The Enemies of Religion, even under the old Law, made their utmoſt Efforts to deprive the World of the Holy Scriptures: In that cruel Perſecution which *Antiochus* rais'd againſt the *Jews*, the Books of the Law were very ſolicitouſly ſought after, torn, and burnt, and ſuch as kept them put to Death; as we read in the firſt Book of *Maccab.* cap. iv. 59, and 60.

Diocleſian renew'd the ſame Impiety, by an Edict publiſh'd in the 19th Year of his Empire, commanding all the ſacred Books to be brought to the Magiſtrates, and burnt.

Many weak Chriſtians, and even ſome Biſhops, overcome by the Fear of Puniſhment, carry'd in their Books to the Perſecutors; which the Church deteſting, made very ſevere Laws againſt them, and gave them the infamous Name of *Traditores*, from *Trado*, I deliver.

As the great Pretence of the Schiſm of the Donatiſts was, that the Catholicks tolerated the *Traditores*; it was decreed in the Council of *Arles*, held in 314, that ſuch as ſhould be found guilty of having deliver'd up any of the Holy Books, or Veſſels, ſhould be depos'd from the Order of the Clergy, *&c.*

TRADUCIANS, Traduciani, a Name the *Pelagians* anciently gave to the Catholicks, becauſe of their teaching, that original Sin was tranſmitted from Father to Children, or that it was communicated to the Children by the Father in the Way of Generation. See Original *Sin.*

The Word is form'd of the *Latin*, *tradux*, which was made Uſe of to expreſs that Communication; and which comes from *traduco*, I tranſmit, or make paſs from one to another.

At preſent, ſome give the Appellation *Traducian* to ſuch as hold that the Souls are tranſmitted to the Children by the Father.

TRADUCTION, the *Tranſlating*, or turning out of one Language into another. See Translation.

The Word is form'd of *trans*, beyond, and *duco*, I lead, draw.

TRAFINE, among Surgeons, an Inſtrument, call'd alſo *Trepanum*, *Anabapiſton*, *Modiolus*, &c. See Trepanum and Modiolus.

TRAFFIC. See Trade and Commerce.

The principal *Traffic* in *Muſcovy*, and the North, is in Furs and Skins: The great *Traffic* of the *Dutch* in the Eaſt is in Spices: The *Traffic* of Money is moſtly carry'd on at the Exchange.

The Word is form'd from the *French*, *Trafic*, and that from the *Italian*, *Trafico*, which is again borrow'd from the *Arabic*.

TRAGACANTH, or Adraganth, a kind of Gum oozing out at Inciſions made in the Trunk and larger Branches of a Plant, or little Shrub, of the ſame Name. See Gum.

The naked Hillocks of Mount *Ida* in *Candia*, M. *Tournefort* tells us, produce a deal of the Plant *Tragacantha*, which gives the Gum ſpontaneouſly towards the End of *June*, and in the following Months; when the nutritious Juice of the Plant, thicken'd by the Heat, burſts moſt of the Veſſels it is contain'd in.

This Juice coagulates in Threads, which make their Way into the Pores of the Bark, where being puſh'd forwards by new Juice, they get thro' the Bark, and are at length harden'd in the Air, either into little Lumps, or into twiſted Pieces in Form of little Worms, more or leſs long according to the Matter they are form'd of.

It ſhould ſeem too that the Contraction of the Fibres contributes to the Expreſſion of the Gum: Thoſe fine Fibres, like thoſe of Hemp, laid bare and trampled under Foot by Men and Horſes, contract themſelves, and facilitate the Expreſſion of the extravaſated Juice.

The Plant grows alſo in ſeveral Places of the *Levant*, particularly about *Aleppo*.

The Word is form'd of the *Greek*, τραγος, Goat, and ακανθα, Thorn, by Reaſon the Plant is beſet with Thorns.

The Gum is of different Colours, and Qualities; ſome being white, other-ſome greyiſh, ſome red, and ſome almoſt black. The white is the beſt. It muſt be choſen clear, ſmooth, and twiſted like little Worms.

It diſſolves eaſily in any aqueous Menſtruum, which it will give the Conſiſtence of a Syrup to, in the ſmall Proportion of a Dram to a Pint. It is ſmooth and ſoftening, and therefore good to obtund the Acrimony of any Humours, which makes it of Service in ſuch Coughs as proceed from Catarrhs and Defluxions of Rheum. It is alſo very ſtrengthening in ſome Seminal Weakneſſes, and prevalent againſt the Whites in Women.

TRAGEA, in Pharmacy, a Term frequently uſed to expreſs Powders groſly beat; but now obſolete. See Powder.

TRAGEDY, a Dramatic Poem, repreſenting ſome ſignal Action, perform'd by illuſtrious Perſons, and which has frequently a fatal Iſſue or End. See Drama.

Ariſtotle more Scientifically defines *Tragedy*, the Imitation of one grave and entire Action, of a juſt Length; and which, without the Aſſiſtance of Narration, by raiſing of Terror and Compaſſion, refines and purges our Paſſions.

This Definition has given the Criticks ſome Perplexity; and *Corneille* declares he cannot reconcile *Ariſtotle* with himſelf: The Inſtances *Ariſtotle* cites, he thinks, ruin his own Definition. He even denies the purging our Paſſions to be the End of *Tragedy*.

Our *Engliſh* Authors are more favourable to the Definition: By the purging our Paſſions, they underſtand not the extirpating them, but the reducing them to juſt Bounds; for by ſhewing the Miſeries that attend a Subjection to them, it teaches us to watch them more narrowly; and by ſeeing the great Misfortunes of others, it leſſens the Senſe of our own.

Tragedy, in its Original, M. *Hedelin*, obſerves, was only a Hymn ſung in Honour of *Bacchus*, by ſeveral Perſons, who, together, made a Chorus of Muſic, with Dances and Inſtruments. See Chorus.

As this was long, and might fatigue the Singers, as well as tire the Audience; they bethought themſelves to divide the ſinging of the Chorus into ſeveral Parts, and to have certain Recitations in the Intervals.

Accordingly, *Theſpis* firſt introduced a Perſon upon the Stage with this View: *Æſchylus* finding one Perſon inſufficient, introduced a Second to entertain the Audience more agreeably, by a kind of Dialogue: He alſo cloath'd his Perſons more decently, and firſt put them on the Buskin. See Cothurnus.

The Perſons who made theſe Recitations on the Scene, were call'd *Actors*; ſo that *Tragedy* at firſt was without Actors. And what they thus rehearſed, being things added to the ſinging of the Chorus, whereof they were no neceſſary Part, were call'd *Epiſodes*. See Episode.

Sophocles found that two Perſons were not enough for the Variety of Incidents; and accordingly introduced a Third: And here the *Greeks* ſeem to have ſtopp'd; at leaſt 'tis very rare that they introduce four Speakers on the ſame Scene. See Person.

Tragedy and Comedy were at firſt confounded with each other; But they were afterwards ſeparated; and the Poets applied themſelves to the cultivating of *Tragedy*, neglecting Comedy. See Comedy.

When *Tragedy* was got into a better Form; they changed the Meaſure of its Verſe, and endeavour'd to bring the Action within the Compaſs of a Day, or of a Revolution of the Sun. See Unity.

For the ſeveral Parts of Tragedy; ſee Act, Scene, Action, Fable, Character, Manners, *&c.*

The *Engliſh* received the firſt Plan of their Drama from the *French*; among whom it had its firſt Riſe towards the End of the Reign of *Charles* V. under the Title of *Chant-Royal*, which were Pieces in Verſe, compoſed in Honour of the Virgin, or ſome of the Saints, and ſung on the Stage; call'd by the Title of *Chant-Royal*, becauſe the Subject was given by the King of the Year; or the Perſon who had bore away the Prize the Year preceding. See Chant.

The Humour of theſe Pieces run wonderfully among the People, inſomuch that in a little time there were form'd ſeveral Societies, who began to vie with each other: One of theſe, to engage the Town from the reſt, began to intermix various Incidents, or Epiſodes, which they diſtributed into *Acts*, *Scenes*, and as many different *Perſons* as were neceſſary for the Repreſentation.

Their firſt Eſſay was in the *Bourg S. Maur*; and their Subject the Paſſion of Our Saviour. The Prevot of *Paris* prohibiting their continuing of it, they made Application to Court; and to render it the more favourable to them, erected themſelves into a Fryary or Fraternity, under the Title of *Brothers of the Paſſion*; which Title has given ſome Occaſion to ſuſpect them to have been an Order of Religious, or Friars of the Paſſion.

The King, on ſeeing and approving ſome of their Pieces, granted them Letters of Eſtabliſhment in 1402: upon which they built a Theatre; and for an Age and a Half, acted none but grave Pieces, which they called *Moralities*; till the People growing weary of them, they began to intermix Farces or Interludes taken from profane Subjects.

This Mixture of Farce, and Religion, diſpleaſing many; they were re-eſtabliſh'd by an Arret of Parliament in 1548, on Condition of their acting none but profane, lawful and decent Subjects, without intermedling with any of the Myſteries of Religion; and thus were the Brothers of the Paſſion deſpoil'd of their religious Character; upon which they mounted the Stage no more in Perſon; but brought up a new Set of Comedians, who acted under their Direction.

Thus was the Drama eſtabliſh'd; and on this Foundation arrived in *England*. In proceſs of Time, as it was improv'd, it became divided into Branches, agreeable to the Practice of the Ancients, and the Nature of Things, *viz.* into *Tragedy* and Comedy, properly ſo call'd, and this laſt again, was ſub-divided into pure Comedy and Farce; ſee each under its proper Head, Comedy, *&c.*

TRAGI-COMEDY, another kind of Dramatic Piece, repreſenting ſome Action paſs'd among eminent Perſons, the Event whereof is not unhappy or bloody; and wherein is ſometimes admitted a Mixture of leſs ſerious Characters.

The Ancients, M. *Dacier* obſerves, knew nothing of ſuch Compoſitions, wherein the Serious and Comic are blended: Nor does the Epithet M. *Corneille* gives them of *Heroic Comedies*, excuſe their Irregularity.

Their Foundation is certainly bad; for endeavouring both to make us laugh and cry in their turns, they endeavour at contrary Emotions, which the Heart can never undergo; every thing that diſpoſes for the one, indiſpoſing for the other.

The *Tragi-Comedy* was formerly very common on the *Engliſh* Stage: Scarce ſuch a thing in the 17th Century, as a pure Tragedy without a ſpice of Comedy, or Farce to make the People laugh. Now, that the Stage and our Taſtes are brought nearer to the Model of Nature and the Ancients, the *Tragi-Comedy* is diſuſed. *Tragi-Comedy* is the only Caſe, wherein Comedy is allow'd to introduce Kings and Heroes. See COMEDY.

TRAGUS, in Anatomy, one of the Protuberances of the Auricle, or external Ear; call'd alſo *Hircus*, becauſe uſually hairy. See EAR.

The *Tragus* is that Protuberance next the Temple; that on the oppoſite Side, to which the ſoft Lobe of the Ear is annex'd, is call'd the *Antitragus*.

TRAJAN *Column*, a famous hiſtorical Column, erected in *Rome*, in Honour of the Emperor *Trajan*. See COLUMN.

'Tis of the *Tuſcan* Order, though ſomewhat Irregular: Its Height is Eight Diameters, and its Pedeſtal *Corinthian*; it was built in a large Square there, call'd the *Forum Romanum*.

Its Baſe conſiſts of 12 Stones of an enormous Size, and it is raiſed on a Socle or Foot of Eight Steps. Within-ſide, is a Stair-caſe, illumined with 44 Windows. 'Tis 140 Foot high, which is 35 Foot ſhort of the *Antonine Column*; but the Workmanſhip of the former is much more valued.

'Tis adorn'd from top to bottom with Bas-relievo's, repreſenting the great Actions of that Emperor againſt the *Dacæ*.

Several learned Men have explain'd the Bas-reliefs of the *Trajan Column*, and among others *Ciaconius* and *Fabretti*.

The late King of *France*, *Louis* XIV. had Models of all the Bas-reliefs taken off in Plaiſter of *Paris*.

TRAJECTORY *of a Comet*, is its Path or Orbit; or the Line it deſcribes in its Motion. See ORBIT.

This, *Hevelius*, in his *Cometagraphia*, will have to be very nearly a right Line; but Dr. *Halley* rather concludes it to be a very excentrical Ellipſis. See ELLIPSIS.

Sir *Iſaac Newton* in Prop. 41. of his third Book, ſhews how to determine the *Trajectory* of a Comet from three Obſervations; and in his laſt Propoſition, how to correct a *Trajectory* graphically deſcribed. See COMET.

TRAIL-*Board*, in a Ship, is a curved Board on each Side of her Beak, which reaches from the Main-ſtem to the Figure, or the Brackets. See SHIP.

TRAIN; the Attendance of a great Perſon; or, the Trail of a Gown, or Robe of State.

In Falconry, it is the Tail of an Hawk. See TAIL.

TRAIN is likewiſe uſed for the Number of Beats which a Watch makes in an Hour, or any other certain Time. See WATCH-*Work*, &c.

TRAIN is alſo uſed for a Line of Gun-powder, laid to give fire to a Quantity thereof, in order to do Execution, by blowing up Earth, Works, Buildings, &c. See GUN-*Powder*, MINE, &c.

TRAIN *of Artillery*, includes the great Guns and other Pieces of Ordnance belonging to an Army in the Field. See GUN, CANNON, ORDNANCE, &c.

TRAIN *Oil*, the Oil procured from the Blubber of Whales, by boiling. See OIL and WHALE.

TRAIN-*Bands*, or TRAINED-*Bands*, a Name given to the Militia of *England*. See MILITIA.

TRAINING *a Load*, among Miners, is the ſearching for, and purſuing a Vein of Ore. See VEIN.

TRAMBLING *the Tin Ore*, among Miners, is a waſhing it very clean; which is done with a Shovel, and in a Frame of Boards. See TIN.

TRAMEL, an Iron Inſtrument, wherewithal to make a Horſe amble. See AMBLING.

It is alſo taken in many Places for an Iron moveable Inſtrument in Chimneys, to hang Pots over the Fire.

TRAMEL-*Net*, is a long Net, wherewith to take Fowl by Night, in Champian-Countries; much like the Net uſed for the Low-bell, both in Shape, Bigneſs and Maſhes.

To uſe it, they ſpread it on the Ground, ſo as the nether or further End, fitted with ſmall Plummets, may lie looſe thereon. Then the other Part being bore up by Men, placed at the Fore-ends, it is thus trailed along the Ground. At each Side, are carried great blazing Lights, by which the Birds are raiſed; as they riſe under the Net, they are taken. See LOW-*Bell* and HAND-*Net*.

The Word comes from the *French*, *Tremail*, form'd of the *Latin Tremaculum* or *Tremaclum*, of *Macula*, by reaſon it is compoſed of three Rows of Maſhes.

TRAMONTAN, TRAMONTANE or TRAMONTAIN, ſomething beyond, or on the further Side the Mountains.

The Term is particularly applied by the *Italian* Painters, to all ſuch as live on the other Side the *Alps*, *i. e.* all out of *Italy*; as the *Germans*, *Flemiſh*, *French*, &c.

The *French* Lawyers give the ſame Title of *Tramontane* or *Ultramontane* Doctors to the *Italian* Canoniſts, *Gomez*, *Hoſtienſis*, *Panorm*, &c. who go upon Rules and Maxims, too favourable to the Court of *Rome*, and contrary to thoſe of *France*, &c.

The Word is form'd from the *Italian*, *tra*, of the *Latin*, *trans*, which ſignify beyond; and *mons* or *mont*, Mountain.

On the *Mediterranean*, and in *Italy*, a North Wind is call'd a *Tramontane Wind*: and ſome call the Pole Star, the *Tramontane*.

Hence the Proverb, To *loſe the* Tramontane; that is, to be out of one's Aim, to be diſconcerted.

TRANCHE is uſed by the *French* Armoriſts, to expreſs that Manner of Partition call'd among us *Party per bend Dexter*. See PARTY and BEND.

A Scutcheon is ſaid to be *tranche*, *cut*, when it is divided in two Diagonally; the Diviſion coming from the Dexter Angle of the Chief, to the Iniſter Angle of the Point: When it is divided contrary-wiſe, it is ſaid to be *taille*.

TRANSACTION, a *Negotiation*, particularly an Accommodation, or a Diſpatch of ſome Buſineſs, or of a Diſpute between two Parties, by a mutual and voluntary Agreement or Contract between them.

Philoſophical TRANSACTIONS, are a kind of Journal of theprincipal Things that come before the Royal Society of *London*. See JOURNAL and *Royal* SOCIETY.

The *Tranſactions* contain the ſeveral Diſcoveries and Hiſtories of Nature and Art, made by the Members of the Society, or communicated by them from their Correſpondents; the ſeveral Experiments, Obſervations, &c. made by them, or tranſmitted to them, &c.

They were firſt ſet on Foot in 1665 by Mr. *Oldenbourg*, Secretary of the Society, and continued by him till the Year 1679. After his Death, Dr. *Hook*, the ſucceeding Secretary, continued them under the Title of *Philoſophical Collections*: But Dr. *Grew*, appointed to the ſame Office in 1689, reſumed the former Title of *Philoſophical Tranſactions*, which was retain'd by his Succeſſor Dr. *Plott*, and ſubſiſts to this Day.

They were publiſh'd every Month, with great Care, by Mr. *Oldenbourg*, and the firſt Secretaries; but after Dr. *Plott*, they were frequently interrupted. In the Year 1700 Dr. *Sloan* reſtored their regular Publication, Monthly; in time they relapſed, and only came out once in two Months; from that they fell to 3, 4 and 6 Months. They are now publiſh'd more frequently and regularly, by the Care of Dr. *Jurin*.

TRANGLE, in Heraldry, the Diminutive of a Feſſe, commonly called a *Bar*. See BAR and FESSE.

TRANSCENDANT, or TRANSCENDENTAL, ſomething raiſed, or elevated beyond other Things; or which paſſes and *tranſcends* the Reaſons and Circumſtances of other inferior Beings, ſo as not to be intimately and eſſentially included under them.

The Term is particularly applied to the Object of Metaphyſicks, which conſiders Being in general, or *Tranſcendant* Beings, as God and Angels; and Truths conſiſting in pure Speculation. See METAPHYSICKS.

The Logicians and Metaphyſicians, call *Tranſcendental* Terms, thoſe which are ſo general and of a Signification ſo extenſive and univerſal, that they paſs through all the Catagories, and agree to all kinds of Things; ſuch are the Terms *Ens*, *Unum*, *Verum*, *Bonum*, *Res*. See ENS, &c.

TRANSCENDENTAL *Quantities*, among the School-men, &c. are particularly apply'd to the Continuation of the Exiſtence, Duration, or Time of a Being. See DURATION and TIME.

TRANSCENDENTAL *Quantities*, among Geometricians, are undeterminate ones; or ſuch as cannot be expreſs'd or fix'd to any conſtant Equation: Such is a *Tranſcendental Curve*, or the like. See TRANSCENDENTAL *Curve*.

M. *Leibnitz* has a Diſſertation in the *Acta Erudit. Lipſ.* wherein he endeavours to ſhew the Origin of ſuch Quantities, *viz.* why ſome Problems are neither Plain, Solid, nor Surſolid, nor of any certain Degree, but do *tranſcend* all algebraical Equations. See PROBLEM.

He alſo ſhews how it may be demonſtrated without a Calculus, that an algebraic Quadratrix for the Circle or Hyperbola, is impoſſible: For if ſuch a Quadratrix could be found, it would follow, that by means thereof, any Angle, Ratio or Logarithm might be divided in the given Proportion of one right Line to another, and this, by one univerſal Conſtruction; and, conſequently, the Problem of the Section of an Angle,

or the Invention of any Number of mean Proportionals, would be of a certain Degree. See CIRCLE, QUADRATRIX, QUADRATURE, &c.

Whereas the different Degrees of algebraical Equations; and, therefore, the Problem, underſtood in general of any Number of Parts of an Angle or mean Proportionals; is of an indefinite Degree, and tranſcends all Algebraical Equations. See EQUATION.

TRANSCENDENTAL *Curve*, in the higher Geometry, is ſuch a one as cannot be defined by any Algebraic Equation, or which, when expreſs'd by an Equation, one of the Terms thereof is a variable or flowing Quantity. See CURVE.

Theſe Curves are the ſame with what *Des Cartes*, and, after his Example, ſeveral others, call *Mechanical Curves*; and which they would have excluded out of Geometry; but Sir *Iſaac Newton* and M. *Leibnitz*, are of another Sentiment. For, in effect, in the Conſtruction of Geometrical Problems, one Curve is not to be preferr'd to another, as is defined by a more ſimple Equation; but as it is more eaſily deſcribed than that other. See GEOMETRICAL *Line*.

And ſome of theſe *Tranſcendental* or Mechanical Curves, are found of greater Uſe than all the Algebraical ones together, except the Circle. See MECHANICAL.

Add, That M. *Leibnitz*, in the *Acta Eruditor. Lipſ.* gives us a kind of *Tranſcendant Equations*, whereby theſe *Tranſcendental* Curves are actually defined, and which are of an indefinite Degree; that is, are not always the ſame in all the Points of the Curve.

Whereas Algebraiſts, uſe to aſſume ſome general Letters, or Numbers, for the Quantities ſought; in theſe *Tranſcendental* Problems, M. *Leibnitz* aſſumes general or indefinite Equations for the Lines ſought; *e. gr.* putting x and y for the Abciſs and Ordinate, the Equation he uſes for a Line ſought, is, $a+bx+cy+exy+fxx+gyy$, &c. $=0$. By the help of which indefinite Equation, which in reality is Finite; for it may always be determined, how far ſoever 'tis neceſſary to raiſe it; he ſeeks the Tangent; and that which reſults, comparing with the given Property of Tangents, he finds the Value of the aſſumed Letters, a, b, c, &c. and thus defines the Equation of the Line ſought.

If that Compariſon abovementioned, do not proceed, he pronounces the Line ſought, not to be an Algebraical, but a *Tranſcendental* one.

This ſuppoſed, he goes on to find the Species of *Tranſcendency*; for ſome *Tranſcendentals* depend on the general Diviſion or Section of a Ratio, or upon the Logarithms; others upon the Arks of a Circle, and others on more indefinite and compound Enquiries.

Here, therefore, beſides the Symbols x and y, he aſſumes a Third, as v, which denotes the *Tranſcendental Quantity*; and of theſe Three, forms a general Equation for the Line ſought; from which he finds the Tangent, according to the differential Method, which ſucceeds even in *Tranſcendental Quantities*. What he finds he compares with the given Properties of the Tangent; and ſo diſcovers, not only the Values of a, b, c, &c. but alſo the particular Nature of the *Tranſcendental Quantity*.

And though it may ſometimes happen, that the ſeveral *Tranſcendents* are ſo to be made uſe of, and theſe of different Natures too, one from another; alſo though there be *Tranſcendents* of *Tranſcendents*, and a Progreſſion of theſe in Infinitum, yet we may be ſatisfied with the moſt eaſy and uſeful one; and for the moſt Part may have recourſe to ſome peculiar Artifices for ſhortning the Calculus, and reducing the Problem, to as ſimple Terms as may be.

This Method being applied to the Buſineſs of Quadratures, or to the Invention of Quadratrices, in which the Property of the Tangent is always given; 'tis manifeſt not only how it may be diſcovered, whether the indefinite Quadrature may be algebraically Impoſſible, but alſo how, when this Impoſſibility is diſcovered, a *Tranſcendental* Quadratrix may be found; which is a Thing which had not before been ſhewn. So that it ſeems, that Geometry is by this Method carried infinitely beyond the Bounds, to which *Vieta* and *Des Cartes* brought it: Since by this means a certain and general Analyſis is eſtabliſh'd, which extends to all the Problems which are of no certain Degree, and conſequently not comprehended within Algebraical Equations.

Again, in order to manage *Tranſcendental* Problems, where-ever the Buſineſs of Tangents or Quadratures occurs, by a Calculus, there is hardly any that can be imagined ſhorter, more advantageous, or univerſal, than the Differential Calculus, or Analyſis of Indiviſibles and Infinites.

By this Method we may explain the Nature of *Tranſcendental* Lines by an Equation, *e. gr.* Let A be the Ark of a Circle, and x the verſed Sine: Then will $A = \int dx$ $\overline{=\!=\!=\!=}$ and if the Ordinate of the Cycloid be y, then will $y = \sqrt{2x-xx} + \frac{\int dx}{\sqrt{2x-xx}}$ $\overline{=\!=\!=\!=\!=\!=\!=}$ which Equation perfectly expreſſes the Relation between the Ordinate y and the Abciſſa x, and from it all the Properties of the Cycloid may be demonſtrated.

Thus is the Analytical Calculus, extended to thoſe Lines which have hitherto been excluded, for no other Cauſe, but that they were thought incapable of it. See GEOMETRICAL *Line*.

TRANSCOLATION, in Pharmacy, the ſame with Filtration or Percolation. See FILTRATION, &c.

TRANSCRIPT, a Copy of any Original Writing; particularly that of an Act or Inſtrument, inſerted in the Body of another. See COPY.

In this Senſe, we ſay *Tranſcript of a Fine*, &c. See FINE, DUPLICATE, &c.

TRANSCRIPTIO *Recognitionis factæ coram Juſticiariis Itinerantibus*, &c. is a Writ for the certifying a Recognizance into *Chancery*, taken before the Juſtices in Eyre. See RECOGNIZANCE.

TRANSCRIPTIO *pedis finis levati mittenda in Cancellariam*, is a Writ for the certifying the Foot of a Fine, levied before the Juſtices in Eyre, &c. into *Chancery*. See FINE.

TRANSEAT, in the Schools, &c. a Term purely *Latin*, ſignifying *Let it paſs*, or ſuppoſe a Propoſition to be true, without granting it.

Hence the Proverb, *Tranſeat, Græcum eſt, non legitur*: The Diction is ſaid to have taken its Riſe from ſome ancient Commentators, or Gloſſographers of the Civil Law, who not underſtanding *Greek*, paſs'd over all the Words that occurr'd in that Language, without explaining them.

In the *Roman* Chancery, a *Nil Tranſeat* is a kind of Oppoſition made to the ſealing of a Bull, or to the Delivery of ſome other Inſtrument, till the Parties againſt whoſe Intereſt it is directed, have been heard againſt it.

TRANSELEMENTATION, in the Schools, a Change of the Elements or Principles of one Body into thoſe of another. See ELEMENT.

Such is that which the *Roman* Catholicks contend for in the Euchariſt; where the Elements of Bread and Wine are changed into thoſe of Fleſh and Blood. See TRANSUBSTANTIATION.

Tranſelementation, where-ever it happens, is always allow'd Miraculous; or an Effect beyond the ordinary Powers of Nature. See MIRACLE.

TRANSFER, in Commerce, &c. an Act whereby a Perſon ſurrenders his Right, Intereſt or Property in any thing moveable or immoveable, to another.

The Term is principally uſed in the Commerce of Stocks; for the aſſigning and making over Subſcriptions, or Shares therein, to ſuch as purchaſe them of the Proprietors. See SUBSCRIPTION, &c.

In the *South Sea* Company, the *Bank*, *Eaſt India*, &c. *Tranſfers* are made, by eraſing the former Proprietors Names, and entering the Stock under the Name of the Purchaſer, under his proper Letter of the Alphabet. See COMPANY, BANK, &c.

In order to a *Tranſfer*, 'tis required the Party bring another with him to ſwear he is the ſame Perſon to whom the Stock is enter'd. A Counterfeit in this Caſe is by Act of Parliament made a capital Crime.

The Lawyers ſay, that the Sale, or Donation of an Inheritance, &c. *Tranſfers* the Property, Rights, &c. thereof.

TRANSFIGURATION, among Divines, that miraculous Change wrought by *Jeſus Chriſt*, in Preſence of St. *Peter*, St. *James* and St. *John*, on Mount *Thabor*, where he appear'd in his Glory, in the middle of *Moſes* and *Elias*. See the Deſcription thereof in St. *Matthew*, *c.* xvii.

The Term is alſo applied to a Feaſt held in the *Romiſh* Church on the Sixth of *Auguſt*, in Commemoration of that Miracle.

TRANSFORMATION, a Change of Form; or a Metamorphoſis. See METAMORPHOSIS.

The Chymiſts have been a long Time ſeeking the *Tranſformation* of Metals, that is, their *Tranſmutation*, or the Manner of changing them into Gold. See TRANSMUTATION.

Among the Myſticks, by *Transformation*, is underſtood a Change of the Contemplative Soul, whereby it is in ſome meaſure deified or converted into the Subſtance of God, and wherein it is, as it were, loſt and ſwallow'd up in the Divinity, ſo as not to perceive its own Diſtinction from God.

The Senſe of the Word *Transformation* is very liable to be abuſed; and, in effect, the Quietiſts and Quakers have abuſed it. But many of the Myſticks uſe it innocently enough; meaning no other by it than what St. *Paul* did when he ſaid, *Vivo ego, jam non ego, vivit vero in me Chriſtus*.

TRANSFORMATION is alſo ſometimes uſed for what we more properly call *Tranſubſtantiation*. See TRANSUBSTANTIATION.

TRANSFUSION, the Act of pouring a Liquor out of one Veſſel into another.

The

The Word is compounded of the *Latin* Prepoſition *trans*, beyond, further, and *fundo*, I pour.

In the Preparations of Chymiſtry and Pharmacy, there are frequent *Transfuſions* of Liquors, Syrup, &c.

TRANSFUSION *of the Blood*, is particularly us'd for the letting out the Blood of one Animal, ſo as to be immediately receiv'd into the Body of another. See BLOOD.

Dr. *Lower* is uſually accounted the Inventor of this *Transfuſion*, and the Experiment ſaid to have been firſt publickly made by him at *Oxford* in 1665, and the Deſcription thereof publiſh'd in his excellent Book *de Corde*.

Yet we are inform'd from good Hands, that it had been propos'd at *Paris* in 1658; that another of our Countrymen had had the Idea before; and that it had been known in *Germany* ſeveral Years. -- 'Tis certain there is a Paſſage in *Libavius*, wherein the *Transfuſion* is exactly deſcrib'd as now practis'd: 'Tis true he diſapproves of it; and only mentions it to ridicule it.

The Uſe moſt naturally expected from the Operation, is, that one Animal may live of the Blood of another; ſo that thoſe which want Blood, or have corrupt, morbid Blood, may be ſupply'd from others with a ſufficient Quantity, and of ſuch as is good and laudable.

However, 'tis certain the Operation has no Place in the preſent Practice of Phyſic; but whether that be the Fault of the Operation itſelf, or owing to the Indolence and Averſeneſs of People to run into new Methods, we will not undertake to ſay.

The Method of *transfuſing*, Dr. *Lower* gives us to the following Effect: Take up the carotid Artery of the Dog, or other Animal whoſe Blood is to be *transfus'd* into another of the ſame, or a different Kind; ſeparate it from the Nerve of the eighth Pair, and lay it bare above an Inch. Make a ſtrong Ligature on the upper Part of the Artery; and an Inch nearer the Heart another Ligature with a running Knot, to be looſen'd and faſten'd as Occaſion requires. Draw two Threads between the two Ligatures; open the Artery, put in a Quill, and tye up the Artery again upon the Quill by the two Threads, and ſtop the Quill by a Stick.

Then make bare the Jugular Vein of the other Animal, for about an Inch and half in Length, and at each End make a Ligature with a running Knot; and in the Space between the two Knots, draw under the Vein two Threads, as in the other.

Open the Vein, and put into it two Quills, one into the deſcending Part of the Vein, to receive the Blood from the other Dog, and carry it to the Heart: The other Quill put into the other Part of the Jugular, towards the Head, through which the ſecond Animal's own Blood is to run into Diſhes. The Quills thus ty'd faſt, ſtop them up with Sticks till there be occaſion to open them.

Things thus diſpos'd, faſten the Dogs on their Sides towards one another, in ſuch Manner, as that the Quills may go into each other: Then unſtop the Quill that goes down into the ſecond Dog's Jugular Vein, as alſo that coming out of the other Dog's Artery; and by the Help of two or three other Quills put into each other, as there ſhall be occaſion, inſert them into one another.

Then ſlip the running Knots, and immediately the Blood runs through the Quills as through an Artery, very impetuouſly.

As the Blood runs into the Dog, unſtop the Quill in the upper Part of his Jugular, for his own Blood to run out at, tho' not conſtantly, but as you perceive him able to bear it, till the other Dog begin to cry, and faint, and at laſt die.

Laſtly, Take out both Quills out of the Jugular, tye the running Knot faſt, and cut the Vein aſunder, and ſew up the Skin: The Dog thus diſmiſs'd, will run away as if nothing ail'd him.

In the *Philoſophical Tranſactions*, we have Accounts of the Succeſs of various *Transfuſions* practis'd at *London*, *Paris*, in *Italy*, &c. Sir *Edmund King transfus'd* 49 Ounces of Blood out of a Calf into a Sheep; the Sheep after the Operation appearing as well and as ſtrong as before.

Mr. *Coxe transfus'd* 14 or 16 Ounces out of a mangy into a ſound Dog: The Effect was, that no Alteration was obſerv'd in the ſound Dog, but the mangy one was cur'd.

M. *Gayant transfus'd* the Blood of a young Dog into the Veins of an old one almoſt blind with Age, and ſcarce able to ſtir; which yet, two Hours afterwards, leap'd and friſk'd about.

M. *Denis transfus'd* the Blood of three Calves into three Dogs, which all continu'd brisk, and eat well as before. --- The ſame Perſon *transfus'd* the Blood of four Weathers into a Horſe 26 Years old, which thence receiv'd much Strength, and a more than ordinary Appetite.

At St. *Griffoni*'s at *Udine*, the Blood of a Lamb was *transfus'd* into the Veins of a Spaniel 13 Years old, which had been quite deaf for three Years, and ſo feeble as ſcarce to be able to walk at all. --- After the Operation he leap'd from the Table, and went about the Houſe to ſeek his Maſters. --- Two Days afterwards he ran up and down the Streets with other Dogs: His Stomach grew ſtrong, and he recover'd his Hearing.

TRANSGRESSION, *Tranſgreſſio*, an Offence againſt ſome Law, or a Breach or Violation thereof. See LAW.

The Term is chiefly us'd in reſpect of the Laws of God. In the Doctrine of Original Sin, all Mankind are ſuppos'd to ſhare with *Adam* in the Guilt of his firſt *Tranſgreſſion*. See ORIGINAL *Sin*.

Moſes threatens the *Tranſgreſſors* of his Law with abundance of Temporal Puniſhments. See PUNISHMENT.

The Word is compounded of *trans*, beyond, and *gradiri*, to go.

TRANSGRESSIONE, in our Law, a Writ uſually call'd a Writ or Action of *Treſpaſs*.

Of this *Fitzherbert* has two Sorts: One Vicountial, thus call'd becauſe directed to the Sheriff, and not returnable; but to be determin'd in the County. See VICOUNTIAL.

Its Form differs from that of the other; as wanting the Words *quare vi & armis*, &c.

The other is term'd a Writ of *Treſpaſs*, and to be ſued in the *Common Pleas* and *King's-Bench*. See TRESPASS.

TRANSIRE, in Stat. Anno 14. *Car.* II. is us'd for a Cuſtom-houſe Warrant, or a Let-paſs; from the Verb *tranſeo*, I go forth.

TRANSIT, TRANSITUS, in Aſtronomy, ſignifies the Paſſage of any Planet, juſt by, or over any fix'd Star; and of the Moon, in particular, covering or moving over any other Planet. See STAR and PLANET.

Mercury, *Venus*, &c. in their *Tranſits* over the Sun, appear like dark Specks. See MERCURY and VENUS.

The Word comes from the *Latin*, *tranſire*, to paſs over; form'd of *trans* and *eo*, I go beyond.

TRANSITION, in Muſic, is when a greater Note is broken into leſſer, to make ſmooth the Roughneſs of a Leap, by a gradual Paſſage to the Note next following; whence it is commonly call'd the *breaking of a Note*; being ſometimes very neceſſary in Muſical Compoſitions. See NOTE and PASSAGE.

TRANSITION, in Rhetoric, (which ſome will have to be a Figure, tho' others, with *Quintilian*, deny it) is a kind of Connexion in Diſcourſe, whereby the ſeveral different Parts and Members thereof are join'd, ſo as to conſtitute one regular Whole.

F. *de Colonia* makes two Kinds of *Tranſitions*; the one perfect, the other imperfect.

A *perfect Tranſition*, is ſuch wherein we briefly intimate what is ſaid, and what remains to be ſaid; as, *Now that we have ſpoke of War, there remains ſomething to be ſaid of Peace. --- Satis multa de Turpitudine: dicam deinceps, quod propoſui, de periculo. --- Uni Epiſtolæ reſpondi: Venio ad alteram. --- Sed hæc Vetera; illud recens: Cæſarem meo Conſilio Interfectum.*

An *imperfect Tranſition*, is ſuch wherein only one of theſe is expreſs'd; as, *Let us now conſider the Conſequences of*, &c. *Poſtularet hic locus ut dicerem de ---- ſed finis ſit; neque enim præ lachrymis jam loqui poſſum; & hic ſe lachrymis defendi nequeat.*

TRANSITIVE, in Grammar, an Epithet given to ſuch Verbs, as ſignify an Action which paſſes from the Subject that does it, to, or upon another Subject which receives it. See VERB.

Under the Head of *Verbs Tranſitive*, come what we uſually call Verbs Active and Paſſive: Other Verbs, whoſe Action does not paſs out of themſelves, are call'd Neuters, and by ſome Grammarians *Intranſitives*. See NEUTER.

In the *Hebrew*, the Verb היה, *hajah*, in the *Greek*, εἰμὶ, and in the *Latin*, *ſum*, are Verbs purely *Neuter* or *Intranſitive*; or, as the *Latin* and *Greek* Grammarians more uſually expreſs it, Verbs ſubſtantive, ſignifying the mere Exiſtence of the Thing, without the active or *tranſitive* Conjugations.

TRANSITORY, in Law, &c. a Term oppoſite to Local. See LOCAL.

TRANSLATION, the Act of transferring or removing a Thing from one Place to another. See PLACE.

As the *Tranſlation* of a Biſhop, a Council, a Seat of Juſtice, a Parliament; the *Tranſlation* of the Relicks of a Saint; the *Tranſlation* of the Empire, &c.

The Word is form'd of *trans*, beyond, and *latio*, of *ferre*, to carry.

The *Tranſlations* of Biſhops from one See to another, are prohibited by the Council of *Nice*, which renders them null, and appoints the *tranſlated* Biſhop to return to his former Church. --- The Council of *Sardica* excludes *tranſlated* Biſhops from Communion. It had been obſerv'd, that no Biſhop was ever remov'd from a greater Church to a leſſer; and that thoſe who thus quitted their Churches, only did it out of Ambition or Avarice.

This Diſcipline was obſerv'd for 900 Years; and the firſt Inſtance of any *Tranſlation* of Note, was that of Pope *Formoſa*, who was Biſhop of *Porto*. One of his Succeſſors took hold of this Pretence to have him taken out of his

Grave; and a Council held ſoon after, forbad this *Tranſlation* to be made a Precedent.

However, the ſame Church allow'd of ſome legitimate Cauſes of *Tranſlations*; as, the apparent Advantage of the Church: Under which Pretence, *Tranſlations* ſoon became ſo frequent, that for 500 or 600 Years laſt paſt, they have been eſteem'd a Kind of Common Law. See BISHOP.

The *Tranſlation* of a Religious from one Order to another, cannot be effected without the Conſent of the Pope: 'Tis added, that it is not allow'd to *tranſlate* from a ſeverer Rule to a laxer one.

TRANSLATION is alſo us'd for the Verſion of a Book, or Writing out of one Language into another. See VERSION.

Tranſlators frequently endeavour to excuſe themſelves at the Expence of their Language; and ask Pardon for it, as if it were not rich and copious enough to expreſs all the Force and Beauties of the Original.

Thus is the *Engliſh* Tongue accus'd of the Poverty and Dryneſs which is in the *Tranſlator*'s own Genius; and the Faults charg'd on that, which ſhould only lie at their own Doors.

The *Italians* have a Proverb, *Traduttore, Traditore*: A *Tranſlator*, a Traytor.

TRANSMARINE, TRANSMARINUS, ſomething that comes from, or belongs to, the Parts beyond Sea. See FOREIGN and EXOTIC.

TRANSMIGRATION, the Removal or Tranſlation of a whole People into ſome other Country, by the Violence of a Conqueror.

Some tranſlate the leading of the Children of *Iſrael* Captive into *Babylon*, the *Tranſmigration* of the *Iſraelites*, &c. See MIGRATION.

TRANSMIGRATION is particularly us'd for the Paſſage of a Soul out of one Body into another; the ſame with what we otherwiſe call METEMPSYCHOSIS.

The *Siameſe*, F. *Tachard* informs us, from a Belief of the *Tranſmigration* of Souls into other Bodies, forbear killing any Beaſts; leſt, by that Means, they ſhould diſpoſſeſs the Souls of their deceas'd Relations.

TRANSMISSION, in Opticks, &c. the Act of a tranſparent Body paſſing the Rays of Light through its Subſtance, or ſuffering them to paſs; in which Senſe the Word ſtands in Oppoſition to *Reflection*. See REFLECTION.

Tranſmiſſion is alſo frequently us'd in the ſame Senſe with *Refraction*, by Reaſon moſt Bodies in *tranſmitting* the Rays, do alſo refract them. See REFRACTION.

For the Cauſe of *Tranſmiſſion*, or the Reaſon why ſome Bodies *tranſmit*, and others reflect the Rays. See TRANSPARENCY and OPACITY.

The Rays of Light, Sir *Iſaac Newton* obſerves, are ſubject to Fits of eaſy *Tranſmiſſion* and each Reflection. See RAY and LIGHT.

TRANSMUTATION, the Act of transforming, converting or changing one Nature into another. See CONVERSION and TRANSFORMATION.

The Term is chiefly us'd in Chymiſtry and Medicine: 'Tis greatly queſtion'd, whether the *Tranſmutation* of Silver into Gold, and of Tin into Silver, ſo much ſought by the Chymiſts, be poſſible or not. See GOLD, &c.

The pureſt and ſubtileſt Parts of the Food are *tranſmuted* or aſſimulated into the proper Subſtance of the Body. For the Manner how, ſee NUTRITION.

Nature, Sir *Iſaac Newton* obſerves, ſeems delighted with *Tranſmutations*: He goes on to enumerate ſeveral Kinds of *Natural Tranſmutations*; groſs Bodies and light, he ſuſpects, may be mutually *tranſmuted* into each other; and adds, That all Bodies receive their active Force from the Particles of Light which enter their Compoſition. See LIGHT and FIRE.

For all fix'd Bodies, when well heated, emit Light as long as they continue ſo; and again, Light intermingles itſelf and inheres in Bodies as often as its Rays fall on the ſolid Particles of thoſe Bodies. See OPACITY.

Again, Water, which is a fluid, volatile, taſtleſs Salt, is by Heat *tranſmuted* into Vapour; which is a kind of Air; and by Cold, into Ice, which is a cold, tranſparent brittle Stone, eaſily diſſolvable; and this Stone convertible again into Water by Heat, as Vapour is by Cold. See WATER, VAPOUR, ICE, &c.

Earth, by Heat, becomes Fire; and by Cold, is turned into Earth again: Denſe Bodies, by Fermentation, are rarified into various kinds of Air; and that Air by Fermentation alſo, and ſometimes without, reverts into groſs Bodies. See AIR, &c.

Quickſilver ſometimes puts on the Form of a fluid Metal; ſometimes it appears in Shape of a pellucid, fragile Salt, called *Sublimate*; ſometimes of a pellucid volatile, white, taſtleſs Earth, called *Mercurius Dulcis*; by Diſtillation it becomes Vapour, and by Agitation in vacuo, ſhines like Fire, &c. See MERCURY and PHOSPHORUS.

All Bodies, Beaſts, Fiſhes, Inſects, Plants, &c. with all their various Parts, grow and increaſe out of Water, and aqueous and ſaline Tinctures; and by Putrefaction, all of them revert into Water or an aqueous Liquor again. See WATER.

Further, Water expos'd a while to the open Air, puts on a Tincture, which in Proceſs of Time has a Sediment and a Spirit; and before Putrefaction, yields Nouriſhment both for Animals and Vegetables. See NUTRITION and VEGETATION.

TRANSMUTATION, in Alchymy, the Act of changing or exalting imperfect Metals into Gold or Silver. See METAL, GOLD, &c.

This is alſo call'd the *Grand Operation*, and is to be effected with the Philoſophers Stone. See PHILOSOPHERS *Stone*.

Some Alchymiſts hold, that the *Tranſmutation* ſhould rather be call'd the *Perfection* of imperfect Metals; as holding all Metals intended by Nature to arrive equally at this Perfection, inaſmuch as they are compos'd of the ſame Matter; and that 'tis only the Impurity of their Matrices, that is, of the Place wherein they are form'd by Nature, that has prevented their arriving thereat. See METAL.

The Elixir being projected on any of thoſe Metals, it is ſuppos'd to purge, and ſeparate the impure Parts from the pure, and to join itſelf wholly to the Mercury (which is the pure Part,) as being of the ſame Nature. See PROJECTION.

Whether or no Metals are *tranſmutable* into one another, is a Point ſtrongly diſputed among the Philoſophers; the Alchymiſts ſtrenuouſly aſſerting the Affirmative. See ALCHYMY.

Some Metals 'tis commonly allow'd may be chang'd into others, *e. gr.* Iron into Braſs or Copper, and Lead into Tin; but *Cardan* and ſome others deny even this, and argue further, that tho' Iron and Braſs, as being nearly alike in Weight and Tenacity, &c. provided their Colour and Hardneſs could be chang'd, might be converted into one another, either really, or, at leaſt, apparently, yet would the *tranſmuting* or ripening of other Metals into Gold or Silver be ſtill impoſſible; both as thoſe Metals are all to be firſt calcin'd, after which they can never be brought again to their priſtine Purity; and as there is a Generation requir'd, which is not the Work of Art, but Nature.

Cardan de Metall. Lemery, Dickenſon, and others, give us Accounts of the various Impoſtures of *Adepti* in the Buſineſs of *Tranſmutation*; ſome, for Inſtance, fixing Mercury with Verdigreaſe, and then heightening the Colour with Cadmia, Turmeric, &c. But this, if try'd with the Coppel, all goes off in Fumes; and, in effect, nothing produc'd this Way ought to be adjudg'd true Gold, unleſs it endure Coppelling, Cementation, Purification, with Antimony and the Depart. See PURIFICATION, ESSAYING, &c.

Add, that it muſt have the Malleability, extreme Ductility, and ſpecific Gravity of Gold, which is to Water as 18 and half to 1. See WEIGHT.

The Trick of *tranſmuting* Cinnabar into Silver is thus: The Cinnabar being bruis'd groſsly, is ſtratify'd in a Crucible with granulated Silver, and the Crucible plac'd in a great Fire; and after due Time for Calcination, taken off: then the Matter being pour'd out, is found to be Cinnabar turn'd into real Silver, tho' the Silver Grains appear in the Number and Form they were put into the Crucible; but the Miſchief is, coming to handle the Grains of Silver, you find them nothing but light friable Bladders, which will crumble to Pieces between the Fingers.

Mr. *Boyle* in his Scept. Chymiſt. tells us, that two Friends of his did, by urging Mercury in a ſkilfully manag'd Fire, turn it almoſt Weight for Weight into Water; but does not ſay what was the ſpecific Gravity of the produc'd Water, nor of the remaining *untranſmuted* Maſs of Mercury. --- He likewiſe aſſures us, that Rain Water being diſtill'd and re-diſtill'd by a Friend of his, near 200 times, did, after each Diſtillation, leave, at the Bottom of the Glaſs Body, a conſiderable Quantity of a white Earth; and that more plentifully in the latter Diſtillation than the former.

This he believ'd to be a certain Quantity of Water actually *tranſmuted* into Earth; adding, that it was above twice as heavy ſpecifically as common Water, and of ſo fix'd a Nature, that it lay a conſiderable Time in a red hot Crucible, without loſing any thing of its Weight, or emitting any Smoak.

TRANSMUTATION, in Geometry, the Reduction, or Change, of one Figure or Body into another of the ſame Area, or Solidity, but of a different Form; as a Triangle into a Square; a Pyramid into a Parallelopiped, &c. See FIGURE, &c.

TRANSMUTATION, in the higher Geometry, is us'd for the Converting a Figure into another of the ſame Kind and Order, whoſe reſpective Parts riſe to the ſame Dimenſions in an Equation, admit the ſame Tangents, &c. See TRANSFORMATION.

If a rectilinear Figure be to be *tranſmuted* into another, 'tis ſufficient that the Interſections of the Lines that compoſe it, be transferr'd; and Lines drawn thro' the ſame in the new Figure. See REDUCTION.

If the Figure to be *tranſmuted* be Curvilinear, the Points, Tangents, and other right Lines, by means whereof the Curve

Curve Line is to be defin'd, muſt be transferr'd. See CURVE.

TRANSMUTATION *of Plants.* See SEED.

TRANSOM, among Builders, the Piece that is framed acroſs a double light Window. See WINDOW.

TRANSOM among Mathematicians, denotes the Vane of a Croſs-ſtaff; or a wooden Member fixed acroſs it, with a ſquare Socket whereon it ſlides, *&c.* See VANE and *Croſs-ſtaff.*

TRANSOM, in a Ship, is a Piece of Timber which lies athwart the Stern, between the two Faſhion Pieces, directly under the Gun-room-port.

TRANSPARENCY, or *Diaphaneity*, in Phyſics, a Quality in certain Bodies, whereby they give Paſſage to the Rays of Light. See LIGHT.

The *Tranſparency* of natural Bodies, as Glaſs, Water, Air, *&c.* ſome have imputed to the great Number, and Size of the Pores or Interſtices between the Particles of thoſe Bodies: But this Account is exceedingly defective; for the moſt ſolid and opake Body in Nature, we know, contains a great deal more Pores than it does Matter; a great deal more, ſure, than is neceſſary for the Paſſage of ſo infinitely fine and ſubtile a Body as Light. See PORE.

Ariſtotle, Des Cartes, &c. place *Tranſparency* in the Rectitude or Straightneſs of the Pores; by means of which, ſay they, the Rays are enabled to make their Way through, without ſtriking againſt the ſolid Parts, and being reflected back again: But this Account, Sir *Iſaac Newton* ſhews, is lame; the Quantity of Pores in all Bodies being ſufficient to tranſmit all the Rays that fall on them, howſoever thoſe Pores be ſituated with reſpect to each other.

The Cauſe, then, why all Bodies are not *Tranſparent*, muſt not be aſcribed to their wanting Rectilinear Pores; but either to the unequal Denſity of the Parts; or to the Pores being fill'd with ſome foreign Matters, or their being empty; by means of which, the Rays in paſſing thro', undergoing a great Variety of Reflections and Refractions, are perpetually diverted this way and that, till at length falling on ſome of the ſolid Parts of the Body, they are extinguiſh'd and abſorbed. See RAY and REFLECTION, *&c.*

Thus, Cork, Paper, Wood, *&c.* are Opake; when-as Glaſs, Diamonds, *&c.* are *Tranſparent*: The Reaſon is, that in the neighbourhood of Parts equal in Denſity, ſuch as thoſe of Glaſs, Water, Diamond, *&c.* are with reſpect to each other; the Attraction being equal on every Side, no Reflection or Refraction enſues; but the Rays which enter'd the firſt Surface of the Bodies, proceed without Interruption quite through the Body; thoſe few only excepted, which chance to meet with the ſolid Parts. But in the Neighbourhood of Parts, that differ much in Denſity, ſuch as the Parts of Wood and Paper are both in reſpect of themſelves, and of the Air or the empty Space in their Pores; as the Attraction will be very unequal, the Reflections and Refractions muſt be very great; and therefore the Rays will not be able to make their Way through ſuch Bodies, but will be perpetually deflected, and at laſt quite ſtopp'd. See OPACITY.

TRANSPARENCY, in Heraldry, the ſame as *Adumbration.* See ADUMBRATION.

TRANSPIRATION, the inſenſible, or almoſt inſenſible Paſſage of an excrementitious Matter through the Pores of the Skin; called alſo *Perſpiration.* See PERSPIRATION.

There are an Infinity of theſe *tranſpiratory* Pores in the Skin; the moſt conſiderable whereof, are the Orifices of the Ducts ariſing from the milliary Glands. See PORE and SKIN.

The Cauſe of *Tranſpiration*, is the Circulation and Heat of the Blood.

Inſenſible *Tranſpiration* is found very much to exceed all the ſenſible Evacuations put together. *Sanctorius* even ſhews, in his *Medicina Statica*, that a Perſon loſes more in one Day by *Tranſpiration*, than by all the other Outlets, in Fifteen. He adds, that if the Food taken in one Day weigh Eight Pounds, the *Tranſpiration* will be Five of them.

Cold prevents *Tranſpiration*, by its conſtringing the Pores of the Skin, and thickening the Liquors circulating in the cutaneous Glands: Heat, on the contrary, augments *Tranſpiration*, both by its opening the excretory Ducts of the Glands, and by its increaſing the Fluidity and Velocity of the Humours. See COLD, *&c.*

M. *Dodart*, from a Number of Experiments made for 33 Years together, aſſures us that we *tranſpire* much more in Youth than in Age.--- In ſome Perſons, the *Tranſpiration* is ſo copious, that they void but very little of the coarſer Excrements, though they eat very heartily.

Tranſpiration is abſolutely neceſſary in the Animal Oeconomy, to purify the Maſs of Blood, and diſcharge it of a Number of uſeleſs heterogeneous Particles which might corrupt it. Hence it is, that upon a Stoppage of the uſual *Tranſpiration*, there ariſe ſo many Indiſpoſitions, particularly Fevers, Agues, Itch, *&c.*

Tranſpiration is alſo of uſe to the Organ of Feeling, in that it prevents the Papillæ of the Skin from being dry'd, either by the Air, or by the continual Touches of external Bodies.

TRANSPIRATION is alſo uſed by ſome Authors, for the Entrance of the Air, Vapours, *&c.* through the Pores of the Skin into the Body.

Cardan, by this kind of *Tranſpiration*, accounts for the Prodigy of a Woman, whoſe daily Urines weigh'd 27 Pounds; though all the Foods ſhe took, both dry and liquid, did not exceed Four Pounds.--- Dr. *Baynard* ſuſpects ſome ſuch *Tranſpiration* to be the Caſe in hydropical Perſons. See DROPSY.

TRANSPLANTATION or TRANSPLANTING, in Agriculture and Gardening, the Removing of Trees or Plants, from the Places where they were ſowed or bred up, and planting them in other. See PLANTING and REPLANTING.

In the Tranſplanting of Foreſt Trees, Care is to be taken to preſerve the Roots, and even the fine Hairs or Filaments thereof, with the Earth that ſticks thereto; theſe Filaments being the Mouths that ſuck the Nouriſhment, and tranſfuſe it to the Tree. See ROOT and VEGETABLE.

The Pits or Foſſes, into which the Trees are *tranſplanted*, ſhould be left open for ſome time before hand, that the Rain, Froſt and Sun may diſſolve the compacted Salt, render the Earth friable, and qualify it for nouriſhing the Tree.---- The ſame may be done, in ſome meaſure, by burning Straw in the new Pits, and drenching the Mould with Water in dry Seaſons, and by enriching the Ground with Manure. See MANURE.

Pliny was of Opinion, no Tree ſhould be removed under two, or above three Years old. *Cato* would have none *tranſplanted* leſs than Five Fingers in Diameter: But we are, now, able to *tranſplant* Trees of all Ages and Sizes, without Danger.

To *tranſplant* old Trees, was reckon'd ſo difficult, that *Veterem Arborem tranſplantare* is become a Proverb for a difficult Enterprize; and yet we are informed of a Grove of Six hundred Coco Trees of 80 Years Growth, and 60 Foot high to the loweſt Bough, *tranſplanted* by Count *Maurice*, to his Paradiſe of *Friburg*: And a great Perſon in *Devonſhire*, Mr. *Evelyn* tells us, *tranſplanted* Oaks, as big as Twelve Oxen could draw, to ſupply a Defect in an Avenue.

For the *Tranſplantation* of grown Trees, Mr. *Evelyn* gives the following Method, as practiſed with good Succeſs by the Lord *Fitzharding*: Chooſe Trees about the Thickneſs of a Man's Thigh; remove the Earth from about them, cut through all the ſide Roots, till the Tree may be, by force, brought down on one Side; ſo that the tap Roots may be conveniently come at to be cut off with the Ax: then redreſs the Tree, and let it ſtand cover'd with the Mould from which it was looſen'd, till next Year, or longer; and by that time it will have drawn new tender Roots fit for *tranſplanting*, and may be taken up at a fit Seaſon.

Otherwiſe, for very large Trees; e'er the hard Froſts come on, make a Trench about the Tree, at ſuch Diſtance from the Stem, as you judge ſufficient for the Root; dig ſo deep, as almoſt to undermine it; place Blocks, and Quarries of Wood to ſuſtain the Earth, and caſt in as much Water as may fill the Trench or ſufficiently wet it, unleſs the Ground were very moiſt before. Thus let it ſtand till ſome hard Froſt bind it firmly to the Roots, and then convey it to its new Station, which may be preſerv'd from freezing, by placing ſtore of warm Litter in it: ſo cloſe the Mould the better to the ſtraggling Fibres, and place the Earth taken out of the Pit about the Root of the new-planted Tree.

The common Rules for *Tranſplanting*, are, 1° The lighter the Soil is, the deeper are the Trees to be planted. 2° If the Soil be Gravel, or Sand, mix Clay with it, and *vice verſa*. 3° The beſt Seaſon, is either *October* or *February*; in warm, moiſt, clear Weather. 4° The large Roots to be abated, to prevent the Neceſſity of digging too deep; but the ſmall Fibrous ones to be ſpared. 5° In taking up the Trees to obſerve how the Roots grow, and in *Tranſplanting*, to diſpoſe them in the ſame Order, and place the Tree to the ſame Aſpect. 6° To defend young Trees after *Tranſplantation*, both from Wind and Sun, till the Roots be fix'd, and they begin to ſhoot. 7° If the Soil you *tranſplant* into, be good, don't top the Trees, but lop all the Boughs to one ſingle one, the moſt upright and promiſing among them: But if the Soil be poor, top them, and when they are ſhot out again, lop off all the Branches to one. See PRUNING.

TRANSPLANTING *of Fruit-Trees.* After a Summer's Growth of Fruit Seedlings in the Seminary, ſuch are pull'd up as are above a Foot high, and *tranſplanted* into a Nurſery; the reſt to be left in the Seed-Plot till another Year. See SEMINARY.

When drawn up, the Sprigs are to be cut off, from about the Top, the Strings from the Roots, and the Extremities, both of the Top, that it mayn't run too faſt upwards, and of the tap or heart Root, that it may not paſs directly downwards; leſt it go beyond the good Soil. The Holes, or Pits to be ſo deep, as that the Plants may ſtand ſomewhat deeper in the Ground, than when in the Seed-plot; cloſe

the

the Mould about them, and if it be a dry Time, water them the firſt Day, and cover the Soil with old Fern.

Mr. *Bradley* gives us a new Method of *Tranſplanting* Trees of all Kinds and Ages with Safety, either while they are in Bloſſom, or with Fruit upon them; thus: The Holes to receive the Trees, are to be prepared before the Trees are taken up; and the Earth which comes out of the Holes to be made very fine, and put into large Tubs and mix'd with Water, till it be about the Conſiſtence of thin Batter. Then the Holes wherein the Trees are to be planted, are to be fill'd with this thus-temper'd Earth, before the earthy Parts have time to ſettle.

The Advantage hereof is, that the Trees thus planted, have their Roots immediately incloſed and guarded from the Air; and the warm Seaſon of the Year diſpoſing every Part of the Tree for Growth and Shooting, it will loſe very little of its Vigour. ---- In Winter it does not ſucceed.

The ſame Author adds, that in conſideration of the Circulation of the Sap, it is as neceſſary to preſerve the Veſſels of Trees entire, as thoſe in Animal Bodies: And therefore in *tranſplanting* Trees in the Summer Seaſons, 'tis not proper to cut off any of the Branches, or wound any of the Veſſels, till they have renewed their Roots, which it is of abſolute Neceſſity to wound in *Tranſplanting* them. For the wounded Roots, he has provided a Plaiſter of a Mixture of Gums to prevent the Canker and Rot, and promote their Healing.

TRANSPLANTATION, in Natural Magic, is uſed for a Method of curing Diſeaſes, by transferring them from one Subject to another; much in Vogue among certain Philoſophers. See SYMPATHETIC.

This *Tranſplantation* is effected, either by the Uſe of a certain Medium, called on that account a *Magnet*; or without, by ſimple Contact.

The firſt Kind, which is that moſt properly call'd *Tranſplantation*, is when the Patient's Excrement being mix'd up with Earth, the Diſeaſe is *tranſplanted* into a Vegetable, ariſing from a Seed ſown in the ſaid Compoſt; or, when the Parings of the Nails of a gouty Perſon, are incloſed in an Auger-hole made in a Plant, particularly an Oak.

Here the Patient's Excrement is the Magnet, and the vital Spirit of the Plant ariſing from the Seed, is the Mumia which the Magnet receives; and the Caſe is the ſame, in the Parings of the Nails, and the vital Spirit of the Oak. See MUMIA.

The ſecond Kind of *Tranſplantation*, properly call'd *Approximation*, is, when a Finger ſeiz'd with a Panaris or Whit-low, is cured by rubbing in a Cat's Ear, which is held to receive the Pain.

In this Caſe, the ſound Subject receives the vital Spirits, unites with them, and corrects their morbific State: And, as certain Diſeaſes are got by Approximation; the infected Spirits of a diſeas'd Body, inſinuating themſelves into a ſound one, and thus infecting the ſame; ſo they are cured by Approximation; when the Spirits of a diſeaſed Perſon entering a ſound Body, the latter corrects and retrieves the morbific State of the former.

Tranſplantation, by means of the Magnet, is of five Kinds, *viz.* *Inſemination*, *Implantation*, *Impoſition*, *Irroration* and *Ineſcation*; each whereof, ſee under its proper Article, INESCATION, IMPLANTATION, *&c.*

TRANSPORT-*Ship*, is a Veſſel whereon to convey Proviſions, warlike Stores, Soldiers, *&c.* See VESSEL.

TRANSPORTATION, the Act of conveying, or carrying a thing from one Place or Country to another. See EXPORTATION.

In Matters of Commerce, *Tranſportation* is of equal Import with *Re-exportation*, *viz.* the taking up of Commodities in one foreign State or Kingdom, bringing them hither, and paying Duties for them; and then conveying them into ſome other foreign State, *&c.* by which it is diſtinguiſh'd from *Importation* and *Exportation*; where the Commodities are either carried originally out of, or brought finally into, our own Kingdom. See IMPORTATION and EXPORTATION.

Our *Tranſportation* or Re-exportation of Wooll, Butter, Hides, Tallow, Herrings, Beef and Salmon, which we tranſport from *Ireland*, to other Provinces, being the Concerns of our Merchants, and paying Duties to His Majeſty, have been reckon'd at 300,000 *l. per Annum.*

'Twou'd be tedious to enumerate the Value of our *Tranſportations* from *Denmark*, *Sweden*, *Spain*, *Portugal*, the *Streights*, *Turkey*, *Guinea*, *&c.* the moſt conſiderable, is from the *Eaſt Indies*. In the Infancy of that Trade, *viz.* in the Year 1613, of Pepper only, beſides what we conſumed at Home, we *tranſported* in one Year to other Countries, after it had paid Duty here, to the Value of 200,000 *l.* and of late Years our Exportation of what we bring from thence, after we have ſupplied ourſelves, is computed at 500,000 *l. Sterling.* See NAVIGATION and COMMERCE.

TRANSPORTATION is alſo a kind of Puniſhment; or, more properly, an Alleviation or Commutation of Puniſhment, for Criminals convicted of Felony, who, for the firſt Offence, unleſs it be an extraordinary one, are ordinarily *Tranſported* to the Plantations, there to bear hard Labour for a Term of Years, within which if they return, they are executed without further Trial. See FELONY, PUNISHMENT, *&c.*

TRANSPOSITION, in Algebra, the bringing any Term of an Equation over to the other Side. See TERM.

Thus if, $a+b=c$, and you may make $a=c-b$; b is ſaid to be *tranſpoſed*. See EQUATION.

TRANSPOSITION, in Grammar, call'd alſo *Hyperbaton*, a diſturbing or diſlocating of the Words in a Diſcourſe; or a changing of their natural Order of Conſtruction, to pleaſe the Ear, by rendring the Contexture more eaſy, ſmooth, and harmonious. See HYPERBATON.

A *Tranſpoſition*, which renders the Senſe perplex'd, is vicious.

The Conſtruction of the ancient Languages being much more Artful than that of the Modern ones; allowed of much greater and more frequent *Tranſpoſitions*. The *Engliſh*, *French*, *&c.* ſcarce ever allow of them but in Oratory and Poetry; in which Caſes they ſerve to give a Force and Energy to the Diſcourſe or the Verſe, and to prevent their languiſhing. See CONSTRUCTION.

TRANSPOSITION *in Muſic*, is a changing of the Notes of a Piece of Muſic. See NOTE.

Of this there are two Kinds; the firſt with reſpect to the *Clef*, the ſecond with reſpect to the *Key*.

Tranſpoſition with reſpect to the Clef, conſiſts in the changing of the Places or Seats of the Notes or Letters, amongſt the Lines and Spaces; but ſo as that every Note is ſet at the ſame Letter. See CLEF.

This is done either by removing the ſame Clef to another Line; or by uſing another Clef, but with the ſame Signature, by reaſon the Piece is ſtill in the ſame Key. See CLEF.

The Practice is eaſy in either Caſe: In the firſt, you take the firſt Note at the ſame Diſtance above or below the Clef-Note, in its new Poſition as before; and all the reſt of the Notes in the ſame Relations or Diſtances from one another; ſo that the Notes are all ſet on Lines and Spaces of the ſame Name.

In the ſecond, or ſetting the Muſic to a different Clef, 'tis to be obſerved, the Places of the three Clef Notes are invariable in the Scale, and are to one another in theſe Relations, *viz.* the Mean a 5th above the Baſs, and the Treble a 5th above the Mean. Now to *Tranſpoſe* to a new Clef, *e. gr.* from the Treble to the Mean; where-ever that new Clef is ſet, we ſuppoſe it the ſame individual Note, in the ſame Place of the Scale, as if that Piece were that Part in a Compoſition to which this new Clef is generally appropriated; that ſo it may direct to the ſame Notes we had before *Tranſpoſition*: Now, from the fix'd Relations of the three Clefs in the Scale, it will be eaſy to find the Seat of the firſt *tranſpoſed* Note; and then all the reſt are to be ſet at the ſame mutual Diſtances they were at before. See SCALE.

Suppoſe, *e. gr.* the firſt Note of a Song be *d*, a 6th above the Baſs-clef; where-ever that Clef is placed, the firſt Note muſt be the greater 2d above it, becauſe a greater 2d above the Mean is a greater 6th above the Baſs-clef, the Relation of thoſe two being a 5th. ---- So that the firſt Note will ſtill be the ſame individual *d*.

The Uſe of this *Tranſpoſition* is, that if a Song being ſet with a certain Clef, in a certain Poſition, the Notes go far above or below the Syſtem of five Lines; they may, by the Change of the Place of the ſame Clef in the particular Syſtem, or by taking a new Clef, be brought more within the Compaſs of the Lines.

Tranſpoſition from one Key to another, is a changing of the Key; or a ſetting all the Notes of the Song at different Letters, and performing it, conſequently, in different Notes upon an Inſtrument. See KEY.

The Deſign hereof is, that a Song which being begun in one Note, is too high or low, or otherwiſe inconvenient for a certain Inſtrument; may be begun in another Note, and from that carried on in all its juſt Degrees and Intervals.

The Clef and its Poſition here remain the ſame; and the Change is of the Notes themſelves, from one Letter, and its Line or Space, to another.

In the former *Tranſpoſition*, the Notes were expreſs'd by the ſame Letters, but both removed to different Lines and Spaces: In this, the Letters are unmoved, and the Notes of the Song transferr'd to, or expreſs'd by other Letters, and conſequently ſet upon different Lines and Spaces, which, therefore, requires a different Signature of the Clef.

TRANSPOSITION *of Equation*. See EQUATION.

TRANSSUMPTIO, TRANSUMPTION, in the Schools, a Syllogiſm by Conceſſion or Agreement, us'd where a Queſtion propos'd is transferr'd to another, with this Condition, that the Proof of this latter ſhall be admitted for a Proof of the former.

Thus *Ariſtotle* in his Book *de Cœlo*, undertaking to ſhew that all the Stars are round, transfers the Queſtion to the Moon, and proves her Rotundity from her Increaſing and Waining;

Waining; ſuppoſing it a Thing admitted by his Opponents, that the Stars are all alike.

TRANSUBSTANTIATION, in Theology, the Converſion or Change of the Subſtance of the Bread and Wine, in the Euchariſt, into the Body and Blood of Jeſus Chriſt. See EUCHARIST.

Tranſubſtantiation, taken in its general and literal Senſe, implies any Change of one Subſtance into another; thus, the Change of *Moſes*'s Rod into a Serpent; of the Waters of the *Nile* into Blood; of *Lot*'s Wife into a Pillar of Salt, were preternatural *Tranſubſtantiations*; and the Change of the Food we eat, into the Subſtance of our Bodies, is a natural *Tranſubſtantiation*. See SUBSTANCE.

But the Word in its proper Senſe, as a Term, is reſtrain'd to the miraculous Change which the *Romiſh* Church holds is wrought in the Sacrament, by the Conſecration of the Prieſt.

One of the great Articles of that Church, rejected by the Reform'd, is that of *Tranſubſtantiation*; the latter maintaining the *Tranſubſtantiation* to be only figurative, and the former real.

The Reform'd interpret *eſt*, *is*, in the Text, *Hoc eſt Corpus meum*, This is my Body, by ſignificat; *q. d.* this *ſignifies* my Body: But the Council of *Trent* ſtand up ſtrenuouſly for the literal Senſe of the Verb: Thus, in Can. 1. Seſſ. 13. of that Council, 'tis expreſsly decreed, that in *Tranſubſtantiation, the Body and Blood of our Lord Jeſus Chriſt are truly, really, and ſubſtantially under the Species of Bread and Wine.*

'Tis added, that by *truly*, we mean properly, and not only by Signification, as if the Euchariſt were no more than a Sign of the Body and Blood of Jeſus Chriſt: That by *really*, we mean in Fact, and not only in a Figure, as if the Euchariſt were only a Figure and Repreſentation of the Body and Blood of the Saviour of the World: And that by *ſubſtantially*, we mean in Subſtance, and not only in Virtue and Energy. --- Thus is *truly* oppos'd to a ſimple Sign; *really* to a Figure; and *ſubſtantially* to Energy.

TRANSVERSALIS, in Anatomy, a Name given to ſeveral Muſcles, &c. in reſpect of their Situation, Progreſs, &c. as the

TRANSVERSALIS *Abdominis*, a Muſcle which lies under the Obliqui, and ariſes from the Cartilago Xiphoides, from the Extremities of the falſe Ribs, from the Tranſverſe Apophyſis of the Vertebræ of the Loins, and fix'd to the inner Side of the Spine of the Ilium, and inſerted in the Os Pubis, and Linea Alba.

This, with the Obliqui, (which ſee) unites its Tendons, as it approaches the *Linea Alba*, and is the only Muſcle that is cut in the Operation of the *Bubonocele*: It has a fine and thin Membrane that cloſes exactly its Ring or Hole, through which the Veſſels paſs.

TRANSVERSALIS *Colli*, is a Part of the *Tranſverſalis Dorſi*, which ſome divide into three, *viz.* the Sacer, Semiſpinatus, and *Tranſverſalis Colli*.

It ariſes from the Os Sacrum, and from all the tranſverſe Proceſſes of the Vertebræ of the Loins, Back, and Neck, except the two firſt; and is inſerted by ſo many diſtinct Tendons to all their ſuperior Spines: It moves the whole Spine obliquely backwards.

TRANSVERSALIS *Pedis Placentini* comes from the Bone of the Metatarſus, that ſuſtains the Toe next the little Toe, and paſſing acroſs the other Bones, is inſerted into the Os Seſamoides of the great Toe: Its Uſe is to bring all the Toes cloſe to one another.

TRANSVERSALIS *Penis* ariſes from the Iſchium juſt by the Erectores, and runs obliquely to the upper Part of the Bulb of the Urethra.

It helps to preſs the Veins upon the Back of the Penis, againſt the Os Pubis, which is the Cauſe of Erection. See ERECTION.

TRANSVERSALIS *Dorſi*, TRANSVERSALIS *Lumborum*, TRANSVERSALIS *Femoris* } See { SEMISPINATUS. SACER. QUADRATUS.

TRANSVERSALIS is alſo a Name given to a Suture of the Cranium, becauſe of its traverſing or croſſing the Face from one Side to t'other. See SUTURE.

It ariſes at one of the leſſer Angles of the Eye, and paſſing along the Bottom of its Orbit, and the Root of its Noſe, terminates in the other leſſer Angle.

TRANSVERSE, ſomething that goes acroſs from Right to Left, or from Corner to Corner.

Thus Bends and Bars in Heraldry are *tranſverſe* Pieces or Bearings. See BEND.

The Diagonals of a Paralelogram or a Square are *tranſverſe* Lines. See DIAGONAL.

Lines which make Interſections with Perpendiculars, are alſo call'd oblique or *tranſverſe* Lines. See LINE, PERPENDICULAR, OBLIQUE, &c.

TRANSVERSE *Axis*, or *Diameter*, call'd alſo the *firſt* or *principal Axis*. See AXIS and LATUS *Tranſverſum*.

The Tranſverſe *Axis of an Ellipſis*, is the longer Axis, or that which *traverſes* it lengthwiſe, in contra-diſtinction to the Conjugate one. See ELLIPSIS and CONJUGATE.

The *Tranſverſe* Axis of an Hyperbola, is the Line D K, Tab. Conicks, Fig. 17. cutting the Curve in the Points D and K. See HYPERBOLA.

TRANSVERSE *Muſcles*, in Anatomy, are certain Muſcles ariſing from the *tranſverſe* Proceſſes of the Vertebræ of the Loins. See VERTEBRÆ and LOINS.

TRANTERY, in ſome Cuſtoms, is the Money ariſing by Amerciaments of Ale-ſellers and Victuallers, for breaking the Aſſize of Bread and Ale. See ASSIZE.

Particularly at *Luſton*, and other Manors in *Herefordſhire*.

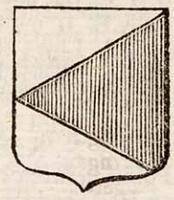
TRAVERSE or TRANSVERSE, ſomething that goes athwart another, *i. e.* croſſes and cuts it obliquely. See TRANSVERSE.

TRAVERSE is particularly uſed for a Piece of Wood or Iron placed tranſverſely, to ſtrengthen and fortify another. Such are thoſe uſed in Gates, Windows, &c.

To plane a Board againſt the Grain, is alſo call'd among Joiners, &c. to *Traverſe* it.

TRAVERSE, in Gunnery, ſignifies to turn or point a Piece of Ordnance which Way one pleaſes, upon her Platform. See ORDNANCE, CANNON, &c.

The laying and removing a Piece of Ordnance or a great Gun, in order to bring it to bear, or lie level with the Mark; is alſo called *Traverſing the Piece*. See GUNNERY, &c.



TRAVERSE is ſometimes alſo uſed in Heraldry, for a Partition of an Eſcutcheon, of the Figure adjoining, which they Blazon parted *per pal Traverſe*, Argent and Gules.

TRAVERSE, in Navigation, is the Variation or Alteration of a Ship's Courſe, occaſion'd by the ſhifting of the Winds, Currents, &c. See COURSE.

Traverſe Sailing, is uſed when a Ship having ſet Sail from one Port, towards another, whoſe Courſe and Diſtance from the Port ſail'd from, is given or known, is, by reaſon of contrary Winds, or other Accidents, forced to ſhift and ſail on ſeveral Courſes, which are to be brought into one Courſe, to learn, after ſo many Turnings and Windings, the true Courſe and Diſtance made from the Place ſail'd from, and the true Point or Place where the Ship is; that ſo the Wind coming fair, it may be known how to ſhape a Courſe for the Place intended. See SAILING.

This may be perform'd Geometrically two Ways: The Firſt, by drawing new Meridians, through the Extremity of every Courſe, parallel to the firſt Meridian, or North and South Lines at firſt made: and ſetting off every Courſe with a Sweep of 60, as if it were a Queſtion in Plain Sailing. You may alſo let fall Perpendiculars to every new Meridian, from the Point that the Ship ſail'd to upon that Courſe, by which you have the Courſe, Diſtance, Difference of Latitude and Departure to every Courſe. To Illuſtrate this by an Example: A Ship being bound for a Port diſtant 120 Miles N. E. ½ E. ſails S. S. E. 30 Miles, then N. E. by N. 40, then E. by N. 25, then N. N. E. 44; 'tis requir'd to find the Courſe and Diſtance made good, and alſo the Courſe and Diſtance to the Port bound for.

Draw the Line HK (Tab. Navigation, Fig. 17.) at pleaſure, for a Meridian, or North and South Line, and therein aſſume a Point, as at A, for the Port ſail'd from; then with 60 of the Chords, and one Foot in A, draw the Arch L m, upon which ſet off two Points (becauſe the Courſe is S.S.E.) from L to m, and draw the Line A m, upon which ſet off the Diſtance 30, from A to B; then is the Ship at B: Thus letting fall the Perpendicular B K, A K 27° 7′ is the Difference of Latitude, and B K 11° 5′, the Departure for the firſt Courſe.

For the ſecond Courſe, with the Diſtance K B, draw the Parallel B N, and thereby with the Chord of 60, as before, ſet off the Second Courſe and Diſtance, N. E. by N. 40, from B to C, and let fall the Perpendicular C L, then is the Ship at C, the Difference of Latitude upon that Courſe is B L 33: 3, and Departure C L 22: 2.

Proceed in the ſame manner for the third Courſe, with the Parallel C O, ſet off E. by N. 25, from C to D, and draw the Line D P, from which ſet off the laſt Courſe, N. N. E. 44, then is your Ship at E.

Since, then, the Ship came from A, and is now at E, the Line A E meaſured on the ſame equal Parts, upon which all the other Diſtances were taken, will be found 91 Miles, and the Arch R Q meaſured on the Rhumbs, five Points, *viz.* N. E. by E. ſo that the Ship is now 91 Miles N. E. by E. from the Port ſailed from.

To find her Courſe and Diſtance to the Port bound for, ſet off 4 half Points upon the Arch R Q from R to S, and from A through S draw the Line A S F; upon which ſet off

120, the Distance from the Port sailed from to the Port bound for, from A to F, then is F the Port bound for; now the Port bound for being at F, and the Ship being but at E, the Line E F measured on the same equal Parts that the rest was taken from, will be found to be 31, and the Arch T U measured on the Chords, is 35° 12′, or N. E. by N. somewhat easterly, &c.

This Method is useful, where the Courses tend generally one way, without intersecting one another; but if they often cross, 'tis best to have recourse to the 2d Method, which is without new Meridian.

In order to this, observe how many Points are between the Point next to be laid down, and the Point opposite to the Course last laid down; for that is the Point for laying down; then, with the Chord of 60, and one Foot in the Point the Ship is last come to, describe an Arch; upon which set off the Points found by the abovesaid Rule, and through that draw the Line for the next Course, &c. For an Example;

Draw a North and South Line, as in the former, as the Line R M, Fig. 17; in which assume a Point, as at A, for the Port sail'd from; then from A set off the first Course and Distance, *viz.* N. N. W. 68, from A to B, and for the second Course, with the Chord of 60, and one Foot in B, draw the Arch T W, upon which to set off the next Course S. S. W. 70, observe the Rule above delivered, *viz.* To take the Number of Points between the Point opposite to the last Course sailed, and the Point you are next to sail. The Reason of which Rule is this: If from A to B your Course be N. N. W. the Back from B to A, must needs be S. S E. the opposite Point, and then if you were to sail S. by E. it must be one Point to the Southward of that S. S. E. Line; if South, it is two Points, and consequently the next Course being S. S. W. I set off 4 Points, upon which set off 70 Miles, from B to C, and then is your Ship at C: For the third Course, if from B to C be S. S. W. then from C to B N. N. E. but the next Course being E. half N. the Points between N. N. E. and E. half N. are five Points and an Half, and therefore with the Chord of 60 and one Foot in C, draw the Arch *x y*, upon which set off five Points and an Half, from *x* to *y*, and through *y* draw the Line C D, upon which set off 90 Miles from C to D, then is *y* our Ship at D.

After the same Manner lay down all the rest, as D E W. N. W. half N. 70, then E F South 25, then F G, E. half S. 45; then lastly G H, South 30, which is the last Course.

Thus your Ship being at H, and the Port sailed from at A, the Line A H 28 Miles, is the Distance made good; and the Angle at A is four Points, *viz.* S. E. but the Port intended for, being S. W. 55. Set it from A to K, and the Ship being at H, the Line H K, 62 Miles, is the Distance from the Ship to the Port bound for; and the Course is found by measuring the Angle at H 71° 48′ or W. S. W. more than a Quarter Westerly, &c.

To work a TRAVERSE *by the Tables of Difference of Latitude and Departure.*

This is the principal Use those Tables are intended for; and the Way of working a *Traverse* hereby, is equal to the best for Exactness, and superior in Point of Expedition.

Make a little Table with six Columns, the First for the Course, the Second for the Distance, the Third for the Northing, the Fourth for the Southing, the Fifth for the Easting, the Sixth for the Westing. Then find the Difference of the Latitude and the Departure to every Course, and set them in their proper Columns; as where the Course is Northerly, set the Difference of the Latitude under Northing, or in the North Column; and where the Course is Southerly, set the Difference of Latitude in the South Column.

Again, where the Course is Easterly, set the Departure in the East Column, and when Westerly, set it in the West Column; then adding up each Column by itself, subtract the North and South Columns, the greater from the lesser, the Remainder is the Northing or Southing made good. Also subtract the East and West Columns, the bigger from the lesser, the Remainder is the Easting or Westing made good; then have you the Difference of Latitude and Departure given, to find the Course and Distance.

In the first Example above specified, the first Course is S. S. E. 30 Miles, or two Points 30 Miles; for which, I find the Difference of Latitude 27 : 7. Now the Course being between South and East, I place my Difference of Latitude in the South Column, and my Departure 11 : 5 in the East Column, leaving the North and West Columns blank.

Then for the Second Course, N. E. by N. or three Points 40 Miles, my Difference of Latitude, 33 : 3 is to be placed in the North Column, and the Departure 22 : 2, in the East Column, because the Course is between the North and East.

Then the third Course being E. by N. or seven Points, 25 Miles, I place my Difference of Latitude, 4 : 9 in the North Column, and Departure 24 : 5, in the East Column.

And so for the fourth Course N. N. E. or two Points 44 Miles, I place my Difference of Latitude 40 : 6, in the North Column, and my Departure, 16 : 8, in the East Column; then adding up each Column, the Sum of the Northing Column is 78 : 8, and the Sum of the South Column is 27 : 7, which subtracted from the Northing 78 : 8, the Remainder 51 : 1, is the Difference of Latitude made good, which is Northing, because the Northing was the greater Number.

Again, the Sum of the Easting Column is 75 : 0, which, because there is no Westing to subtract from it, is the Easting made good. Thus you have the Northing 51 : 1, and the Easting 75 : 0 given, to find Course and Distance; and though you cannot find in the Table the exact Number of 51 : 1, and 75 : 0 together, yet find the nearest you can, which is 75 : 4, and 50 : 9, over which at the Top, you find 34 Degrees for the Course, which is N. E. by N. 0° 15′ easterly, and the Distance 91 Miles.

TRAVESTY or TRAVESTI, a Term which some late Authors have introduced into Poetry. The Word is originally *French*, being a Participle, of the Verb *Travestir*, to disguise one's self, or to appear in Masquerade. Hence *Travesty* comes to be applied to the disfiguring of an Author, or the Translating him into a Style and Manner different from his own; by which means it becomes difficult to know him.

G. Battista Lalli, has *travestied Virgil*, or turn'd him into *Italian* Burlesque Verse. *Scarron* has done the same in *French*, and *Cotton* and *Phillips* in *English* Verse. See BURLESQUE.

Castalio is charged with having *travestied* the Bible, by reason of the Difference of Air and Stile between his Version and the Original.

TRAUMATICKS, Τραυματικὰ, Vulneraries; are Herbs or Drugs good for the curing of Wounds. See VULNERARY.

TRAYL-BASTON, TRAIL-BASTON (*q. d. trahe baculum*, drag a Club or Staff). See JUSTICE *of Trail-baston*.

Edward I. in his 32d Year, sent out a new Writ of Inquisition, called *Trail-baston*, against the Intruders on other Mens Lands, who to oppress the right Owner, would make over their Lands to great Men; against Batterers hired to beat Men; Breakers of Peace; Ravishers; Incendiaries; Fighters; false Assisors and other Malefactors; which Inquisition was so strictly executed, and such Fines taken, that it brought in a world of Treasure to the King.

TRAYTOR, TRAITOR, TRADITOR, a Betrayer of his King and Country; or one guilty of High Treason. See TREASON and TRADITOR.

TRAYTEROUS *Position*, is particularly understood of a Tenet, which some formerly held, of the Legality and Property of taking Arms by the King's Authority against his Person and those commission'd by him; which is condemn'd by Statute 14 *Car.* II.

TREACLE, in Pharmacy, &c. See THERIACA.

TREASON, *Treachery*; the Act of Infidelity to one's lawful Soveraign.

Treason, in our Laws, is of two Sorts, *viz. High* and *Petty Treason*.

High TREASON or TREASON *Paramount*, is an Offence committed against the Security of the King or Kingdom, whether by Imagination, Word or Deed. Such are, To compass or imagine the Death of the King, Queen or Prince; or to Deflour the King's Wife, or his Eldest Daughter unmarried, or his Eldest Son's Wife; or to levy War against the King in his Realm; to adhere to his Enemies; Counterfeit his great Seal or Money; to kill the King's Chancellor, Treasurer, Justices of either Bench, Justices in Eyre, of Assize, or of Oyer and Terminer, being in their Place during their Office; diminishing or impairing current Money; saying that the King is a Heretic or Papist, or intends to introduce Popery, &c. *Anno* 13 *Car.* II.

'Tis a Maxim, That *In majori Proditione, omnes sunt Principales*; there are no Accessaries in *Treason*, all are Principals.

Also, that *Voluntas non reputabitur pro facto, nisi in causa Proditionis*; the Will is never taken for the Deed in any Case, but that of *High Treason*: Though some *High Treasons* are much more Heinous than others, yet the Punishment appointed by Law, is the same in all (Clipping and Coining only excepted) which is, that the Traitor be laid upon a Hurdle or Sledge, drawn to the Gallows, there hanged, but cut down while alive, the Entrails pulled out and burnt before the Criminal's Face; then his Head and Quarters cut off, and Impaled where the King shall judge meet. Add to this, that he forfeits all his Lands and Goods whatever, to the King; his Wife loses her Dowry; his Children their Nobility, and all Right of Inheriting.

Even an Ideot or Lunatic, though judg'd incapable of most Crimes, shall be punished as a Traitor, if he go about to kill the King.

For Petty TREASON. See PETTY *Treason*.

This Kind gives Forfeiture of Eſcheats to every Lord within his Manor. See ESCHEAT.

There is alſo mention made of *Accumulative* and *Conſtructive Treaſon*, in the Statute 14 *Car.* II.

TREASURE, *Theſaurus*, Θεσαυρ⊙, Store of Money in reſerve. See TREASURER and TREASURY.

TREASURE-*Trove*, q. d. *Treaſure found*, in Law, is when any Money, Gold, Silver, Plate, or Bullion, is found in any Place, and none knows to whom it belongs.

This ſhould, naturally, fall to the Finder; but particular People have made particular Proviſions for it.---- The *Jews* gave it the Proprietor of the Place where it was found: The *Roman* Juriſprudence was various with regard hereto; ſometimes it was given to the Maſter of the Grounds; ſometimes to the Finder; and ſometimes it was adjudged to the public Treaſury.

In *France* and *England*, the general Uſage is to have ſuch *Treaſure* ſequeſtred to the King, unleſs where the Benefit thereof is expreſly granted or made over by the King to ſome other.

In ſome Places in *France*, it is divided into three Parts; one for the Prince, one for the Proprietor of the Land, and one for the Finder.

Briton ſays, 'tis every Subject's Part, as ſoon as he hath found any Treaſure in the Earth, to make it known to the Coroners of the County, &c.

This was anciently call'd *Findaringa*, of finding the *Treaſure*, L L. *Hen.* I.

The Puniſhment for concealing *Treaſure* found in *England*, is Impriſonment and Fine; but if any Mine of Metal be found in any Ground, it always appertains to the Lord of the Soil, except it be a Mine of Gold or Silver, which anciently always belong'd to the King, in whoſe Ground ſoever it were found: But by an Act of Parliament, the King now, hath only the Præ-emption.

TREASURER, an Officer to whom the Treaſure of a Prince or Corporation is committed to be kept and duly diſpoſed of in the Payment of Officers and other Expences. See TREASURY.

Of theſe there is a great Variety. ---- His Majeſty of *Great Britain*, in Quality of Elector of *Brunſwick*, is *Arch Treaſurer of the* Roman *Empire*. ---- In the States of *Poland* are two *Grand-Treaſurers*; that of the Kingdom of *Poland*, and that of the Dutchy of *Lithuania*.

In *England*, the principal Officers under this Denomination are the Lord *High Treaſurer*, the *Treaſurer of the Houſhold*; *Treaſurer of the Navy*, of the *Wardrobe*, of the *King's Chamber*, &c.

Anciently we had likewiſe a *Treaſurer of the Exchequer*; *Treaſurer of Wars*, &c.--- In the *Romiſh* Countries, the Title *Treaſurer* is alſo given, ſomewhat abuſively, to an Eccleſiaſtic, who has the keeping of the Relicks, and the Charters, and Archives of a Church, or Monaſtery.

This Dignity ſucceeds, in ſome meaſure, to that of the ancient Deacons, who had the like Charge in the Primitive Church. See DEACON.

Lord High TREASURER *of England*, is the Third great Officer of the Crown. See CROWN.

He receives the Office, by Delivery of a white Staff to him from the King, and holds it during the King's Pleaſure: Anciently, he received it, by Delivery of the Golden Keys of the Treaſury.

Under his Charge and Government, is all the King's Revenue kept in the Exchequer. See REVENUE and EXCHEQUER.

He has the Check of all the Officers, any way employ'd in collecting Impoſts, Cuſtoms, Tributes or other Revenues of the Crown. He has the Gift of all the Cuſtomers, Comptrollers and Searchers Places, in all the Ports of *London*, and the Nomination of the Eſcheators in every County. See CUSTOM-*Houſe*, &c.

He, alone, or others in Commiſſion with him, letteth Leaſes of all the Crown Lands, gives Warrants to certain Perſons of Quality to have their Wine Cuſtom-free, &c.

The ancient Salary was 383 *l.* but at preſent 8000 *l.* The Office of Lord *Treaſurer*, is now in Commiſſion. See TREASURY.

TREASURER *of the Houſhold*, is an Officer, who, in the Abſence of the Lord Steward, has Power, with the Comptroller and other Officers of the Green Cloth and the Steward of the *Marſhalſea*, to hear and determine Treaſons, Felonies and other Crimes committed within the King's Palace. See HOUSEHOLD, GREEN *Cloth*, &c.

TREASURER *of the Navy*, is an Officer who receives Money out of the Exchequer, by Warrant from the Lord *High Treaſurer*, or the Lords Commiſſioners executing that Place; and pays all Charges of the Navy, by Warrant from the principal Officers of the Navy. See NAVY.

TREASURY, the Place wherein the Revenues of a Prince are receiv'd, preſerv'd, and disburs'd.

In *England*, the *Treaſury* is a Part of the Exchequer, by ſome call'd the *Lower Exchequer*. See EXCHEQUER.

The Officers of his Majeſty's *Treaſury*, or the lower *Exchequer*, are, the Lord Treaſurer, a Chancellor, a Secretary, two Chamberlains, an Auditor, four Tellers, a Clerk of the Pells, Uſhers of the Receipt, a Tally-cutter, &c. See each Officer under his proper Article, CHANCELLOR, TELLER, TALLY, &c.

At *Rome* under the Emperors, there were two Kinds of *Treaſuries*, the one call'd *Ærarium*, wherein the Monies deſtined to ſupport the Charges of the Government were kept; the other *Fiſcus*, wherein were preſerv'd thoſe intended for the particular Subſiſtence of the Emperor and his Court. In effect the Ærarium belong'd to the People, and the Fiſcus to the Prince. See FISCUS.

We have ſtill a Reſemblance of this Difference among us; but it is confounded in *France*, &c. where the King diſpoſes abſolutely of the public Treaſure, &c.

Lords of the TREASURY. In lieu of one ſingle Director, and Adminiſtrator of his Majeſty's Revenues, under the Title of Lord *High Treaſurer*; it is frequently thought proper to put that Office in Commiſſion, *i. e.* to appoint ſeveral Perſons to diſcharge it, with equal Authority, under the Title of *Lords Commiſſioners of the Treaſury*. See TREASURER.

TREAT, in our old Law-books, from the *French*, *Traiter*, ſignifies as much as taken out, or withdrawn: Thus a Juror was challenged, becauſe he could not diſpend 40 *l.* and therefore was *Treat* by the Statute. *Old. Nat. Br.* or diſcharged.

TREATISE, TRACTATUS, a ſet Diſcourſe in Writing, on any Subject.

The *Treatiſe* is ſuppoſed more expreſs, formal and methodical than an Eſſay; but leſs ſo than a Syſtem. See ESSAY, &c.

TREATY, a Covenant between ſeveral Nations; or the ſeveral Articles or Conditions ſtipulated and agreed upon between Sovereign Powers. See ALLIANCE.

There are *Treaties* of Peace, of Marriage, of Confederacy, of Neutrality, of Capitulation, and of Commerce and Navigation. See PEACE, CONFEDERACY, &c.

The celebrated *Treaties* are thoſe of *Nimeguen*, of *Munſter*, of the *Pyreneans*, of *Weſtphalia*, of *Riſwick*, of *Utrecht*, of *Hanover*, of *Vienna*, &c.

Treaties of Commerce are uſually follow'd by various Tariffs, to adjuſt the Duties of Exportation and Importation of Merchandizes into the reſpective Dominions of the contracting Power.

The laſt *Treaty* of Peace, Commerce, Navigation, &c. between *England* and *France*, was ſign'd at *Utrecht* the 1ſt of *April*, 1713, and conſiſts of 39 Articles, moſt whereof are regularly executed between the two Nations, only ſome of the more particular ones cannot yet be executed, by Reaſon of ſome Difficulties in the Tariffs. See TARIF.

TREATY, in Commerce, is a Convention or Contract agreed on, and the Clauſes and Conditions thereof regulated between two or more Perſons. The Word is underſtood of any thing that may enter into Commerce by way of Purchaſe, Sale, Exchange, &c. There are *Treaties* for the Buying of Merchandize, for the Freighting of Veſſels, for the Aſſurance of Goods, &c. See POLICY.

TREBELLIANICA, or TREBELLIAN *Fourth*, in the *Roman* Juriſprudence, a Right belonging to an Heir inſtituted by Teſtament.--- If the Teſtator, after appointing a full and general Heir, ſpent and diſpos'd of all his Effects in Legacies; or if he went *ultra Dodrantem*, beyond three Fourths thereof; in that Caſe, the Heir was allow'd to retrench and detain one fourth Part of the Legacies to his own Uſe.

In like Manner, if the Teſtator charg'd his Heir with a Feoffment of Truſt, and to reſtore the Succeſſion to another; in that Caſe, the Heir might likewiſe retain a Fourth of the whole Succeſſion, that the Quality of Heir might not be render'd wholly vain and fruitleſs.

TREBLE, in Muſic, the higheſt or acuteſt of the four Parts in Symphony, or that which is heard the cleareſt in a Concert. See MUSIC, GRAVITY, and SYMPHONY.

In the like Senſe we ſay, a *Treble* Violin, *Treble* Hautboy, &c. See VIOLIN, &c.

In Vocal Muſic, the *Treble* is uſually committed to Boys and Girls.--- Their Part is the *Treble*. See PART.

The *Treble* is divided into *firſt* or *higheſt Treble*, and *ſecond* or *Baſe Treble*.--- The half *Treble* is the ſame with Counter-tenor. See HARMONY.

TREBUCHET, TRIBUCH, TRIBUCHETUM, a Tumbrel, or Cucking-ſtool. See CUCKING-STOOL.

TREDECILE. See ASPECT.

TREE, *Arbor*, the firſt and largeſt of the vegetable Kind, conſiſting of a ſingle Trunk, out of which ſpring forth Branches and Leaves. See VEGETABLE, &c.

Standards, or *Trees in full Air*, are ſuch as naturally riſe a great Height, and are not topp'd.--- For the Choice of *Trees* of this Kind to be tranſplanted out of a Nurſery, *Quinteney* recommends us to ſuch as are ſtraight, ſix Foot high

high at leaſt, and five or ſix Inches thick at Bottom, and three or four at Top; the Bark pretty ſmooth and ſhining, as a Token of their Youth, and of the good Soil they grew in. See TRANSPLANTING, NURSERY, &c.

Dwarf Trees, are ſuch as are kept low, and never ſuffer'd to have above half a Foot in Stem. --- Theſe are us'd to be kept vacant or hollow in the Middle, that the Branches ſpreading round about the Sides, may form a kind of round Bowl or Buſh. See DWARF.

Wall Trees, are thoſe whoſe Branches are ſtretch'd out, and nail'd againſt Walls. See WALL and ESPALIER.

For Dwarf and Wall *Trees*, ſuch are to be choſe out of the Nurſery for Tranſplantation as are ſtraight, and conſiſt of a ſingle Stem, and a ſingle Graft, rather than two or three Grafts in ſeveral Branches: Their Thickneſs at Bottom ſhould be two or three Inches.

Fruit Trees, are ſuch as bear *Fruit*. See FRUIT.

Timber Trees, are thoſe whoſe Trunks are tall and ſtraight, whereof Beams, Maſts, &c. are us'd to be made. See TIMBER.

Coniferous Trees, are thoſe whoſe Fruit is of a conical Figure, as the Pine, Fir, Larch, &c. See CONIFEROUS.

Theſe are alſo call'd *Reſiniferous*, by reaſon Coniferous *Trees* are generally cover'd with a Bark that abounds in Reſin.

Mr. *Ray*, and other Authors, ſpeak of ſeveral *Trees* of prodigious Bulk. --- The Jeſuit *d'Acoſta*, in his Hiſtory of the *Indies*, lib. iv. c. 3. mentions a hollow *Tree* at *Tlococharaya*, three Leagues from *Gauxa* in *New Spain*, nine Fathom within-ſide near the Ground, and ſixteen without-ſide. He adds, that 'tis under this *Tree* the Barbarians aſſemble to perform their religious Ceremonies, dance round their Idols, &c. --- *Herrera* mentions another, which ſixteen Men, joining Hands, cannot fathom. --- F. *Kircher*, in his *Latium*, *p.* 50. affirms, he has ſeen a *Tree* near *Gonzano*, which would lodge a whole Family of 25 Perſons in its Cavity. The common People have a Tradition, that it was planted by *Auguſtus*.

In the *Indies* there are very large Foreſts conſiſting only of one ſingle *Tree*, whoſe Branches falling to the Ground, take Root, and put forth new *Trees*: The Fig *Tree* and Paretuvier are of this Kind.

M. *Lonvillier* mentions *Trees* in *Peru*, one Part of whoſe Branches produce Fruit one half the Year, and the other Part the other half.

In *China* is a *Tree* which bears Tallow, whereof that Nation make their Candles. See TALLOW.

There are two or three very remarkable Phænomena in the Growth of *Trees*, which have eſcap'd the Obſervations of the Naturaliſts of all Ages, except thoſe of our own: Theſe are the *Perpendicularity of their Trunks*, or Stems, to the Horizon; and the *Paralleliſm of their Tufts* to the Spot of Earth they grow on. An Account of each, ſee under the Articles PERPENDICULARITY and PARALLELISM.

For the *Planting*, *Tranſplanting*, *Semination*, *Pruning*, *Felling*, *Grafting*, &c. *of Trees*; ſee the reſpective Articles, PLANTING, TRANSPLANTING, SEMINATION, PRUNING, FELLING, GRAFTING.

Mr. *Ray* diſtinguiſhes the *Trees* and Shrubs of our native Growth in *England*, into, I. Such as have their Flower diſjoin'd, and remote from the Fruit. Theſe are,

1°. *Nuciferous* ones, or ſuch as bear Nuts; as the Walnut *Tree*, the Hazle-nut *Tree*, the Beach, the Cheſnut, and the common Oak. See NUT.

2°. *Coniferous* ones, or ſuch as bear a ſquammous or ſcaly Fruit, of a kind of Conical Figure, and of a woody or hard Subſtance, in which are many Seeds, which, when they are ripe, the Cone opens or gapes in all its ſeveral Cells or Partitions, and lets them drop out: Of this Kind are the *Scotch* Firs, Male and Female; the Pine, which in our Gardens is call'd the *Scotch* Fir; the common Alder *Tree*, and the Birch *Tree*.

3°. *Bacciferous* ones, or ſuch as bear Berries; as the Juniper and Yew *Tree*. See BACCIFEROUS.

4°. *Lanigerous* ones, or ſuch as bear a woolly, downy Subſtance; as the black, white, and trembling Poplar, Willows, and Oſiers of all Kinds.

5°. Such as bear their Seeds, (having an imperfect Flower) in leafy Membranes and Caſes; as the Horn-beam, or Hard-beam, call'd, in ſome Places, the Hornbeech.

II. Such as have their Fruits and Flowers contiguous; which are either with the Flower plac'd on the Top of the Fruit, or adhering to the Baſe or Bottom of the Fruit.

Of the former Kind, ſome are *Pomiferous*, as Apples and Pears; and ſome *Bacciferous*, as the Sorb or Service *Tree*, the White or Haw-thorn, the wild Roſe, Sweet-brier, Currants, the great Bilberry-buſh, Honey-ſuckle, Ivy, &c.

The latter Kind are either ſuch as have their Fruit moiſt and ſoft when ripe, as 1°. *Pruniferous* ones, whoſe Fruit is pretty large and ſoft, with a Stone in the Middle, as the black Thorn or Sloe *Tree*, the black and white Bullace *Tree*, the common wild Cherry, the black Cherry, &c.

2°. *Bacciferous* ones; as the Strawberry *Tree* in the Weſt of *Ireland*, Miſſletoe, Water-Elder, the Dwarf, a large Laurel, the Viburnum or way-faring *Tree*, the Dogberry *Tree*, the Sea black Thorn, the Berry-bearing Elder, the Privet, Barberry, common Elder, the Holly, the Buckthorn, the Berry-bearing Heath, the Bramble, and the Spindle *Tree* or Prickwood.

Or ſuch as have their Fruit dry when ripe; as the Bladder-Nut *Tree*, the Box *Tree*, the common Elm and Aſh, the Maple, the Gaule or Sweet Willow, common Heath-Broom, Dyers Weed, Furze or Gorſe, the Lime *Tree*.

Diana's TREE, *Arbor Dianæ*, among the Chymiſts, is a kind of Vegetation of Mercury, which after a long Proceſs ſhoots out into Branches, with the Appearance of Leaves, and even Flowers. See DIANA's *Tree*.

Arbor Martis, or TREE *of Mars*, is another very ſingular Vegetation, firſt diſcover'd accidentally by the younger *Lemery*. See VEGETABLE.

The Manner of the Diſcovery was this: On a Diſſolution of Iron-filings in Spirit of Nitre, contain'd in a Glaſs, he pour'd Oil of Tartar per Deliquium: Upon this the Liquor ſoon ſwell'd very conſiderably, tho' with a very ſmall Fermentation; and was no ſooner at reſt, than there aroſe a Sort of Branches adhering to the Surface of the Glaſs, which continuing to grow, at length cover'd it all over.

The Form of the Branches was ſo perfect, that one might even diſcover a kind of Leaves and Flowers thereon; ſo that this Vegetation has as good a Title to the Appellation of *Arbor Martis*, as the former has to that of *Arbor Dianæ*. See *Hiſtoir. Acad. Royal. An.* 1706.

TREDDLE, or TREADLE, *Chalazza*, in Natural Hiſtory. See CHALAZZA, EGG, CICATRICULA, &c.

TREMOR, *Trembling*, in Medicine, a Diſeaſe nearly akin to a Convulſion, wherein there is ſomething of a convulſive Motion accompanying a voluntary or natural Motion. See CONVULSION.

A *Tremor* is frequently found to ariſe upon the more violent Paſſions, particularly, Anger, Gluttony, Venery, &c. but this is accidental and tranſitory.

A *Tremor* is ſometimes apt to degenerate into other worſe Diſeaſes, *viz.* Palſey, Apoplexy, Lethargy, Spaſmus, &c. In old Men it is incurable.

Tremor of the Heart. See PALPITATION.

The Medicine commonly made uſe of in *Tremors* and other nervous Diſtempers, by the Name of *Palſey Drops*, is no other than *compound Spirit of Lavender*. The moſt ſucceſsful Way of uſing it, is by taking 30 or 40 Drops twice or thrice a Day, dropt on Loaf Sugar or a little Bread. --- 'Tis ſuppos'd, that by this Way the moſt ſpirituous and efficacious Parts make their Way directly by the Nerves of the Pallat, &c. without undergoing the Courſe of the Circulation, as it is ſaid to do when taken in a liquid Vehicle.

TRENCH, a Ditch cut or dug in the Ground, to drain off the Waters in a Meadow, a Moraſs, or the like; or to divert the Courſe of a River.

Many of the Bogs in *Ireland* have been drain'd, and made good Ground, by only digging *Trenches* around them. See BOG.

TRENCHES, *in Fortification*, are Moats or Ditches, which the Beſiegers cut to approach more ſecurely to the Place attack'd; whence they are alſo call'd Lines of Approach. See DITCH, APPROACH, &c.

Theſe *Trenches* are of ſeveral Sorts, according to the Nature of the Soil; for if the adjacent Territory be rocky, the *Trench* is only an Elevation of Bavins, Gabions, Woollpacks, or Shouldrings of Earth, caſt round about the Place: But where the Ground may be eaſily open'd, the *Trench* is dug therein, and border'd with a Parapet on the Side of the Beſieg'd. See PARAPET, &c.

The Breadth of the *Trench* is from eight to ten Foot, and the Depth from ſix to ſeven; and 'tis cut in Talus, or aſlope. See TALUS.

The *Trenches* are to be carry'd on with winding Lines, in ſome Manner parallel to the Works of the Fortreſs, ſo as not to be in View of the Enemy, nor to expoſe its Length to their Shot, which they call *Enfilading*; for then it will be in Danger of being Enfiladed, or ſcoured by the Enemies Cannon: This carrying of the *Trenches* obliquely, they call carrying them by *Coudees* or *Traverſes*.

They call it *Opening the Trenches*, when the Beſiegers begin to work upon the Line of Approaches, which is uſually done in the Night, and ſometimes within Muſket-ſhot, and ſometimes within half, or whole Cannon-ſhot of the Place, if there be no riſing Ground about it, the Garriſon ſtrong, and their Cannon well ſerv'd.

The Workmen that open the *Trenches*, are always ſupported by Bodies of Men againſt the Sallies of the Beſieg'd; and ſometimes thoſe Bodies lie between them and the Place, as alſo on their Right and Left.

The Pioneers ſometimes work on their Knees; and the Men that are to ſupport them lie flat on their Faces, in order

to

to avoid the Enemies Shot; and the Pioneers are likewiſe uſually cover'd with Mantelets, or Sauciſſons.

They ſay, *Mount the Trenches*, that is, go upon Duty in them: To *Relieve the Trenches*, is to relieve ſuch as have been upon Duty there.

The Enemy is ſaid to have clear'd the *Trenches*, when they have driven away or kill'd the Soldiers who guarded them.

The *Tail of the Trench*, is the Place where it was begun; and the *Head* that to which it is carry'd. See HEAD.

To TRENCH *the Ballaſt*, is a Sea Phraſe, ſignifying to divide the Ballaſt into ſeveral *Trenches* in a Ship's Hold. See BALLAST.

TRENCHE, in Heraldry. See TRANCHE.

TRENCHING *Plough*, is an Inſtrument for cutting out the Sides of *Trenches* and Drains, or the Sides of Turf, *&c.* See PLOUGH.

TRENTAL, TRIGINTAL, or TRICENNAL, a *Romiſh* Office for the Dead, conſiſting of thirty Maſſes, rehears'd for thirty Days after the Party's Death: Thus call'd from the *Italian*, *trenta*, *triginta*, thirty.

'Tis mention'd *Anno primo Ed.* VI. *Et volo, & ordino, quod Executores mei ordinant ſeu ordinare faciunt unum* Trental *pro ſalute Animæ meæ.*

TREPANUM, a Chirurgeon's Inſtrument, call'd alſo *Anabaptiſton* and *Modiolus*. See MODIOLUS, *&c.*

It is in Form of a Terebra or Wimble, only the Handle indented ſomewhat in Manner of a round Saw.

Its Uſe is for the Cure of Wounds, Contuſions, and Fractures of the Cranium, when they don't go beyond the ſecond Table; for by means hereof, an Amputation or Exfoliation is made of what Part, or Quantity of a Bone one pleaſes. See CRANIUM, FRACTURE, TREPANNING, *&c.*

It has uſually a ſharp Nail in the Middle of its Circumference, ſerving to keep it firm and ſteady during the Operation. --- It ſhould alſo have a kind of Cope to riſe and fall as Occaſion requires, that it mayn't go deeper in the Bone than is neceſſary.

There are alſo two-pointed *Trepans*, others Triangular, Quadrangular, and Hexagonal, for the Cure of Caries's of the Bones. --- There are alſo perforative *Trepans*, and exfoliative ones.

TREPANNING, in Chirurgery, the Operation of relieving Cuts, Contuſions, Corruptions, and Fractures in the Scull; by means of an Inſtrument call'd the *Trepanum*. See TREPANUM.

Trepanning is a very dangerous and difficult Operation; not to be us'd, unleſs when the Chips and Prominences of the Bones prick; when the upper Table is entire, but depreſs'd, and the lower broken; and when the extravaſated Blood would endanger the Perſon's being ſuffocated. See CRANIUM.

The Manner of *Trepanning*, or Opening the Scull, is thus: The Hairs being ſhaven off, the Skin is to be cut thro' to the Pericranium, avoiding, as much as poſſible, the Muſcles of the Temples, and the Sutures of the Scull: And for this Time the Wound is to be bound up, unleſs there be ſo little Blood ſpilt, that the Pericranium may at the ſame time be pull'd up from the Bone.

After a few Hours, ſtop the Patient's Ears, and take one of the Inſtruments call'd a *Male Trepanum*, or *Modiolus*; fix its Point in the Skull, but ſo far off the Fracture, that it touch it not, much leſs the Suture, with its Teeth; tho' ſome Surgeons don't mind to avoid the Sutures, but aſſure us, they have perforated them as ſucceſsfully as any other Part.

Then, holding the Inſtrument faſt with the left Hand, turn it round with the right, till you have cut a pretty deep Hole: After this take a Female *Trepanum*, which has no Point in the Middle, and turn it round as before: In the mean time, take away the Duſt or Chips that proceed from the Perforation, and moiſten the Inſtrument in Oil and Water to make it cool and ſlippery.

The Blood appearing, will ſhew you are now gone as deep as the ſecond Table, *i. e.* beyond the Skull, to the Dura Mater; in which Caſe you muſt preſs very gently, leſt that Membrane be unadviſedly hurt.

When the Bone begins to wag, put ſomething in between the Sides of the Wound; looſen it, and take it out with a Pair of Surgeons Pincers or Forceps.

After the Operation is over, the Part is to be waſh'd gently with weak red Wine; and proper Dreſſings apply'd thereon, as Honey of Roſes, Arceus Liniment, Oil of St. *John*'s Wort, *&c.* --- If the Dura Mater be corrupted, add, as Occaſion requires, Spirits of Wine, Tincture of Myrrh and Aloes, Venice Turpentine, Honey, Ægyptiacum, *&c.*

Mr. *Cheſelden* takes Notice, that the Sinus's and Spine in the Os Frontis, make it very dangerous, if not impracticable, to apply a Trepanum to the middle and lower Part of the Forehead.

TREPIDATION, in Medicine, a *Tremor*, or Trembling of the Members and Nerves of the Body. See TREMOR.

The firſt Symptom of Madneſs in Dogs, is a *Trepidation* of the Members, *&c.* See HYDROPHOBRA.

TREPIDATION, in the ancient Aſtronomy, is a Libration of the eighth Sphere; or a Motion which the *Ptolomaic* Syſtem attributes to the Firmament, to account for certain almoſt inſenſible Changes and Motions obſerv'd in the Axis of the World; by means whereof the Latitudes of the fix'd Stars come to be gradually chang'd, and the Ecliptic ſeems to approach reciprocally, firſt towards one Pole, then the other. See PTOLOMAIC, *&c.*

This Motion is alſo call'd the Motion of the firſt Libration. See LIBRATION.

TRESPASS, in Law, ſignifies any Tranſgreſſion of the Law, under Treaſon, Felony, or Miſpriſion of Treaſon. See TRANSGRESSION.

For a Lord of Parliament to depart from thence without the King's Licence, is neither Treaſon nor Felony, but *Treſpaſs. Staundford Pl. Cor.*

The Word *Treſpaſs*, however, is generally us'd either for that Wrong or Damage which is done to the King in his Foreſt, or by one private Man to another.

According to this Signification, it is of two Sorts; *Treſpaſs general*, otherwiſe call'd *Treſpaſs vi & armis*, where Force or Violence is us'd: And *Treſpaſs ſpecial*, otherwiſe call'd *Treſpaſs upon the Caſe*; which ſhould be that done without Force. --- But the two are ſometimes confounded.

In an Action of *Treſpaſs*, the Plaintiff always ſues for Damages, or the Value of the Hurt done him by the Defendant. See DAMAGES.

There is alſo *Treſpaſs local* and *Treſpaſs tranſitory*.

Treſpaſs local is that which is ſo annex'd to the Place certain, that if the Defendant join Iſſue upon a Place, and traverſe the Place mention'd in the Declaration, and aver it; it is enough to defeat the Action.

Treſpaſs tranſitory, is that which cannot be defeated by the Defendants Traverſe of the Place, becauſe the Place is not material. See TRAVERSE.

The Action of *Treſpaſs*, *quare clauſum fregit*, ought to be local.

TRESSURE, in Heraldry, a Diminutive of an *Orle*, uſually ſuppos'd to be half the Breadth thereof. See ORLE.

It is uſually born flory, and counter-flory; and ſometimes double, as in the Figure adjoining; and ſometimes triple.

TRESTLE, of the *French Treſteau*, is explain'd by *Minſhew* to be three Stools, or a three-footed Stool; particularly a wooden Frame to bear up Tables, Scaffolds, *&c.*

TRET, in Commerce, an Allowance made for the Waſte or the Duſt that may be mix'd with any Commodity; which is always 4 Pounds in every 104 Pounds Weight. See TARE.

TREVE *de Dieu*, *Trevia*, *Treuvia*, *Treuga*, or *Truga Dei*, a Phraſe famous in the Hiſtories of the XIth Century; when the Diſorders and Licences of private Wars between particular Lords and Families, oblig'd the Biſhops of *France* to forbid ſuch Violences within certain Times, under Canonical Pains.

Thoſe Intervals they call'd *Treve de Dieu*, *q. d.* Truce of God, a Phraſe frequent in the Councils ſince that Time. See TRUCE.

The firſt Regulation of this Kind was in a Synod held in the Dioceſe of *Elno* in *Rouſſillon*, Anno 1027, where it was enacted, That throughout that County, no Perſon ſhould attack his Enemy from the Hour of Nones on *Saturday*, to that of Primes on *Monday*, that *Sunday* might have its proper Honour: That no Body ſhould attack, at any Time, a Religious or Prieſt walking unarm'd, nor any Perſon going to Church, or returning from the ſame, or walking with Women: That no Body ſhould attack a Church, or any Houſe within thirty Paces around it. --- The whole under Penalty of Excommunication, which, at the End of three Months, was converted into an Anathema.

TRIA *prima*, among Chymiſts, the three Hypoſtatical Principles, *viz.* Salt, Sulphur, and Mercury; of which they hold all Bodies to be primarily made, and into which they are all held reſolvable by Fire. See PRINCIPLE and ELEMENT. See alſo SALT, SULPHUR, and MERCURY.

TRIAD, TRIAS, τριας, a Term ſometimes us'd for a Trinity. See TRIAS.

TRIAL, in Law, the Examination of any Cauſe, whether Civil or Criminal, according to the Laws of the Realm, before a proper Judge. See CAUSE and PROOF.

Of this there are divers Kinds: Matters of Fact, *e. gr.* being to be *try'd* by the Jurors; Matters of Law by the Juſtices; Matters of Record by the Record itſelf. See JURY, JUDGE, JUSTICE, RECORD, *&c.*

A Lord of Parliament indicted of Treaſon or Felony, ſhall be *try'd*, without any Oath, by his Peers, upon their Honours and Allegiance; but in Appeal, at the Suit of any Subject, they ſhall be *try'd per bonos & legales homines*. See PEER.

If ancient Demeſne be pleaded of a Manor, and deny'd, this ſhall be *try'd* by the Record of Doomſday. See DEMESNE and DOOMSDAY.

Baſtardy, Excommunication, Lawfulneſs of Marriage, and other Eccleſiaſtical Matters, ſhall be *try'd* by the Biſhop's Certificate.

Before *Trial* in a Criminal Caſe, 'tis uſual to ask the Criminal how he will be *try'd*? which was anciently a very pertinent Queſtion, tho' not ſo now; in regard there were formerly ſeveral Ways of *Trial*, *viz.* by *Battel*, *Ordeals*, and *Jury*. See BATTEL, ORDEAL, and JURY.

When the Criminal anſwer'd by God, and his Country, it ſhew'd he made Choice to be *try'd* by a Jury. --- But there is now no other Way of *Trial*. This is alſo call'd *trying per pais*, *per patriam*.

For the ancient Manner of Trial *by Combat and great Aſſize*; See COMBAT, DUEL, and ASSIZE.

TRIANGLE, in Geometry, a Figure comprehended under three Lines, and which of Conſequence has three Angles. See FIGURE and ANGLE.

If the three Lines or Sides of the *Triangle* be all right, it is ſaid to be a *Plane* or *Rectilinear Triangle*. See PLANE and RECTILINEAR.

If all the three Sides of the *Triangle* be equal, (as ABC Tab. Geometry, Fig. 68.) it is ſaid to be *equilateral*. See EQUILATERAL.

If only two of the Sides of the *Triangle* be equal, (as in DEF, Fig. 69.) it is call'd an *Iſoſceles*, or *Equicrural Triangle*. See ISOSCELES, *&c.*

If all the Sides of the *Triangle* be unequal to each other, (as in ACB, Fig. 70.) the *Triangle* is ſaid to be *Scalenous*. See SCALENOUS.

If one of the Angles (as K of Fig. 71.) of a *Triangle* KML be a right Angle, the *Triangle* is ſaid to be *Rectangular*. See RECTANGLE.

If one of the Angles (as N Fig. 72.) be obtuſe, the *Triangle* is ſaid to be *Obtuſangular*, or *Amblygonous*. See OBTUSANGLE.

If all the Angles be acute, (as in ACB, Fig. 68.) the *Triangle* is ſaid to be *Acutangular*, or *Oxygonous*. See ACUTANGLE, *&c.*

If the three Lines of the *Triangle* be all curves, the *Triangle* is ſaid to be *Curvilinear*. See CURVILINEAR.

If ſome of the Sides be right, and others curve, the Angle is ſaid to be *Mixtilinear*. See MIXTILINEAR.

If the Sides be all Arches of great Circles of the Sphere, the *Triangle* is ſaid to be *Spherical*. See SPHERICAL *Triangle*.

Conſtruction of TRIANGLES.

1°. Two Sides, as AB and AC, Fig. 73. being given in Numbers, or otherwiſe, together with the Quantity of the Angle intercepted between them, A; to conſtruct a *Triangle* --- Aſſume AB as a Baſe; and in A make the given Angle: On the other Leg ſet off the other given Line AC; laſtly, draw BC: Then will ABC be the *Triangle* requir'd.

Hence, two Sides with the intercepted Angle being determin'd, the whole *Triangle* is determin'd. --- Wherefore, if in two *Triangles* ACB and *acb*; $a=A$; and $ab : ac :: AB : AC$, the *Triangles* are determin'd in the ſame Manner, and are therefore ſimilar; conſequently $c=C$ and $b=B$, $ab : bc :: AB : BC$, *&c.*

2°. Three Sides, AB, BC, and CA, Fig. 70. being given, any two whereof, as AC, AB, taken together, are greater than the third, to conſtruct a *Triangle* --- Aſſume AB for a Baſe; and from A, with the Interval AC, deſcribe an Arch *y*; and from B, with the Interval BC, deſcribe another Arch *x*: Draw the right Lines AC and BC. Thus is the *Triangle* conſtructed.

Hence, as of any three given right Lines, only one *Triangle* can be conſtructed; by determining the three Sides, the whole *Triangle* is determin'd.

Wherefore if in two *Triangles* ACB and *acb*; $AC : AB :: ac : ab$; $AC : CB :: ac : bc$; the *Triangles* are determin'd in the ſame Manner, and conſequently are ſimilar, and therefore are mutually equiangular.

3°. A right Line, as AB, and two adjacent Angles A and B, which, taken together, are leſs than two right ones, being given; to deſcribe the *Triangle* ABC. --- On the given Line AB, make the two given Angles A and B: Continue the Sides AC and BC till they meet in C. Then will ABC be the *Triangle* requir'd.

Hence, one Side and two Angles being given, the whole *Triangle* is determin'd. --- Wherefore if in two *Triangles* $A=a$ and $B=b$, Fig. 73. the *Triangles* are determin'd after the ſame Manner, and therefore are ſimilar.

Menſuration of TRIANGLES.

To find the Area of a Triangle. -- Multiply the Baſe AB Fig. 74. by the Altitude C*d*; half the Product is the Area of the *Triangle* ABC.

Or thus: Multiply half the Baſe AB by the Altitude CD; or the whole Baſe by half the Altitude; the Product is the Area of the *Triangle*.

E. gr. AB = 342	AB = 342	½ AB = 171	
C*d* = 234	½ CD = 117	C*d* = 234	
1368	2394	684	
1026	342	513	
684	342	342	
2) 80028 (	40014	40014	Area

are as 40014

Or, The Area of any *Triangle* is had by adding all the three Sides together, and taking half the Sum; and from that half Sum, ſubſtracting each Side ſeverally, and multiplying that half Sum and the Remainder continually into one another, and extracting the Square Root of the Product.

Hence, 1°. If between the Baſe, and half the Altitude; or between the Altitude, and half the Baſe, be found a mean Proportional; it will be the Side of a Square equal to the *Triangle*.

2°. If the Area of a *Triangle* be divided by half the Baſe, the Quotient is the Altitude.

General Properties of Plane TRIANGLES.

1°. If in two *Triangles* ABC and *abc*, Fig. 73. the Angle $Abc=a$; and the Sides $AB=ab$, and $AC=ac$; then will the Sides $BC=bc$, and $C=c$, the Angle $B=b$; and therefore the whole *Triangles* will be equal and ſimilar.

2°. If one Side of a *Triangle* ABC (Fig. 75.) be continu'd to D; the external Angle DAB will be greater than either of the internal oppoſite ones B or C.

3°. In every *Triangle*, the greateſt Side is oppos'd to the greateſt Angle, and the leaſt to the leaſt.

4°. In every *Triangle*, any two Sides taken together are greater than the third.

5°. If in two *Triangles*, the ſeveral Sides of the one be reſpectively equal to the Sides of the other, the Angles will likewiſe be reſpectively equal; and conſequently the whole *Triangles* equal and ſimilar.

6°. If any Side, as AC (Fig. 76.) of a *Triangle* ACB be continu'd to D, the external Angle DCA will be equal to the two internal oppoſite ones *y* and *z* taken together.

7°. In every *Triangle*, as ABC, the three Angles A, B, C, taken together, are equal to two right ones, or 180°.

Hence, 1°. If the *Triangle* be rectangular, as MKL, (Fig. 71.) the two oblique Angles M and L, taken together, make a right Angle, or 90°; and therefore are half Right, if the *Triangle* be Iſoſceles. --- 2°. If one Angle of a *Triangle* be oblique, the other two taken together are oblique likewiſe. --- 3°. In an Equilateral *Triangle*, each Angle is 60°. --- 4°. If one Angle of a *Triangle* be ſubſtracted from 180°, the Remainder is the Sum of the other two; and if the Sum of two be ſubſtracted from 180°, the Remainder is the third. --- 5°. If two Angles of one *Triangle* be equal to two of another, either together or ſeparately; the third of the one is likewiſe equal to the third of the other. --- 6°. Since in an Iſoſceles *Triangle* DFE (Fig. 69.) the Angles at the Baſe *y* and *v* are equal; if the Angle at the Vertex be ſubſtracted from 180°, and the Remainder be divided by 2, the Quotient is the Quantity of each of the equal Angles: In like Manner, if the double of one of the Angles at the Baſe *y* be ſubſtracted from 180, the Remainder is the Quantity of the Angle at the Vertex.

8°. If in two *Triangles*, ABC, and *abc*, Fig. 73. $AB=ab$, $A=a$ and $B=b$; then will $AC=ac$, $BC=bc$, $C=c$, and the *Triangle* ACB equal and ſimilar to the *Triangle* *abc*. --- Hence, if in two *Triangles*, ACB and *acb*, $A=a$, $B=b$ and $BC=bc$; then will $C=c$; conſequently $AC=ac$, $AB=ab$; and the *Triangle* $ACB=acb$.

9°. If in a *Triangle* DFE the Angles at the Baſe *y* and *v*, Fig. 69. be equal, the *Triangle* is Iſoſceles: Conſequently, if the three Angles be equal, it is equilateral.

10°. If in a *Triangle* ABC, (Fig. 77.) a right Line DE be drawn parallel to the Baſe; then will $BA : BC :: BD : BE :: AD : EC$. And $BA : AC :: BD : DE$. Conſequently the *Triangle* BDE ſimilar to BAC.

11°. Every *Triangle* is inſcribable in a Circle. See CIRCLE.

12°. The Side of an equilateral *Triangle*, inſcrib'd in a Circle, is in Power triple of the Radius. See RADIUS.

13°. *Triangles* on the ſame Baſe, and having the ſame Height, that is between the ſame parallel Lines, are equal. See PARALLEL.

14°. Every *Triangle*, as CFD, Fig. 41. is one half of a Parallelogram ACDB on the ſame, or an equal Baſe CD, and of the ſame Altitude, or between the ſame Parallels: Or a *Triangle* is equal to a Parallelogram upon the ſame Baſe, but half the Altitude; or half the Baſe, and the ſame Altitude. See PARALLELOGRAM.

15°. In

TAB: TRIGONOMETRY.

Fig. 1 Secant Fig. 6 Sine Fig 26 Tangent Fig. 2 Sector

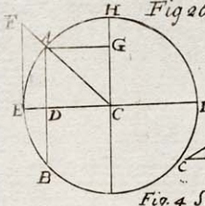


Fig. 3 Sector

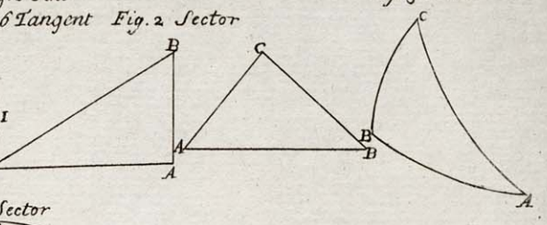


Fig. 4 Sector

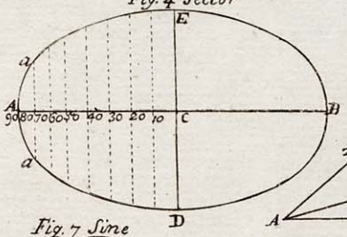


Fig. 5 Sector

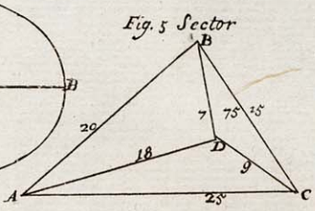


Fig. 35 Gunters Scale

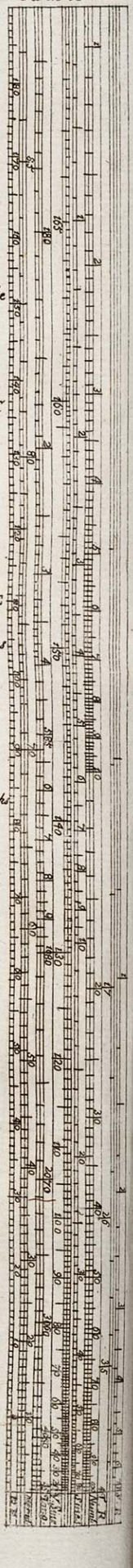


Fig. 7 Sine

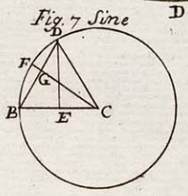


Fig. 8 Sine

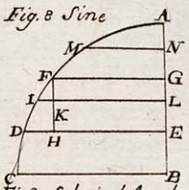


Fig. 9 Sine

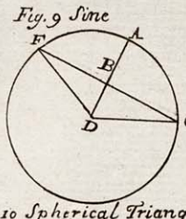


Fig. 9 Spherical Angle Fig. 21 Spherick

Fig. 8 Spherical Angle

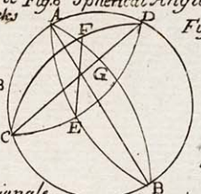


Fig. 10 Spherical Triangle

Fig. 11 Spherical Triangle

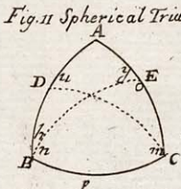


Fig. 12, 13 Spherical Triangle

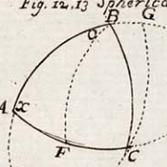


Fig. 14 Spherical Triangle

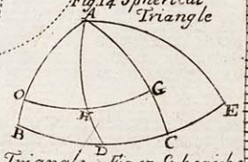


Fig. 16 Spherical Triangle

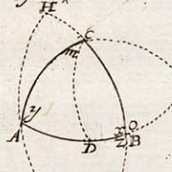


Fig. 15 Spherical Triangle

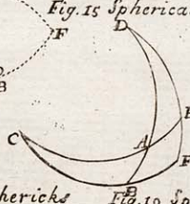


Fig. 17 Spherick

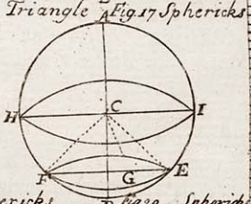


Fig. 18 Spherick

Fig. 19 Spherick

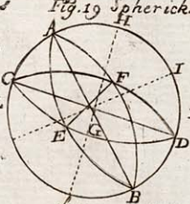


Fig. 20. Spherick

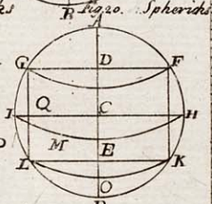


Fig. 22 part

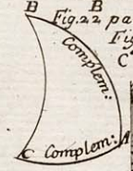


Fig. 23 Altitude

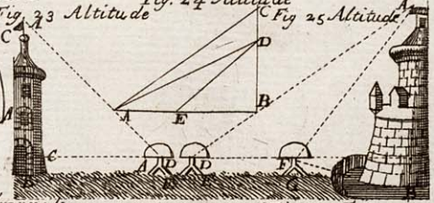


Fig. 24 Altitude

Fig. 25 Altitude

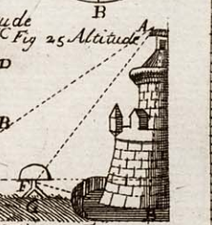


Fig. 27 Triangle

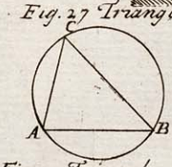


Fig. 28 Triangle

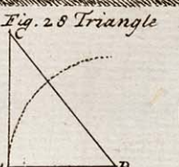


Fig. 29 Triangle

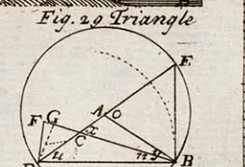


Fig. 30 Triangle

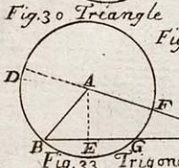


Fig. 31 Triangle

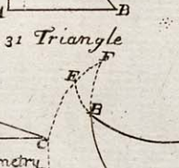


Fig. 32 Triangle

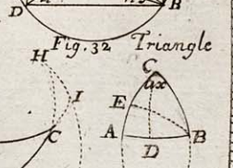


Fig. 33 Trigonometry

Fig. 34 Trigonometry

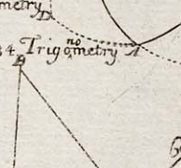
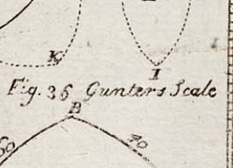


Fig. 36 Gunters Scale



15°. In every *Triangle*, as well plane as ſpherical, the Sines of the Sides, are proportional to the Sines of the oppoſite Angles.

16°. In every plane *Triangle*, as the Sum of two Sides is to their Difference, ſo is the Tangent of half the Sum of the oppoſite Angles, to the Tangent of half their Difference. See TANGENT.

17°. If a Perpendicular be let fall upon the Baſe of an oblique angled *Triangle*; the Difference of the Squares of the Sides is equal to double the Rectangle under the Baſe, and the Diſtance of the Perpendicular from the Middle of the Baſe.

18°. The Sides of a *Triangle* are cut proportionably, by a Line drawn parallel to the Baſe.

19°. A whole *Triangle*, is to a *Triangle* cut off by a right Line, as the Rectangle under the cut Sides, is to the Rectangle of the other two Sides.

20°. In a right lined *Triangle*, a Line drawn from the right Angle at the Top perpendicular to the Hypothenuſe, divides the *Triangle* into two other right lined *Triangles*, which are ſimilar to the firſt *Triangle*, and to one another.

21°. In every right angled *Triangle*, the Square of the Hypothenuſe is equal to the Sum of the Squares of the other two Sides. See HYPOTHENUSE.

22°. If any Angle of a *Triangle* be biſſected, the biſſecting Line will divide the oppoſite Side, in the ſame Proportion as the Legs of the Angle are to one another. See BISSECTION.

23°. If the vertical Angle of any *Triangle* be biſſected, the Difference of the Rectangles, made by the Sides and the Segments of the Baſe, is equal to the Square of the Line that biſſects the Angle.

24°. If a right Line BE, Fig. 78. biſſect an Angle ABC of a *Triangle*, the Square of the ſaid Line BE = AB + BC − AE + EC. *Newt. Arith. Univerſ.*

Properties of Spherical Triangles. See SPHERICAL *Triangle*.

To divide a Triangle *into any given Number of equal Parts:* Divide the Baſe CD (Fig. 77.) into as many equal Parts as the Figure is to be divided into; and draw the Lines A 1, A 2, &c.

TRIANGLE, in Trigonometry.— The Solution or Analyſis of *Triangles*, is the Buſineſs of *Trigonometry*. See TRIGONOMETRY.

The ſeveral Caſes thereof are reducible to the following Problems.

Solution of plane TRIANGLES.

1°. *Two Angles* A *and* C *(Tab. Trigonometry, Fig. 27.) being given, together with the Side* AB *oppoſite to one of them; to find the Side* BC *oppoſite to the other.*

The Rule or Canon is this: As the Sine of the Angle C, is to the given Side AB, oppoſite to the ſame; ſo is the Sine of the other Angle A, to the Side requir'd. The Side BC, therefore, is commodiouſly found by the Logarithms, from the Rule for finding a fourth Proportional to 3 Numbers given. See LOGARITHM.

For an Example: Suppoſe C = 48° 35′, A = 57° 28′, AB = 74. The Operation will ſtand thus:

Log. of Sine of C	9.8750142
Log. of AB	1.8692317
Log. of Sine of A	9.9258681
Sum of Log. of AB and of Sine of A	11.7950998

Log. of BC 1.9200956. The Number correſponding to which, in the Table of Logarithms, is 83, the Quantity of the Side ſought.

2°. *Two Sides* AB *and* BC, *together with the Angle* C, *oppoſite to one of them given; to find the other Angle* A *and* B.

The Rule is this: As one Side AB is to the Sine of the given Angle oppoſite thereto C; ſo is the other Side BC, to the Sine of the Angle requir'd oppoſite thereto.

E. gr. Suppoſe AB = 94, BC = 69, C = 7° 15′.

Log. of AB	1.9731279
Log. of Sine of C	9.9788175
Log. of BC	1.8388491
Sum of Log. of Sine of C and of BC	11.8176666

Log. of Sine of A 9.9444387. The Number correſponding to which, in the Table of Logarithms, is 61° 37′. Now the given Angle C being 72° 13′, the Sum of the two; 133° 52′ ſubſtracted from 180, the Sum of the three, gives 46° 8′ for the other Angle ſought B.

In like Manner, ſuppoſe, in a right angled *Triangle*, (Fig. 28.) that beſide the right Angle, A, is given the Hypothenuſe BC, 49, and the Cathetus AC, 36, to find the Angle B; Then will the Operation ſtand thus:

Log. of BC	1.6901961
Log. of whole Sine	10.0000000
Log. of AC	1.5563025

Log. of Sine of B 9.8661064. The correſponding Number to which, in the Table of Logarithms, is 47° 16′; conſequently, C = 42° 44′.

3°. *Two Sides* BA *and* AC, *together with the included Angle* A *being given; to find the two remaining Angles.*

I. If the *Triangle* ABC be rectangular; take one of the Sides including the Right Angle, as AB, for Radius; then will CA be the Tangent of the oppoſite Angle B: The Rule then is;

As one Leg AB, *is to the other* AC; *ſo is the whole Sine to the Tangent of the Angle* B.

E. gr. Suppoſe BA 79, and AC 74;

Log. of BA	18976271
Log. of AC	17323938
Log. of whole Sine	10000c000

Log. of Tang. of B 98347667; The correſponding Number to which, in the Table of Logarithms, is 34° 21′; conſequently the Angle C is 55° 39′.

II. If the *Triangle* be oblique, the Rule is; *As the Sum of the given Sides* AB *and* AC, *Fig. 29. is to this Difference; ſo is the Tangent of Half the Sum of the ſought Angles* C *and* B, *to the Tangent of Half the Difference.* Adding, therefore, the Half Difference, to the Half Sum; the Aggregate will be the greater Angle C; and ſubtracting the Half Difference from the Half Sum; the Remainder is the leſs Angle B.

E. gr. Suppoſe AB = 75, AC 58, A 108° 24′; Then will

AB 75	AB 75	A + B + C	179° 60′
AC 58	AC 58	A	108 24
Sum 133	Differ. 17	B + C	71 36
		B + C	35 48

Log. of AB + AC 2.1238516
Log. of AB − AC 1.2304489
Log. of Tang. B+C 9.8580694

Sum of Log. 12.0885183
L. of Tang. C − B 8.9646667. The correſponding Number to which is 5° 16′.

B + C = 35° 48′ B + C = 35° 48′
C − B = 5 16 C − B = 5° 16′
C = 41 4 B = 30 32

4° *The Three Sides*, AB, BC *and* CA *(Fig. 30.) being given, to find the Angle* A, B *and* C.

From the Vertex of the Angle A, with the Extent of the leaſt Side AB, deſcribe a Circle: Then will CD be the Sum of the Legs AC and AB; and CF their Difference. The Rule then is,

As the Baſe BC is to the Sum of the Legs CD; ſo is the Difference of the Legs CF, to the Segment of the Baſe CG. ---- This Segment, thus found, being ſubtracted from the Baſe CB, the Remainder is the Chord GB. Then, from A to the Chord GB let fall the Perpendicular AE; thus will BE = EG = ½ GB.

Thus, in a rectangled *Triangle*, AEB, the Sides AB and BE being given; Or, in an obliquangled *Triangle*, ACE the Sides AC and CE being given: the Angles B and A are found.

E. gr. Suppoſe AB = 36, AC = 45, BC = 40.

AC = 45	AC = 45
AB 36	AB = 36
AC + AB = 81	FC = 9
Log. of BC =	1. 6020600
Log. of AC + AB	1. 9084850
Log. of FC =	0. 9542425
Sum of Log. =	2. 8627275

Log. of CG = 1. 2606675; The correſponding Number to which, in the Tables, is 18.

BC = 4000	EG = 1089
CG = 1822	CG = 1822
BG = 2178	CE = 2911
BE = 1089	

Log. of AB =	3.5563025
Log. of whole Sine =	10.0000000
Log. of EB =	3.0370279

Log. of Sine of EAC = 9. 8108297; to which the correſpondent Number in the Tables is 40° 18′; therefore ACE 49° 42′; and CAB 57° 54′.

Solution of right angled ſpherical TRIANGLES, *by the common Rules.*

I. *In a right angled ſpherical* Triangle, *any two Parts beſide the right Angle, being given, to find any of the reſt.*

1° Conſider whether the Parts, which come to the Queſtion, be conjunct or disjunct (See PART.) If the disjunct be oppoſite to each other; as, if the Hypothenuſe BC, and the Angle C, Fig. 31. be given for the oppoſite Leg AB; then the Rule is;

As the whole Sine is to the Sine of the Hypothenuſe BC; *ſo is the Sine of the Angle* C, *to the Sine of the oppoſite Leg* AB.

2° If the disjunct Parts be not oppoſite to each other; as, if AB, and the adjacent Angle B be given for the oppoſite Angle C; the Sides of the *Triangle* are to be continued one Way, 'till they become Quadrants, that you may thus have a new *Triangle*, wherein the Parts that come into the Queſtion, are mutually oppoſite to each other; as, in our Caſe, the *Triangle* EBF, wherein we have given BF, the Complement of the Leg AB, and the Angle B for EF, the Complement of the Angle C. The Rule then is;

As the whole Sine is to the Sine of BF; *ſo is the Sine of the Angle* B *to the Sine of* EF, *or Co-ſine of* C.

3° If the Hypothenuſe be not among the conjunct Parts, as if the Legs AB and AC be given for an Angle oppoſite to one of them; the Rule is,

As the Sine of AC *is to the whole Sine; ſo is the Tangent of* AB, *to the Tangent of* O.

4° But if the Hypothenuſe be found among the conjunct Parts; as if the Hypothenuſe BC, and the Angle C be given to find the adjacent Side AC: The Sides of the *Triangle* are to be continued one way, till they become Quadrants, that we may have a new *Triangle*, wherein the Hypothenuſe is not among the Parts that come into the Queſtion; *e. gr.* in our Caſe, the *Triangle* EBF, wherein are given the Complement EB of the Hypothenuſe BC, and the Complement of the Angle C, and the Angle F the Complement of the Leg AC. Since then, in the *Triangle* EFB, the Hypothenuſe does not come in the Queſtion; the Rule is as before.

As the Sine of EF, *or Co-ſine of* C, *is to the whole Sine; ſo is the Tangent of* EB, *or Co-tangent of* BC, *to the Tangent of* F, *or Co-tangent of* AC.

5° When the Sides of a *Triangle* are to be continued, 'tis the ſame thing, which way ſoever they be produced, provided no acute Angle come into the Queſtion; otherwiſe, the Sides are to be continued through the other oblique one. If both be in the Connection, the Sides are to be continued through that adjacent to the Side in Queſtion.

By this means, a *Triangle* is always obtained, wherein the Thing required is found, either by the Rule of Sines or Tangents.

Solution of right angled ſpherical Triangles, *by one catholick Rule.*

Conſider, as before, whether the Parts that come in Queſtion be conjunct or disjunct. See PART.

If either one, or both the Sides, including the right Angle, come into the Queſtion; for it, among the Data, write its Complement to a Quadrant. ---- Since, then, by the catholic Rule, deliver'd under the Article *Trigonometry*; the whole Sine, with the Sine Complement of the middle Part, is equal to the Sines of the disjunct Parts, and the Co-tangents of the conjunct Parts; from the Sum of thoſe Data, ſubtract the third Datum: the Remainder will be ſome Sine or Tangent, the Side or Angle correſponding to which, in the artificial Canon of *Triangles*, is the Side or Angle ſought.

This univerſal Rule being of great Service in Trigonometry, we ſhall apply it to the various Caſes thereof, and illuſtrate it with Examples; which Examples, in the Caſe of ſeparate Parts, will at the ſame time illuſtrate the common Method; but in the Caſe of contiguous Parts, admit of other Solutions.

1° *Given the Hypothenuſe* BC 60° *and the Angle* C 23° 30′, *to find the oppoſite Leg* AB *(Fig. 32.)*

Since AB is the middle Part, C and BC are disjunct (See PART); the whole Sine, with the Co-ſine of the Complement AB, *i. e.* with the Sine itſelf of AB, is equal to the Sines of C and BC.

Therefore, from Sine of C	96006997
Sine of BC	99375306
Sum	195382303
Subtract whole Sine	100000000

Remain Sine of AB 95382303. The correſponding Number to which, in the Canon, is 20° 12′ 6″.

2° *Given the Hypothenuſe* BC 60° *and the Leg* AB 20° 12′ 6″ *to find the oppoſite Angle* C.

'Tis evident from the preceding Problem, that from the Sum of the whole Sine, and the Sine of the Leg AB, the Sine of the Hypothenuſe BC is to be ſubtracted; the Remainder is the Sine of the Angle C. The Example, therefore, of the former Caſe is eaſily converted into an Example of this.

3° *Given the Leg* AB 20° 12′ 6″ *and the oppoſite Angle* C 23° 30′, *to find the Hypothenuſe* BC.

'Tis evident from the firſt Caſe, that from the Sum of the whole Sine, and the Sine of AB is to be ſubtracted the Sine of the Angle C, and the Remainder is the Sine of the Hypothenuſe BC.

4° *Given the Hypothenuſe* BC 60°, *and one Leg* AB 20° 12′ 16″ *to find the other Leg.*

Since BC is the mean Part, and AB and AC are disjunct Parts, the whole Sine, with the Co-ſine of the Hypothenuſe BC, are equal to the Sines of the Complements; *i. e.* to the Co-ſines of the Legs AB and AC.

Therefore from whole Sine	100000000
Co-ſine of BC	96989700
Sum	196989700
Subtract Co-ſine of AB	99724279

Remains Co-ſine of AC 97265421. The Correſponding Number to which, in the Canon, is 32° 11′ 34″; therefore AC 57° 48′ 26″.

5° *Given the Legs* AC 57° 48′ 26″ *and* AB 20° 12′ 6″, *to find the Hypothenuſe* BC.

'Tis evident from the preceding Caſe, that the whole Sine is to be ſubtracted from the Sum of the Co-ſines of the Legs AB and AC; the Remainder is the Co-ſine of the Hypothenuſe BC. The Example, therefore, of the preceding Caſe is eaſily applied to this.

6° *Given the Leg* AC 50° 48′ 26″ *and the adjacent Angle* C 23° 30′ *to find the oppoſite Angle* B.

Since B is the middle Part, and A and C disjunct Parts; the whole Sine, with the Co-ſine of B, is equal to the Sine of C, and the Sine of the Complement, *i. e.* to the Co-ſine of AC;

Therefore from Sine of C	96006997
Co-ſine AC	97265421
Sum	193272418
Subtract whole Sine	100000000

Remains Co-ſine of B 93272418. The Number correſponding to which, in the Canon, is 12° 15′ 56″; therefore B 77° 44′ 4″.

7° *Given the Leg* AC 57° 48′ 26″ *and the oppoſite Angle* B 77° 44′ 4″ *to find the adjacent Angle* C.

'Tis evident from the preceding Caſe, that the Co-ſine of AC is to be ſubtracted from the Sum of the whole Sine, and the Co-ſine of B; the Remainder is the Sine of C. The former Example, therefore, is eaſily accommodated to the preſent Caſe.

8° *Given the oblique Angles* B 77° 44′ 4″ *and* C 23° 30′, *to find the Leg adjacent to the other,* AC.

From Problem the Sixth, 'tis evident that the Sine of C is to be ſubtracted from the Sum of the whole Sine, and the Co-ſine of B; and that the Remainder is the Co-ſine of AC. The Example of the ſixth Problem is eaſily applied to this.

9° *Given the Leg* AC 57° 48′ 26″ *and the adjacent Angle* C 23° 30′, *to find the oppoſite Leg* AB.

Since AC is the mean Part, and C and AB conjunct Parts; the whole Sine, with the Sine of AC, is equal to the Co-tangent of C, and the Tangent of AB.

Therefore from whole Sine	100000000
Sine of AC	99275039
Sum	199275039
Subtract Co-tangent of C	103616981

Remains Tangent of AB 95658058. To which the correſponding Number in the Canon, is 20° 12′ 6″.

10° *Given the Leg* AB 20° 12′ 6″ *and the oppoſite Angle* C 23° 30′, *to find the adjacent Leg* AC.

From

From the Sum of the Co-tangent of C, and the Tangent of AB, ſubtract the whole Sine; the Remainder is the Sine of AC.

11° *Given the Legs* AB 20° 12′ 6″, *and* AC 57° 48′ 26″, *to find the Angle* C, *oppoſite to one of them.*

From the Sum of the whole Sine, and Sine AC, ſubtract the Tangent of BA; the Remainder is the Co-tangent of C.

12° *Given the Hypothenuſe* BC 60°, *and the oblique Angle* C 23° 30′, *to find the adjacent Leg* AC.

Since C is the middle Part, and BC and AC conjoynt Parts; the whole Sine, with the Co-ſine of C, will be equal to the Co-tangent of AC.

Therefore from whole Sine	100000000
Co-ſine of C	99623978
Sum	199623978
Subtract Co-tangent of BC	97614394

Remains Tangent of AC 102009584. The Number correſponding to which, in the Tables, is 57° 48′ 26″.

13° *Given the Leg* AC 57° 48′ 26″, *and the adjacent Angle* C 23° 30′, *to find the Hypothenuſe* BC.

From the Sum of the whole Sine, and the Co-ſine of C, ſubtract the Tangent of AC, the Remainder is the Co-tangent of BC.

14° *Given the Hypothenuſe* BC 60°, *and the Leg* AC 57° 48′ 26″, *to find the adjacent Angle* C.

From the Sum of the Co-tangent of BC, and Tangent of AC, ſubtract the whole Sine; the Remainder is the Co-ſine of C.

15° *Given the Hypothenuſe* BC 60°, *and one Angle* C 23° 30′, *to find the other*, B.

Since BC is the middle Part, and B and C disjunct Parts, the whole Sine, and the Co-ſine of BC will be equal to the Co-tangents of B and C.

Therefore from whole Sine	100000000
Co-ſine of BC	96989700
Sum	196989700
Subtract Co-tangent of C	10366981

Remains Co-tangent of B 93372719; The correſponding Number to which, in the Canon, is 12° 15′ 56″; therefore B is 77° 44′ 4″.

16° *Given the oblique Angles* B 77° 44′ 4″ *and* C 23° 30′, *to find the Hypothenuſe.*

From the Sum of the Co-tangents of C and B, ſubtract the whole Sine; the Remainder is the Co-ſine of BC.

Solution of oblique-angled ſpherical TRIANGLES.

1° *In an oblique-angled ſpherical* Triangle ABC, (*Tab. Trigonometry Fig.* 32.) *two Sides* AB *and* BC *being given, together with an Angle* A, *oppoſite to one of them, to find the other* C: The Rule is,

As Sine of the Side BC, is to the Sine of the oppoſite Angle A; ſo is the Sine of the Side BA, to the Sine of the oppoſite Angle C,

Suppoſe, for Example, BC 39° 29′; A 43° 20′; BA 66° 45′; then will

Sine of BC	98033572
Sine of A	983647
Sine of BA	99632168
	197996939
Sine of C	99963367.

The correſponding Number to which, in the Tables, is 82° 34′ 7″.

2°. *Given two Angles* C 82° 34′ 7″, *and* A 43° 20′, *together with the Side* AB 60° 45″, *oppoſite to one of them* C; *to find the Side* BC *oppoſite to the other of them* A. Say,

As Sine of Angle C, is to Sine of the oppoſite Side AB; ſo is Sine of Angle A, to Sine of oppoſite Side BC. --- The former Example may ſuffice for the preſent Caſe.

3°. *Given two Sides* AB 66° 45′, *and* BC 39° 29′, *together with an Angle oppoſite to one of them* A 45° 20′; *to find the Angle included by them* B.

Suppoſe the Angle C to be acute, ſince the other, A, is alſo acute; the Perpendicular BE falls within the *Triangle*. In the rectangled *Triangle* ABE, therefore, from the given Angle A, and Side AB, find the Angle ABE. Since BE is aſſum'd as a *lateral* Part in the *Triangle* AEB, the Angle EBC is the middle Part, and the Side BC a conjoynt Part: The Coſine of the Angle EBC will be found by ſubtracting the Co-tangent of AB from the Sum of the Coſine of the Angle ABE, and the Co-tangent of BC. If then the Angles ABE and EBC be added together; or, in caſe the Perpendicular fall without the *Triangle*, be ſubtracted from each other, you will have the Angle requir'd B.

E. gr.

whole Sine	10000000
Coſine of AB	95963154
Sum	195963154
Cotang. of A	100252805

Cotang. of AB 95710349. The Number correſponding to which, in the Tables, is 20° 25′ 35″. AB therefore is 69° 34′ 25″.

Coſine of ABE	95428300
Cotang. of BC	100141529
Sum	196269829
Cotang. of B	96330085

Coſine of EBC 9938544. The Number correſponding to which, in the Tables, is 80° 26′. Therefore ABC is 79° 9′ 59″.

4°. *Given two Angles* A 43° 20′, *and* B 79° 9′ 59″, *together with the adjacent Side* AB 66° 45′; *to find the Side* BC *oppoſite to one of them.*

From one of the given Angles B, let fall a Perpendicular EB, to the unknown Side AC; and, in the rectangled *Triangle* ABE, from the given Angle A, and Hypothenuſe AB, find the Angle ABE; which ſubtracted from the Angle ABC, leaves the Angle EBC. But if the Perpendicular ſhould fall without the *Triangle*, the Angle ABC ſhould have been ſubtracted from ABE. Since as the Perpendicular BE is taken for one of the lateral Parts, the middle Part in the *Triangle* ABE, is the Angle E, and the conjoynt Part BC; the Co-tangent of the Side BC is found by ſubtracting the Coſine of EBA, from the Sum of the Co-tangent of AB, and the Coſine of EBC. ---The Example of the preceding Caſe is eaſily apply'd to this.

5°. *Given two Sides* AB 66° 45′, *and* BC 39° 29′, *with the Angle* A *oppoſite to one of them*, 43° 20′; *to find the third Side* AC.

Letting fall, as before, the Perpendicular BE; in the rectangled *Triangle* ABE, from the given Angle and Hypothenuſe AB, find the Side AE. Since, aſſuming BE for a lateral Part in the *Triangle* AEB, AB is the middle Part, and AE the ſeparate Part; and in the *Triangle* BEC, BC, is the mean Part, and EC a disjunct Part; the Coſine of EC is found by ſubtracting the Coſine of AB from the Sum of the Coſines of AE and CB. If then the Segments AE and EC be added together; or in caſe the Perpendicular fall without the *Triangle*, be ſubtracted from each other; the Side AC will be had.

6°. *Given two Sides* AC 65° 30′ 46″, *and* AB 66° 45′, *together with the included Angle* A; *to find the third Side* BC *oppoſite thereto.*

Letting fall the Perpendicular BE, find, in the rectangled *Triangle*, the Segment AE; which ſubtracted from AC, leaves EC. If the Perpendicular fall without the *Triangle*, AC is to be ſubtracted from AE; ſince by aſſuming the Perpendicular BE for a lateral Part in the *Triangle* AEB, AB becomes a middle Part, and AE a ſeparate Part: In the *Triangle* EBC, CB is the middle Part, EC a ſeparate Part: The Coſine of BC is found, by ſubtracting the Coſine of AE from the Sum of the Coſines of AB and EC.

7°. *Given two Angles* A 43° 20′, *and* B 79° 9′ 59″, *together with the Side* CB 39° 29′, *oppoſite to one of them*; *to find the Side* AB *adjacent to both.*

Letting fall the Perpendicular CD from the unknown Angle C, to the oppoſite Side AB; and that falling within the *Triangle*, from the given Angle B, and the Hypothenuſe BC, ſeek in the rectangled *Triangle* BCD for the Segment BD. Since aſſuming the Perpendicular CD for a lateral Part in the *Triangle* CDB, DB is the mean Part, and the Angle B a conjunct Part; and in the *Triangle* CDA, AD is the middle Part, and the Angle A a conjunct Part: The Sine of the Segment AD is found, by ſubtracting the Co-tangent of the Angle B from the Sum of the Sine of DB, and the Co-tangent of the Angle A. If then the Segments AD and DB be added, or in caſe the Perpendicular fall without the *Triangle*, be ſubtracted from each other, the Reſult will be Side AB requir'd.

8°. *Given two Sides* AB 66° 45′, *and* BC 39° 29′, *with the included Angle* 79° 9′ 59″; *to find the Angle* A *oppoſite to one of them.*

Letting fall the Perpendicular CD, find the Segment DB, as in the preceding Problem. This ſubtracted from AB leaves AD. If the Perpendicular fall without the *Triangle*, AB is to be added to DB; ſince by aſſuming the Perpendicular CD for a lateral Part in the *Triangle* CDB, BD is the middle Part, and the Angle B a conjoynt Part; and in the *Triangle* CDA, AD is the middle Part, and the Angle A a conjoynt Part: The Co-tangent of the Angle A is found by ſubtracting the Sine of DB from the Sum of the Co-tangent of the Angle B, and of the Sine of AD.

9°. *Given two Angles* A 43° 20′, *and* B 79° 9′ 59″, *together with the adjacent Side* AB 66° 45′; *to find the Angle* C *oppoſite to the ſame.*

From one of the given Angles B, letting fall the Perpendicular B E, to the oppoſite Side A C; in the rectangled *Triangle* A B E, from the given Angle A, and Hypothenuſe A B, we find the Angle A B E; which ſubtracted from A B C, leaves the Angle E B C. In caſe the Perpendicular fall without the *Triangle*, A B C is to be ſubtracted from A B E; ſince by aſſuming B E for a lateral Part in the *Triangle* C E B, the Angle C is the middle Part, and the Angle C B E the disjoynt Part; and in the *Triangle* A B E, the Angle A is the middle Part, and the Angle A B E the disjoynt Part: The Coſine of the Angle C is found by ſubtracting the Sine of the Angle A B E, from the Sum of the Coſine of the Angle A, and of the Coſine of E B C.

10°. *Given two Angles* A 43° 20′, *and* C 82° 34′, *together with a Side* B A 66° 45′, *oppoſite to one of them; to find the other Angle.*

From the ſought Angle B, let fall a Perpendicular B E; and in the right angled *Triangle* A E B, from the given Angle A, and Hypothenuſe B A, find the Angle A B E; ſince aſſuming the Perpendicular E B for a lateral Part in the *Triangle* E C B, the Angle E is the middle Part, and the Angle C B E a disjunct Part; and in the *Triangle* A B E, the Angle A is the middle Part, and the Angle A B E a disjunct Part: The Sine of the Angle E B C is found by ſubtracting the Coſine of A from the Sum of the Coſine of C, and of the Sine of A B E. If then A B E and E B C be added, or in caſe the Perpendicular fall without the *Triangle*, be ſubtracted from each other, the Reſult will be Angle requir'd A B C.

11°. *Given the three Sides; to find an Angle oppoſite to one of them.*

I. If one Side A C, Fig. 16. be a Quadrant, and the Leg A B leſs than a Quadrant, find the Angle A. Continue A B to F, till A F become equal to a Quadrant; and from the Pole A draw the Arch C F, to cut the Arch A F at right Angles in F. Since in the rectangled *Triangle* C B F, we have given the Hypothenuſe B C, and the Side A F, or its Complement A B to a Quadrant; we ſhall find the Perpendicular C F C, which being the Meaſure of the Angle C A B, that Angle is found of courſe.

II. If one Side A C be a Quadrant, and the other A B greater than a Quadrant, ſeek again the Angle A: From A B ſubtract the Quadrant A D, and from the Pole A deſcribe the Arch C D, cutting the Arch C D at right Angles in D. Since in the rectangled *Triangle* C D B, the Hypothenuſe B C, and Side D B, or Exceſs of the Side A B beyond a Quadrant, is given, the Perpendicular C D will be found as before, which is the Meaſure of the Angle A requir'd.

III. If the *Triangle* be Iſoſceles, and A C = C F, and the Angle A C F be requir'd; biſſect A F in D, and thro' D and C draw the Arch D C. Since C D is perpendicular to A F, the Angles A and F, and A C D and D C F are equal; from the Hypothenuſe A C, and Leg A D, given in the rectangled *Triangle* A C D, we find the Angle A C D; the double whereof is the Angle requir'd A C F: and from the ſame Data may the Angle A or F be found.

IV. If the *Triangle* be Scalenous, and the Angle A, Fig. 32. be requir'd; from C let fall the Perpendicular C D, and ſeek the Semi-difference of the Segments A D and D B, by ſaying, As the Tangent of half the Baſe A B, is to the Tangent of half the Sum of the Legs A C and C B; ſo is the Tangent of their Semi-difference, to the Tangent of the Semi-difference of the Segments A D and D B: Add then the Semi-difference of the Segments to the half Baſe, to find the greater Segment; and ſubtract the ſame from the ſame for the leſs. Thus having in the rectangled *Triangle* C A D, the Hypothenuſe A C, and the Side A D, the Angle A is found thence. After the ſame Manner is B found in the other C D B, from C D and D B given.

12°. *Given the three Angles* A B *and* C, *to find any of the Sides.*

Since in lieu of the given *Triangle*, another may be aſſum'd, whoſe Sides are equal to the given Angles, and the Angles to the given Sides; this Problem is reſolv'd after the ſame Manner as the preceding one.

TRIANGLE, TRIANGULUM, in Aſtronomy, a Name common to two Conſtellations; the one in the Northern Hemiſphere, call'd ſimply *Triangulum*, or *Triangulum Cœleſte*; the other in the Southern Hemiſphere, call'd *Triangulum Auſtrale*. See CONSTELLATION.

The Stars in the Northern *Triangle*, in *Ptolomy*'s Catalogue are 4; in *Tycho*'s as many; in the *Britannic* 24: The Longitudes, Latitudes, Magnitudes, &c. whereof, are as follow:

Stars in the Conſtellation TRIANGULUM.

Names and Situation of the Stars.	Signs	Longitude ° ′ ″	Latitude. ° ′ ″	Mag.
That preceding the Vertex	♉	0 05 17	17 39 08	6
Vertex of the Triangle		2 30 51	16 48 23	4
That following the Vertex		6 00 25	19 28 00	6
Firſt of 3 in the Baſe		7 59 44	20 34 17	4
		7 18 45	17 06 18	7
		10 32 52	16 16 32	7
Laſt of theſe Informes		9 59 15	14 13 08	6
A ſmaller contiguous to it.		10 12 15	14 24 24	7
		13 08 28	20 00 37	6
		13 15 01	18 26 18	7
Informes between the Triangle and the Rams Tail, which are alſo number'd among the Stars of Aries. 28th, 31ſt, 33d, 40th, 48th	of Aries	10 14 15	8 49 48	7
		11 48 01	10 51 52	5
		12 35 47	11 17 13	4
		13 51 45	10 25 37	3
		16 13 53	8 51 55	7
50th, 51ſt, 54th, 55th		16 22 25	8 59 42	7
		16 39 24	7 29 04	6
		18 37 56	10 54 26	7
		18 41 07	8 58 28	7 6

TRIANGULAR *Compaſſes*, are ſuch as have three Legs or Feet, whereby to take off any *Triangle* at once. See COMPASSES.

Theſe are much us'd in the Conſtruction of Maps, Globes, &c.

TRIANGULAR *Numbers*, are a kind of Polygonous Numbers; ſee POLYGONOUS *Number*; being the Sums of Arithmetical Progreſſions, the Difference of whoſe Terms is 1: Thus,

Of Arithmetical Progreſs	1	2	3	4	5	6
are form'd *Triang.* Numb.	1	3	6	10	15	21.

TRIANGULAR *Quadrant*, is a Sector furniſh'd with a looſe Piece, whereby to make it an Equilateral *Triangle*. See SECTOR.

The Calendar is graduated thereon, with the Sun's Place, Declination, and other uſeful Lines; and by the Help of a String and a Plummet, and the Diviſions graduated on the looſe Piece, it may be made to ſerve for a Quadrant. See QUADRANT.

TRIANGULARIS, in Anatomy, a Name given to two Muſcles, in reſpect of their Figure. See MUSCLE.

The *Triangularis Pectoris*, which has ſometimes the Appearance of three or four diſtinct Muſcles, ariſes from the Inſide of the Sternum, and is implanted into the Cartilages which join the four loweſt true Ribs to the Sternum.

The Action of this Muſcle is very obſcure; ſince both the Origination and Inſertion are at Parts not moveable, but together. --- Dr. *Drake* conjectures it may conduce towards the forming the neceſſary Incurvation of the Sternum, and by its Over-tenſion in Children, while the Cartilages are ſoft, may occaſion that morbid Acumination of the Sternum ſeen in rickety Children. --- Others ſuppoſe it may contract the Cavity of the Thorax in Expiration.

TRIANGULARIS *Labii*. See DEPRESSOR *Labii Superioris*.

TRIARII, in the *Roman* Militia, a kind of Infantry, arm'd with a Pike and a Shield, a Helmet and a Cuiraſs.

They were thus call'd, becauſe they made the third Line of Battle.

Polybius diſtinguiſhes four Kinds of Forces in the *Roman* Army: The firſt, call'd *Pilati*, or *Velites*, were a raw Soldiery, lightly arm'd. --- The *Haſtati*, or Spear-men, were a Degree older, and more experienc'd. --- The third, call'd *Principes*, Princes, were ſtill older, and better Soldiers than the ſecond. --- The fourth were the eldeſt, the moſt experienc'd, and the braveſt: Theſe were always diſpos'd in the third Line, as a Corps de Reſerve, to ſuſtain the other two, and to reſtore the Battle, when the others were broken or defeated.

Hence their Name of *Triarii*; and hence the Proverb *ad* Triarios *ventum eſt*, to ſhew that one is at the laſt and hardeſt Struggle.

The *Triarii* were alſo call'd *Poſtſignani*, becauſe rang'd behind the *Principes*, who bore the Standard in a Legion. See PRINCIPES.

TRIAS *Harmonica*, or the *Harmonical* TRIAD, in Muſic, a Compound of three radical Sounds, heard all together; two whereof are a Fifth, and a Third above the other, which is the Fundamental. See CONCORD, &c.

The *Triad* is properly a Conſonance form'd of a Third and a Fifth; which, with the Baſs, or fundamental Sound, makes three different Terms, whence the Name *Trias*. --- That of *harmonical* is doubtleſs given it from that wonderful Property of the Fifth, which divides itſelf naturally into two Thirds, both excellent, and perfectly harmonical; ſo that this one

Sound

Sound dispos'd between two others, makes two Thirds at once, and of Consequence a double Harmony. See FIFTH.

Hence it is, that in *Trio*'s, particularly, this Concord is preferr'd to that which divides the Octave into a Fifth and a Fourth: In regard that, if there be a Concord on one Side, there is a Discord on the other; whereas here the Harmony is compleat on both Sides.

Of the three Sounds which compose the harmonical *Triad*, the gravest is call'd the *Fundamental*, or *Bass*; the acutest, *i. e.* that which makes the Fifth, and which terminates the Concord upwards, is call'd the *excluded* or *highest* Sound; and that which divides the Fifth so agreeably into two Thirds, is call'd the *harmonical Mean*.

The Division of the Fifth into two Thirds, may be perform'd two Ways, *viz.* 1°. Harmonically, when the greater Third is lowest, and the less a-top; in which Case the *Triad* is perfect and natural.

2°. Arithmetically, when the less Third is lowest, and the greater a top; in which Case the *Triad* is imperfect and flat. Both are good; but the latter not to be often us'd.

TRIBE, TRIBUS, in Antiquity, a certain Quantity or Number of People; when a Division is made of a Nation into Quarters or Districts.

The City of *Athens* was divided into ten *Tribes*.--- The *Jewish* Nation into twelve *Tribes*, the Descendants of the twelve Sons of *Jacob*, *viz.* the *Tribes* of *Judah*, of *Reuben*, *Gad*, *Asher*, *Dan*, *Naphthali*, *Ephraim*, *Manassah*, *Simeon*, *Levi*, *Issachar*, *Zabulon*, and *Benjamin*.

These, in effect, make thirteen *Tribes*, from twelve Patriarchs; by Reason the Posterity of *Joseph* was divided into two *Tribes*, that of *Manassah*, and that of *Ephraim*. See PATRIARCH.

There were ten of these *Tribes* that revolted and follow'd *Jeroboam*.

The *Roman* People was at first only divided into three *Tribes*; and from this Number *three*, *tres*, it was that the Word *Tribe*, *Tribus*, took its Rise. --- This Division was accommodated by *Romulus*, to the several Nations he had united: The first consisted of the *Albans*, the second of the *Sabins*, and the third of a Mixture of Fugitives, who came to seek an Asylum at *Rome*.

Servius Tullus fearing this Partition might occasion Seditions, divided the Inhabitants of *Rome* by Cantons, not by Nations; accordingly, he distributed the City into four Quarters or *Tribes*; and by Reason a great Number of Citizens had retir'd into the Country about, of those he compos'd 26 other *Tribes*; so that from his Time the *Roman* People consisted of 30 *Tribes*.

In after-times, the Number of *Tribes* was encreas'd to 35; but they then ceas'd to be rang'd according to the Quarters of the City. --- The Distribution depended on the Censors, who form'd their List at Discretion, frequently confounding the Country *Tribes* with those of the City.

A Man was never absolutely a *Roman* Citizen, unless he had the *Jus Tribus*, *i. e.* till he were intitled to the Honours of the Magistrature, as also to a Right of voting in Assemblies of the People: And this was what they call'd *Jus Quiritium*.

Hence, the Inhabitants of the municipal Cities, were only imperfect Citizens, as being of no *Tribe*. See CITIZEN.

The Freedmen were oblig'd to purchase this *Right of Tribe*, which did not otherwise belong to them, tho' they were Citizens of *Rome*. See LIBERTUS.

The Names of the 35 *Tribes* were, 1°. the *Palatina*. 2°. the *Suburana*. 3°. the *Collina*. 4°. the *Esquilina*. 5°. the *Romilia*. 6°. the *Æmilia*. 7°. the *Cruſtumina*. 8°. the *Cornelia*. 9°. the *Fabia*. 10°. the *Galeria*. 11°. the *Leomonia*. 12°. the *Mentina* or *Menenia*. 13°. the *Ocriculana*. 14°. the *Papiria*. 15°. the *Pollia*. 16°. the *Popilia*. 17°. the *Pupinia*. 18°. the *Sergia*. 19°. the *Vegentina*. 20°. the *Voltinia*. 21°. the *Claudia*. 22°. the *Stellatina*. 23°. the *Tromentina*. 24°. the *Arnenſis*. 25°. the *Sabatina*. 26°. the *Pomptina*. 27°. the *Poblilia*. 28°. the *Mœcia*. 29°. the *Scaptia*. 30°. the *Onfentina*. 31°. the *Falerina*. 32°. the *Anienſis*. 33°. the *Terentina*. 34°. the *Velina*. 35°. the *Quirina*. In ancient Authors and Inscriptions, we meet with the Names of others, *viz.* *Pinaria*, *Sappinia*, *Camilla*, *Ceſtia*, *Cluentia*, &c.

TRIBRACHYS, in the ancient Prosody, a Foot of Verse, consisting of three Syllables, and those all short, as *Melius*.

The Word is form'd from the *Greek*, τρεῖς, three, and βραχυς, short.

TRIBUCH, and TREBUCHET, a Tumbrel, or Cucking-stool. See CUCKING-*stool*.

TRIBUNAL, *Judgment-Seat*, the Seat of a Judge. See JUDGE.

The *Tribunal* in a Court of Justice, is properly the Seat or Bench whereon the Judge and his Associates are placed. See BENCH.

The Word is *Latin*, and takes its Origin from a Seat rais'd from the Ground, wherein the *Tribune* of the *Roman* People was plac'd to administer Justice. See TRIBUNE.

Tribunal, *Tribuna*, or *Tribune*, among the Ancients, was also a Place from whence the People were harangued.

Among the *Romans*, it was an Eminence near the Temple, in the Place call'd *Pro Roſtris*, where the People were harangued in *Tribes*.

The *French* Architects likewise use the Word *Tribune* for a Gallery or Eminence in a Church, or other Place, wherein the Music is plac'd for a Symphony or Concert.

TRIBUNE, TRIBUNUS *Militum* or *Militaris*; an Officer in the *Roman* Army. See TRIBUNUS.

TRIBUNE, TRIBUNUS *Plebis*, in Antiquity, a *Roman* Magistrate, chosen out of the Populace, to protect them against the Oppression of the Great, and to defend the Liberty of the People against the Attempts of the Senate and Consuls.

The *Tribunes of the People* were first establish'd in the Year of *Rome* 259. The first Design of the Creation, was to shelter them from the Cruelties of Usurers, and to engage them to quit the *Aventine* Mount, whither they had retir'd in Displeasure.

Their Number, at first, was but two; but the next Year, under the Consulate of *A. Posthumus Aruncius*, and *Cassius Viscellinus*, there were three more added; and this Number of five was afterwards increas'd by *L. Trebonius* to ten.

The Appellation *Tribune* was given them, by reason they were at first chosen out of the *Tribunes* of the Army. See TRIBUNUS.

The *Tribunes* were, as it were, the Leaders and Guardians of the People. --- They call'd Assemblies of the People when they pleas'd; and in those Assemblies frequently annull'd the Decrees of the Senate. Nothing could be concluded without their Consent, which they express'd by subscribing the Letter *T* at the Bottom of the Decree. They had it in their Power to prevent the Execution of any Decree, without giving any Reason for it, and merely by subscribing *Veto*.

They sometimes call'd the Consuls and Dictator to account for their Conduct, before the People.

Augustus himself was *Tribune* for 37 Years; *Tiberius* assum'd the same Quality; as likewise did his Successor, signifying the Year of their *Tribunate* on their Medals and Coins: But their Design, herein, was only to possess themselves of all the Authority, that there might be no-body to oppose them. See TRIBUNICIAN.

TRIBUNICIAN, a Term among Antiquaries and Medallists.--- The *Tribunician Power*, was the Dignity, Office, or Authority of a *Tribune of the People*. See TRIBUNE.

This Power was assum'd by the Emperors, and makes one of the chief Titles they bear on their Medals: The Quality was first introduc'd by *Augustus*, to keep the Sovereign Authority over the other Magistrates, without either taking that of Dictator or King. Indeed it was offer'd to *Julius Cæsar*, but he despis'd it. *Augustus* is the first who us'd it, and his Successors follow'd his Example. --- They reckon the Years of their Empire on their Medals by those of their *Tribunician Power*.

This Power was sometimes given them for a certain Number of Years, and sometimes for ever. Sometimes the Emperors would communicate the Power to such as they associated, or as they intended to succeed them: And *Tiberius* held it fifteen Years with *Augustus*. But this Practice only obtain'd till the Time of *Valerian* and *Gallian*. After them we only find T R. P. II. in *Claudius*; T R. P. V. in *Aurelian*; and T R. P. in *Probus*.

This, however, is to be understood of Medals; for in Inscriptions we find it after that Time.

Cardinal *Noris* and F. *Pagi* have disputed about this *Tribunician Power*, wherein it consisted. --- The first maintains, that it did not at all differ from that of the ordinary Tribunes, which consisted in three Things, 1°. In a Right of opposing all the Acts and Resolutions of the other Magistrates. 2°. In that it render'd their Person sacred and inviolable. 3°. In a Right of making Edicts and Laws.

F. *Pagi* asserts, that it made an Addition to the Power of the Tribunes; that the Privilege it had of making Edicts, was more ample than that of the ordinary Tribunes; besides, that it carry'd with it a Power of convening the Senate at Pleasure.

M. *Spanheim* is of F. *Pagi*'s Opinion: He believes that the *Tribunician Power* had much the Advantage of the *Tribunate*, 1°. In that it was peculiar to the Patricians, and did not reduce the Person who held it to the Degree of a Plebeian. 2°. In that it was not confin'd to the City of *Rome* alone, like the other, but extended throughout the Empire; as well as the Proconsular Power, which was usually annex'd to it. 3°. That the Dignity of the Tribunes was inferior to that of the Pretors; whereas the *Tribunician Power* of the *Cæsars*, conferr'd, according to *Tacitus*, a Sovereign Authority over all Magistrates, and render'd such as it was communicated to, equal to the Emperors, and even their Collegues in the Empire: Besides the Power of opposing the Enterprizes of all the other Magistrates; and

that