all the reſt refer; which principal Action is to be terminated in a certain Space of Time, ordinarily about a Year. 'Tis true all this is arbitrary; but the Senſe of all Words is ſo too: And in Matters of Language we muſt always be guided by Cuſtom.

If M. *de la Motte* had only pretended, that one might make a fine, inſtructive Poem, on the whole Life of a Hero; or an agreeable, and diverting Poem, on ſome humorous Adventure; all the World would have been of his Side. But 'tis enough that Cuſtom has not thought good to apply the Term *Epic*, either to Subjects of too much Extent, and that are ſtuff'd with too many Incidents no wiſe connected together; nor to burleſque Poems, as the *Batrachomyamachia* of *Homer*; the *Secchia Rapita* of *Taſſoni*; the *Defaite de Dulot*; the *Lutrin* of *Boileau*; the *Hudibras* of *Butler*; the *Rape of the Lock* of Mr. *Pope*; or the *Diſpenſary* of Dr. *Garth*. See BURLESQUE.

The *Epic* Poem, then, as appears from what was above obſerved, bears a Relation, or Analogy, to four Things; Hiſtory, Morality, Fable, and Poetry: To Hiſtory, as both of 'em relate one or more Actions; but then, the Actions of Hiſtory are ſingular; ſo that the *Epopea* is no Hiſtory, nor Kind of Hiſtory. See HISTORY.

To Moral Philoſophy, as both of them conſiſt of Inſtructions for forming the Manners; but the Action and Allegories diſtinguiſh it herefrom. See MORALITY.

But it relates entirely to Poetry and Fable, as being ſtrictly a Poem, and a Fable. See POETRY and FABLE.

The Nature of the *Epic* Poem, is finely drawn by the great Critic abovementioned: The *Epic* Poets, ſays Fath. *Boſſu*, have done that with Regard to Morality, which the ancient Heathen Divines did with Regard to the Divinity. The too great Diverſity of divine Actions and Perfections, ſo very diſproportionate to our Comprehenſion, obliged the latter to divide a ſingle Idea of a ſimple Eſſence, God, into ſeveral Perſons; to whom they attributed ſeveral Names, *Jupiter*, *Juno*, *Neptune*, &c. See GOD.

And, on the contrary, the Nature of moral Philoſophy, which never preſcribes Rules for particular Things, lead the Poets to collect into one ſingle Idea, one and the ſame Perſon, and one apparently ſingular Action, whatever of that Kind was found in different Perſons, and different Actions.

Thus *Ariſtotle*, Ου σχαζεται ἡ Ποιησις ονομασι, &c. Poetry, ſays he, teaches moral Philoſophy, not by relating only, in manner of an Hiſtorian, what *Alcibiades*, for inſtance, did or ſuffer'd; but by propoſing what ſome Perſon, named as the Poet thinks fit, wou'd, probably, or neceſſarily have done on the like Occaſion. And thus it is that he ſhews either the unhappy Conſequences uſually attending imprudent Schemes, or ill Actions; or the Reward of good Actions, and the Satisfaction reſulting from a Deſign laid in Virtue, and conducted with Prudence. So that in the *Epic* Poem, according to *Ariſtotle*'s Sentiment, the Perſons and Actions, however named, are all feign'd, allegorical, and univerſal, not hiſtorical and ſingular.

But the Poets thus taking on 'em the Office of Moral Philoſophers, did not ceaſe to be Divines. On the contrary, their Morality it ſelf frequently obliges them to introduce the Deity into their Works; as the Knowledge, Fear, and Love of God, are the firſt and moſt ſolid Foundations of all Morality. The Preſence of the Divinity, and the Care ſo auguſt a Perſonage was ſuppoſed to have of the Action, obliged the Poet to make the Action great and important, and to have it tranſacted by Kings and Princes. The ſame likewiſe obliged 'em to think and ſpeak, in a manner elevated above the common Pitch of Men; and equal, in ſome meaſure, to the Dignity of the divine Perſons introduced. To which End ſerves the poetical and figurative Language, with the Majeſty of Heroic Verſe. Add, that as ſo much of the divine and miraculous might ruin the Probability, they were hereby obliged to have Recourſe to ſeveral Rules to maintain the ſame. See MACHINE.

Thus much the Poets were driven to by the Subſtance of the Things they had choſe for the Matter of their Poems and Inſtructions. The Manner of delivering 'em uſefully and methodically, obliged 'em to ſeveral other Rules. See UNITY, EPISODE, &c.

The *Epic* Poem is intended more for the Manners and Habitudes, than for the Paſſions. Theſe latter riſe all at once, and their Violence is but of ſhort Duration; but the Habitudes are more calm, and impreſs'd, or quitted more leiſurely. Conſequently, the *Epic* Action cou'd not be included in the Space of a Day, as that of the Theatrical. A longer Time was neceſſary than is required for Tragedy, which is altogether for the Paſſions.

This Diſtinction has introduced a World of Difference between Tragedy and *Epic* Poetry. The Tragic Violence requires a more lively and animated Repreſentation, than a mere Recital. Accordingly, it is wholly thrown into Action, and the Poet never ſpeaks at all, as he does in the *Epopea*, where there are no Actors.

See further of the Nature of the *Epic* Poem under FABLE.

For its Matter, ſee ACTION. For its Form, ſee NARRATION. See alſo MANNERS, CHARACTER, MACHINES, &c.

EPICARPIUM, in Medicine, a Kind of Remedy, uſually in Form of a Cataplaſm, or Plaiſter, conſiſting of ſharp, penetrating Ingredients, as Garlic, or Onion, Spiders-Web, Hellebore, Camphor, Treacle, &c. applied round the Wriſt, at the Beginning of the Acceſs of a Fever, to prevent the ſame.

The Word is form'd of the *Greek* ἐπὶ, *ſuper*, *on*, and καρπὸς, *Carpus*, *Wriſt*.

EPICEDION, in the *Greek* and *Latin* Poetry, a Poem, or poetical Compoſition, on the Death of a Perſon.

At the Obſequies of any Man, there were three Kinds of Diſcourſes uſually made: That rehears'd at his *Buſtum*, or Funeral Pile, was call'd *Nenia*; that engraven on his Tomb, *Epitaph*; and that ſpoke in the Ceremony of his Funeral, *Epicedion*. See NENIA and EPITAPH.

We have two beautiful *Epicedions* in *Virgil*; that of *Euryalus*, and that of *Pallas*.

The Word is *Greek*, form'd of ἐπὶ, *upon*, and κήδεσθαι, *to perform Funerals*, to do the laſt Office to any one, of κῆδος, *cura*, *care*.

EPICOENE, in Grammar, a Term applied to Nouns, which, under the ſame Gender and Termination, mark, indifferently, two Kinds, or Sexes. See GENDER.

Such, in *Latin*, is *Aquila*, *Veſpertilio*, &c. which ſignifie equally, a Male or Female Eagle, or Bat.

Grammarians diſtinguiſh between *Epicœne* and *Common:* A Noun is ſaid to be common of two Kinds, when it may be joyned either with a Maſculine, or a Feminine Article; and *Epicœne*, when it is always joyn'd to ſome one of the two Articles, and yet ſignifies both Genders.

EPICERASTICKS, in Medicine, are Remedies, which by their emplaſtic Virtue, or temperate Moiſture, ſoften the Acrimony of an Humour, and aſſwage the painful Senſation of the Part irritated or afflicted: Such are the Roots of Althæa, Mallows, Liquorice; Leaves of Lettice, Mallows, Nenuphar, Purſlain; the Seeds of Flax, Poppy, &c.

The Word is form'd of ἐπὶ and κεράννυμι, *tempero*, I moderate, correct.

EPICHEREMA, in Logic, an Argumentation, consisting of four, or more Propositions; some whereof are Proofs of others.

Thus, that Oration of *Cicero* for *Milo*, may be reduced to the *Epicherema*. Those who Way-lay a Man to kill him, 'tis lawful for him to kill; as is allowed by the Laws of Nature and Nations, and by the Practice of the best Men: But *Clodius* Way-laid *Milo* with that View; as appears from his forming an Ambuscade before his Country House, and from his Provision of Weapons, Soldiers, &c. Therefore it was lawful for *Milo* to kill *Clodius*. See SORITES.

EPICOLIC *Regions*, from ἐπὶ, *supra*, upon, and *Colon*, the Gut so called; a Name given by Dr. *Glisson*, to that Space, on both Sides, over the Colon. See COLON.

EPICUREANS, a Sect of antient Philosophers, who adhere to the Doctrines and Opinions of *Epicurus*. See EPICUREANISM.

The *Epicureans* have, in all Ages, been decried for their Morals, and their Attachment to the Pleasures of Sense: Several Authors, particularly, *Cicero* among the Antients, and *Gassendus* among the Moderns, have endeavoured to vindicate them from this Charge; by shewing that the Pleasure wherein their Master *Epicurus* places the *Summum bonum*, or supreme Happiness of this Life, was not any sensual, or brutal Pleasure, but a Contentment, and Tranquillity of Mind, exempt from all tumultuary Passions, &c.

This Opinion seems just, and well grounded; but, without entering into the Question, which *Gassendus*, *Du Rondel*, and others have exhausted; 'tis certain, that in the common Use of the Word, *Epicurean* constantly signifies a Debauchee, an indolent, soft, effeminate Person, who only consults his Pleasure, without concerning himself with any Thing serious.

In Effect, there were always two Kinds of *Epicureans*; the Rigid and Remiss: The Rigid *Epicureans*, were those strictly attach'd to the Sentiments of *Epicurus*, who placed all their Happiness in the pure Pleasures of the Mind, resulting from the Practice of Vertue. The Remiss *Epicureans*, taking the Words of that Philosopher in a gross Sense, placed all their Happiness in Pleasures of the Body, in Eating, Drinking, Loving, &c. The former Kind, who were the genuine *Epicureans*, call'd the other the Sophists of their Sect.

The *Epicureans* take their Name from the Chief of their Sect, *Epicurus*, whom some, however, deny to be the Author of the Philosophy he taught; charging him with Retailing for Physicks, the Doctrine of *Democritus*; and for Ethicks, that of *Aristippus*.

Be this as it will, he was an *Athenian*, and the Son of *Neocles*; born in the 109th Olympiad, and consequently 342 Years before Christ. He began to form his School at *Mitylene* and *Lampsachus*, about the 32d Year of his Life; tho' he afterwards remov'd to *Athens*, where he philosophized chiefly in his Garden: And died of the Stone at 72 Years of Age.

EPICUREANISM, or EPICUREAN *Philosophy*, the Doctrine, or System of Philosophy, maintain'd by *Epicurus*, and his Followers. See EPICUREANS.

The noble Poet *Lucretius*, who has given us a beautiful System of *Epicureanism* in fine *Latin* Verse, prefers its Father *Epicurus*, above all other Philosophers, whom, he makes no Scruple to say, he obscured, as much as the Sun does the other Stars. 'Tis said he first taught Grammar; till upon reading *Democritus*'s Books, he began to apply himself to Philosophy.

From *Democritus* he learnt the Doctrine of Atoms, or Corpuscles, which he afterwards made the Basis of his Physicks. *Clem. Alexand.* Strom. 6. advances, that *Epicurus* stole his chief Doctrines from *Democritus*. But, 'tis certain, he greatly improved and illustrated them. *Diog. Laertius* assures us, he composed an infinite Number of Volumes.

This Philosophy consisted of three Parts: *Canonical* κανονικὸν, *Physical* φυσικὸν, and ἠθικὸν, *Ethical*; which he explain'd briefly in three Epistles.

The first, as *Laertius* relates, was about the Canons, or Rules of Judging; wherein, rejecting the Use of Logic, he establish'd the Senses, Passions, and Anticipations, as the Criterions, or Judges of Truth. See CRITERION, SENSE, &c.

In the second, he laid down Atoms, Space and Gravity, as the first Principles of all Things. The Universe he taught, consisted of Atoms, or Corpuscles, of various Forms, Magnitudes and Weights, which having been dispersed at Random thro' the immense Inane, or Space, fortuitously concurred into innumerable Systems, or Worlds, which were thus form'd, and afterwards, from Time to Time, increas'd, changed, and dissolved again, without any certain Cause, or Design; without the Intervention of any Deity, or the Intendance of any Providence. See ATOM and CORPUSCLE.

Not that he denied the Existence of a God: On the contrary, he asserted it; but thought it beneath the Majesty of the Deity to concern it self with human Affairs: *Laertius* assures us, he held him, τὸ μακάριον, καὶ ἀφθαρτον, ὅτε αὐτὸ πράγματα ἔχει ὅτε ἄλλῳ παρέχει, *A Blessed, Immortal Being, having no Affairs of his own to take Care of, and above taking Care of those of others.* See CORPUSCULAR, SPACE, GRAVITY, ELEMENT, &c.

As to *Ethicks*; his first Principle, or the supreme Felicity of Man, he held, was Pleasure. Which some, as already observed, understand of Mental, and others of Carnal Pleasure. See EPICUREANS.

EPICYCLE, in the antient Astronomy. As the Astronomers have invented an Eccentric Circle, to solve the apparent Irregularity of the Planets, and their different Distances from the Earth; they have likewise invented a little Circle to solve the Stations, and Retrogradations of the Planets. This little Circle which they call *Epicycle*, has its Centre in the Circumference of another greater, which is the Eccentric of a Planet. See ECCENTRIC.

In this Eccentric, the Centre of the *Epicycle* moves; carrying with it the Planet fix'd in its Circumference, the Centre of the Planet, all the Way, moving regularly along the Circumference of the *Epicycle*, when downwards, according to the Order of the Signs, and when upwards, contrary to it.

The highest Point of the *Epicycle* is call'd the *Apogee*, and the lowest the *Perigee*. See APOGEE and PERIGEE.

The great Circle, in whose Circumference the Centre of the *Epicycle* is plac'd, is call'd the *Deferent of the Epicycle*, as carrying the *Epicycle* along with it. See DEFERENT.

Thus, the Moon is supposed to move in an *Epicycle*, whose Centre is in the Orbit of the Earth, according to the Hypothesis of *Copernicus*: But in that of *Ptolomy*, who supposed the Heavens solid, the *Epicycle* was a Sphere, which revolved with the Moon, of the Thickness allowed its Heaven or Orbit; and which, sometimes shew'd it higher, and sometimes lower. See *Ptolemaic* SYSTEM.

'The Astronomers, who deny the Motion of the Earth; 'in Order to render the Phænomena of the Motions of the 'Planets more consistent with the Motion of the Sun, 'have affix'd the Orbit of the Earth, as an *Epicycle*, to 'the Orbit of the Planets: So that the Planet should 'proceed in an *Epicycle*, while it is carried through its 'Orbit round the Sun: But this is far from answering 'their Expectations.' *Wolf. Elem. Math.* T. II. p. 501.

'*Ricciolus*, tho' a zealous Enemy of the Motion of the 'Earth, cou'd not make any Astronomical Tables that 'should but tolerably agree with Observation, without 'supposing the Earth to move; not, tho' he called in all 'the foreign and forced Assistances of changeable *Epicycles*, 'liable to continual Increase and Decrease, and variously 'inclined to the Ecliptic.' *De Chales Astron. Reform.* Lib. X. *C.* 1. f. 353, &c.

The Word is form'd of the *Greek*, ἐπὶ, and κύκλος, *Circle*, q. d. a Circle on a Circle.

EPICYCLOID, in Geometry, a Curve generated by the Revolution of a Point of the Periphery of a Circle, along the Convex, or concave Part of another Circle. See CURVE.

A Point of the Circumference of a Circle, proceeding along a Plane, in a right Line, and at the same Time revolving on its Centre, describes a *Cycloid*. See CYCLOID.

And the generating Circle, if in lieu of moving on a right Line, it move along the Circumference of another Circle, whether equal or unequal; the Curve described by any Point in its Circumference is called an *Epicycloid*.

If the generating Circle proceed along the Convexity of the Periphery, it is called an *upper*, or *Exterior Epicycloid*: If along the Concavity, a *lower*, or *Interior Epicycloid*.

In an *Epicycloid*, the Part of the Circle, the generating Point moves along, is called the *Base of the Epicycloid*: Thus in *Tab. Geom. Fig.* 58. D B is the *Base* of the *Epicycloid*, V its *Vertex*; V B its *Axis*; D P V half of the *Exterior Epicycloid*, made by the Revolution of the *Semi-circle* V L B, (which is called the *Generant*) along the Convex Side of the Base, D B: As D P U is the *Interior Epicycloid*, formed by the Generant's revolving along the Concave Side of the Base.

The Length of any Part of the Curve, which any given Point in the revolving Circle has described, from the Time it touched the Circle whereon it revolved, is demonstrated to be double the versed Sine of half the Arch, which all that Time touched the quiescent Circle, as the Sum of the Diameters of the Circles, to the Semi-diameter of the quiescent Circle: Provided the revolving Circle moves upon the Convex Side of the quiescent Circle; but, if upon the Concave Side, as the Difference of the Diameters, to the Semi-diameter.

Dr. *Halley* gives us a general Proposition for measuring all *Cycloids* and *Epicycloids*; thus: The Area of a *Cycloid*, or *Epicycloid*, either primary, or contracted, or prolate, is to the Area of the generating Circle; and also the Area of the Parts, generated in those Curves, to the Areas of analagous Segments of the Circle: As the Sum of double the Velocity of the Centre, and Velocity of the

circular

circular Motion, to the Velocity of the circular Motion. The Demonſtration hereof, See in *Phil. Tranſact.* N° 218.

EPIDEMIA, or EPIDEMIC *Diſeaſe*, is ſometimes uſed for a catching, or contagious Diſeaſe; communicable from one to another: Such as the Plague, Pox, Scorbutus, *&c.*

Epidemic Diſeaſe, however, is more properly, and uſually, underſtood of a general or ſpreading Diſorder, as a Plague, ariſing from ſome Corruption, or Malignity in the Air, which ſeizes great Number of People in a little Time.

The Word is form'd of ἐπὶ and δῆμος, *Populus*, People; ſuch Diſeaſes running among all Kinds of People, of whatever Age, Sex, Quality, *&c.* as ariſing from a common or general Cauſe. Whence the *Latins* call them *Populares Morbi*, popular Diſeaſes; in Oppoſition to thoſe call'd *Sporadici*, which are only here and there, as ariſing from private, or particular Cauſes. See SPORADIC.

EPIDEMIA, in Antiquity, Feaſts of *Apollo* at *Delphos*, and *Miletus*; and of *Diana* at *Argos*. See FEAST.

Theſe Feaſts bore the Name *Epidemia*, by Reaſon thoſe Gods were imagin'd to be preſent on thoſe Days among the *People*. Accordingly, on the laſt Day of the *Epidemia*, they ſang Hymns, call'd ἀποπεμπτικὸς, to bid them adieu, and ſet them forwards on their Journey.

As thoſe Gods could not be every where, and yet were honour'd in Abundance of different Places; there were Times allow'd them to paſs from one Place to another to receive the Vows of their Adorers. See *Scaliger*, *Poet.* L. III. *C.* 114.

EPIDERMIS, in Anatomy, the *Cuticula*, or Scarf-ſkin. See CUTICLE.

Some hold the *Epidermis* to be form'd of the Excrements of the *Dermis*, or Skin: *Hippocrates* is of Opinion, it is engender'd by Cold; as, on Blood, Broth, or the like, when cold, we ſee a Pellicle form'd.

But 'tis now paſt doubt, that it is produced at the ſame Time, and after the ſame Manner with the other Parts; it being found in *Fœtus's* of all Ages, in the Womb: It has neither Veins, Arteries, nor Nerves; whence it is inſenſible.

The Word is form'd of the *Greek*, ἐπὶ, *on*, *over*, and δέρμα, *Skin*.

EPIDIDYMIS, in Anatomy, a little, round Body, on the Back of each Teſticle; call'd alſo *Paraſtata*. See PARASTATA.

The Word is form'd of the *Greek*, ἐπὶ, and δίδυμος, *Twin*, *Teſticle*.

EPIGASTRIC *Region*, is a Name given to the upper Part of the Abdomen, or Belly; reaching from the *Cartilago Xyphoides*, almoſt to the Navel. See REGION.

It is divided into three Parts: The Sides, or lateral Parts, call'd *Hypochondria*; and the middle, the *Epigaſtrium*. See HYPOCHONDRIA, *&c.*

There are alſo two *Epigaſtric* Veins, and as many Arteries. The Arteries are Branches of the Iliac External Arteries: The Veins diſcharge themſelves into the Iliac External Veins.

EPIGASTRIUM, in Anatomy, the middle Part of the *Epigaſtric* Region; or, according to others, the interior Part of the lower Venter, or Abdomen. See EPIGASTRIC.

The Word is form'd of the *Greek*, ἐπὶ and γαστὴρ, *Belly*.

EPIGLOTTIS, in Anatomy, the Cover or Lid of the *Larynx*. See LARYNX.

The *Epiglottis* is a thin, moveable Cartilage, in Form of a Leaf of Ivy, or a little Tongue, and therefore likewiſe call'd *Lingula*; ſerving to cover the Cleft, or Rima of the *Larynx*, call'd *Glottis*. See GLOTTIS.

The Word is form'd of ἐπὶ and γλῶσσα, or γλῶττα, *Tongue*.

Galen takes the *Epiglottis* to be the principal Organ, or Inſtrument, of Voice; ſerving to vary, modulate, and render it harmonious. See VOICE.

Its Baſe, which is pretty broad, is in the upper Part of the *Cartilago Scutiformis*, and its Point, or Tip, turn'd towards the Palate. It is only ſhut by the Weight of the Piece in ſwallowing; but not ſo exactly, but that a Crum, or a Drop, ſometimes eſcapes thro' it into the *Trachea*. See TRACHEA, *&c.*

EPIGRAM, in Poetry, a ſhort *Poem*, or Compoſition in Verſe, treating of one only Thing, and ending with ſome Point, or lively, ingenious Thought. See POEM.

The Word is form'd of the *Greek*, ἐπίγραμμα, *Inſcription*, of ἐπιγράφειν, *to inſcribe*, or make an *Inſcription*.

Epigrams, in Effect, properly ſignify *Inſcriptions*, and derive their Origin from thoſe Inſcriptions placed by the Antients on their Tombs, Statues, Temples, triumphal Arches, *&c.* See INSCRIPTION.

Theſe, at firſt, were only ſimple Monograms; afterwards, increaſing their Length, they made them in Verſe, to be the more eaſily retain'd: *Herodotus*, and others, have preſerved us ſeveral of them.

Such little Poems retain'd the Name *Epigrams*; even after the Deſign of their firſt Inſtitution was varied, and People began to uſe them for the relating of little Facts, and Accidents, the Characterizing of Perſons, *&c.*

The *Greeks* confine their *Epigrams* to a very narrow Compaſs: For tho', in the Anthology, we here and there meet with a very long one; ordinarily, they don't exceed ſix, or, at moſt, eight Verſes. The *Latins* were not always ſo ſcrupulous, and the Moderns much leſs, as to theſe Bounds.

M. *le Brun*, in the Preface to his *Epigrams*, defines an *Epigram* a little Poem, ſuſceptible of all Kinds of Subjects, and ending with a lively, juſt, and unexpected Thought: Which are three Qualifications eſſential to the *Epigram*; particularly the firſt and laſt of them, *viz.* Brevity and the Point, or Cloſe of the *Epigram*.

To attain Brevity, only one Thing is to be aim'd at in the Poem, and that to be purſued in the conciſeſt Terms poſſible. Authors are much divided, as to the Length the *Epigram* is to be confined to: The ordinary Limits are from two to twenty Verſes; tho' we have Inſtances, both among the Antients and Moderns, where they extend to fifty. But ſtill it is allow'd that the ſhorter the better, and more perfect, as it partakes more of the Nature and Character of this kind of Poem.

The Point is a Quality much inſiſted on by the Criticks, who require the *Epigram* conſtantly to cloſe with ſomething poignant, and unexpected, to which all the reſt of the Compoſition is only preparatory. Others there are, who exclude the Point, and require the Thought to be equably diffuſed throughout the whole Poem, without laying the whole Streſs on the Cloſe: The former is uſually *Martial's* Practice, and the latter that of *Catullus*. Which is the moſt beautiful and perfect Manner, is diſputed by a third Claſs of Criticks.

The Greek *Epigrams* have ſcarce any Thing of the Point, or Briſkneſs, of the *Latin* ones: Thoſe collected in the Anthology, have moſt of them a certain Air of Eaſineſs and Simplicity, attended with ſomething juſt and witty: Such as we find in a ſenſible Peaſant, or a Child that has Wit. They have nothing that bites, but ſomething that tickles. Tho' they want the Salt of *Martial*, yet to a good Taſt they are not inſipid; except a few of them, which are quite flat and ſpiritleſs. However, the general Faintneſs, and Delicacy of the Pleaſantry in them, has given Occaſion for *a Greek Epigram*, or *Epigram a la Grecque*, to be the Denomination for an *Epigram* void of Salt or Sharpneſs.

'Tis principally the Point that characteriſes the *Epigram*, and diſtinguiſhes it from the *Madrigal*. See POINT.

In the modern Verſification, as obſerved by *Fa. Mourgues*, the *Epigram* and *Madrigal*, are diſtinguiſh'd by the Number of Verſes, and the Cloſe. 1°. By the Number of Verſes, which in the Modern *Epigram* does not go beyond eight, nor in the Modern *Madrigal*, comes ſhort of ſix: And, 2dly, In that the Cloſe, or Fall of the *Epigram*, has always ſomething more lively and ſtudied than that of the *Madrigal*. See MADRIGAL.

The *Epigram* is the loweſt, and leaſt conſiderable of all the Productions of Poetry; and 'tis rather an Effect of good Luck, than of Art, to ſucceed therein. The Fineſſe, and Subtlety of the *Epigram*, M. *Boileau* obſerves, ſhould turn on the Words, rather than the Thought; which ſeems very little to the Credit of this Kind of Compoſition, as it reduces it to the Nature of the Pun, or Equivoque. *Fa. Bouhours* confirms the Hint, in adding, that the Equivoque is what uſually ſhines the moſt in the *Epigram*.

One great Beauty of the *Epigram*, is to leave ſomething for the Reader to gueſs, or ſupply. Nothing pleaſes the Mind ſo much, as to find ſomething of it ſelf in the Objects preſented it; nor does any Thing diſguſt it more than to preclude it from ſhewing and exerciſing a Faculty it values it ſelf for. *Segrais*.

Monſ. *B. L. M.* the Author of a new Collection of French *Epigrams*, in the Year 1720, has a deal of good Obſervations on the Nature of *Epigram*. He defines it an ingenious Thought delivered in a few Verſes; and conceives it as a Generical Name, including under it divers Kinds of ſhort, lively Poeſies, as the *Sonnet*, *Rondelay*, *Madrigal*, and little *Tales* which only turn on ſome merry Thought. Epitaphs and Inſcriptions, he thinks, may be alſo uſed, reduced to the Head of *Epigrams*. See SONNET, RONDELAY, *&c.*

The *Epigram* admits of great Variety of Subjects: Some are made to Praiſe, and others to Satyrize, which laſt are much the eaſieſt; ill Nature ſerving inſtead of Point and Wit. *Boileau's Epigrams*, are all Satyrs on one or another. Thoſe of *des Reaux*, are all made in Honour of his Friends. And thoſe of Mad. *Scudery*, are ſo many Eloges. The *Epigram* being only a ſingle Thought, it would be ridiculous to expreſs it in a great Number of Verſes;

Verſes; it muſt have its Unity like the *Drama*. The Comedy has an Action for its Subject; and the *Epigram* a Thought. See UNITY.

EPIGRAPH, an Inſcription on a Building, to ſignifie its Uſe, Occaſion, the Time when, and the Perſons by whom, it was built.

The Word is *Greek*, and ſignifies *Superſcription*.

EPILEPSY, in Medicine, a Convulſion, either of the whole Body, or ſome of its Parts; attended with a Deprivation of the Senſes and Underſtanding; and returning from Time to Time in Fits, or Paroxyſms. See CONVULSION.

The Patient ſeized herewith, falls inſtantly and ſuddenly down; or, rather, throws and precipitates himſelf violently to the Ground. When down, he grinds his Teeth, foams at Mouth, and frequently ſhakes his Head; his Arms, Legs, Neck, Back, *&c.* either becoming rigid, or variouſly diſtorted. And as all the Parts are in a violent Contraction, there is frequently an involuntary Flux of Urine, Seed, and fecal Matter. After ſome Time he returns to himſelf; only retaining a Head Ache, Heavineſs, Wearineſs of their Limbs, *&c.*

Etmuller more accurately diſtinguiſhes the Diſeaſe into three Degrees: The firſt, or loweſt, is much the ſame with the higheſt Degree of a Vertigo. See VERTIGO.

In the ſecond, there ariſe various Agitations and Geſticulations; and the Senſes, both external and internal, either remaining, or being tranſported into a Delirium; they dance, ſing, laugh, weep, talk idly, ſhreek, and beat their Breaſts. Sometimes they remember all after the Fit is over, and ſometimes nothing at all.

In the third Degree, which alone is ordinarily call'd the *Epilepſy*, they loſe the Uſe both of Reaſon and Senſe; fall, or fling themſelves down, foam, grind their Teeth, and bite their Lips, with the other Circumſtances above related. Thoſe affected with the ſecond Degree, are uſually held for *poſſeſs'd by the Devil*.

The Cauſe of this Diſeaſe, *Boerhave* attributes to too much Action of the Brain, on the motory Nerves, and none on the ſenſitive ones. Some are pleas'd to account for it, from the Abundance of ſharp Humours mixing with the animal Spirits, and giving them extraordinary and irregular Motions, and Directions; Whence ariſes its Diſtinction from a Syncope, and Apoplexy, which take away all Motion as well as Senſe. See SYNCOPE and APOPLEXY.

The *Epilepſy* is either *Idiopathic*, or *Sympathetic*: It is Idiopathic, when it ariſes meerly from a Diſorder of the Brain, or Spirits: And ſympathetic, when it is preceded by ſome other Diſeaſe which brings it on.

The *Epilepſy* ſometimes hangs many Years to a Perſon, without much Danger: Tho' when its Paroxyſms return faſt, it renders the Patient more or leſs paralytic, delirious, or ſtupid. In young People there is Hopes of its going off about the Time of Puberty. *Hippocrates* obſerves, that when it ſeizes a Perſon after 25 Years of Age, it laſts for Life; but this does not always hold.

The Cure is very difficult: The principal *Anti-epileptick*s are, the Roots of Pæony, Leaves of the Lilly of the Valley, Seeds of Rue, Miſletoe of the Oak, or Hazle, Box-wood, Spirit of black Cherries, Spirit of human Blood, human Secundines, human Cranium, Tooth of the Sea-Horſe, Caſtoreum, Peacocks Dung, Camphor, Salt, and Oil of Amber.

To recover a Perſon in a Fit, Tobacco Smoak, or that of burnt Feathers, is recommended. *Barbette* above all Things directs the Flowers and Spirits of Sal Ammoniac againſt this Diſeaſe; *Crato*, native Cinnabar. Sir *John Colbatch* has an expreſs Treatiſe on the Miſleto of the Oak, to ſhew it a Specific in this Diſeaſe. Elks Claws have long had the Reputation of the ſame. See each Remedy, its Pretenſions, *&c.* under its proper Term in this Work, as MISLETO, ELKS *Claws*, *&c.*

M. *Poupart*, from a Diſſection of an *Epileptic* Perſon, wherein, immediately under the *Dura Mater*, was found a deal of white, thick, viſcid *pituita*, glued, and, as it were, incorporated with the Membrane; thinks, that this might be the Cauſe of the Diſeaſe; The exceſſive Quantity of ſuch thick Lympha, loading the Brain, and obſtructing its Motions. The firſt Cauſe, he judges, might be the Spongeouſneſs of the *Dura Mater*, which imbibed the Seroſities of the Brain.

He adds, that he knows an *Epileptic* Perſon, who, upon the firſt Approach of his Diſorder, rubs his Forehead with his Hand, and bends his Head as far backward as he can, reſting it againſt a Wall; and by that Means ſecures himſelf againſt the Convulſion. 'Tis probable, that by this he gives a Motion to the Lympha, and drives it from the Place which before it diſturb'd.

The Word *Epilepſy* is form'd of the *Greek*, ἐπιλαμβάνεσθαι, *to ſurprize, graſp hold of one*, by reaſon the Diſeaſe ſeizes and overcomes the Senſes, ſo that the Patient ſeems as if dead.

In *Engliſh* it is uſually call'd the *Falling Sickneſs*, by reaſon People fall down when attack'd therewith. The *Latins* call it *Comitialis Morbus*, by reaſon when any body was ſeiz'd therewith in a *Comitia*, or Aſſembly of the *Roman* People, they preſently broke up the Aſſembly, as deeming it an unhappy Preſage. See COMITIALIS.

Some call it the *Morbus Sacer*, as ſuppoſing it ſent by way of immediate Puniſhment from God. Others, the *Morbus Caducus*, others *Herculeus*, *Sonticus*, *Lues Deifica*, &c.

EPILOGUE, EPILOGUS, in Oratory, *&c.* The Peroration, or laſt Part of a Diſcourſe, or Treatiſe; wherein there is ordinarily made a Recapitulation of the principal Matters deliver'd therein. See PERORATION.

The Word is form'd of the *Greek* ἐπίλογος, of the Verb ἐπιλέγω, *I ſay after*, the Epilogue being the End, or Concluſion of a Diſcourſe.

EPILOGUE, in dramatic Poetry, a Speech addreſs'd to the Audience, when the Play is over, by one of the principal *Perſonæ*, or Actors therein; containing uſually ſome Reflections on certain Incidences in the Play, particularly thoſe of the Part of the Perſon who ſpeaks it.

In the modern Tragedy, the *Epilogue* has uſually ſomewhat of Pleaſantry; intended, we ſuppoſe, to compoſe the Paſſions rais'd in the Courſe of the Repreſentation, and ſend away the Audience in good Humour; tho' how far that Deſign is good and laudable, will bear ſome Diſpute. See TRAGEDY.

An ingenious Author in the *Spectator*, compares it to a merry Jig on the Organ, after a good Sermon, to wipe away any Impreſſions that might have been made thereby, and ſend the People away juſt as they came.

In Effect, tho' the *Epilogue*, in this Senſe, may ſeem an Abuſe; yet has it the Countenance of Antiquity: The *Romans* had ſomething of the ſame Nature, tho' under another Name. Their *Exodium* was a Kind of Farce, brought on the Stage when the Tragedy was over; *ut quidquid Lacrymarum ac triſtitiæ cepiſſent ex Tragicis affectibus, hujus ſpectaculi riſus detergeret*, ſays the Scholiaſt of *Juvenal*.

The *Epilogue* is but of modern Date, much later than the Prologue. See PROLOGUE.

Many, indeed, have taken the *Exodium* of the antient *Greek* Drama, for an *Epilogue*; by reaſon *Ariſtotle* defines it, to be a Part rehearſed after the Chorus had ſung for the laſt Time: But, in Reality, it was of a quite different Nature. The *Exodium* was the laſt of the four Parts of a Tragedy; containing the unravelling and Cataſtrophe of the Plot, and anſwering to our laſt, or fifth Act. See EXODIUM.

EPINICION, a Term in the *Greek* and *Latin* Poetry. It has two different Significations among the Ancients. 1°. A Feaſt, Ceremony, or Rejoycing, on Occaſion of a Victory obtain'd. 2°. A Poem, or Compoſition, on the ſame Subject.

Scaliger treats expreſly thereof in his Poeticks, *L.* I. *c.* 44.

The Word is form'd from the *Greek* νικη, *Victory*.

EPIPHANY, in Antiquity, the *Feaſt of Kings*. A double Feſtival, of the firſt Rank, ſolemnized on the *6th* of *January*, *New-Years-Day*, in Honour of the Appearance of *Jeſus Chriſt* to the Three Kings, or *Magi*, who came to adore and bring him Preſents. See FEAST.

The *Feaſt of Epiphany*, now held in Honour of the Adoration of the *Magi*, had, at its firſt Inſtitution among the *Greeks*, a different Object, *viz.* Our Saviour's Birth; and was call'd *Theophany*, and *Epiphany*, that is, Appearance, and Manifeſtation of God.

Pope *Julius*, who reign'd from the Year 337, to 352, was the firſt who taught the Church to diſtinguiſh the Feaſts of the Nativity, and *Epiphany*. *Papebroch. paral. ad Conat.* p. 23. *Act. SS. Maii. T.* VII. See NATIVITY.

The Word in the Original *Greek*, Ἐπιφάνεια, ſignifies *Appearance*, or *Apparition*; and was applied, as ſome Criticks will have it, to this Feaſt, on Account of the Star which appeared to the *Magi*. St. *Jerom*, and St. *Chryſoſtom*, take it for the Day of our Saviour's Baptiſm, when he was declared to Men by the Voice, *Hic eſt filius meus dilectus, in quo mihi complacui*. This is my beloved Son, in whom I am well pleaſed. And accordingly it is ſtill obſerved by the *Cophtæ* and *Ethiopians* in that View. See *Ludolph. Hiſt. Ethiop. Lib.* XXI. *c.* 2.

Others contend, that the Feaſt of *Chriſtmas*, or the Nativity of our Saviour, was held in divers Churches on this ſame Day; which had the Denomination *Epiphany*, or Appearance, by reaſon our Saviour firſt appear'd on Earth on that Day. And it muſt be allow'd, that the Word is uſed among the antient *Greek* Fathers, not for the Appearance of the Star to the *Magi*, but for that of our Saviour to the World. In which Senſe, St. *Paul* uſes the Word *Epiphania*, in his Second Epiſtle to *Timothy*, *c.* i. v. 10.

Add,

Add, that the *Armenians*, to this Day, celebrate the Feaſt of the Nativity, on the Day of *Epiphany*, according to the Practice of the ancient Church; which ſome *Romiſh* Miſſionaries have impertinently cenſured 'em for, not knowing that the *Epiphany*, originally, and properly, was the Nativity of our Saviour.

Ammianus Marcellinus makes mention of this Feaſt, *Lib.* XXI. *c.* 2. and obſerves that it was held in *January*. Upon which Paſſage, *Valeſius* in his Notes, endeavours to ſhew, that the Hiſtorian meant by *Epiphany*, the Feaſt of the Nativity.

The Heathen Writers uſed the Word *Epiphania* in the like Senſe, *viz.* to expreſs the Appearance of their Gods on Earth. And the Chriſtians, after their Example, applied it, in the general, to expreſs any Appearance, or Manifeſtation of the Deity.

EPIPHONEMA, in Rhetoric, a Figure of Speech. See FIGURE.

The *Epiphonema* is a ſententious Kind of Exclamation, frequently added after a Narrative, or Rehearſal, of any Thing remarkable; containing, uſually, a lively, cloſe Reflection, on the Subject there ſpoke of.

Such is that of St. *Paul*, when, after diſcourſing of the Rejection of the *Jews*, and the Vocation of the *Gentiles*, he cries out:

Oh the Depth of the Wiſdom and Knowledge of God!

Such alſo is that of *Lucretius*, after relating the Story of *Agamemnon*'s ſacrificing his Daughter *Iphigenia:*

Tantum Religio potuit ſuadere malorum ---

Such, laſtly, is that of *Virgil*, upon Occaſion of *Juno*'s perſecuting *Æneas:*

--- *Tantæne animis Cœleſtibus Iræ!*

Which M. *Boileau* has imitated in,

Tant de fiel entre il en l' Ame des Devots?

And Mr. *Pope* in,

And dwells ſuch Rage in ſofteſt Boſoms then?
And lodge ſuch daring Souls in little Men?

EPIPHORA, in Medicine, a Diſeaſe of the Eyes; conſiſting in a preternatural Defluxion of Rheum, or the Matter of Tears; accompanied, frequently, with Heat, Redneſs, and Twitching. *Pitcairn* calls it a Kind of Catarrh of the Glands of the Eye.

The internal Cauſes of the *Epiphora*, or *Rheum in the Eyes*, are a Relaxation of the Glands of the Eyes, and a too great Acrimony, or Sharpneſs of the ſerous Humour ſeparated thereby; which fretting and vellicating the Eye, draws an unuſual Quantity of Blood and Lympha thereto; by which, at length, the Cheek becomes excoriated, *&c.* Children are moſt liable to it, from the frequent Uſe, and ſtraining of the Glands of the Eye in Crying.

The external Cauſes of the *Epiphora*, are ſharp Duſts, Steams, *&c.* entring the Eye, and irritating the ſame. A too cold and ſharp Air has frequently the like Effect. Children are moſt liable to it.

An inveterate *Epiphora* frequently degenerates into a *Fiſtula Lacrymalis.*

The Cure of the *Epiphora*, is, 1°. By cauſing a Revulſion, or Derivation, of the peccant Humour, to ſome other Part, as by Venæſection, Cupping, Bliſtering, or Catharticks. 2°. By correcting its Acrimony by proper Remedies. And, 3°. By applying Aſtringents externally. *Lapis Calaminaris* is much commended.

The Word is *Greek*, form'd of ἐπιφέρομαι, *I am drawn.*

EPIPHYSIS, in Anatomy, is a leſſer Bone, adhering, or growing to another, by ſimple Contiguity. See BONE.

The Subſtance of the *Epiphyſes* is rare and lax; in young Children it is merely cartilaginous; but hardens as they grow in Age, and, at length, becomes quite bony.

'Tis commonly laid down, that there is no regular Articulation between the *Epiphyſis* and the Bone; tho' 'tis certain, that there is a reciprocal Admiſſion of the Heads, or Extremities of each, into the Cavities of the other. See ARTICULATION.

There are ſome Bones that have no *Epiphyſes* at all, as the lower Jaw: Others have no leſs than five, as the *Vertebræ*. The Deſign of adding *Epiphyſes* to Bones, was, to ſupply their Defects, and render them longer and bigger at the Extremes.

The Word is form'd of the *Greek*, ἐπι, *on*, *upon*, and φυειν, *to grow*, *adhere*. It is alſo called *Appendix*, *Additamentum*, *Adnaſcentia*, &c.

EPIPHYSES *Vermiformes*, are two Eminences of the *Cerebellum*, ſhaped like Worms, which keep open the Paſſage from the third to the fourth Ventricle.

In dilating the third Ventricle of the Brain, we perceive four Eminences, two upper, and two bigger, call'd orbicular Protuberances; and two lower, and leſs, call'd *Epiphyſes* of the orbicular Protuberance. *Dionis.*

EPIPLASMA, the ſame with *Cataplaſma*. See CATAPLASM.

EPIPLOCELE, in Medicine, a Kind of *Hernia*, or Tumor, occaſion'd by the Deſcent of the *Epiploon*, or Caul, into the *Scrotum*. See HERNIA. See alſo ENTERO-*Epiplocele.*

EPIPLOIC, or EPIPLOIDES, a Term applied to the Arteries and Veins, diſtributed through the Subſtance of the *Epiploon*, or Caul. See EPIPLOON.

EPIPLOIS *Dextra*, is a Branch of the Celiack Artery, which runs thro' the right Side of the inner, or hinder Leaf of the Caul. See CELIAC.

EPIPLOIS *Siniſtra*, is a Branch of the Celiack Artery, which is beſtowed on the lower and left Side of the Caul. See CELIAC.

EPIPLOIS *Poſtica*, is a Branch of the Celiack Artery, ſpringing out of the lower End of the *Splenica*, and running to the hinder Leaf of the Caul.

EPIPLOMPHALUS, in Medicine, a Species of *Exomphalus*, or Navel-Rupture; being a Tumor, or Swelling of the Part, occaſion'd by the *Epiploon*'s bearing too hard againſt it. See EXOMPHALUS.

The Word is compounded of the *Greek* ἐπίπλοον, and ομφαλὸς.

EPIPLOON, in Anatomy, a fatty Membrane, ſpread over the Inteſtines, and entering even into the Sinuoſities thereof; call'd alſo the *Omentum*, and popularly the *Caul*. See OMENTUM.

The Word is form'd of the *Greek*, ἐπιπλέειν, *to ſwim*, by reaſon it ſeems to float on the Inteſtines.

EPIPLOSARCOMPHALUS, in Medicine, a Sort of Tumor, of the *Exomphalous* Kind. It is form'd of the *Epiploon*, and the Fleſh. See EXOMPHALUS.

The Word is compounded of the three *Greek* Words, ἐπίπλοον, *Epiploon*, σὰρξ, *Fleſh*, and ομφαλὸς, *Umbilicus*, Navel.

EPISCOPACY, the Quality of *Epiſcopal* Government; or that Form of Church Diſcipline, wherein Diocеſan Biſhops are eſtabliſh'd, diſtinct from, and ſuperior to Prieſts or Presbyters. See BISHOP, HIERARCHY, *&c.*

Epiſcopacy and *Presbytery*, have been alternately eſtabliſhed and aboliſhed in *Scotland*. See PRESBYTERY.

EPISCOPACIDE, the Crime of murdering a Biſhop by one of his own Clergy.

By the Laws of *England*, the ſame Obedience is due from a Clergyman to his Biſhop, as from a Child to his Father: And therefore the Offences of *Epiſcopacide* and Parricide are made equal, *viz.* Petty-Treaſon. See TREASON.

EPISCOPAL, ſomething that belongs to a Biſhop. See BISHOP.

The *Epiſcopal Government*, is the Government of a Dioceſe, wherein one ſingle Perſon, legally conſecrated, preſides over a whole Clergy, or a whole Church, in Quality of Head, or Super-intendent thereof; conferring Orders, and exerciſing a Sort of Juriſdiction. See DIOCESE.

The *Presbyterians* reject the *Epiſcopal* Eſtabliſhment, and condemn the *Epiſcopal* Order as a human Inſtitution, the mere Reſult of Pride and Ambition. See PRESBYTERIANS.

Among the *Epiſcopal* Functions, the principal is that of making frequent Viſitations of the Dioceſe. See VISITATION.

The Word is form'd of the *Latin*, *Epiſcopus*, Biſhop; derived from the *Greek*, ἐπισκεπτεσθαι, *inſpicere*, to inſpect, whence ἐπισκοπος, *Inſpector*, Biſhop; who is to watch over the Flock committed to his Care.

EPISCOPALIA, is ſometimes uſed in the ſame Senſe with *Pontificalia*. See PONTIFICALIA.

It is alſo uſed to denote Synodals, or cuſtomary Payments, due to the Biſhops from the Clergy of his Dioceſe; call'd alſo *Onus Epiſcopale.*

EPISCOPALIANS, a Name given to thoſe who retain to the Church of *England*, and particularly to the Eccleſiaſtical Hierarchy, ſuch as it was in the *Romiſh* Church, before the Reformation; who affect the Diſcipline of Biſhops, Prieſts, Canons, the Office, or Liturgy, *&c.* and retain the greateſt Part of the Canon Law, with the Decretals of the Popes, more cloſely than the Catholicks themſelves of ſeveral Countries. Tho', as to Matters of Doctrine, or Faith, they agree in moſt Points with the Calviniſts, or Reformed.

In *Scotland*, the principal Diſſenters are the *Epiſcopalians*. Lay *Epiſcopalians* enjoy all the ſame Civil Privileges with thoſe of the Eſtabliſh'd Church. They are under no Reſtrictions; tied to no Teſts; but are imploy'd in all Places of Truſt, upon taking the Oaths to the Government. But the *Epiſcopal* Miniſters are liable to ſeveral penal Laws; the greateſt part of 'em being Nonjurors. *Chamberlain.*

EPISCOPUS *puerorum.* It was an ancient Cuſtom for ſome Layman, about the Feaſt of Epiphany, to plait his Hair, that he might ſeem to have the Tonſure, and to put on the *Epiſcopal* Garments; and then to exerciſe a Shew of Juriſdiction, and do ſeveral ludicrous Actions: For which Reaſon he was call'd the *Biſhop of the Boys.* This Cuſtom obtain'd among us, long after ſeveral Conſtitutions were made to aboliſh it.

EPISODE, is commonly conceiv'd to be a ſeparate Incident, Story, or Action, which an Hiſtorian, or Poet, inſerts and connects with his principal Action; to furniſh out the Work with a greater Diverſity of Events; tho', in Strictneſs, all the particular Incidents, whereof the Action or Narration is compoſed, are call'd *Epiſodes.*

From the *Greek*, ἐπί, and ᾠδή, *Carmen, Verſe.*

EPISODE, EPISODIUM, in dramatic Poetry, was the ſecond part of the ancient Tragedy. See TRAGEDY.

The Origin and Uſe of *Epiſodes*, is admirably deſcribed by M. *Hedelin*, and Fa. *Boſſu.* Tragedy, in its Original, being only a Hymn ſung in Honour of *Bacchus*, by ſeveral Perſons, who made a Kind of Chorus, or Conſort of Muſic, with Dancing, and the like; to diverſify the Repreſentation a little, and divert the Audience, they bethought themſelves at length to divide the Singing of the Chorus into ſeveral parts; and to have ſomething rehears'd in the Intervals.

At firſt, a ſingle Perſon, or Actor, was introduced, then two, then more; and what the Actors thus rehearſed, or entertain'd the Audience withal, being ſomething foreign, or additional to, or beſide, the Song of the Chorus, and no neceſſary part thereof, was call'd Επεισοδιον, *Epiſode.*

And hence Tragedy came to conſiſt of four parts, the *Prologue*, *Epiſode*, *Exode*, and *Chorus.*

The *Prologue* was all that preceded the firſt Entrance of the Chorus. See PROLOGUE.

The *Epiſode*, all that was interpoſed between the Singings of the Chorus.

The *Exode*, all that was rehearſed after the Chorus had done ſinging. See EXODIUM.

And the *Chorus*, was the Grex, or Company that ſung the Hymn. See CHORUS.

And as this Recitation of the Actors was in ſeveral parts, and inſerted in ſeveral places; it might either be conſider'd together, as a ſingle *Epiſode*, conſiſting of ſeveral parts; or each part might be call'd a diſtinct *Epiſode.*

Theſe ſeveral *Epiſodes* in the ſame Tragedy, might either be taken from ſo many different Subjects; or from the ſame, divided into a proper Number of Recitations, or Incidents.

To conſider only the firſt Occaſion, and Inſtitution, of theſe foreign, or additional pieces; it appears no ways neceſſary that they ſhou'd all be taken from one and the ſame Subject: Three or four Recitations of different Actions, no-wiſe related, or connected to each other, wou'd eaſe the Actors, and amuſe the People, in the Intervals of the Chorus as well as if they were all ſo many parts of the ſame Action. By degrees, what was at firſt only an Addition to the Tragedy, became the principal part thereof. Then, the ſeveral Pieces, or *Epiſodes*, began to be conſider'd as one ſingle Body, which were not to have parts, or Members of different Nature, and independent of each other.

The beſt Poets took the Thing in this Light, and drew all their *Epiſodes* from the ſame Action; which Practice was ſo fully eſtabliſh'd in *Ariſtotle*'s Time, that he lays it down as a Rule. Thoſe Tragedies wherein this Unity and Connection was not obſerved, he calls *Epiſodic Pieces.* See EPISODIC.

EPISODE in *Epic* Poetry. The Term *Epiſode*, by being tranſplanted from the Stage to the *Epopea*, did not change its Nature. All the Difference *Ariſtotle* makes between the Tragic and Epic *Epiſodes*, is, that the latter are more ample than the former. See EPIC.

Ariſtotle uſes the Word in three different Senſes: The firſt taken from the Enumeration already made, of the parts of the Tragedy, *viz. Prologue*, *Chorus*, *Epiſode*, and *Exode.* Whence it follows, that in Tragedy, every Thing is *Epiſode*, that is none of the other parts: So that as among us, there are Tragedies, without either *Prologue*, *Chorus*, or *Epilogue*, the *Tragic Epiſode* includes the whole Tragedy: Conſequently, the *Epic Epiſode* muſt be the whole Poem, in like manner. All there is to retrench from it being the Propoſition, and Invocation, which ſtand in lieu of the *Prologue.* In this Senſe, the *Epopea* and Tragedy, have each only one *Epiſode*; and if the Parts, or Incidents, be ill connected together, the Poem will be *Epiſodic* and defective.

But further, as all that was ſung in the Tragedy, was call'd the *Chorus*, in the ſingular Number; yet this Singularity did by no means prevent every Part or Diviſion of the ſame from being call'd a *Chorus*, without making ſeveral *Chorus's:* So 'twas with the *Epiſode:* Each Incident, and part of the Fable and Action, is not only a part of the *Epiſode*, but an *Epiſode* it ſelf.

The Term *Epiſode*, therefore, in this Senſe, ſignifies every part of the Action expreſs'd in the Plan, or firſt Draught of the Fable; as the Abſence and Wanderings of *Ulyſſes*, the Diſorders in his Family, and his Preſence which retriev'd every Thing.

Ariſtotle furniſhes us with a third Kind of *Epiſode*; in ſhewing, that what is contain'd and expreſs'd in the firſt Plan of the Fable is *proper*, and that all the reſt is *Epiſode.*

By proper, he means what is abſolutely neceſſary; and by *Epiſodes*, what in one Senſe are neceſſary, and in another not; ſo that the Poet is at Liberty to uſe, or let 'em alone.

Thus, *Homer*, having made the firſt Draught of the Fable of his Odyſſee, was not at Liberty to make *Ulyſſes* abſent from his Country, or not. His Abſence was eſſential; and therefore *Ariſtotle* ranks it among the Things he calls *proper.* But he does not beſtow that Appellation on the Adventures of *Antiphale*, *Circe*, the *Syrens*, *Scylla*, *Carybdis*, &c. The Poet was at Liberty to have left theſe alone, and choſen others in their Room; ſo that they are *Epiſodes*, diſtinct from the firſt Action, to which they are not immediately neceſſary. Indeed, in one Senſe, they may be ſaid to be neceſſary: For *Ulyſſes*'s Abſence being neceſſary, it follows, that not being in his own Country, he muſt be ſomewhere elſe. If therefore the Poet was at Liberty, not to have uſed thoſe particular Adventures above mention'd; yet he was not at Liberty not to have uſed any: But if he had omitted thoſe, he muſt neceſſarily have ſubſtituted others in their Room. Otherwiſe, he wou'd have omitted a part of the Matter contain'd in his Plan, and his Poem had been defective.

This third Senſe, therefore, of the Word *Epiſode*, comes to the ſecond: All the Difference between them, is, that what we call *Epiſode*, in the ſecond Senſe, is the Ground, or Plan of the *Epiſode* in the third: And that the third adds to the ſecond, certain Circumſtances which are only probable, and not neceſſary; as the Places, Princes, and People, among whom *Ulyſſes* was caſt by *Neptune.*

It muſt be added, that in an *Epiſode* in the third Senſe, the Incident, or *Epiſode* in the firſt Senſe, whereon it is grounded, is to be extended and amplified; otherwiſe, an eſſential part of the Action and Fable, does not become an *Epiſode.* Laſtly, 'tis in this third Senſe that we are to underſtand that Precept of *Ariſtotle*, not to make the *Epiſodes*, till after the Names of the Perſons have been cho'en. *Homer* wou'd not have ſpoke of the Fleet and Ships as he has done; if, in lieu of the Names of *Achilles*, *Agamemnon*, and *Iliad*, he had choſe thoſe of *Adraſtus*, *Capaneus*, and *Thebaid.* See FABLE.

Upon the whole, the Term *Epiſode*, in the Epic Poem, as uſed by the Father of the Criticks, *Ariſtotle*, does not ſignifie any foreign, or accidental Adventure; but the whole Narration of the Poet, or a neceſſary and eſſential part of the Action and Subject, amplified with probable Circumſtances.

Thus, *Ariſtotle* enjoins, that the *Epiſode* be not added to the Action, or fetch'd from elſewhere; but be a part of the Action; and never uſes the Word *adding*, in ſpeaking of *Epiſodes*, tho' it occurr'd ſo naturally to his Interpreters that they have generally uſed it in their Tranſlations and Comments. He does not ſay, that after laying the Plan, and chuſing the Names, the Poet is to *add the Epiſodes*; but uſes a Derivative of the Word *Epiſode*, επεισοδόω, as if in *Engliſh* we ſhou'd ſay, *Epiſodify* his Action.

Add, that to ſhew the different Extenſion of the Tragedy and *Epopea*, that is, how the one becomes longer than the other; he does not ſay, that there is but little *Epiſode* in Tragedy; but more accurately, that the *Epiſodes* of Tragedy are ſhort and conciſe; whereas the *Epopea* is lengthen'd out and extended by 'em. In one Word, the taking Vengeance of the wicked People in *Ulyſſes*'s Court, as expreſs'd in a few Words by *Ariſtotle*, in his Plan of the Odyſſee, is a ſimple proper Action, neceſſary to the Subject. It is no *Epiſode*, but the *baſis*, and, as it were, *ſtamen* of an *Epiſode.* And this ſame Puniſhment explain'd and open'd, with all the Circumſtances of Time, Place, and Perſons, is no ſimple and pro-

proper Action, but an Action *Epiſodified*, or a real *Epiſode*; which, tho' at the Diſcretion of the Poet, is yet neceſſary and proper to the Subject.

From what has been ſaid, we may venture to define *Epiſodes* to be neceſſary Parts of the Action, extended and fill'd up with probable Circumſtances. Now, an *Epiſode* is only a Part of an Action; and not a whole Action. And this Part of the Action, which is the Baſis, or Ground of the *Epiſode*, muſt not, when *Epiſodified*, retain any Thing of the Simplicity which it had when firſt expreſs'd in general, in the Plan of the Fable.

Ariſtotle rehearſing the Parts of the Plan of the *Odyſſe*, ſays expreſly, that they are proper; and by that, diſtinguiſhes them from *Epiſodes*. Thus, in the *Oedipus* of *Sophocles*, the ceaſing of the Plague at *Thebes* is no *Epiſode*. 'Tis only the Ground, and Matter of an *Epiſode*, which the Poet might have uſed, had he pleaſed. And *Ariſtotle*, obſerving that *Homer*, in the *Iliad*, had taken but few Things for his Subject, but that he had uſed *Abundance of his Epiſodes*, intimates, that the Subject contains in it ſelf Abundance of *Epiſodes*, which the Poet may uſe, or let alone, at Pleaſure. That is, it contains the Grounds, or Stamina thereof, which may either be left in their general and ſimple Brevity, as *Seneca* has done the ceaſing of the Plague; or may be extended and unfolded, as the ſame Author has done the Puniſhment of *Oedipus*.

The Subject of a Poem is lengthen'd two Ways: Either, by the Poets making uſe of a great many of his *Epiſodes*; or by amplifying, and giving a great Extent to every one. By this latter Method, chiefly, it is, that the *Epic* Poets lengthen their Poems much beyond the *Dramatic*. It muſt be added, that there are certain Parts of an Action, which, of themſelves, don't naturally preſent or afford more than one *Epiſode*; ſuch as the Death of *Hector*, of *Turnus*, or the like: Whereas, there are other Parts of the Fable more copious and fertile, and which oblige the Poet to make divers *Epiſodes* on each; tho' laid down in the firſt Plan, with as much Simplicity as the reſt: Such are the Battels of the *Trojans* and *Grecians*; the Abſence of *Ulyſſes*; the Wanderings of *Æneas*, &c. For *Ulyſſes*'s Abſence ſo many Years from his own Country, required his Preſence elſewhere; and the Deſign of the Fable was to throw him into ſeveral Dangers, and different Countries.

Now each Peril, and each new Country, furniſh'd an *Epiſode*, which the Poet might uſe if he pleas'd.

The Reſult of the whole is, that *Epiſodes* are not Actions, but Parts of Actions; that they are not added to the Action and Matter of the Poem, but that they make that Action and Matter themſelves, as the Members make the Body: That, of Courſe, they are not to be fetch'd from elſewhere, but rais'd from the Ground, or Fund of the Action: That they are not united, and connected with the Action, but with one another: That all the Parts of an Action are not ſo many *Epiſodes*, but only ſuch as are amplified, and extended with particular Circumſtances: And, laſtly, that their Union with each other, is neceſſary in the Ground of the *Epiſode*, and probable in the Circumſtances thereof. See ACTION.

EPISODIC, in Poetry. A Fable is ſaid to be *Epiſodic*, when it is ſwell'd with unneceſſary *Incidents*; and its Epiſodes are not neceſſarily, nor properly connected with each other. See EPISODE.

Ariſtotle lays it down, that thoſe Tragedies are moſt defective, whoſe *Epiſodes* have no Connection, or Dependance, on each other; which he calls *Epiſodic*, q. d. ſuperabundant in *Epiſodes*; by Reaſon ſo many little *Epiſodes* can never compoſe one whole one; but neceſſarily remain in a vicious Plurality. See FABLE.

The moſt ſimple Actions are moſt ſubject to this Irregularity; in that, having fewer Incidents and fewer Parts than others, they afford leſs Matter. An unwary Poet would ſometimes have conſumed his whole Stock in the firſt, or ſecond Time that his Actors appear'd between the Chorus's: and be driven to a Neceſſity of looking out for other Actions, to ſupply the remaining Intervals. *Ariſt. Poem.* C. 9.

The firſt *French* Poets did the like: To fill each Act, they took ſo many different Actions of a Hero; which had no other Connection between them, but that they were done by the ſame Perſon. *Boſſu* p. 106.

If an *Epiſode* be uſed, the Names and Circumſtances whereof are unneceſſary, and whoſe Ground and Subject is no Part of the Action, that is of the Matter of the Poem; ſuch an *Epiſode* renders the Fable *Epiſodic*. This Irregularity is diſcover'd, when one may take away a whole *Epiſode*, without ſubſtituting any Thing in its Room; and yet leave no Chaſm, or Defect in the Poem. The Hiſtory of *Hypſipile*, in *Statius*'s *Thebaid*, affords an Inſtance of theſe faulty *Epiſodes*. If the whole Story of that illuſtrious Nurſe were retrench'd, the Sequel of the principal Action would be the better for it. Nor would any Body imagine he had forgot any Thing, or that there was any Member of his Action wanting. *Boſſu.*

EPISPASTIC, in Medicine, a Remedy, which being externally applied, draws or attracts the Humour to the Part; call'd alſo an *Attractive*. See ATTRACTIVE.

Of *Epiſpaſticks* there are ſome which act very gently, and others with a deal of Violence. Thoſe of the latter Kind ſwell, and bloat the Skin, make it Red, and even raiſe Bliſters thereon. See VESICATORY.

The principal ſimple *Epiſpaſticks* are *Pellitory*, *Garlic*, *Muſtard*, *Onions*, *Yeaſt*, *Gooſe-dung*, and that of *Pidgeons*, *Cantharides*, &c.

The Word is *Greek*, form'd of ἐπὶ and σπάω, *traho*, *I draw*.

EPISTATES, in Antiquity, a Commander, or Perſon, who has the Direction and Government of a People.

The Term is of conſiderable Uſe, in ſpeaking of the antient Government of *Athens*; where the *Epiſtates* was the Senator in Command for that Day, or whoſe Turn it was to preſide that Day.

The Conſtitution was this: The ten Tribes of *Athens*, elected every Year by Lot, each of them fifty Senators; which made a Senate of five Hundred. Every Tribe had the Precedence in its Turn, and ſurrender'd it again, ſucceſſively, to another. The fifty Senators in Office were call'd *Prytanes*; the particular Place where they aſſembled *Prytoneum*; and the Term, or Duration, of their Office, *viz.* thirty five Days, *Prytania*. During theſe thirty five Days, ten, of the fifty *Prytanes*, preſided weekly, under the Name of *Proedres*. And of theſe *Proedres*, there was one to preſide each Day of the Week, under the Title of *Epiſtates*.

No Perſon was allow'd to hold this Office more than once in his whole Life; leſt he ſhould fall too much into the Taſt of Dominion. The Senators of all the other Tribes ſtill voted, according to the Order the Lot had given them; but the *Prytanes* alone convened the Aſſemblies; the *Proedres*, laid the Buſineſs before them; and the *Epiſtates*, took their Votes and Opinions.

It muſt be added, that of the ten *Proedres*, of each Week, there were but ſeven that could preſide, each his Day, in Quality of *Epiſtates*. The ten *Proedres* elected the ſeven *Prytanes*. See PRYTANES.

The Word is derived from the *Greek*, ἐπὶ, *ſuper*, over, and ἵστημι, *ſto*, I ſtand.

EPISTEMONARCH, a Dignitary in the *Greek* Church.

The *Epiſtemonarch* was appointed to watch over the Doctrines of the Church; and to inſpect, or ſurvey every Thing relating to the Faith, in Quality of Cenſor thereof.

His Office anſwer'd pretty much to that of *Magiſter ſacri Palatii* at *Rome*.

The Word is derived from the *Greek*, ἐπίσταμι, *ſcio*, I know, of ἐπίσημα, *Science*, *Knowledge*, and ἀρχὴ, *Command*, *Precedence*.

EPISTLE, a Letter miſſive. See LETTER.

The Term *Epiſtle* is now ſcarce uſed, but for Letters wrote in Verſe; and Letters *Dedicatory*. See *Epiſtle* DEDICATORY.

In ſpeaking of Letters wrote by Moderns, or rather, in the modern Languages, we never uſe the Word *Epiſtle*. Thus, we ſay, the Letters, not *Epiſtles*, of the Cardinal *d' Oſſat*; of *Voiture*, of *Balzac*, of *Howel*, of *Farquhar*, &c. But thoſe wrote by the Antients, or rather in the Antient Languages, we call *Epiſtles*: As the *Epiſtles*, not Letters, of *Cicero*, *Pliny*, *Seneca*, *Busbequius*, *Launoy*, &c. Of St. *Auguſtin*, St. *Jerome*, &c. The *Epiſtles* of St. *Paul*, St. *Peter*, St. *John*, &c. to the *Romans*, *Corinthians*, &c.

The Word is form'd of the *Greek*, ἐπιστέλλω, *mitto*, I ſend.

EPISTOLARY, a Term chiefly uſed in the Phraſe *Epiſtolary Style*. See STYLE.

The Word is, ſometimes, alſo applied to Authors who have wrote *Epiſtles* or Letters: The principal *Epiſtolary* Authors, are *Sidonius Apollinaris*, *Tully*, the younger *Pliny*, *Seneca* the Philoſopher, *Petrarch*, *Politian*, *Busbequius*, *Eraſmus*, *Lipſius*, *Muret*, *Aſcham*, *Milton*, *Petau*, *Launoi*, *Sarau*, *Balzac*, and *Voiture*.

EPISTOMIUM, in Hydraulicks, a *Plug*, or Inſtrument by the Application whereof, an Aperture may be open'd, and ſhut again at Pleaſure.

EPISTROPHEUS, from ἐπιστρέφω, *converto*, I turn about; the ſame with *Cardo*. See CARDO.

EPISTYLE, in the antient Architecture, a Term uſed by the *Greeks*, for what we call *Architrave*, viz. a Maſſive of Stone, or Piece of Wood, laid immediately over the Capital of a Column. See ARCHITRAVE.

The

The *Epiſtyle* is the firſt, or loweſt Member of the *Entablature*. See ENTABLATURE.

The Word is derived from the *Greek*, ἐπὶ, *ſuper*, upon, and στυλὸς, *Column*.

EPITAPH, a Monumental Inſcription, in Honour, or Memory, of a Defunct; or an Inſcription engraven, or cut, on a Tomb, to mark the Time of a Perſon's Deceaſe, his Name, Family, and uſually ſome Eloge of his Vertues, or good Qualities. See MONUMENT, TOMB, *&c.*

The Style of *Epitaphs*, eſpecially thoſe compoſed in *Latin*, is ſingular. See LAPIDARY *Style*.

At *Sparta*, *Epitaphs* were only allowed to People who died in Battel. *Boxhornius* has made a Collection of *Epitaphs*, not very ample, but exceedingly well choſen. *Fa. Labbe*, has likewiſe given a Collection of the like Kind, in *French*; entitled, *Treſor des Epitaphes*. *Cambden* has done ſomething in the ſame Way in our Engliſh *Epitaphs*. An *Epitaph* is ſaid to be yet wanting to the Duke of *Marlborough*'s Monument; tho' a Premium of 500 Pounds was offer'd by his Dowager, to him that ſhould compoſe one worthy of the Hero deceas'd.

In *Epitaphs*, the dead Perſon is ſometimes introduced, by Way of *Proſopopœia*, ſpeaking to the Living; of which we have a fine Inſtance, worthy the *Auguſtan* Age, wherein the dead Wife thus beſpeaks her ſurviving Husband.

Immatura peri: ſed tu felicior, Annos
Vive tuos, Conjux optime, vive meos.

The Word comes from ἐπὶ, *upon*, and τάφος, *Sepulcher*. See SEPULCHER.

The *French* have a Proverb, *Menteur comme une Epitaph*: He lies like an *Epitaph*; in Alluſion to the Eloges ordinarily contain'd therein, which are not always over juſt.

EPITAPH, is alſo applied to certain Eloges, either in Proſe or Verſe, compoſed without any Intent to be engraven on Tombs.

In the Collection of Epigrams, we have Abundance of ſuch *Epitaphs*; ſome of them ludricrous and ſatyrical. See EPIGRAM.

For a Specimen, we ſhall here add a very beautiful *Epitaph*, compoſed by Mr. *Cowley*, on himſelf, to be put on a little Country Houſe, whither he retreated from the Court and Town, to ſpend his laſt Days.

Hic, O Viator, ſub Lare parvulo,
Couleius *hic eſt Conditus, hic jacet*
Defunctus humani laboris
Sorte, ſupervacuaq; Vita;

Non indecora pauperie *nitens,*
Et non inerti nobilis otio,
Vanoq; dilectis popello,
Divitiis, animoſus *hoſtis.*

Poſſis ut illum dicere mortuum,
En terra jam nunc quantula *ſufficit?*
Exempta ſit curis, Viator,
Terra ſit illa levis, precare.

Hic ſparge flores, *ſparge breves* Roſas;
Nam vita gaudet Mortua floribus;
Herbiſq; odoratis corona
Vatis adhuc cinerem Calentem.

EPITASIS, in the antient Poetry, the ſecond Part, or Diviſion of a Dramatic Poem; wherein, the Plot, or Action, propoſed, and enter'd upon, in the firſt Part, or *Protaſis*, was carried on, heighten'd, warm'd, and work'd up, till it arrived at its State, or Height, call'd the *Cataſtaſis*. See PROTASIS, and CATASTASIS.

This Diviſion is laid aſide in the Modern Drama; in Lieu whereof, our Plays are divided into *Acts*. See ACT.

The *Epitaſis* might, ordinarily, take up about our ſecond or third Act. See TRAGEDY.

The Word is pure *Greek*, ἐπτάσις, of ἐπτείνω, *Intendo*, I heighten.

EPITASIS, in Medicine, is ſometimes uſed for the Increaſe, or Growth, and heightening of a Diſeaſe; or a Paroxyſm of a Diſeaſe, particularly a Fever. See STATE.

EPITHALAMIUM, in Poetry, a *Nuptial Song*; or a Compoſition, uſually in Verſe, on Occaſion of a Marriage between two Perſons of Eminence.

The Topicks it chiefly inſiſts on, are the Praiſes of Matrimony, and of the Married Couple; with the Pomp and Order of the Marriage Solemnity. It concludes, with praying to the Gods for their Proſperity, their happy Offspring, *&c.* *Catullus* exceeded all Antiquity, in his *Epithalamiums*; and the Cavalier *Marino*, all the Moderns.

The Word is form'd of ἐπὶ and θαλαμος, *Bride-Chamber*.

EPITHEME, EPITHEMA, in Pharmacy, a Kind of *Fomentation*, or Remedy, of a liquid, ſpirituous Kind; applied externally upon the Regions of the Heart, or Liver; to ſtrengthen and comfort the ſame, or to correct ſome Intemperature. See FOMENTATION.

There are two Kinds of *Epithems*; the one *Liquid*, and the other *Solid*: The *Liquid Epithem* is a Fomentation of a more ſpirituous Nature than the reſt; the *Solid*, is a Mixture of Conſerves, Treacle, Confections, and Cordial Powders, generally ſpread on a Piece of Scarlet, or Leather.

The Word is form'd of the *Greek*, ἐπὶ, *upon*, and τίθημι, *pono*, I put.

EPITHET, a Noun Adjective, expreſſing ſome Quality of a Subſtantive to which it is joyn'd. See ADJECTIVE.

As, a *fruitful* Vine, a *ſtately* Pile, an *Echoing* Vault, *&c.*

Epithets, are Engines of mighty Uſe and Conveniency among the Poets and Orators; who ſupply in *Epithets*, what they want in Things. Card. *Perron* even blames *Homer* on the Head of *Epithets*; obſerving, that he frequently hooks in *Epithets*, without any Senſe, or Significancy at all, to help out his Meaſures; and that he equips every Hero with an *Epithet*, not according to the Exigence of the Caſe, but the Meaſure of the Verſe.

The Word is form'd of ἐπὶ, *upon*, and θησις, *poſitio*, putting.

EPITHET, is alſo uſed for a *Sur-name*, or ſecond Appellation. See SUR-NAME.

Epithets, were antiently beſtow'd very frankly, either on Account of any Defects of the Body, or Mind: The Kings themſelves, were not exempted from them. Hence, thoſe *Epithets* ſo frequent in Hiſtory; as Henry *Long-ſhanks*, Edward *Iron-ſides*, Richard *Crook-back*, John *Lack-land*, &c.

Nor have the *French* uſed their Kings any better: Witneſs their Charles *the ſimple*, Louis *the lazy*, *faineant*, Ludovicus *nihil faciens*; Pepin *the ſhort*; Louis *the Stammerer*, *le Begue*.

EPITHYME, a Medicinal Plant, of a very extraordinary Nature and Figure. Its Seed is very ſmall, from which ariſe long Threads like Hairs, which ſoon periſh, as well as the Root, unleſs they meet with ſome neighbouring Plant, both to ſuſtain and feed them.

The *Epithyme* grows indifferently on all Kinds of Herbs; and, of Conſequence, the Kinds thereof are infinite: To which Writers uſually attribute the particular Virtues of the Plants they grow on.

The moſt known of theſe Plants, and thoſe moſt uſed in Medicine, are ſuch as grow on Thyme; which are the proper *Epithymes*; and thoſe on Flax. There are two Kinds in the Shops; the one from *Venice*, the other from *Candia*: They have both an Aromatic Taſt, but that of *Venice* the ſtrongeſt.

Their Uſe is to ſtrengthen the Parts, and prevent Obſtructions of the Viſcera, *&c.*

EPITOME, an Abridgment, or Reduction, of the principal Matters of a larger Book, into a little Compaſs. See ABRIDGMENT.

The *Epitome* of *Baronius*'s Annals is done by *Sponde*: *Bernier* has made an *Epitome* of the Philoſophy of *Gaſſendus*.

'Tis a popular Objection againſt the *Epitomizing* of Authors, that it frequently occaſions the Loſs of the Originals. Thus the Loſs of the Hiſtorian *Trogus Pompeius*, is attributed to his Epitomizer *Juſtin*; and the Loſs of a great Part of *Livy* to *Lu. Florus*.

The Word is *Greek*, ἐπιτομὴ, form'd of ἐπιτέμνειν, *reſecare*, to retrench, abridge, or cut off.

EPITRITUS, a Foot of the antient *Latin* Verſe, conſiſting of four Syllables. See FOOT.

Grammarians reckon four Species of *Epitrites*: The firſt compounded of *an Jambus* and *Spondee*, as *Sălūtantēs*. The ſecond of a *Trochee* and *Spondee*, as *Concĭtati*. The third of a *Spondee* and *an Jambus*, as *Comunĭcans*. And the fourth of a *Spondee* and *Trochee*, as *Incāntārĕ*.

EPITROPE, in Rhetoric, a Figure of Speech, by the *Latins* call'd *Conceſſio*; whereby the Orator grants ſomething which he might deny; that, by this Shew of Impartiality, he may the more eaſily be granted what he requires, in his Turn. See FIGURE.

This Figure is frequently invidious: Let them extol his Probity; I acquieſce and am ready to be ſilent: But when they propoſe him for a Pattern of Wit, my Spleen is rais'd, *&c.*

EPITROPUS, a Kind of Judge, or rather Arbitrator, which the *Greek* Chriſtians, under the Dominion of the *Turks*, elect, in the ſeveral Cities, to terminate the Differences that ariſe among them; and avoid carrying them before the *Turkiſh* Magiſtrates.

There are ſeveral *Epitropi* in each City: Monſ. *Spon*, in his Travels, obſerves, that at *Athens* there are Eight, taken out of the ſeveral Pariſhes, and call'd *Vecchiardi*,

i. e.

i. e. old Men. But *Athens* is not the only Place where there are *Epitropi*. They are in all the Iſlands of the *Archipelago*.

Some *Latin* Authors of the V*th* Century, call *Epitropi*, thoſe who more anciently were call'd *Villici*, and ſince *Vidames*. See VIDAME.

In Times ſtill earlier, the *Greeks* applied the Term ἐπιτροπος, in the ſame Senſe as the *Latins* did *Procurator*, viz. for a Commiſſioner, or Intendant: Thus the Commiſſioners of Proviſions in the *Perſian* Army, are call'd by *Herodotus*, and *Xenophon*, *Epitropi*; and in the New Teſtament, Ἐπιτροπος, is the Intendant of a Houſe, render'd in the vulgate *Procurator*.

EPLOYE, in Heraldry. An Eagle *Eploye*, is what in *Engliſh* we more uſually call an *Eagle diſplay'd*, or *Spread Eagle*. See DISPLAY'D and EAGLE.

EPOCHA, or *Æra*, in Chronology, a Term, or fix'd Point of Time, whence the Years are number'd, or accounted. See YEAR.

The Word is form'd of the *Greek*, ἐποχη, *inhibitio*, *repreſſio*, of ἐπεχειν *to ſuſtain*, *ſtop*; by reaſon the *Epocha* defines, or limits a certain Space of Time. See TIME.

Very different *Epochs*, or *Epocha*'s, obtain in different Nations; and no wonder: for there being no aſtronomical Conſideration to render one preferable to another, their Conſtitution is purely arbitrary.

That principally regarded among Chriſtians, is the *Epocha* of the Nativity, or Incarnation of JESUS CHRIST; that of the Mahometans, the *Hegira*; that of the Jews, &c. the *Creation of the World*; that of the ancient Greeks, the *Olympiads*; that of the *Romans*, the *Building of the City*; that of the ancient *Perſians* and *Aſſyrians*, the *Epocha* of *Nabonaſſar*, &c.

The Doctrine and Uſe of *Epocha*'s, is of very great Extent in Chronology. See CHRONOLOGY.

To reduce the Years of one *Epocha* to thoſe of another, *i. e.* to find what Year of one, correſponds to a given Year of another; a Period of Years has been invented, which commencing before all the known *Epocha's*, is, as it were, a common Receptacle of them all, call'd the *Julian Period*. To this Period all the *Epocha's* are reduced, *i. e.* the Year of this Period, whereon each *Epocha* commences, is determined. All that remains, therefore, is to add the given Year of one *Epocha*, to the Year of the Period correſponding with its Riſe; and from the ſame to ſubtract the Year of the ſame Period correſponding to the other *Epocha*. The Remainder is the Year of that other *Epocha*. See JULIAN PERIOD.

The EPOCHA *of Chriſt*, or *our Lord*, is the *vulgar Epocha* throughout *Europe*; commencing from our Saviour's Nativity, *December* 25; or rather, according to the uſual Account, from his Circumciſion, the 1*ſt* of *January*; but particularly in *England*, from the Incarnation, or Annunciation of the Bleſſed Virgin, on the 25*th* of *March*; Nine Months prior to the Nativity. See NATIVITY, CIRCUMCISION, ANNUNCIATION, &c.

Now, the Year of the *Julian* Period whereon *Chriſt* was born, and circumciſed, is uſually computed to be the Year 4713; conſequently, the firſt Year of the Æra of *Chriſt*, correſponds to the Year 4714 of the *Julian* Period.

Hence, 1°. If to any given Year of *Chriſt*, you add 4713, the Sum will be the Year of the *Julian* Period correſponding thereto. *E. gr.* if to the preſent Year 1725, be added 4713, the Sum 6438, is the preſent Year of the *Julian* Period.

2°. On the contrary, ſubtracting 4713, from any given Year of the *Julian* Period, the Remainder is the current Year of *Chriſt*, *e. gr.* From the Year of the *Julian* Period 6438, ſubtracting 4713, the Remainder is the Year of *Chriſt* 1725.

In Effect, the *Epocha* of *our Lord*, ſerves not only for the Computation of the Years elapſed ſince the *Epocha* commenced; but even of thoſe before it.

Now, to find the Year of the *Julian* Period, correſponding to a given Year before *Chriſt*; ſubtract the given Year from 4714; the Remainder is the correſpondent Year required. Thus, *e. gr.* the Year before *Chriſt* 752, is the Year 3956 of the *Julian* Period. On the contrary, ſubtracting the Year of the *Julian* Period from 4714, the Remainder is the Year before *Chriſt*.

The Author of the vulgar *Epocha*, or Way of computing from *Chriſt*, is an Abbot of *Rome*, one *Dionyſius Exiguus*, by Nation a *Scythian*; who flouriſh'd under *Juſtinian*, about the Year 507: Tho' *Dionyſius* borrowed the Hint from *Panodorus* a *Greek* Monk. Till his Time, the Generality of Chriſtians computed their Years, either from the Building of *Rome*, or according to the Order of the Emperors and Conſuls, and the other Ways in Uſe with the People they lived among.

This Diverſity occaſioning a great Diſtraction between the Churches of the *Eaſt* and *Weſt*; *Dionyſius*, to compoſe the ſame, firſt propoſed a new Form of the Year, with a new general Æra, which in a few Years Time was generally admitted.

Dionyſius began his Account from the Conception, or Incarnation, popularly call'd Lady-Day, or the Annunciation: Which Method ſtill obtains in the Dominions of *Great Britain*, and there only; ſo that the *Dionyſian*, and *Engliſh Epocha*, is the ſame. In the other Countries of *Europe*, they reckon from the 1*ſt* of *January*; except in the Court of *Rome*, where the *Epocha* of the Incarnation ſtill obtains for the Date of their Bulls.

It muſt be added, that this *Epocha* of *Dionyſius* is charged with a Miſtake: The common Opinion is, that it places our Saviour's Nativity a Year too late; or, that he was born the Winter preceding the Time preſcribed by *Dionyſius* for his Conception.

But, the Truth is, the Fault lies on *Beda*, who miſinterpreted *Dionyſius*, and whoſe Interpretation we follow; as has been ſhewn by *Petavius*, from *Dionyſius*'s own Epiſtles. For *Dionyſius* began his Cycle from the Year of the *Julian* Period 1712; but his *Epocha* from the Year 1713, wherein the vulgar Æra ſuppoſes *Chriſt* to have been incarnate.

The Year, therefore, which according to the vulgar *Epocha* is the 1*ſt* Year of *Chriſt*; according to *Dionyſius*'s Æra, is the 2*d*. So that the preſent Year, which we call 1725, ſhou'd, in Juſtice, be 1726. Tho' ſome Chronologiſts, inſtead of one Year, will have the Error two.

To this vulgar Æra, as a ſure, fix'd Point, Chronologers uſe to reduce all the other *Epocha's*; tho' there is not one of 'em but what is controverted: So much Uncertainty there is in Time. We ſhall exhibit 'em as reduced to the *Julian* Period.

EPOCHA *of the Creation*, or *Orbis conditi*, according to the Computation of the *Jews*, call'd alſo the *Jewiſh Epocha*, is the Year of the *Julian* Period 953; anſwering to the Year before *Chriſt* 3761; and commences on the 7*th* Day of *October*.

Hence, ſubtracting 952 Years from any given Year of the *Julian* Period, the Remainder is the Year of the *Jewiſh Epocha*, correſponding thereto. Thus, *e. gr.* the preſent Year being the 6438*th* Year of the *Julian* Period; it is the 5486*th* Year of the *Jewiſh Epocha*, or ſince the Creation of the World.

This *Epocha* is ſtill in Uſe among the *Jews*.

The EPOCHA *of the Creation*, uſed by the *Greek* Hiſtorians, is the Year before the *Julian* Period 787; anſwering to the Year before *Chriſt* 5500.

Hence, to any given Year of the *Julian* Period, adding 787; the Sum gives the Year of this *Epocha*. *E. gr.* 6438 being the preſent Year of the *Julian* Period; 7390 is the preſent Year of this *Epocha*, or the Age of the World, according to this Computation.

The Author of this *Epocha*, is *Julius Africanus*, who collected it from the Hiſtorians. But when it came to be admitted into civil Uſe, 8 Years were added to it; that ſo, every Year thereof divided by 15, might exhibit the Indiction, which the *Eaſtern* Emperors uſed in their Charters and Diploma's.

The *Epocha of the Creation* uſed by the later *Greeks*, and *Ruſſians*, is the Year 795, before the *Julian* Period; or the Year 5509 before *Chriſt*; commencing from the 1*ſt* Day of *September*. Tho' the *Ruſſians*, having lately admitted the *Julian* Calendar, begin their Year from the 1*ſt* of *January*.

Hence, adding 795, to the Year of the *Julian* Period, the Sum gives the Year of this *Epocha*. Thus, *e. gr.* the *Julian* Period of the preſent Year being 6438; the preſent Year of this *Epocha*, i. e. the Years from the Creation, on this Footing, are 7233. Again, from the preſent Year 7233, ſubtracting 5508; the Remainder is the Year of the common Æra 1725.

This Æra was uſed by the Emperors of the *Eaſt*, in their Diplomata, &c. And thence alſo call'd the *Civil Æra of the Greeks*. In Reality, it is the ſame with the *Epocha* of the *Conſtantinopolitan* Period; whence ſome call it the *Epocha of the Period of Conſtantinople*. See PERIOD.

The *Alexandrian* EPOCHA *of the Creation*, is the Year 780, before the *Julian* Period; anſwering to the Year before *Chriſt* 5494; and commencing on the 29*th* Day of *Auguſt*.

Hence, adding 5493, to the preſent Year of *Chriſt* 1725; the Sum, 7218, gives the preſent Year of this *Epocha*; or Years elapſed ſince the Creation, according to this Computation.

This *Epocha* was firſt concerted by *Panodorus*, a Monk of *Egypt*, to facilitate the Computation of *Eaſter*; whence, ſome call it, *Greek Eccleſiaſtical Epocha*.

The *Euſebian* EPOCHA *of the Creation*, is the Year of the *Julian* Period 486; anſwering to the Year before *Chriſt* 4228; and commencing in Autumn.

Hence, ſubtracting 486, from the *Julian* Period of the preſent Year 6438; or adding 4428 to the preſent Year of *Chriſt*, the Reſult 5953, is the preſent Year of this *Epocha*.

This *Epocha* is uſed in *Euſebius*'s *Chronicon*, and the *Roman* Martyrology. See CREATION.

EPOCHA *of Olympiads*, is the Year of the *Julian* Period 3938: anſwering to the Year 776, before *Chriſt*; and the Year 2985 from the Creation; commencing at the Full Moon next the Summer Solſtice. And each *Olympiad* containing four Years.

This *Epocha* is very famous in ancient Hiſtory: It was uſed principally by the *Greeks*, and had its Origin from the *Olympic* Games, which were celebrated at the Beginning of every fifth Year. See OLYMPIAD.

EPOCHA *of the Building of* Rome, or *Urbis conditæ*, U. C. is the Year of the *Julian* Period 3961, according to *Varro*; or 3962, according to the *Faſti Capitolini*; anſwering to the Years before *Chriſt* 753, or 752, and beginning on the 21*ſt* of *April*.

Hence, if the Years of this *Epocha* be fewer than 754, ſubtracting 'em from 754, or 753; you have the Year before *Chriſt*. And, on the contrary, if they be more than 745, adding 'em to the ſame, the Sum is the Number of Years ſince *Chriſt*. Laſtly, adding the Year before *Chriſt*, to 753, or 752; the Sum will give the Year of this *Epocha*, or the Time ſince the Building of *Rome*. Thus, *e. gr.* the preſent Year 1725, according to *Varro*, is the Year of *Rome* 2488.

EPOCHA *of Nabonaſſar*, is the Year of the *Julian* Period 3967; anſwering to the Year before *Chriſt* 747; commencing on the 26*th* Day of *February*.

This Æra takes its Denomination from its Inſtituter, *Nabonaſſar* King of *Babylon*; and is that uſed by *Ptolomy* in his Aſtronomical Obſervations, by *Cenſorinus* and others.

Dioclefian EPOCHA, or EPOCHA *of Martyrs*, is the Year of the *Julian* Period 4997, anſwering to the Year of *Chriſt* 283; call'd *Æra of Martyrs* from the great Number of Chriſtians, who ſuffer'd Martyrdom under the Reign of that Emperor.

The *Abyſſinians*, among whom 'tis ſtill uſed in all Eccleſiaſtical Computations, call it the *Years of Grace*. Tho' they don't reckon their Years in a continued Series from this *Epocha*. But when the *Dionyſian* Period of 534 Years is expired, they begin their Computation afreſh from 1, 2, &c.

EPOCHA *of the Hegira*, or *Mahometan* EPOCHA, is the Year of the *Julian* Period 5335, anſwering to the Year of *Chriſt* 622. It commences on the 16*th* of *July*, the Day of *Mahomet*'s Flight from *Mecca* to *Medina*.

This *Epocha* is uſed by the *Turks* and *Arabs*, and even all who profeſs the *Mahometan* Faith: It was firſt introduced by *Omar*, the third Emperor of the *Turks*. The Aſtronomers, *Alfraganus*, *Albategnius*, *Alphonſus*, and *Ulugh Beigh*, refer *Mahomet*'s Flight to the 15*th* of *July*; but all the People who uſe the *Epocha*, agree to fix it on the 16*th*. See HEGIRA.

EPOCHA *of the Seleucides*, uſed by the *Macedonians*, is the Year of the *Julian* Period 4402; anſwering to the Year before *Chriſt* 312. See SELEUCIDES.

Yezdegerdic, or *Perſian* EPOCHA, is the Year of the *Julian* Period 5345; anſwering to the Year of *Chriſt* 632, and commencing on the 16*th* of *June*.

This *Epocha* is taken from the Death of *Yezdegerdis*, the laſt King of *Perſia*, ſlain in Battle by the *Sarazens*.

Julian EPOCHA, or *Epocha* of *Julian* Years, is the Year of the *Julian* Period 4668; anſwering to the Year before *Chriſt* 45.

This *Epocha* had its Origin from the Year of the Reformation of the Calendar under *Julius Cæſar*; call'd the *Year of Confuſion*. See YEAR.

Spaniſh EPOCHA, is the Year of the *Julian* Period 4676; anſwering to the Year before *Chriſt* 38.

Actiac, or *Actian* EPOCHA, is the Year of the *Julian* Period 4684, anſwering to the Year before *Chriſt* 30. Commencing on the 29*th* Day of *Auguſt*. See ACTIAC.

Other memorable *Epocha*'s are, that of the *Deluge*, in the Year of the Creation 1656: The Birth of *Abraham* in 2039: The *Iſraelites Exodus* or Departure out of *Egypt*, in 2544: The Building of the *Temple* of *Jeruſalem*, in 2023: And the *Deſtruction* of the ſame in the Year of *Chriſt* 70: The taking of *Conſtantinople* by the *Turks*, in 1453, &c.

EPODE, in Poetry. In the *Lyric* Poetry of the *Greeks*, the *Epode* is the third Part, or End of the Ode: Their Ode, or Song, being divided into Strophe, Antiſtrophe, and *Epode*. See ODE.

The *Epode* was ſung by the Prieſts, ſtanding ſtill before the Altar, after all the Turns and Returns of the Strophe and Antiſtrophe. See STROPHE.

The *Epode* was not confined to any preciſe Number, or Kind of Verſes; as the Strophe and Antiſtrophe were. See STROPHE, &c.

But when the Ode contain'd ſeveral *Epodes*, Strophes, &c. they were all alike.

As the Word *Epode*, then, properly ſignifies the End of the Song; and as in Odes, what they call'd the *Epode*, finiſh'd the Singing: It became cuſtomary, as M. *Dacier* ſhews, for a little Verſe, which being put after another, cloſed the Period, and finiſh'd the Senſe which had been ſuſpended in the firſt Verſe, to be call'd *Epode*, ἐπῳδὴ.

And hence it is, that the VI*th* Book of *Horace*'s Odes is entitled *Liber Epodωn*, Book of *Epodes*, by reaſon the Verſes thereof are all alternately long and ſhort; and that the ſhort one, generally, tho' not always, cloſes the Senſe of the long one.

But the Signification of the Word is extended ſtill further; *Epode* being become a general Name for all Kinds of little Verſes, that follow one or more great ones, of what Kind ſoever they be: And, in this Senſe, a Pentameter is an *Epode*, after an Hexameter, which in Reſpect thereof is a Pro-ode.

EPOMIS, in Anatomy, the upper Part of the Shoulder, reaching up to the Neck. See SHOULDER.

Some Authors apply the Word *Epomis* to the upper Part of the *Os Humeri*: But the ancient *Greek* Phyſicians only uſe it for the muſcular, or fleſhy Part, placed as abovementioned.

The Word is *Greek*, Ἐπωμὶς, which ſignifies the ſame Thing.

EPOPEA, Epos, in Poetry, is ſtrictly the Hiſtory, Action, or Fable, that makes the Subject of an *Epic* Poem. See ACTION and FABLE.

In the common Uſe of the Word, however, *Epopea* is the ſame with *Epic* Poem it ſelf: In which Senſe it is defined, a Diſcourſe invented with Art, or a Fable agreeably imitated from ſome important Action; and related in Verſe, in a probable and ſurprizing Manner; with a View to form the Manners, &c. See EPIC *Poem*.

The Word is derived from the *Greek*, ἔπος, *Carmen*, *Verſe*; and ποιέω, *facio*, *I make*.

EPULO, in Antiquity, a Miniſter of Sacrifice among the *Romans*. See SACRIFICE.

The Pontifices not being able to attend all the Sacrifices perform'd at *Rome*, to ſo many Gods as were adored by the People; appointed three Miniſters, whom they called *Epulones*, by reaſon they conferr'd on 'em the Care and Management of the *Epula*, Feaſts in the ſolemn Games and Feſtivals.

To them belong'd the ordering and ſerving the ſacred Banquet, offer'd on ſuch Occaſions to *Jupiter*. They wore a Gown border'd with Purple, like the Pontifices. Their Number was at length augmented from Three to Seven, and afterwards by *Cæſar* to Ten.

Their firſt Eſtabliſhment was in the Year of *Rome* 558, under the Conſulate of *L. Furius Purpureo*, and *M. Claudius Marcellus*.

EPULOTICKS, in Medicine, dry, aſtringent Remedies, proper to cicatrize, or incarnate Wounds and Ulcers. See INCARNATIVE, CICATRICIVE.

Such are Emplaſters of Ceruſs, and Diapalma; the Unguent Pompholix, &c.

The Word is form'd of the *Greek*, ἐπὶ, *ſuper*, and ὠλὴ, *Cicatrix*, *Eſchar*. Whence the Verb ἐπουλόω, *cicatricem*, *infero*.

EPULUM, in Antiquity, *Banquet*, a holy Feaſt prepared for the Gods. See FEAST.

The Statues of the Gods were commonly laid upon a Bed, and were ſerved as if they had been very hungry; to perform which, was the Function of the Miniſters of Sacrifice, hence called *Epulones*. See EPULO.

EQUABLE *Motion*, is that whereby the moveable Body proceeds with the ſame continued Velocity; neither accelerated nor retarded. See MOTION.

EQUAL, a Term of Relation between two or more Things of the ſame Magnitude, Quantity, or Quality.

Wolfius defines *Equals* to be thoſe Things which may be ſubſtituted for each other, without any Alteration of Quantity. 'Tis an Axiom in Geometry, that two Things which are *Equal* to the ſame third, are *Equal* to each other. And again, if to, or from *Equals*, you add or ſubtract *Equals*, the Remainders will be *Equal*. See EQUALITY.

EQUAL *Circles*, in Geometry, are thoſe whoſe Diameters are *Equal*. See CIRCLE.

EQUAL *Angles*, are thoſe whoſe Sides are inclined alike to each other; or that are meaſured by ſimilar Parts of their Circles. See ANGLE.

EQUAL *Figures*, are thoſe whoſe Area's are *Equal*; whether the Figures be ſimilar or not. See FIGURE.

The Segments of a Sphere, or Circle, are of an *Equal Concavity*, or *Convexity*, when they have the ſame Ratio, or Proportion to the Diameters of the Spheres, or Circles whereof they are Parts. See SEGMENT.

EQUAL *Solids*, are thoſe which comprehend, or contain each as much as other; or whoſe Solidities and Capacities are *Equal*. See SOLID.

EQUAL *Hyperbola's*, are thoſe whoſe Ordinates to their indeterminate Axes, are *Equal* to each other; taken at *Equal* Diſtances from their Vertices. See HYPERBOLA.

EQUAL *Numbers*, EQUAL *Hours* } See { NUMBER. HOUR.

EQUAL *Geometrical Ratio's*, are thoſe whoſe leaſt Terms are ſimilar *aliquot*, or *aliquant* Parts of greater. See RATIO.

Equal Arithmetical Ratio's, are thoſe wherein the Difference of the two leſs Terms, is *Equal* to the Difference of the two greater. See RATIO.

In Opticks, we ſay, that Things ſeen under *Equal Angles*, are *Equal*. *Equal* Parts of the ſame Interval, or Magnitude, if unequally diſtant from the Eye, appear unequal. *Equal* Objects, and at *Equal* Diſtances, only the one placed directly, and the other obliquely, ſeem unequal; and that placed directly, the bigger. See VISION.

EQUALITY, in Aſtronomy. The *Circle of Equality*, or the *Equant*, is a Circle uſed in the *Ptolomaic* Aſtronomy, to account for the Eccentricity of the Planets, and reduce them more eaſily to a Calculus. See EQUANT.

In Geometry, the *Ratio*, or *Proportion of* EQUALITY, is that between two equal Numbers, or Quantities.

Proportion of EQUALITY *evenly ranged*, or *ex Æquo ordinata*, is that wherein two Terms in a Rank, or Series, are Proportional to as many Terms in another Series, compared to each other in the ſame Order, *i. e.* the firſt of one Rank to the firſt of another; the ſecond to the ſecond, &c.

Proportion of EQUALITY *evenly diſturbed*, call'd alſo *ex Æquo Perturbata*, is that wherein more than two Terms of a Rank, are proportional to as many Terms of another Rank, compared to each other, in a different and interrupted Order; *viz.* The firſt of one Rank to the ſecond of another; the ſecond to the third, &c.

EQUALITY, in Algebra, is a Compariſon of two Quantities, that are equal both really and repreſentatively, *i. e.* both equal in Effect and Letters: And *Equation*, is a Compariſon of two Magnitudes, equal in Effect, but unequal in Letters, to render them equal.

Equality, in Algebra, is uſually denoted by two parallel Lines, as =: Thus, $2 + 2 = 4$, *i. e.* 2 *Plus* 2, are equal to 4.

This Character was firſt introduced by *Hariot*. *Des Cartes*, and ſome after him, in Lieu thereof uſe ∞: Thus, $2 + 2 \infty 4$, ſo $z - y = b + c$, ſignifies that z *minus* y, is equal to b *plus* c.

From an Equation, we arrive at an *Equality*, by changing one Letter into another, whereby the two Members of the Equation, *i. e.* the two Quantities compared together, and connected by the Sign of *Equality*, are render'd Equal.

Thus, in the Equation $aax = bcd$; ſuppoſing $x = \frac{bcd}{aa}$, we change x into $\frac{bcd}{aa}$, and by this Subſtitution arrive at the *Equality* $bcd = bcd$.

In the Solution of a Numerical Problem, to be render'd rational; if there be only one Power to be equall'd to a Square, or other higher Power; it is call'd *ſimple Equality*.

When there are two Powers to be equall'd, each to a Square, it is call'd *double Equality*, &c.

Diophantus has given us a Method for double *Equalities*, and *Fa. Billy*, another for *triple Equalities*, in his *Diophantus* and *Redivivus*.

EQUANT, or ÆQUANT, in Aſtronomy, a Circle, imagined by Aſtronomers, in the Plane of the Deferent, or Eccentric; for the regulating and adjuſting of certain Motions of the Planets. See DEFERENT.

EQUATION, or ÆQUATION, in Algebra, an Expreſſion of the ſame Quantity, in two different, that is, diſſimilar, but *Equal* Terms or Denominations. As when we ſay, 2. $3 = 4 + 2$; that is, twice three is equal to four and two. See QUANTITY.

Stifelius defines *Equation* to be the Ratio of Equality, between two Quantities differently denominated: As when we ſay 3 Shill. = 36 Pence. Or 50 Shill. = 2 Lib. 10 Shill. = 600 Pence, = 2400 Farth. Or, $b = d + e$. Or, $12 = \frac{a - P}{5}$, &c.

Hence, the Reduction of two heterogeneous, or diſſimilar Quantities to the ſame Value, *i. e.* to an Equality, is called the *bringing them to an Equation*.

The Character, or Sign of an *Equation*, is = or ∞; See CHARACTER.

The Reſolving of Problems, by Means of *Equations*, is the Buſineſs of Algebra. See ALGEBRA.

The *Terms of an Equation*, are the ſeveral Quantities, or Parts, of which an *Equation* is compoſed; connected together by the Signs + and −. Thus, in the *Equation* $b + c = d$; the Terms are b, c and d. And the Tenor of the *Equation* is, that ſome Quantity, repreſented by b, is equal to two others repreſented by c and d. See TERMS *of Equations*.

The *Root of an* EQUATION, is the Value of the unknown Quantity in the *Equation*. E. gr. if $a^2 + b^2 = x^2$; the Root will be $\sqrt{(a^2 + b^2)}$. See ROOTS *of Equations*.

Equations are divided with Regard to the Powers of the unknown Quantities, into *Simple*, *Quadratic*, *Cubic*, &c.

A *Simple* EQUATION, is that wherein the unknown Quantity is only of one Dimenſion, or the firſt Power. As, $x = (a + b) : 2$. See SIMPLE *Equation*.

A *Quadratic* EQUATION, is that wherein the unknown Quantity is of two Dimenſions, or the ſecond Power. As, $x^2 = a^2 + b^2$. See QUADRATIC *Equation*.

A *Cubic* EQUATION, is that wherein the unknown Quantity is of three Dimenſions. As $x^3 = a^3 - b^3$, &c. See CUBIC *Equation*.

If the unknown Quantity be of four Dimenſions, as $x^4 = a^4 - b^4$, the *Equation* is call'd a *Biquadratic*; if of 5, a *Surdeſolid*, &c. See POWER.

Equations are conſider'd two Ways: Either, as the ultimate Concluſions we arrive at in the Solution of Problems; or as Means, by the Help whereof, we arrive at thoſe final Solutions. See SOLUTION and PROBLEM.

An *Equation* of the firſt Kind, conſiſts only of one unknown Quantity, intermix'd with other known Quantities. Thoſe of the latter Kind, conſiſt of ſeveral unknown Quantities, which are to be compared, and connected together, till out of them all ariſe a new *Equation*, wherein the one unknown Quantity ſought, is mix'd with the known. To get the Value of which unknown Quantity, the *Equation* is generally turn'd, and transform'd various Ways, till it be brought as low, and render'd as ſimple as poſſible.

The Doctrine and Practice of *Equations*; that is, the Solution of Queſtions by *Equations*, conſiſts of ſeveral Steps, or Parts, *viz.* 1°. The denominating of the ſeveral Quantities, or expreſſing them in proper Signs, or Symbols. 2°. The bringing the Quantities thus denoted to an *Equation*. 3°. The reducing that *Equation* to its loweſt and ſimpleſt Terms. To which 4°. may be added the conſtructing of the *Equation*, or repreſenting it in Geometrical Lines: We proceed to each in its Order.

With Regard to the *firſt*; a Queſtion, or Problem, being propoſed; we conceive the Thing ſought, or required, as already done: And accordingly note, or expreſs it by one of of the Vowels, as *a*, or more uſually, by one of the laſt Letters the Alphabet, *x* y or z; noting the other known Quantities, by the Conſonants, or the beginning Letters of the Alphabet, *b*, *c*, *d*, &c. See QUANTITY, CHARACTER, SPECIES.

The Queſtion being thus ſtated in Species; it is conſider'd whether, or no, it be ſubject to any Reſtrictions, *i. e.* whether it be determinate, or no; which is found by theſe Rules.

1°. If the Quantities ſought, or required, be more than the Number of *Equations* given, or contain'd in the Queſtion; it is indeterminate, and capable of innumerable Solutions. The *Equations* are found, if they be not expreſly contain'd in the Problem it ſelf, by the Theorems of the Equality of Quantities.

2°. If the *Equations* given, or contain'd in the Problem, be juſt equal in Number with the unknown Quantities; the Queſtion is determinate, or has one only Solution.

3°. If the unknown Quantities be fewer than the given *Equations*, the Queſtion is yet more limited, and ſometimes diſcovers it ſelf impoſſible, by ſome Contradiction between the *Equations*. See DETERMINATE, &c.

To bring Queſtions to EQUATIONS.

Now, *to bring a Queſtion to an Equation*, that is, to bring the ſeveral mediate *Equations*, to one final one; the principal Thing to be attended to, is to expreſs all the Conditions thereof, by ſo many *Equations*. In order to which, it is to be conſider'd, whether the Propoſitions, or Sentences, wherein it is expreſſed, be all of them fit to be noted in Algebraic Terms; as our Conceptions uſe to be in *Latin*, or *Greek* Characters. And if ſo, as is generally the Caſe in Queſtions about Numbers, or abſtract Quantities; then let Names be given both to the known and unknown Qualities, as far as Occaſion requires: And thus the Drift of the Queſtion may be couch'd, as we

may

may call it, in the *Algebraical Language*. The Conditions, thus tranſlated to Algebraic Terms, will give as many *Equations* as are neceſſary to ſolve it. To illuſtrate this by an Inſtance: Suppoſe it required to find three Numbers, in continual Proportion, whoſe Sum is 20, and the Sum of the Squares 140; putting x, y, z, for the Names of the three Numbers ſought, the Queſtion will be tranſlated out of the Verbal to the Symbolical Expreſſion, thus:

The Queſtion in Words.	*In Symbols.*
Required three Numbers, on theſe Conditions.	x, y, z?
That they be continually proportional.	$x : y :: y : z$, or $xz = yy$
That the Sum be 20.	$x + y + z = 20.$
And the Sum of their Squares 140.	$xx + yy + zz = 140.$

Thus, is the Queſtion brought to theſe *Equations*, viz. $xz = yy$, $x + z + y = 20$, and $xx + yy + zz = 140$, by the Help whereof, x, y, and z, are to be found.

The Solutions of Queſtions are, for the moſt Part, ſo much the more expedite and artificial, by how much the unknown Quantities, you have at firſt, are the fewer. Thus, in the Queſtion propoſed, putting x for the firſt Number, and y for the ſecond, $\frac{yy}{x}$ will be the third Proportional; which being put for the third Number, bring the Queſtion into *Equations* as follows.

The Queſtion in Words.	*Symbolically.*
There are ſought three Numbers in continual Proportion. - - -	x, y, $\frac{yy}{x}$?
Whoſe Sum is 20. - - - - -	$x + y + \frac{yy}{x} = 20.$
And the Sum of their Squares 140. - - - - - - - - - -	$xx + yy + \frac{y^4}{xx} = 140.$

You have therefore the *Equations* $x + y + \frac{yy}{x} = 20$, and $xx + yy + \frac{y^4}{xx} = 140$, by the Reduction whereof, x and y are to be determined.

Take another Example: A Merchant increaſes his Eſtate annually by a third Part, abating 100 *L.* which he ſpends yearly in his Family; and after three Years he finds his Eſtate doubled. *Query*, What is he worth? To reſolve this, it muſt be obſerved, that there are (or lie hid) ſeveral Propoſitions, which are all thus found out and laid down.

In Engliſh.	*Algebraically.*
A Merchant has an Eſtate. —— ——	x
Out of which the firſt Year he expends 100 *l.*	$x - 100.$
And augments the reſt by one Third. ——	$x - 100 + \frac{x - 100}{3}$, or $\frac{4x - 400}{3}$
And the ſecond Year he expends 100 *l.* —	$\frac{4x - 400}{3} - 100$, or $\frac{4x - 700}{3}$
And augments the reſt by one Third. ——	$\frac{4x - 700}{3} + \frac{4x - 700}{9}$, or $\frac{16x - 2800}{9}$
And ſo the third Year he expends 100 *l.* —	$\frac{16x - 2800}{9} - 100$, or $\frac{16x - 3700}{9}$
And by the reſt gains likewiſe one Third.	$\frac{16x - 3700}{9} + \frac{16x - 3700}{27}$, or $\frac{64x - 14800}{27}$
And he becomes at length twice as rich as at firſt.	$\frac{64x - 14800}{27} = 2x.$

Therefore the Queſtion is brought to this *Equation*, $\frac{64x - 14800}{27} = 2x$, by the Reduction whereof you will find

$x = 14800.$

x. *Viz.* Multiply it into 27, and you have $64x - 14800 = 54x$; ſubtract $54x$, and there remains $10x - 14800 = 0$, or $10x = 14800$; and dividing by 10, you have $x = 1480$. So that the Value of his Eſtate at firſt was 1480 *Lib.*

It appears then, that to the Solution of Queſtions about Numbers, or the Relations of abſtract Quantities; there is ſcarce any Thing more required, but to tranſlate 'em out of the common, into Algebraic Language; *i. e.* into Characters, proper to expreſs our Idea's of the Relations of Quantities. Indeed, it may ſometimes happen, that the Language wherein the Queſtion is ſtated, may ſeem unfit to be rendred into the Algebraical; tho' by making a few Alterations therein, and attending to the Senſe, rather than the Sound of the Words, the Tranſlation becomes eaſy enough. The Difficulty here reſults merely from the Difference of Idioms, which is as obſervable between moſt Languages, as between the common and ſymbolical.

However, to render the Solution of ſuch Problems a little more eaſy and familiar, we ſhall add an Example or two thereof.

1°. *Given, the Sum of two Numbers* a, *and the Difference of their Squares* b; *to find the Numbers themſelves.* Suppoſe the leſſer, x; the other will be $a - x$; and their Squares xx and $aa - 2ax + xx$: Whoſe Difference, $aa - 2ax$ is call'd b. Conſequently, $aa - 2ax = b$. Whence, by Reduction, $aa - b = 2ax$. Or $\frac{aa - b}{2a}$ $(= \frac{1}{2}a - \frac{b}{2a}) = x$.

E. gr. Suppoſe the Sum of the Numbers, or a, to be 8, and the Difference of their Squares, or b, 16: Then will, $\frac{1}{2}a - \frac{b}{2a} (= 4 - 1) = 3 = x$. And $a - x = 5$. Therefore the Numbers are 3 and 5.

2°. *To find three Quantities* x, y, *and* z; *the Sum of each Pair whereof is given.* Suppoſe the Sum of the Pair x and y be a; that of x and z, b: and that of y and z, c. To determine the three Numbers required, x, y, and z; we have three *Equations* $x + y = a$; $x + z = b$; and $y + z = c$: Now, to exterminate two of the unknown Quantities, *e. gr.* y and x; take away x, both from the firſt and ſecond *Equations*; and we ſhall have $y = a - x$ and $z = b - x$. Which Values being ſubſtituted for y and z in the third *Equation*; there will ariſe $a - x + b - x = c$; and by Reduction $x = \frac{a + b - c}{2}$. Having found x the former *Equations*, $y = a - x$ and $z = b - x$ will give y and z.

Thus, *e. gr.* If the Sum of the Pair x and y be 9; of x and z, 10; and of y and z, 13: Then, in the Values x, y and z, write 9 for a, 10 for b, and 13 for c; and you will have $a + b - c = 6$; and conſequently x $(= \frac{a + b - c}{2})$ $= 3$, y $(= a - x) = 6$ and z $(= b - x) = 7$.

3°. *To divide a given Quantity into any Number of Parts, ſo as that the greater Parts ſhall exceed the leaſt by any given Differences.* Suppoſe A a Quantity to be divided into four ſuch Parts, the firſt and ſmalleſt whereof is x; the Exceſs of the ſecond Part above this, b, of the third, c, and the fourth, d: Then will $x + b$ be the ſecond Part, $x + c$ the third, and $x + d$ the fourth: The Aggregate of all which $4x + b + c + d$ is equal to the whole Line a. Now, taking away from each, $b + c + d$, and there remains $4x = a - b - c - d$ or $x = \frac{a - b - c - d}{4}$.

Suppoſe, *e. gr.* a Line of 20 Feet, to be divided into 4 Parts, in ſuch manner, as that the Exceſs of the ſecond above the firſt may be 2 Feet, of the third, 3 Feet, and of the fourth 7 Feet. Then the four Parts will be x $(= \frac{a - b - c - d}{4}$ Or $\frac{20 - 2 - 3 - 7}{4}) = 2$, $x + b = 4$, $x + c = 5$, and $x + d = 9$. And after the ſame Manner, may a Quantity be divided into a greater Number of Parts on the ſame Conditions.

4°. *A Perſon diſpoſed to diſtribute a little Money among ſome Beggars; wants Eight Pence, of Three Pence for each of 'em: He therefore gives 'em Two Pence a-piece, and has Three Pence left: The Number of Beggars is required.* Let the Number of Beggars be call'd x; and the Perſon want Eight Pence of giving 'em all $3x$. Conſequently he has $3x - 8$; out of which he gives $2x$ Pence; and the remaining Pence are 3. That is $x - 8 = 3$ or $x = 11$.

5°. *The Power or Strength of one Agent being given; to determine how many ſuch Agents will produce a given Effect* a, *in a given Time* b. Suppoſe the Power of the Agent ſuch, as that it may produce the Effect c, in the Time d; then, as the Time d, is to the Time b, ſo is the Effect c, which the Agent can produce in the Time d, to the Effect it can produce in the Time b, which accordingly will be $\frac{bc}{d}$ Then, as the Effect of one Agent $\frac{bc}{d}$ is to the joynt Effect of 'em all a; ſo is that one Agent, to all the Agents. Conſequently the Number of Agents will be $\frac{ad}{bc}$.

Thus, *e. gr.* If a Clerk, or Writer, in 8 Days Time, tranſcribe 15 Sheets; how many ſuch Clerks are required to tranſcribe 405 Sheets in 9 Days? *Anſ.* 24. For if 8 be ſubſtituted for d, 15 for c, 405 for a, and 9 for b, the Number $\frac{ad}{bc}$ will become $\frac{405 \times 8}{9 \times 15}$ That is $\frac{3240}{135}$ or 24.

5°. *The Powers of ſeveral Agents being given; to determine the Time* x, *wherein they will joyntly perform a given Effect d.* Suppoſe the Powers of the Agents, A, B, C, ſuch as that in the Times e, f, g, they would produce

duce Effects a, b, c, reſpectively: And theſe, in the Time x, would produce Effects $\frac{ax}{e}$, $\frac{bx}{f}$, $\frac{cx}{g}$. Conſequently $\frac{ax}{e} + \frac{bx}{f} + \frac{cx}{g} = d$, and by Reduction $x = \frac{d}{\frac{a}{e}+\frac{b}{f}+\frac{c}{g}}$.

Suppoſe, *e. gr.* three Workmen cou'd finiſh a certain Work, on ſuch and ſuch Times, *viz.* A once in three Weeks, B thrice in eight Weeks, and C five Times in twelve Weeks: And it is required, in what Time they will finiſh it together? Here, the Powers of the Agents A, B, C, are ſuch as in the Times 3, 8, and 12, reſpectively produce Effects 1, 3, 5; and it is enquired in what Time they will produce the Effect, 1. For a, b, c, d, e, f, g, write 1, 3, 5, 1, 3, 8, 12; and there will come out $x = \frac{1}{\frac{1}{3}+\frac{3}{8}} + \frac{5}{12}$ or $\frac{8}{9}$ of a Week, that is, 6 Days, $5\frac{1}{3}$ of an Hour; the Time they will finiſh it in together.

6°. *Given, the ſpecific Gravities of a Mixture, and of the ſeveral Ingredients thereof; to find the Proportion of the Ingredients therein.* Suppoſe e the ſpecific Gravity of the Mixture A + B; a that of A, and b that of B: Since the abſolute Gravity, or Weight, is compounded of the Bulk of the Body, and its ſpecific Gravity; a A will be the Weight of A; B b that of B; and e A + e B the Weight of the Aggregate A + B. Conſequently, a A + b B = e A + e B; and therefore a A − e A = e B − bB or e − b. a − e :: A. B.

Thus, *e. gr.* ſuppoſe the ſpecific Gravity of Gold to be as 19, that of Silver as $10\frac{1}{3}$, and that of K. *Hiero*'s Crown as 17; then will 10. 3 (:: e − b. a − e :: A. B) :: the Bulk of Gold in the Crown, to the Bulk of Silver: Or 190. 31 (:: 19 × 10. $10\frac{1}{3}$ × 3 :: a × e − b. b × a − e) :: The Weight of the Gold in the Crown, to the Weight of the Silver, and 221. 31 :: the Weight of the Crown to the Weight of Silver.

To bring Geometrical Problems to Equations.

Geometrical Queſtions, or thoſe relating to continued Quantities, are ſometimes brought to *Equations*, after the ſame manner as Arithmetical ones. So that the 1*ſt* Rule to be here preſcribed is, to obſerve every Thing directed for the Solution of Numerical Problems.

Suppoſe, *e. gr.* it were required, *to cut a right Line, as* A B, (*Tab. Algebra. Fig.* 6.) *in mean and extreme Propation in* C; that is, ſo as that B E, the Square of the greateſt Part, ſhall be *Equal* to the Rectangle B D, contain'd under the whole and the leaſt Part.

Here ſuppoſing A B = a and C B = x; then will AC = a − x; and xx = a into a − x. An *Equation*, which by Reduction gives $x = -\frac{1}{2}a + \sqrt{\frac{1}{4}aa}$.

But 'tis very rare, that Geometrical Problems are thus brought to *Equation*; as being generally found to depend on various complex Poſitions, and Relations of Lines; ſo that, here, ſome further Artifice, and certain ſpecial Rules, will be required, to bring 'em to Algebraic Terms. Indeed, 'tis very difficult to preſcribe any Thing preciſe in ſuch Caſes: Every Man's own Genius ſhould be the Rule of his Procedure.

Something, however, ſhall be ſaid in the general, for the Sake of ſuch as are nothing verſed in ſuch Operations; and that principally from Sir *I. Newton*.

Obſerve then, 2°. That Problems concerning Lines related to each other in any definite manner, may be variouſly ſtated, by ſuppoſing different Quantities, the *Quæſita*, or Things ſought, from different *Data*: Yet ſtill, with whatever Date and *Quæſita* the Queſtion is propoſed, its Solution will ariſe after the very ſame manner, without the leaſt Alteration of any Circumſtance, except in the imaginary Species of Lines, or the Names whereby the *Data* are diſtinguiſh'd from the *Quæſita*.

Suppoſe, *e. gr.* the Queſtion were about an *Iſoſceles* Triangle, B C D, (*Fig.* 7.) inſcribed in a Circle; whoſe Sides, BC, B D, and Baſe C D, were to be compared with the Diameter of the Circle A B. Here, the Queſtion may be either propoſed, of the inveſtigating the Diameter, from the given Sides and Baſe; or of inveſtigating the Baſe, from the Sides and Diameter given. Or, laſtly, of finding the Sides, from the Baſe and Diameter given: And propoſe it under which Form you will, it will be brought to an *Equation*, by the ſame Algebraic Series.

Thus, if the *Diameter* be ſought, I put A B = x, C D = a, and B C, or B D = b. Then, drawing A C, as the Triangles A B C and C B E are ſimilar; A B : B C :: B C : B E, Or xx : b :: b : B E. Wherefore B E = $\frac{bb}{x}$ and C E = $\frac{1}{2}$ C D or $\frac{1}{2}$ a. And, by reaſon the Angle C E B is a right Angle, C E q + B E q = B C q, that is, $\frac{1}{4}aa + \frac{b^4}{xx} = bb$. Which *Equation* being reduced, gives the Diameter required, x. Again,

If the Baſe be ſought, I put A B = c, C D = x, and B C, or B D = b. Then, drawing A C, as the Triangles ABC and CBE are ſimilar; AB : BC :: BC : BE, or c : b :: b : BE. Wherefore B E = $\frac{bb}{c}$. And C E = $\frac{1}{2}$ C D or $\frac{1}{2}x$. And ſince the Angle C E B is right, C E q + B E q = B C q; that is, $\frac{1}{4}xx + \frac{b^4}{cc} = bb$; an *Equation*, which reduced, gives the Baſis ſought, x.

Laſtly, If the Side B C, or B D, were ſought, I put A B = c; C D = a, and B C or B D = x. Then, drawing A C, the Triangles A B C, and C B E, being ſimilar; we have A B : B C :: B C : B E; or c : x :: x : B E. Wherefore, B E = $\frac{xx}{c}$. And C E = $\frac{1}{2}$ C D or $\frac{1}{2}$ a; And the Angle C E B being right C E q + B E q = B C q. That is $\frac{1}{4}aa + \frac{x^4}{cc} = xx$. An *Equation*, which by Reduction, gives x required.

Thus is the *Calculus* for arriving at the *Equation*, as well as the *Equation* it ſelf; the ſame in all the Caſes; except that the ſame Lines are deſign'd by different Letters, according as they are *Data*, or *Quæſita*. Indeed, as the *Data*, or *Quæſita* differ, there ariſes a Difference in the Reduction of the *Equation* found: But no Difference in the *Equation* it ſelf. So that we need make no Difference between given and ſought Quantities; but are at Liberty to ſtate the Queſtion with ſuch *Data* and *Quæſita*, as we think moſt favourable to the Solution of the Queſtion.

3°. A Problem, then, being propoſed, compare the Quantities it includes; and, without making any Difference between *Data* and *Quæſita*, conſider what Dependances they have of each other; that you may learn which of 'em will, by Compoſition, give the reſt. In the doing of which, it is not neceſſary you ſhou'd at firſt contrive, how ſome may be deduced out of others, by an Algebraic *Calculus*; It ſuffices you remark in the general, that they may be deduced by ſome direct Connection.

Thus, *e. gr.* If the Queſtion be about the Diameter of a Circle, A D (*Fig.* 8.) and three Lines A B, B C, and C D, inſcribed in a Semi-circle; whereof, the reſt being given, B C is required: It is evident at firſt Sight, that the Diameter A D, determines the Semi-circle; as alſo, that the Lines A B, and C D, by Inſcription, determine the Points B and C, and conſequently B C required, and that by a direct Connection. Yet does not it appear how B C is deduced from the ſame *Data*, by any analytical *Calculus*.

4°. Having conſider'd the ſeveral Manners, wherein the Terms of the Queſtion may be explain'd and decompounded; chuſe ſome of the ſynthetic Methods; aſſuming ſome Lines as given, from which there is the moſt eaſy Acceſs, or Progreſſion to the reſt, and to which the Regreſſion is the moſt difficult. For, tho' the *Calculus* may be carried on divers Ways, yet muſt it begin with theſe Lines. And the Queſtion is more readily ſolved, by ſuppoſing it to be of theſe *Data*, and ſome *Quæſitum* readily flowing from 'em; than by conſidering the Queſtion as 'tis actually propoſed.

Thus, in the Example already given, if from the reſt of the Quantities given, it were required to find A D; perceiving that this cannot be done ſynthetically; yet that if it were ſo done, I cou'd proceed in my Ratiocination on it in a direct Connection from one Thing to others; I aſſume A D as given, and begin to compute as if it was given indeed, and ſome of the other Quantities, *viz.* ſome of the given ones, as A B, B C, or C D, were ſought. And thus, by carrying on the Computation, from the Quantities aſſumed to the others, as the Relations of the Lines to one another direct, there will always be obtained an *Equation* between two Values of ſome one Quantity; whether one of thoſe Values be a Letter ſet down as a Repreſentation, or Name, at the Beginning of the Work for that Quantity; and the other, a Value of it found out by Computation: or whether both be found by Computation made different Ways.

5°. Having thus compar'd the Terms of the Queſtion in general, there is further Thought and Addreſs required, to find the particular Connections, or Relations of the Lines, fit for Computation. For, what to a Perſon who does not ſo throughly conſider them, may ſeem immediately, and by a very near Relation, connected together; when we come to expreſs that Relation Algebraically, are often found to require a longer Circuit; and ſhall even oblige you to begin your Schemes a-new, and carry on your Computation Step by Step; as may appear by finding B C, from A D, A B, and C D. For you are only to proceed by ſuch Propoſitions, or Enunciations, as can be fitly repreſented in Algebraic Terms, whereof there are

several arise from *Eucl.* Ax. 19. Prop. 4. Book 6. and Prop. 47. *Lib.* I. Elem.

To facilitate this Discovery, of the Relations of the Lines in the Figure, there are several Things that contribute; as first, the Addition and Substraction of Lines; since from the Values of the Parts, you may find the Values of the whole; or from the Value of the whole, and one of the Parts, you may obtain the Value of the other Part. Secondly, by the Proportionality of Lines; since, as above supposed, the Rectangle of the mean Terms, divided by either of the Extremes, gives the Value of the other; or, which is the same Thing, if the Values of all four of the Proportionals are first had, we make an Equality (or *Equation*) between the Rectangles of the Extremes and Means. But the Proportionality of Lines is best found out by the Similiarity of Triangles; which, as it is known by the Equality of their Angles, the Analyst ought in particular to be conversant in. In Order to which, 'twill be necessary he be Master of *Euclid*, Prop. 5, 13, 15, 29, and 32, *Lib.* I. and of Prop. 4, 5, 6, 7, 8, *Lib.* VI. and of the 20, 21, 22, 27, and 31, *Lib.* III. To which may be added, the 3d Prop. *Lib.* VI. or the 36th and 37th Prop. *Lib.* III. Thirdly, the Calculus is promoted by the Addition, or Substraction of Squares, *viz.* in right angled Triangles, we add the Squares of the lesser Sides, to obtain the Square of the greater; or from the Square of the greater Side, we substract the Square of one of the lesser, to obtain the Square of the other. On which few Foundations, if we add to them Prop. 1. of the VIth *Elem.* when the Business relates to Superficies, and also some Propositions taken out of the 11th and 12th of *Euclid*, when Solids come in Question; the whole analytic Art, as to right-lined Geometry, depends. Indeed, all the Difficulties of Problems may be reduced to the sole Composition of Lines out of Parts, and the Similiarity of Triangles; so that there is no Occasion to make Use of other Theorems; because they may all be resolved into these two, and consequently into the Solutions that may be drawn from them.

6°. To accommodate these Theorems to the Solution of Problems, the Schemes are oft times to be farther constructed, by producing out some of the Lines, till they cut others, or become of an assigned Length; or by drawing Lines parallel, or perpendicular from some remarkable Point; or by conjoyning some remarkable Points; as also, sometimes, by constructing them after other Methods, according as the State of the Problems, and the Theorems, which are made use of to solve it, shall require.

As for Example: If two Lines that do not meet each other, make given Angles, with a certain third Line; perhaps we produce them so, that when they concur, or meet, they shall form a Triangle, whose Angles, and consequently the Ratio of their Sides, shall be given; or if any Angle is given, or be equal to any one, we often complete it into a Triangle given in Specie, or similar to some other, and that by producing some of the Lines in the Scheme, or by drawing a Line subtending an Angle. If the Triangle be an oblique-angled one, we often resolve it into two right-angled ones, by letting fall a Perpendicular. If the Business concern multilateral, or many sided Figures, we resolve them into Triangles, by drawing diagonal Lines, and so in others; always aiming at this End, *viz.* that the Scheme may be resolved either into given, or similar, or right angled Triangles.

Thus, in the Example proposed, draw the Diagonal B D, that the Trapezium A B C D, may be resolved into the two Triangles, A B D a right angled one, and B D C an oblique-angled one, (*Figure* 8.) Then resolve the oblique-angled one into two right-angled Triangles, by letting fall a Perpendicular from any of its Angle B C or D, upon the opposite Side; as from B upon C D, produced to E, that B E may meet it perpendicularly. But since the Angles B A D, and B C D, make in the mean while two right ones, (by 22 Prop. 3 *Elem.*) as well as B C E and B C D, the Angles B A D, and B C E are perceived to be equal; consequently the Triangles B C E, and D A B to be similar. And so the Computation (by assuming A D, A B, and B C, as if C D were sought) may be thus carried on, *viz.* A D and A B, (by Reason of the right-angled Triangle A B D) give you B D. A D, A B, B D and B C, (by Reason of the similar Triangles A B D, and C E B) give B E, and C E. B D, and B E, (by Reason of the right-angled B E D) give E D: and E D — E C gives C D. Whence there will be obtain'd an *Equation* between the Value of C D so found out, and the small Algebraic Letter that denotes it. We may also (and for the greatest Part it is better so to do, than to follow the Work too far in one continued Series) begin the Computation from different Principles, or at least promote it by divers Methods to one and the same Conclusion; that at length there may be obtained two Values of any the same Quantity; which may be made equal to one another. Thus, A D, A B, and B C, give B D, B E, and C E as before; then C D + C E, gives E D; and lastly, D B and E D (by Reason of the right-angled Triangle B E D) give B E.

7°. Having concerted your Method of Procedure, and drawn up your Scheme; give Names to the Quantities that enter the Computation, (that is, from which assumed the Values of others are to be derived, till you come to an *Equation*) chusing such as involve all the Conditions of the Problem, and seem accommodated before others to the Business, and that shall render the Conclusion (as far as you can guess) more simple, but yet not more than what shall be sufficient for your Purpose: Wherefore, don't give new Names to Quantities, which may be denominated from Names already given. Thus, of a whole Line given, and its Parts, of the three Sides of a right-angled Triangle, and of three or four Proportionals, some one of the least considerable we leave without a Name; because its Value may be deriv'd from the Names of the rest. As in the Example already brought, if I make A D = x, and A B = a, I denote B D by no Letter, because it is the third Side of a right-angled Triangle A B D, and consequently its Value is $\sqrt{xx - aa}$. Then if I say, B C = b, since the Triangles D A B, and B C E are similar, and thence the Lines A D, A B :: B C, C E proportional, to three whereof, *viz.* to A D, A B, and B C, there are already Names given; for that Reason I leave the fourth C E without a Name, and in its Room I make use of $\frac{ab}{x}$ discover'd from the foregoing Proportionality. And so if D C be called c, I give no name to D E, because from its Parts D C, and C E, or c and $\frac{ab}{x}$, its Value $c + \frac{ab}{x}$ comes out.

8. By this Time, the Problem is almost reduced to an *Equation*. For after the aforesaid Letters are set down for the Species of the principal Lines, there remains nothing else to be done, but that out of those Species, the Values of other Lines be made out, according to a preconceived Method; till after some foreseen Way they come to an *Equation*. And there is nothing wanting in this Case, except that by Means of the right-angled Triangles B C E and B D E, I can bring out a double Value of B E, *viz.* B C q — C E q $\left(\text{or } bb - \frac{aabb}{xx}\right) =$ B E q; as also B D q — D E q $\left(\text{or } xx - aa - cc - \frac{2abc}{x} - \frac{aabb}{xx}\right) =$ B E q. And hence (blotting out on both Sides $\frac{aabb}{xx}$) you shall have the *Equation* $bb = xx - aa - cc - \frac{2abc}{xx}$; which being reduced, becomes $x^3 = +aa + bbx + 2abc$. as before. $+cc$

9°. For the Geometry of Curve Lines: We use to denote them, either by describing them by the local Motion of right Lines, or by using *Equations* indefinitely expressing the Relation of right Lines disposed in Order, according to some certain Law, and ending at the Curve Lines. See CURVE.

The Antients did the same by the Sections of Solids, but less commodiously. The Computations, which regard Curves, described after the first Manner, are performed as above directed: Thus, suppose A K C (*Fig.* 9.) a Curve Line, described by K, the vertical Point of the Square A K φ, whereof one Leg A K, freely slides thro' the Point A given in Position, while the other K φ of a determinate Length is carried along the right Line A D, also given in Position; and it is required to find the Point C, in which any right Line C D, given also in Position, shall cut this Curve: Draw the right Lines A C, C F, which may represent the Square in the Position sought, and the Relation of the Lines (without any Difference, or Regard, of what is given or sought, or any Respect had to the Curve) being considered; you perceive the Dependency of the others upon C F, and any of these four, *viz.* B C, B F, A F, and A C, to be synthetical; two whereof you assume, as C F = a, and C B = x; and Beginning the Computation from thence, you presently obtain B F = $\sqrt{aa - xx}$, and A B = $\frac{xx}{\sqrt{aa - xx}}$, by Reason of the right Angle C B F; and that the Lines B F, B C :: B C, A B are continual Proportionals. Moreover, from the given Position of C D, A D is given, which therefore call b; there is also given the Ratio of B C to B D, which suppose as d to e, and you have B D = $\frac{ex}{d}$, and A B = $b - \frac{ex}{d}$.

Therefore $b - \frac{ex}{d} = \frac{xx}{\sqrt{aa - xx}}$, an *Equation* which (by squaring

ſquaring its Parts, and multiplying by $aa - xx$) will be reduced to this Form.

$$x^4 = \frac{2bdex^3 - bbdd + aaee\,xx - 2aabdex + aabbdd.}{dd + ee}$$

Whence, laſtly, from the given Quantities a, b, d, and e; x may be found by Rules given hereafter; and at that Interval, or Diſtance x or B C, a right Line drawn parallel to A D, will cut C D in the Point ſought C.

If, inſtead of Geometrical Deſcriptions, we uſe *Equations* to denote the Curve Lines by; the Computations will thereby become as much ſhorter and eaſier, as the gaining of thoſe *Equations* can make them. Thus, ſuppoſe the Interſection C, of the given Ellipſis A C E, *Fig.* 10. with the right Line C D given Poſition, ſought: To denote the Ellipſis, take ſome known *Equation* proper to it, as $rx - \frac{r}{q}xx = yy$, where x is indefinitely put for any Part of the Axis A b, or A B, and y for the Perpendicular b c, or B C, terminated at the Curve; and r and q are given from the given Species of the Ellipſis. Since therefore C D is given in Poſition, A D will be alſo given, which call a; and B D will be $a - x$; alſo the Angle A D C will be given, and thence the Ratio of B D to B C, which call 1 to e; and B C (y) will be $= ea - ex$, whoſe Square $eeaa - 2eeax + eexx$, will be equal to $rx - \frac{r}{q}xx$. And thence by Reduction there will ariſe $xx = \frac{2aaeex + rx - aaee}{ee + \frac{r}{q}}$, or $x = \frac{aee + \frac{1}{2}r \pm e\sqrt{ar + \frac{rr}{4ee} - \frac{aar}{q}}}{ee + \frac{r}{q}}$. Add, that tho' a Curve be denominated by a Geometrical Deſcription, or by a Section of a Solid, yet thence an *Equation* may be obtained, which ſhall define the Nature of the Curve, and conſequently all the Difficulties of Problems propoſed about it, may be reduced hither. Thus, in the former Example, if A B be called x, and B C, y, the third Proportional B F will be $\frac{yy}{x}$, whoſe Square, together with the Square of B C, is equal to C F q, that is, $\frac{y^4}{xx} + yy = aa$; or $y^4 + xxyy = aaxx$. And this is an *Equation*, by which every Point C, of the Curve A K C, agreeing or correſponding to any Length of the Baſe (and conſequently the Curve it ſelf) is defined; and from whence conſequently you may obtain the Solutions of Problems propoſed concerning this Curve.

After the ſame Manner almoſt, when a Curve is not given in Specie, but propoſed to be determined, you may feign an *Equation* at Pleaſure, that may contain its general Nature; and aſſume this to denote it, as if it was given, that from its Aſſumption you ſome Way arrive at *Equations*, by which the Aſſumptions may be determined.

What remains of the Doctrine and Practice of *Equations*, relates to their *Reduction* to the loweſt and ſimpleſt Terms, the better to come at the Value of the unknown Quantity in the *Equation*; and their Geometrical *Conſtruction*.

For the *Reduction of* EQUATIONS. See REDUCTION *of Equations*.

Extraction of the Roots of EQUATIONS. See EXTRACTION *of the Roots of Equation*.

Conſtruction of Equations. See CONSTRUCTION *of Equations*.

EQUATION *of Time*, in Aſtronomy, the Difference between mean and apparent Time; or the Reduction of the apparent unequal Time, or Motion of the Sun, or a Planet, to Equable and mean Time or Motion. See TIME and MOTION.

Time is only meaſured by Motion; and as Time, in it ſelf, flows ever equably; to meaſure it, ſuch a Motion muſt be uſed as is equable, or which always proceeds at the ſame Rate.

The Motion of the Sun, is what is commonly uſed for this Purpoſe; as the moſt eaſy to be obſerved: Yet it wants the great Qualification of a Chronometer. In Effect, the Aſtronomers find that the Sun's apparent Motion is no Ways equal: That he now and then ſlackens his Pace, and afterwards quickens it again. Conſequently equal Time cannot be meaſured thereby. See SUN.

Hence, the Time which the Sun's Motion ſhews, call'd the *apparent Time*, becomes different from the true and equable Time, wherein all the Celeſtial Motions are to be eſtimated, and accounted.

This Inequality of Time is thus accounted for: The Natural, or Solar Day is meaſured, not, properly, by one entire Revolution of the Equinoctial, or 24 Equinoctial Hours; but by the Time which paſſes while the Plane of a Meridian paſſing thro' the Centre of the Sun, does, by the Earth's Converſion round its Axis, return again to the Sun's Centre: Which is the Time between one Mid-day and the next. See DAY and MERIDIAN.

Now, had the Earth no other Motion but that round its Axis; all the Days would be preciſely equal to each other, and to the Time of the Revolution of the Equinoctial: But the Caſe is otherwiſe; for while the Earth is turning round its Axis, it is likewiſe proceeding forward in its Orbit. So that when a Meridian has compleated a whole Revolution from the Sun's Centre, its Plane has not yet arrived at the Sun's Centre again: As will appear from the Figure.

Let the Sun be S, (*Tab. Aſtronom. Fig.* 50.) and let A B be a Portion of the Ecliptic: Let the Line M D, repreſent any Meridian, whoſe Plane produced, paſſes thro' the Sun when the Earth is in A. Let the Earth proceed in its Orbit, and in making one Revolution round its Axis, let it arrive at B; then, will the Meridian M D be in the Poſition m d parallel to the former M D; and conſequently has not yet paſſed thro' the Sun, nor have the Inhabitants under that Meridian, yet had their Mid-day. But the Meridian d m, muſt ſtill proceed with its angular Motion, and deſcribe the Angle d B f e're its Plane can paſs thro' the Sun. See EARTH.

Hence it appears, that the Solar Days are all longer than the Time of one Revolution of the Earth round its Axis.

However, were the Planes of all the Meridians perpendicular to the Plane of the Earth's Orbit; and did the Earth proceed with an equal Motion in its Orbit; the Angle d B f would be equal to the Angle B S A, and the Arches A f and A B be ſimilar: Conſequently, the Times would be always equal; the Arch A B, and the Angle d B f, of the ſame Quantity; all the Solar Days equal to each other; and the apparent and real Time agree.

But, as it is, neither of thoſe is the Caſe: For the Earth does not proceed in its Orbit with an equable Motion, but in its Aphelion, deſcribes a leſs Arch, and in its Perihelion a greater, in the ſame Time; beſide, that the Planes of the Meridians, are not perpendicular to the Ecliptic, but to the Equator. Conſequently, the Time of the Angular Motion d B f, which is to be added to the entire Revolution in order to make a whole Day, is not always of the ſame Quantity.

The ſame will be found, if, ſetting aſide the Conſideration of the real Motion of the Earth, we conſider the apparent Motion of the Sun in lieu thereof; as being what we meaſure Time by.

On this Principle we obſerve, that the Day not only includes the Time of one Converſion of the Globe on its Axis, but is increas'd by ſo much as anſwers to that Part of the Sun's Motion, performed in that Time. For when that Part of the Equinoctial, which, with the Sun, was at the Meridian yeſterday at Noon, is come thither again to Day; it is not yet Noon; the Sun not being now at the Place where he yeſterday was, but gone forward near a Degree more or leſs. And this Additament above the 24 Equinoctial Hours is upon a double Account unequal.

1°. In that the Sun, by Reaſon of his Apogee and Perigee, does not at all Times of the Year diſpatch an equal Arch of the Ecliptic in one Day; but greater Arches near the Perigæum, which is about the middle of *December*; and leſſer nearer the Apogæum, which is about the middle of *June*.

2°. In that tho' the Sun ſhould always move equably in the Ecliptic, yet equal Arches of the Ecliptic do not in all Parts of the Zodiac, anſwer to equal Arches of the Equator, by which we are to eſtimate Time; by Reaſon ſome Parts thereof, as the two Solſtitial Points, lie nearer to a parallel Poſition to the Equinoctial than others, *e. gr.* thoſe about the Equinoctial Points, where the Ecliptic and Equinoctial interſect. Whereupon an Arch of the Ecliptic, near the Solſtitial Points, anſwers to a greater Arch of the Equinoctial, than an Arch equal thereto near the Equinoctial Points.

The apparent Motion of the Sun to the Eaſt, then, being unequal; the natural and apparent Days are no Ways proper to be applied to meaſure the Cœleſtial Motions, which have no Dependance on that of the Sun.

And hence Aſtronomers have been obliged to invent other Days for the Uſe of their Calculations: Thoſe others are equal; and a mean between the ſhorteſt and longeſt of the unequal ones.

Theſe are had by conſidering the Number of Hours in the whole Revolution of the Sun in the Ecliptic, and dividing the whole Time into as many Equal Parts as there are Hours, 24 of which conſtitute the Day: And this Reduction of the Days conſtitutes the *Equation of natural Days*.

Conſe-

Consequently, computing those Motions according to the equal Time, it is necessary to turn that Time back again into apparent Time, that they may correspond to Observation: On the contrary, any Phenomena being observed, the apparent Time thereof must be added to equal Time, to have it correspond with the Times mark'd in the Astronomical Tables.

As we don't know of any Body in Nature that moves equably; yet such a Motion is alone proper to measure equal Days and Hours: It has been thought fit to imagine some Body, *e. gr.* a Star, moving in the *Equator*, Eastward; and never quickening, or slackening its Pace, but going thro' the *Equator*, in precisely the same Time, as the Sun finishes his Period in the Ecliptic.

The Motion of such a Star will represent equal Times; and its diurnal Motion in the *Equator*, will be 59′ 8″; the same as the mean, or equated Motion of the Sun in the Ecliptic. Consequently, the mean or equable Day, is determined by the Arrival of this Star at the Meridian; and is equal to the Time wherein the whole Circumference of the *Equator*, or 360°, pass the Meridian, and 59′ 8″ more. Which Addition of 59′ 8″ remaining always the same, these *mean* or *equated Days* will be constantly equal.

Since then the Sun goes unequally Eastwards with respect to the *Equator*; it will sometimes arrive at the Meridian sooner than this imaginary Star, and sometimes later: The Difference is the Difference between true and apparent Time: Which Difference is known by having the Place of the imaginary Star in the *Equator*; and the Point of the *Equator* which comes to the Meridian with the Sun. For the Arch intercepted between 'em, being converted into Time, shews the Difference between equal and apparent Time; which, as before, is call'd the *Equation of Time*.

The *Equation* of Time then, may be defined the Time that flows while the Arch of the *Equator* intercepted between the Point determining the right Ascension of the Sun, and the Place of the imaginary Star, passes the Meridian: Or, as *Tycho*, and, after him, *Street*, state it, the Difference between the Sun's true Longitude, and his right Ascension.

To Equate *Solar Days*, that is, *to convert apparent into mean Time, and mean into apparent Time.*

1°. If the Sun's right Ascension be equal to his mean Motion, the imaginary and true Sun will pass the Meridian at the same Time: Consequently, the true coincides with the apparent Time.

2°. If the right Ascension be greater than the mean Motion, subtract the latter from the former; and turning the Difference into Solar Time, either subtract it from the apparent Time, to find the mean Time: or add it to the mean Time to find the apparent.

3°. Lastly, if the right Ascension be less than the mean Motion, subtract the former from the latter, and turning the Difference into Solar Time, either add it to the apparent Time, to find the mean Time; or subtract it from the mean to find the apparent.

This Method of *Equation* obtains, if the *Calculus* be progressive; if it be Retrograde, that is, if the Time be reckon'd backwards, the Operation must be just the Reverse.

This Doctrine of the Inequality and *Equation* of natural Days, is not only of Use in Astronomical Computations, but also in the adjusting and directing of Clocks, Watches, and other Time Keepers: Hence we see, why a Pendulum, or other Movement, which measures equal Time, does not keep Pace with the Sun, which measures apparent Time; but is sometimes before, and sometimes later than the same. Whence, such Automata and Sun-Dials, are found almost perpetually at Variance. See Clock and Dial.

The Variations of the two Kinds of Time, are exhibited in the following Table, for every Day throughout the Year. 'Tis borrowed from Mr. *Flamsteed*; one Part of whose Praise it is, that he was the first who fully demonstrated and clear'd this Inequality of Natural Days: Tho' others, and even *Ptolomy*, had a partial Notion of it.

The Use of the Table is obvious: A Clock, or Watch, that is to be kept to true or equal Time, must be so many Minutes and Seconds faster or slower than a Sun-Dial, as is assign'd in the Table, for the respective Day: Or, if you would have it go by the Sun-Dial, it goes well, if it gains or loses each Day the Number of Minutes and Seconds in the Table.

A Table of the Equation of Natural Days, with the Regulation of a Movement by the same.

DAYS.	January. W. too fast.		February. W. too fast.		March. W. too fast.		April. W. too fast.		May. W. too slow.		June. W. too slow.		July. W. too fast.		August. W. too fast.		Sept. W. too slow.		Oct. W. too slow.		Nov. W. too slow.		Dec. W. too slow.	
	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.
1	8	59	14	48	10	08	0	48	4	07	1	03	4	43	4	30	3	48	13	14	15	23	5	2
2	9	21	14	47	9	51	0	32	4	09	0	51	4	51	4	20	4	08	13	28	15	15	5	13
3	9	43	14	45	9	34	0	16	4	11	0	39	4	58	4	10	4	28	13	42	15	06	4	44
4	10	04	14	42	9	17	0	* 01	4	12	0	27	5	05	3	59	4	49	13	55	14	56	4	15
5	10	24	14	38	8	59	0	* 14	4	12	0	15	5	11	3	48	5	10	14	08	14	45	3	46
6	11	44	14	33	8	41	0	29	4	11	0	* 02	5	17	3	36	5	31	14	20	14	33	3	17
7	11	03	14	28	8	23	0	44	4	10	0	* 11	5	22	3	24	5	52	14	31	14	20	2	48
8	11	21	14	22	8	05	0	58	4	08	0	24	5	27	3	11	6	13	14	42	14	06	2	18
9	11	39	14	16	7	47	1	12	4	06	0	37	5	31	2	58	6	34	14	52	13	52	1	48
10	11	56	14	09	7	29	1	25	4	04	0	50	5	35	2	44	6	54	15	02	13	37	1	18
11	12	12	14	01	7	11	1	38	4	01	1	03	5	38	2	30	7	14	15	11	13	21	0	48
12	12	28	13	53	6	53	1	50	3	57	1	16	5	41	2	16	7	34	15	19	13	04	0	* 18
13	12	43	13	44	6	35	2	02	3	52	1	29	5	43	2	01	7	54	15	26	12	40	0	* 12
14	12	57	13	34	6	16	2	14	3	47	1	42	5	43	1	46	8	14	15	32	12	28	0	42
15	13	10	13	24	5	57	2	25	3	41	1	54	5	46	1	30	8	34	15	38	12	09	1	12
16	13	22	13	13	5	38	2	36	3	35	1	06	5	46	1	34	8	54	15	43	11	50	1	42
17	13	34	13	02	5	19	2	46	3	29	2	18	5	45	0	57	9	14	15	48	11	30	2	11
18	13	45	12	50	5	00	2	56	3	22	2	30	5	44	0	40	9	33	15	52	11	09	2	40
19	13	55	12	38	4	41	3	05	3	15	2	42	5	42	0	25	9	52	15	55	10	47	3	09
20	14	04	12	25	4	22	3	13	3	07	2	54	5	40	0	* 05	10	11	15	58	10	25	3	38
21	14	12	12	12	4	03	3	21	2	58	3	05	5	38	0	* 13	10	30	16	00	10	02	4	7
22	14	19	11	58	3	44	3	28	2	49	3	16	5	35	0	31	10	48	16	01	9	38	4	35
23	14	25	11	43	3	25	3	35	2	40	3	27	5	31	0	50	11	06	16	01	9	14	5	3
24	14	31	11	28	3	07	3	41	2	30	3	38	5	27	1	09	11	24	16	00	8	49	5	30
25	14	36	11	13	2	49	3	46	2	20	3	49	5	22	1	28	11	41	15	58	8	24	5	37
26	14	40	10	57	2	31	3	51	2	10	3	59	5	16	1	48	11	58	15	56	7	58	6	24
27	14	43	10	41	2	13	3	55	2	00	4	09	5	10	2	08	12	14	15	53	7	52	6	50
28	14	46	10	25	1	55	3	59	1	49	4	18	5	03	2	28	12	30	15	49	7	05	7	16
29	14	48			1	38	4	02	1	38	4	27	4	56	2	48	12	45	15	44	6	38	7	41
30	14	49			1	21	4	05	1	27	4	35	4	48	3	08	13	00	15	38	6	10	8	5
31	14	49			1	04			1	15			4	39	3	28			15	31			8	29

Watch too Fast so far as the two Stars

Watch too Slow so far as the two Stars

Watch too Fast as far as the two Stars

Watch too Slow as far as the two Stars

Equation *of the Centre*, call'd also *Prostaphæresis*, and *total Prostaphæresis*; is the Difference between the true and mean Place or Motion of a Planet; or the Angle made by the Lines of the true and mean Place or Motion; or, which amounts to the same, between the mean and equated Anomaly. See Prostaphæresis.

The Motions of the Sun and Moon, are affected with various Inequalities; whence arises a Necessity of so many *Equations*. See Moon, *&c.*

From these Inequalities, the Moon's Place became exceeding difficult to be determined; to remove which Difficulty, is the great Design of Sir *Isaac Newton*'s new Theory

Theory of the Moon; wherein we are furniſh'd with *Equations* for all the Inequalities of the mean Motion. The principal are,

Annual EQUATIONS *of the mean Motion of the Sun and Moon, and of the Apogee and Nodes of the Moon.* The Annual *Equation* of the mean Motion of the Sun, depends on the Eccentricity of the Earth's Orbit round the Sun, which is 16 $\frac{1}{12}$ of ſuch Parts, whereof the Earth's mean Diſtance from the Sun is 1000: Whence its Denomination of *Equation of the Centre*. This, when greateſt, is 1 Deg. 56′ 20″. The greateſt *Annual Equation of the Moon's mean Motion* is 11′ 49″: That of *her Apogee* 20′: And of *her Node* 9′ 30″.

Which four Annual *Equations* are always mutually proportional one to another: Wherefore, when any of them is at the greateſt, the other three will alſo be greateſt; and when any one leſſens, the other three will alſo be diminiſhed in the ſame Ratio.

The Annual *Equation* of the Sun's Centre being given, the three other correſponding Annual *Equations* will be alſo given; and therefore a Table of that will ſerve for all. For if the Annual *Equation* of the Sun's Centre be taken from thence, for any Time, and be called P, and let $\frac{1}{10}$ P (*Tab. Aſtronomy Fig.* 51.) = Q, Q + $\frac{1}{60}$ Q = R, $\frac{1}{6}$ P = D, D + $\frac{1}{30}$ D = E, and D − $\frac{1}{60}$ D = 2 F; then ſhall the Annual *Equation* of the Moon's mean Motion for that Time be R, that of the Apogee of the Moon will be E, and that of the Node F.

Only obſerve, that if the *Equation* of the Sun's Centre be required to be added; then the *Equation* of the Moon's mean Motion muſt be ſubſtracted, that of her Apogee muſt be added, and that of the Node ſubducted. And on the contrary, if the *Equation* of the Sun's Centre were to be ſubducted, the Moon's *Equation* muſt be added, the *Equation* of her Apogee ſubducted, and that of her Node added.

There is alſo an *Equation of the Moon's mean Motion*, depending on the Situation of her Apogee in Reſpect of the Sun; which is greateſt, when the Moon's Apogee is in an Octant with the Sun; and is nothing at all, when it is in the Quadratures, or Syzygies. This *Equation*, when greateſt, and the Sun in *Perigæo*, is 3 Min. 56 Seconds. But if the Sun be in *Apogæo*, it will never be above 3 Min. 34 Seconds. At other Diſtances of the Sun from the Earth, this *Equation*, when greateſt, is reciprocally as the Cube of ſuch Diſtance. But when the Moon's Apogee is any where but in the Octants, this *Equation* grows leſs, and is moſtly at the ſame Diſtance between the Earth and Sun, as the Sine of the double Diſtance of the Moon's Apogee, from the next Quadrature or Syzygy, to the Radius. This is to be added to the Moon's Motion, while her Apogee paſſes from a Quadrature with the Sun to a Syzygy; but is to be ſubſtracted from it, while the Apogee moves from the Syzygy to the Quadrature.

There is, moreover, another *Equation of the Moon's Motion*, which depends on the Aſpect of the Nodes of the Moon's Orbit with the Sun: And this is greateſt, when her Nodes are in Octants to the Sun, and vaniſhes quite, when they come to their Quadratures or Syzygies. This *Equation* is proportional to the Sine of the double Diſtance of the Node from the next Syzygy, or Quadrature; and at greateſt, is but 47 Seconds. This muſt be added to the Moon's mean Motion, while the Nodes are paſſing from their Syzygies with the Sun, to their Quadratures with him; but ſubſtracted while they paſs from the Quadratures to the Syzygies.

From the Sun's true Place take the *equated* mean Motion of the Lunar Apogee, as was above ſhewed; the Remainder will be the Annual Argument of the ſaid Apogee. From whence the *Eccentricity of the Moon*, and the *ſecond Equation* of her Apogee may be compared.

EQUATOR, or ÆQUATOR, in Aſtronomy, and Geography, a great moveable Circle of the Sphere, equally diſtant from the two Poles of the World, or having the ſame Poles with thoſe of the World. See CIRCLE.

Such is the Circle D A, (*Tab. Aſtronom. Fig.* 52.) its Poles being P and Q.

It is call'd the *Equator*, by Reaſon when the Sun is therein, the Days and Nights are *Equal*; whence alſo it is call'd the *Equinoctial*; and when drawn on Maps, and Planiſpheres, the *Equinoctial Line*, or ſimply the *Line*. See EQUINOCTIAL.

Every Point of the *Equator* is a Quadrant's Diſtance from the Poles of the World; whence it follows, that the *Equator* divides the Sphere into two Hemiſpheres, in one of which is the Northern, and in the other Southern Pole. See HEMISPHERE.

By the Paſſages, or Tranſits of Arches of the *Equator* over the Meridian, its equal or mean Time is eſtimated: Hence we have frequent Occaſion for the Converſion of Degrees of the *Equator* into Time; and, again, for the Re-converſion of Parts of Time into Parts of the *Equator*.

For Performance whereof, we ſubjoyn the following Table; wherein are exhited the Arches of the *Equator*, which paſs the Meridian in the ſeveral Hours, Minutes, *&c.* of *Equated*, or mean Time. See EQUATION *of Time*.

Converſion of Parts of the *Equator* into Time, and *vice verſa*.

Deg. of *Equat.*	Hours.	I	Hours.	Deg. of *Equat.*	Hour. Min.	Deg. of *Equat.*	I
Min.		II			Sec.		II
Sec.	II	III			Third.		III
Third.	III	IV			Fourth		IV
1	0	4	1	15	1	0	15
2	0	8	2	30	2	0	30
3	0	12	3	45	3	0	45
4	0	16	4	60	4	1	0
5	0	20	5	75	5	1	15
10	0	40	6	90	6	1	30
15	1	0	9	135	10	2	30
30	2	0	12	180	20	5	0
60	4	0	15	225	30	7	30
90	6	0	18	270	40	10	0
180	12	0	21	315	50	12	30
360	24	0	24	360	60	15	0

The Uſe of the Table is obvious; ſuppoſe, *e. gr.* it were required to turn 19° 13′ 7″ of the *Equator* into Time: Againſt 15 Deg. in the firſt Column, we have 1ʰ 0′ 00″: Againſt 4 Deg. we have 16′ 0″: Againſt 10 Minutes, 40″; againſt 3 Minutes, 12″ 0‴: Againſt 5 Seconds, we have 0″ 20‴; and againſt 2 Seconds, 8‴: Which added together, give 1ʰ 16′ 52″ 28‴.

Again, ſuppoſe it were required to find how many Degrees, Minutes, *&c.* of the *Equator*, anſwer to 23 Hours 25 Min. 17 Sec. and 9 thirds. Againſt 21ʰ in the fourth Column of the Table you have 315°: Againſt 2 Hours, 30°: Againſt 20′, 5°: Againſt 10 Sec, 2′ 30″: Againſt 5 Sec. 1′ 15″ 0‴: Againſt 2 Sec. 30″ 0‴; againſt 6 Thirds, 0″ 45‴: Which added together give 351° 19′ 17″ 15‴.

The Elevation, or Altitude of the EQUATOR, is an Arch of a Vertical Circle, intercepted between the *Equator* and the Horizon. The *Elevation of the Equator*, with that of the Pole, is always equal to a Quadrant. See ELEVATION.

EQUERY, or ECURY, a grand Stable, or Lodge for Horſes, furniſh'd with all the Conveniencies thereof; as Stalls, Manger, Rack, *&c.*

Some hold that Stable, in Propriety, relates only to Bullocks, Cows, Sheep, Hogs, *&c.* And *Equery* to Horſes, Mules, *&c.*

A *ſimple Equery*, is that provided for one Row of Horſes: A *double Equery* is that provided for two, with a Paſſage in the middle, or two Paſſages; the Horſes being placed Head to Head: As in the little *Equery* at *Verſailles*.

Under *Equery* is ſometimes alſo comprehended the Lodgings, and Apartments, of the *Equeries*, Grooms, Pages, *&c.*

The Word is form'd from the French *Eſcurie*, which ſignifies the ſame Thing. Some, again, derive *Eſcurie* from the Latin *Scuria*, which is not only a Place for Beaſts to be put up in, but alſo a Grange, or Barn. But a more probable Derivation is from *Equile*, a Stable for Horſes, of *Equus*, Horſe.

EQUERY, *Eſcuyer*, is alſo an Officer, who has the Care and Management of the Horſes of a King, or Prince.

Of theſe *Equeries*, there are a great Number in the King of *France*'s Service: As the *Grand Ecuyer*, call'd abſolutely *Monſieur le Grand*; one of the principal Offices of the Crown, and a Branch of that of Conſtable; anſwering to the Maſter of Horſe among us. He has the chief Intendance and Direction of the great and little *Ecurie*, and diſpoſes of all the vacant Poſts therein: the *firſt great Ecuyer of the great Ecurie*, who has the Command thereof in the Abſence of the *Grand Ecuyer*: The *firſt Ecuyer of the little Equeries* call'd abſolutely *Monſieur le Premier*: *Ecuyer Cavalcadeur*, who commands the *Equery* of Horſes for a Prince's own Riding: *Ecuyer de Main*, who not only directs the *Ecurie*, but alſo attends his Maſter in walking, *&c.* call'd alſo Gentlemen-Uſhers, and *Chevaliers d' Honneurs*: *Ecuyer Trenchant*, the King's Carver and Server: *Ecuyer Bouche*, who ranges the Diſhes and Plates on the Table: *Ecuyer de Caiſine*, &c.

EQUERIES are particularly uſed among us, for Officers of the King's Stables; who when his Majeſty goes Abroad, ride in the leading Coach; are in Waiting one at a Time monthly, and have a Table with the Gentlemen Uſhers during the Time.

They uſed to ride on Horſe-back by the Coach-Side, when the King travelled; but that being more expenſive to them, than neceſſary to the Sovereign, it has been diſcontinued. There are Six of them, and their Salary is 300*l. per Annum* each.

The *Equeries* of the Crown Stable have that diſtinct Appellation, as being imployed in managing and breaking the Saddle Horſes, and preparing them for the King's Riding.

One of them is, or always ſhould be, in cloſe Waiting at Court; and when his Majeſty rides, holds the Stirrup, whilſt the Maſter of the Horſe, or one of the *Equeries*, in his Abſence, aſſiſts in mounting him; or when his Majeſty rides, they uſually attend him. They are two, and their Salary is 256*l. per Annum* each.

EQUES *Auratus*, is uſed to ſignifie a Knight Batchelor; call'd *Auratus*, becauſe anciently none but Knights might gild or beautify their Armour, or other Habiliments of War, with Gold. See KNIGHT.

However, in Law, this Term is not uſed; but inſtead of it *Miles*; and ſometimes *Chevalier*. See MILES, CHEVALIER, *&c.*

EQUESTRIS, EQUESTRIAN, a Term rarely uſed, but in the Phraſe *Equeſtrian Statue*, which ſignifies a Statue repreſenting a Perſon mounted on Horſeback. See STATUE.

The *Fortuna Equeſtris*, in ancient *Rome*, was a Statue of that Goddeſs on Horſeback.

We ſometime alſo ſay, *Equeſtrian Column*. See COLUMN.

And *Equeſtrian Order*, which ſignified, among the *Romans*, the Order of Knights, or *Equites*. See KNIGHT,

The Word is form'd of the Latin, *Eques*, Knight, Horſeman; of *Equus*, Horſe.

EQUIANGULAR, or ÆQUIANGULAR, in Geometry, is applied to Figures whoſe Angles are all equal. See ANGLE.

A *Square* is an *Equiangular* Figure. See SQUARE.

All equilateral Triangles are alſo *Equiangular*. See EQUILATERAL.

When the three Angles of one Triangle, are ſeverally equal to the three Angles of another Triangle; the Triangles are alſo ſaid to be *Equiangular*. See TRIANGLE.

EQUICULUS, *Equuleus*, or *Equus minor*, a Conſtellation of the Northern Hemiſphere. See EQUULEUS.

EQUICRURAL, or EQUICRURAL *Triangle*, is what we more uſually call an *Iſoſceles*. See ISOSCELES.

EQUIDIFFERENT, or ÆQUIDIFFERENT, in Arithmetic. If in a Series of three Quantities, there be the ſame Difference between the firſt and ſecond, as between the ſecond and third, they are ſaid to be *continually Equidifferent:* But if in a Series of four Quantities, there be the ſame Difference between the firſt and ſecond, as between the third and fourth, they are ſaid to be *diſcretely Equidifferent*. Thus, 3, 6, 7, and 10, are diſcretely *Equidifferent*; and 3, 6, and 9, continually *Equidifferent*.

EQUIDISTANT, or ÆQUIDISTANT, in Geometry, a Term of Relation between two Things, which are every where at an equal, or the ſame, Diſtance from each other. See DISTANCE.

Thus parallel Lines are ſaid to be *Equidiſtant*, as they neither approach nor recede.

Parallel Walls are *Equidiſtant* from each other. See PARALLEL.

EQUILATERAL, or ÆQUILATERAL, is applied to any Thing whoſe Sides are all equal. Thus, an *Equilateral Triangle*, is that whoſe Sides are all of equal Length. In an *Equilateral* Triangle, all the Angles are likewiſe equal. See TRIANGLE.

All regular Polygons, and regular Bodies, are *Equilateral*. See POLYGON.

An EQUILATERAL *Hyperbola*, is that wherein the conjugate Axes, as A B, and D E, are equal. (*Tab. Conick's Fig.* 20.)

Hence, as the Parameter is a 3*d* Proportional to the conjugate Axes, it is alſo equal thereto. Conſequently, in the Equation $y^2 = bx + \frac{b}{a}x^2$, make $b = a$; And the Equation $y^2 = ax + x^2$, defines the Nature of an *Equilateral Hyperbola*. See HYPERBOLA.

EQUILIBRIUM, or ÆQUILIBRIUM, in Mechanicks, a Term implying an exact Equality of Weight between two Bodies, compared with each other. See WEIGHT.

Thus, we ſay a Balance is in *Equilibrio*; when the two Ends are ſo exactly pois'd, that neither of 'em aſcends or deſcends, but both retain their parallel Poſition to the Horizon. From which Circumſtance the Word is originally taken; as being a Compound of *æquus*, equal, and *libra*, Balance.

Whence we frequently uſe the Word *Balance* in lieu thereof. See BALANCE.

The *Equilibrium* of Fluids makes a conſiderable Part of the Doctrine of Hydroſtaticks. See FLUID.

The Term *Equilibrium*, is alſo uſed figuratively on other Occaſions. A Painter muſt take Care to obſerve the *Equilibrium* of his Figures, *i. e.* to diſpoſe 'em well on their Center of Gravity, that they mayn't ſeem ill ſupported, or ready to tumble.

Thus, *e. gr.* if one Arm be moving forward, the other muſt be proportionably backward to poiſe the Figure.

In a Picture, there ſhould be an *Equilibrium* between one Part and another: That is, the Objects are to be diſtributed ſo, as to balance, and contraſt each other; and not too many, *e. gr.* be crowded on one Side, and the other left bare. — Peace is never well ſecured, unleſs the Neighbouring States are in *Equilibrio*.

EQUIMULTIPLE, in Arithmetic and Geometry, is applied to ſimple Magnitudes, when multiplied equally, *i. e.* by equal Quantities, or Multiplyers. See MULTIPLICATION.

Thus, taking A as many Times as B; or multiplying 'em equally, there will ſtill remain the ſame *Ratio* between the Magnitudes thus multiplied, as between the primitive Magnitudes before Multiplication.

Now, thoſe Magnitudes, thus equally multiplied, are call'd *Equimultiples* of the original ones A and B: Whence we ſay, that *Equimultiples* have the ſame *Ratio* as the ſimple Quantities. See RATIO.

In Arithmetic, we generally uſe the Term *Equimultiples* for Numbers which contain equally, or an equal Number of Times, their *Submultiples*.

Thus 12 and 6 are *Equimultiples* of their *Submultiples* 4 and 2; inaſmuch as each of them contains its *Submultiple* three Times. See SUBMULTIPLE.

EQUINOCTIAL, or ÆQUINOCTIAL, in Aſtronomy, a great and immoveable Circle of the Sphere, under which the *Equator* moves in its diurnal Motion. See SPHERE.

The *Equinoctial*, or *Equinoctial Line*, is ordinarily confounded with the *Equator*; but there is a Difference: the *Equator* being moveable, and the *Equinoctial* immoveable; and the *Equator* drawn about the Convex Surface of the Sphere, but the *Equinoctial* on the Concave Surface of the *magnus Orbis*. See EQUATOR.

The *Equinoctial* is conceiv'd, by ſuppoſing a Semi-diameter of the Sphere, produced thro' a Point of the *Equator*, and there, by the Rotation of the Sphere about its Axis, deſcribing a Circle on the immoveable Surface of the *primum Mobile*.

Whenever the Sun, in his Progreſs thro' the Ecliptic, comes to this Circle, it makes equal Days and Nights all around the Globe; as then ariſing due Eaſt, and ſetting due Weſt, which he never does at any other Time of the Year. See DAY.

And hence the Denomination, from *æquus*, and *nox*, Night; *quia equat diem nocti*. See DAY and NIGHT.

The *Equinoctial*, then, is the Circle which the Sun deſcribes, or appears to deſcribe, at the Time of the *Equinoxes*; that is, when the Length of the Day is every where equal to that of the Night; which happens twice *per Annum*. See EQUINOX.

EQUINOCTIAL, in Geography. See EQUATOR.

People who live under this Circle, by Geographers and Navigators call'd the *Line*, have their Days and Nights conſtantly equal. And at Noon, the Sun is in their *Zenith*, and caſts no Shadow. See ASCII.

From this Circle, is the Declination, or Latitude of Places, accounted in Degrees of the Meridian. See LATITUDE, *&c.*

EQUINOCTIAL *Points*, are the two Points wherein the Equator and Ecliptic interſect each other. The one, being in the firſt Point of *Aries*, call'd the *Vernal*; and the other in the firſt Point of *Libra*, call'd the *Autumnal Point*. See POINT.

EQUINOCTIAL *Colure*, is that paſſing thro' the *Equinoctial* Points. See COLURE.

EQUINOCTIAL *Dial*, is that whoſe Plane lies parallel to the *Equinoctial*. See DIAL.

EQUINOX, or ÆQUINOX, in Aſtronomy, the Time when the Sun enters one of the *Equinoctial* Points.

That when he enters the *Vernal* Point is particularly denominated the *Vernal*; and that in the *Autumnal* Point, the *Autumnal Equinox*. See EQUINOCTIAL *Points*.

The *Equinoxes* happen when the Sun is in the *Equinoctial* Circle; when, of Conſequence, the Days are equal to the Nights throughout the World, which is the Caſe twice