

J'ay fait voir cela a plusieurs de nos medecins, & apres avoir consulté Messieurs les Vicaries Generaux; nous luy avons fait prendre un habit d'homme, sous le nom d' Arnaud Malaufé; & on va presentement luy faire apprendre quelque metier. Il n' y avoit pas a hesiter la dessus, parce que notre Hermaphrodite peut fort bien faire la fonction d' homme, & point du tout celle de femme.

J'ay cru vous faire plaisir de vous ecrire ce fait, qui commence deja d'etre public dans cette ville, mais qui est bien rare, & bien extraordinaire.

Tholose
Decemb. 4. 1686.

Accounts of B O O K S.

I. *Historia Plantarum, species hæcenus editas aliasq; insuper multas noviter inventas & descriptas complectens &c.* Autore Joanne Rajo e Societate Regia. Tomus primus. Londini, 1686 Fol. Apud Henricum Faithorne R.S. Typographum; ad insigne Rosæ in Cæmeterio D. Pauli.

THE excellent Author of this great Work, is so well known for his incomparable Skill in the *Botanick* Science, and other Parts of useful Learning, that it will be needless to say any thing of him. The Forreign Journals having given Accounts of this Book have prevented the mentioning of many particulars, but they only speaking in general, and *per saltum*, neglecting the Divisions, Subdivisions, and the Method; I shall therefore only confine my self to those Particulars.

The *First Tome* contains 18 Books, to which are premiſed a *Botanick Lexicon*, or Interpretation of Terms of Art ,

N n

to-

together with an Account of most of the Writers that have handled the Subject of Plants. The first Book treats of Plants in general; as of their Roots, Stalks, Sap, Juices, their Motions, and Differences; of Gems or Buds, Leaves, Flowers, Fruits, Seeds, Clavicles or Climbers, Prickles, their Varieties, and Vegetations; of Sowing, Propagating, Cultivating, Grafting, or Inoculating; of the Transmutation of Plants, their Statures or Magnitudes, their Ages or Duration, their Faculties, Tasts, and Uses, their Places, and Divisions; of Collecting, Drying, and Preserving them, their Chymical *Analysis*, and their Diseases.

The 2d. Book begins with Particulars, as the imperfect Plants, such as seem to have no Flower or Seed; these are either *Submarine*; as the *Corals*, *Sponges*, *Alga's*, *Wracks*, &c. or Terrestrial, as the *Mushrooms*, and barren *Mosses*. Or Subterraneous, as the *Truffles*; some of the *Fungi* and *Mosses*, have visible Seeds: These are all subdivided into subordinate *Genera*, as the *Mushrooms* according to their *Lamella*, *Plates*, *Brim*, and *Caps*; and as they are noxious, or esculent; or grow upon Trees.

The 3d. Book contains the *Capillary* or *Acaulose* Herbs, which bear their very minute Seeds on the backs of their Leaves, that are conspicuous by the *Microscope*: These are subdivided according to their Leaves, as they are whole, entire and undivided; or variously cut, lacinated, pinnate, and ramose. Of this Kind are the *Ferns*, the *Spleenworts*, *Polypodies*, *Maiden-Hairs*, &c. which have nothing like a Flower.

The 4th. Treats of such Herbs as have an imperfect or staminate Flower, commonly call'd *Apetalose*, because it is not composed of *Petala* or tender fugacious coloured Leaves, only of a *Calyx* or Cup, of *Stamina* or Capillaments of *Styles*. These are subdivided, I. into such whose Fruits are not contiguous to their Flowers; as in *Hops*, *Hemp*, *Nettles*, *Spinache*, *Mercury*, *Palma Christi*, the *American Phy-*

Physick - Nut, &c. II. Into such that have a triquetrous, or triangular Seed, as the *Docks*, *Sorrels*, *Arsmarts*, *Knot-grass*, *Snake-weeds*. III. Into those that have round, compressed, and otherwise figured Seeds, as the *Pond-Weeds*, *Orraches*, *Sea-Purslane*, the *Blites*, the *Amaranthi*, the *Beets*, some *Kali's*, &c.

The 5th. Book begins with those that have a perfect planifolious Flower, or tender coloured *Petala*, or Leaves, that make up a compound Flower: these are, I. either *lactescent*, milky, and *pappose*, containing their Seeds in a *lanugo* or downy Substance; as the *Lettuces*, *Sow-thistles*, *Succorys*, *Hawk-weeds*, *Mouse-ears*, *Dandelyons*, *Scorzonerá's* or *Viper-grass*, *Goats-beard*, &c. II. Such as have solid Seeds without any *pappus* or *lanugo*; as *Endive*, *Nipple-wort*, and some *Succorys*; these are *lactescent*.

The 6th. Book contains the Herbs that are not Milky, and yet bear their Seeds in a downy or *pappose* Substance, succeeding the Flowers; these have either radiated, discose, and flat Flowers; as *Colts-foot*, the *Conyza's* or *Flea-banes*, *Elecampane*, the *Star-worts*, the *Leopards Banes*, the *Golden Rods*, the *Stacha's*, the *Jacobaa's* or *Ragworts*; or else the Flower is disposed into a *Tbyrsus* or Spike, as in the *Petasitis* or *Butter-bur*.

The 7th. Is of the capitate Herbs, whose Flowers are *fistular*, and whose Seeds are included in a *Squamosé Calyx* or cup, conglobated into a Head, fill'd with a *Pappus*: of this Kind are the *Blew-bottles*, *Saw-wort*, the *Jacea's* or *Knap-weeds*, the great *Centory*, the great *Burr-dock*, and most of the *Thistles*, which are sub-divided according to their Heads, Flowers, Prickles, Spots, Consistence of their Leaves, &c.

The 8th. Comprehends the *Corymbiferous*, that are not *Pappose*; these have either a radiated, or a naked Flower, and are subdivided according to the Colours of the *Barbula* and *Discus*, and from the Figures the Flowers make; of this Tribe are the *Sun-flowers*, the *Chrysanthemum's* and *Marigolds*, the *Yarrows*, *Daisies*, *Feverfew*, the *Lavender-cot-*

tons, the Tansies, Wormwoods, Southernwoods, Mugworts, Scabioses, Teasels, Eringo, the Globe-thistle, &c.

The 9th. Treats of the *Umbelliferous* Herbs, to which are premised some Herbs that are a little a Kin to the *Umbelli*; only they have a single Seed succeeding each Flower; whereas the true *Umbelli* have two; of the first Kind are many *Valerians*, the *Sea Lavenders*, the *Marvel of Peru*, *Agrimony*, *Burnit*, *Meadow-Rue*. *Fumitory*, &c. The genuine *Umbelli* have *Pentapetalous* Flowers, to each of which, succeed two naked Seeds joined together; these are put under so many sub-divisions, according to the various Figures of their Seeds, and Leaves; of this *Umbelliferous* Family are the *Parfneps*, the *Fennels*, the *Angelica's*, the *Cummins Parslys*, *Hemlocks*, *Smallage*, *Aniseed*, *Caramays*, the *Carrots*, *Coriander*, &c. all which are very nicely distinguished, and variously sub-divided.

The 10th. Contains the *Stellate* Herbs, whose Leaves like a radiated *Star* embrace the Stalk; their Flowers are *Monopetalous*, tho' divided or cut into four Segments, or coloured Leaves; to each Flower there generally succeeds two Seeds; of this Kind are the *Madders*, the *Crosworts*, the *Ladies Bed-straw*, the *Wood-roofs*, the *Cleavers* or *Goose-grafs*, &c. The second Section of this Book, comprehends the *Asperifolious* Herbs, whose Flowers are *Monopetalous*, and generally reflected at the end like a *Scorpions Tail*, yet cut into five *Margins* or *Segments*; to every one of these Flowers succeed for the most part four Seeds; of this Kind are the *Pulmonaria Maculosa*, or *Sage of Jerusalem*, the *Hounds-Tongues*, *Borage*, *Bugloss*, *Alkanet*, the *Heliotropes* or *Turnsoles*, the *Gromils*, *Scorpion-grafs*, *Comfrey*, the *Honey-Worts*, &c.

The 11th. is of the *Verticillate* Herbs, so called from the Flowers embracing the stalk like a whirl, or wherle, the Leaves are generally placed together exactly opposite on the Stalk, the Flowers are *Monopetalous*, *labiated* for the most part or *galeated*; to each Flower succeeds 4 Seeds,
which

which the *Calyx* or *Perianthium* serves instead of a Vessel; these are subdivided according to their substance and duration, as they are *Lignous*, *Fruticose*, *Perennial*, and *Herbaceous*. Of this tribe are the *Sages*, the *Lavenders*, *Rosemary*, the *Hyssops*, the *Savoury's*, *Thymes*, *Poley-mountain*, the *Germanders*, the *Mints*, *Penneroyalls*, *Vervain*, the *Majorams*, *Basil*, the *Clarys*, *Betonys*, *Marrubiums*, *Lamiums*, *Sideritis*, *Ground-Ivy*, *Baulm*, *Calamint*, *Ground-pine*, *Bugle*, &c.

The 12th. Comprehends those Herbs, to each of whose Flowers succeed more than 4 naked Seeds, whose number is indefinite, they being *Polyspermous*; here we may note that Mr. Ray takes those for naked Seeds whose *Follicules* or *Covers* (if they seem to have any) are not cast off, but fall with the Seeds from the mother Plant, being not separable from them. Of this family are the *Hepatica's*, the *Ranunculi*, the lesser *Celantine*, some *Mallows* and *Althaea's*, *Avens*, *Strawberries*, *Cinquefoils*, *Tormentill*, &c. The second Section of this Book is of such Herbs as have many naked Seeds, and a Flower without any *Perianthium* or *Calyx*, as the *Travellers-joy*, and some *Climbers*, *Dropwort*, *Meddow-sweet*, the *Anemonies*, *Pasque-flowers*: Those of the former Section having *Perianthia* or *Cups* about their Flowers.

The 13th. Is of the *Pomiferous*, and *Bacciferous* Herbs, these are distinguished by the *Magnitude*, and *Skins* of their Fruits; the Flowers are naked, *Monopetalous*, divided into five *Margins* or *Segments*, placed on the top of the Fruit like a *Corolla* or *Umbilicus*. Of this kind are the *Gourds*, the *Pompions*, the *Coloquintida*, the *Citruls*, *Melons*, *Cucumbers*, the *Passion-flowers*, &c. *China*, *Bryony*, *Solomon's-seals*, *Solanum's* or *Nightshades*, *Mandrakes*, *Capsicum's* or *Guinny pepper*, *Sparagus*, *Lillies* of the Vallie. &c.

The 14th. Contains the *Multisiliquose* or *corniculated* Herbs, which after each Flower bear many *Pods* or *horned Seed Vessels*. Of this kind are some *Sedums* or *House-leecks*,

leeks, Orpines, Peionys, black Hellebore, some *Althea's*, Monks-hoods, Columbines, Larks-spur's.

The 15th. Is of such Herbs as have a uniform *Monopetalous* Flower, and besides the *Calyx* of the Flower have a distinct and proper Seed Vessel, such as are the *Henbanes*, the *Tobacco's*, the *Gentians*, the *Convulvuli* or *Bind-weeds*, the *Bell-flowers*, *Throatworts*, *Rampions*, *Stramonium's* or *Thorn Apples*: The other Section is of the deform'd *Monopetalous* Herbs, both of which are subdivided according to the Figures and Valves of the feminal Vessels, of this last kind are the *Butterworts*, the *Toad-flax* or *Linaria*, *Birthworts*, *Figworts*, *Foxgloves*, *Cock-combs* or *Rattles*, *Eyebrights*, *Cow-wheats*, &c.

The 16th. Treats of such Herbs as have a uniform *Tetrapetalous* or four leav'd Flower with a *deciduous quadrifolious Calyx* or *Perianthium*, to which succeed long or broad Seed Vessels, or short ones: the first are *Siliquose*, the other *Capsular*; of these kinds are the *Stock-gilliflowers*, the *Wallflowers*, *Toothworts*, *Rockets*, *Mustards*, *Cabbages*, *Colliflowers*, *Turneps*, *Raaisbes*, *Cresses*, *Scurvigrasses*, &c. all which are subdivided according to their various Pods, and *Capsula's*. To these are subjoyn'd many *Anomalous tetrapetalous* Herbs, or rather *Monopetalous*, their Flowers being laciniated or cut into 4 parts; of this latter kind are some *Veronica's* or *Speedwells*, some *Chickweeds*, *Brooklimes*, *Poppies*, some *Lyfimachia* or *Willow-herbs*, *Rues*, the *Spurges*, *Plantaines*, &c. these make the 17th. Book.

The 18th. and last Book of the first Tome comprehends the *Legumes* or *Papilionaceous* Herbs, whose Flower somewhat represents a Butterfly with expanded wings, and is properly a deform'd *Monopetalous* Flower, tho' laciniated into 4 unequal Segments. These are divided I. into such *Legumes* as climb, and run up sticks, or perches, as the *Kidney Beans*, *Pease*, *Tares*, *Vetches*, *Lentills*, &c. II. into such as have no clasps, and doe not climb, neither are trifoliated, these are subdivided into many subordinate
genera,

genera, according as their Pods are simple and erect, as in *Lupines*, *Beans*, common *Liguorice*, *Goats-Rue*; or *echinated* and *monospermous*, as in *Cocks-head*; or propendent, as in the *Orobi*, *Astragoli* or *Heath-Peafe*, *Chiches*; or as their Cods are included or hid in Bottles, or Vesicles, as in the *Anthyllis*; or joyned, as in some *Colutea's*, *Ferrum equinum*, *Ornithopodium* or *Birds-foot*; or double, containing a double Series of Seeds, as in the *Tragacanth's*, &c. The III. general division is into such Legumes as are trifoliated, which are variously subdivided, according as their heads are thicker or thinner spicated; or their Pods hid in the *Calyx*, or appear out of it, or are longer, shorter, intorted or cochleated; of these kinds are all the *Trefoils*, *Hares-foot*, *Melilots*, *Fenugreek*, *Anonis* or *Rest-Harrows* *Saint-foin* or *Medick-Fodder*, the *Medica's* or *Snail Trefoils*, the *Loti* which are almost *Pentaphyllous* or five leaved *Legumes*, the *Cytisi* or *shrub Trefoils*; to these are subjoined many *anomalous siliquose* Herbs, very near a kin to the *Papilionaceus*; as several *Fumitorys*, *Acasia's*, *Mimosa's* or sensitive Plants.

So much for the general Method of this Book; as for the subdivisions of each tribe, they are so numerous and very nice, that I could not trace and set them down in this account for want of room and words: therefore the Reader is referr'd for them to Mr. *Ray* himself, who discovers in every part a vast Memory, a quick Apprehension, a clear Judgment, and a long Experience.

Before we leave this Work it may bee necessary to note, that all the Plants confusedly dispersed up and down in Books, are collected and Methodically digested in it, together with many new ones never before published; in the History of each Plant Mr. *Ray* observes this excellent Order, first he gives the *Etymologies*, then the *Characteristick* Notes of distinction, the best *Synonymous* Names, descriptions of all the parts, the times and places of Growth, and the uses as well Medicinal as Mechanical.

The second and last Tome is already far advanced in the Press, above 100 Sheets being work't off, and the whole will certainly be finished and published by the end of this Summer; this Volume will contain the *Pentapetalous* and *Polypetalous* Herbs, the *Bulbs* and those a kin to them; the *Culmiferous* and *Graminifolious*, as the *Corns*, *Grasses*, *Reeds*, *Rushes*, &c. After which follows the *Anomalous* or disorderly tribe of Herbs; and then the *Dendrology* or History of Trees and Shrubs begins, all which will be digested in a new and most natural Method; there will also be a very large Appendix. As soon as this Volume is published a particular account shall be given of it; in the mean time a short general Specimen of the *Dendrology* may be inserted, containing only a few of the principal heads.

First Mr. Ray divides the Trees into such as have *caudicem simplicem non ramosum*, and such as have *caudicem ramosum*: the first have a simple Stemme without any Branches, and produce but one great *Gemma* or Bud; the second that are *ramose*, are first distinguished into such as have *florem a fructu disjunctum seu remotum*, and such as have *florem Fructui contiguum*; of the first sort some have the Flower remote from the Fruit in the same Plant, and some *totis Plantis sejunctum*. Of such as have also the Flower contiguous to the Fruit, some have it *summo Fructui insidentem*, and others *imo Fructui adnascentem*; of the first of these (which have for the most part a *Corolla* or *Umbilicus* on the top of the Fruit) some contain their seed in *Pericarpio seu pulpa humida*, others in *materia Sicciore*. Each of these may be divided according to the number of the Seeds which the Fruit contains, into those that have *Fructum monococcum, dicoccum, tricoccum, tetracoccum, pentacoccum, and polycoccum*; after the same manner also may the other sort which have *Florem imo Fructui adnascentem* be divided: there will be many other Heads, of which at large and in particular when the Work comes forth.

II. *Philosophiæ Naturalis Principia Mathematica*, Auctore H. Newton Trin. Coll. Cantab. Soc. Mathematicos Professore Lucasiano, & Societatis Regalis Sodali. 4to. Londini. Prostat apud plures Bibliopolas.

THIS incomparable Author having at length been prevailed upon to appear in publick, has in this Treatise given a most notable instance of the extent of the powers of the Mind; and has at once shewn what are the Principles of Natural Philosophy, and so far derived from them their consequences, that he seems to have exhausted his Argument, and left little to be done by those that shall succeed him. His great skill in the old and new Geometry, helped by his own improvements of the latter, (I mean his method of *infinite Series*) has enabled him to master those Problems, which for their difficulty would have still lain unresolved, had one less qualified than himself attempted them.

This Treatise is divided into three Books, whereof the two first are entituled *de Motu Corporum*, the third *de Systemate Mundi*.

The first begins with definitions of the Terms made use of, and distinguishes *Time*, *Space*, *Place* and *Motion* into absolute and relative, real and apparent, Mathematical and vulgar: shewing the necessity of such distinction. To these definitions are subjoyned, the Laws of Motion, with several Corollaries therefrom; as concerning the composition and resolution of any direct force out of, or into any oblique forces, (whereby the powers of all sorts of Mechanical Engines are demonstrated:) the Laws

of the reflection of Bodies in Motion after their Collision : and the like

These necessary *Præcognita* being delivered, our Author proceeds to consider the Curves generated by the composition of a direct impressed motion with a gravitation or tendency towards a Center : and having demonstrated that in all cases the Areas at the Center, described by a revolving Body, are proportional to the Times ; he shews how from the Curve described, to find the Law or Rule of the decrease or increase of the Tendency or Centripetal forces (as he calls it) in differing distances from the Center. Of this there are several examples : as if the Curve described be a Circle passing through the Center of tendency ; then the force or tendency towards that Center is in all points as the fifth power or squared-cube of the distance therefrom reciprocally. If in the proportional Spiral, reciprocally as the cube of the distance. If in an Ellipse about the Center thereof directly as the distance. If in any of the *Conick* Sections about the *Focus* thereof ; then he demonstrates that the *VisCentripeta*, or tendency towards that *Focus*, is in all places reciprocally as the square of the distance therefrom ; and that according to the Velocity of the impressed Motion, the Curve described is an *Hyperbola* ; if the Body moved be swift to a certain degree than a *Parabola* ; if slower an *Ellipse* or Circle in one case. From this sort of tendency or gravitation it follows likewise that the squares of the Times of the periodical Revolutions are as the Cubes of the *Radii* or *transverse Axes* of the *Ellipses*. All which being found to agree with the *Phænomena* of the Celestial Motions, as discovered by the great Sagacity and Diligence of *Kepler*, our Author extends himself upon the consequences of this sort of *Viscentripeta* ; shewing how to find the *Conick* Section which a Bodie shall describe when cast with any velocity in a given Line, supposing the quantity of the said force known : and laying down several neat constructions to determine

termine the Orbs, either from the *Focus* given and two points or Tangents; or without it by five points or Tangents or any number of Points and Tangents making together five. Then he shews how from the Time given to find the Point in a given Orb answering thereto; which he performs accurately in the *Parabola*, and by concise approximations comes as near as he pleaseth in the *Elipse* and *Hyperbola*: all which are Problems of the highest concern in Astronomy. Next he lays down the Rules of the perpendicular descent of Bodies towards the Center, particularly in the case where the tendency thereto is reciprocally as the square of the distance; and generally in all other cases, supposing a general quadrature of Curve lines: upon which supposition likewise he delivers a general method of discovering the Orbs described by a Body moving in such a tendency towards a Center, increasing or decreasing in any given relation to the distance from the Center; and then with great subtilty he determines in all cases the Motion of the *Apsides* (or of the Points of greatest distance from the Center in all these *Curves*, in such Orbs as are nearly Circular. Shewing the *Apsides* fixt, if the tendency be reciprocally as the square of the distance; direct in Motion in any *Ratio* between the Square and the Cube and retrograde; if under the Square: which Motion he determines exactly from the Rule of the increase or decrease of the *Vis Centripeta*.

Next the Motion of bodies in given Surfaces is considered, as likewise the Oscillatory Motion of Pendules, where is shewn how to make a *Pendulum* Vibrate always in equal times, tho' the center or point of tendency be never so near; to which, the Demonstration of Mr. *Hugens de Cycloide* is but a *Corollary*. And in another Proposition is shewn the Velocity in each Point, and the time spent in each part of the Arch described by the Vibrating Body. After this the Effects of two or more Bodies, towards each of which there is a tendency, is considered; and 'tis made out that two Bodies, so drawing or attracting each other, describe

about the common center of Gravity, Curve Lines, like to those they seem to describe about one another. And of three Bodies, attracting each other, reciprocally as the Square of the distance between their Centers, the various Consequences are considered and laid down, in several *Corollarys* of great use in explicating the *Phenomena* of the *Moons* Motions, the Flux and Reflux of the Sea, the Precession of the *Equinoctial* Points; and the like.

This done our Author with his usual Acuteness proceeds to examine into the Causes of this Tendency or centripetal Force, which from undoubted Arguments is shown to be in all the great Bodies of the Universe. Here he finds that if a Sphere be composed of an infinity of Atoms, each of which have a *Conatus accedendi ad invicem*, which decreases in duplicate Proportion of the Distance between them; then the whole *Congeries* shall have the like tendency towards its Center, decreasing, in Spaces without it, in duplicate Proportion of the Distances from the Center; and decreasing, within its Surface, as the distance from the Center directly; so as to be greatest on the Surface, and nothing at the Center: and tho' this might suffice, yet to compleat the Argument, there is laid down a Method to determine the forces of Globes composed of Particles whose Tendencies to each other do decrease in any other *Ratio* of the Distances: Which Speculation is carried on likewise to other Bodies not Spherical, whether finite or indeterminate. Lastly is proposed a Method of explaining the Refractions and Reflections of transparent Bodies from the same Principles; and several Problems solved of the greatest Concern in the Art of *Dioptricks*.

Hitherto our Author has considered the Effects of compound Motions *in Mediis non resistentibus*, or wherein a Body once in Motion would move equably in a direct Line, if not diverted by a supervening Attraction or tendency toward some other Body. Here is demonstrated what would

would be the consequence of a resistance from a *Medium*, either in the simple or duplicate *Ratio* of the Velocity, or else between both: and to compleat this Argument is laid down a general Method of determining the density of the *Medium* in all places, which, with a uniform Gravity tending perpendicularly to the plain of the *Horizon*, shall make a *Project* move in any curve Line assigned; which is the 1th. *Prop. Lib. II.* Then the circular Motion of Bodies in resisting *Media* is determined, and 'tis shown under what Laws of decrease of Density, the Circle will become a proportional Spiral. Next the density and compression of Fluids is considered, and the Doctrine of *Hydrostaticks* demonstrated; and here 'tis proposed to the Contemplation of Natural Philosophers, whether the surprising *Phenomena* of the Elasticity of the Air and some other Fluids may not arise from their being composed of Particles which flie each other; which being rather a Physical than Mathematical Inquiry, our Author forbears to Discuss.

Next the Opposition of the *Medium* and its Effects on the Vibrations of the *Pendulum* is considered, which is followed by an Inquiry into the Rules of the Opposition to Bodies, as their Bulk, Shape, or Density may be varied: Here with great exactness is an Account given of several Experiments tried with *Pendula*, in order to verify the foregoing Speculation, and to determine the quantity of the Airs Opposition to Bodies moving in it.

From hence is proceeded to the undulation of Fluids, the Laws whereof are here laid down, and by them the Motion and Propagation of Light and Sound are explained. The last *Section* of this Book is concerning the Circular Motion of Fluids, wherein the Nature of their *Vortical* Motions is considered, and from thence the *Cartesian* Doctrine of the *Vortices* of the Celestial Matter carrying with them the Planets about the *Sun*, is proved to be altogether impossible.

The III. and last Book is entituled *de Systemate Mundi*, wherein the Demõstrations of the two former Books are applied to the Explication of the principal *Phenomena* of Nature: Here the verity of the *Hypothesis* of *Kepler* is demonstrated; and a full Resolution given to all the difficulties that occur in the *Astronomical Science*; they being nothing else but the necessary consequences of the *Sun, Earth, Moon, and Planets*, having all of them a gravitation or tendency towards their Centers proportionate to the Quantity of Matter in each of them, and whose Force abates in duplicate proportion of the Distance reciprocally. Here likewise are indisputably solved the Appearances of the Tides, or Flux and Reflux of the Sea; and the Spheroidal Figure of the *Earth* and *Jupiter* determined, (from which the precession of the Equinoxes, or rotation of the Earths Axis is made out,) together with the retrocession of the *Moons* Nodes, the Quantity and inequalities of whose Motion are here exactly stated *a priore*: Lastly the Theory of the Motion of Comets is attempted with such success, that in an Example of the great Comet which appeared in 1680, the Motion thereof is computed as exactly as we can pretend to give the places of the primary Planets; and a general Method is here laid down to state and determine the *Trajectoria* of Comets, by an easy Geometrical Construction; upon supposition that those Curves are *Parabolic*, or so near it that the *Parabola* may serve without sensible Error; tho' it be more probable, saith our Author, that these Orbs are *Elliptical*, and that after long periods Comets may return again. But such *Ellipses* are by Reason of the immense distance of the *Foci*, and smallness of the *Latus Rectum*, in the Parts near the Sun where Comets appear, not easily distinguished from the Curve of the *Parabola*: as is proved by the Example produced.

The whole Book is interspersed with *Lemma's* of General use in *Geometry*, and several new Methods applied, which

which are well worth the considering; and it may be justly said, that so many and so Valuable *Philosophical Truths*, as are herein discovered and put past Dispute, were never yet owing to the Capacity and Industry of any one Man.

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

Whereas the Publication of these Transactions has for some Months last past been interrupted; The Reader is desired to take notice that the care of the Edition of this Book of Mr. Newton having lain wholly upon the Publisher (wherein he conceives he hath been more serviceable to the Commonwealth of Learning) and for some other pressing reasons, they could not be got ready in due time; but now they will again be continued as formerly, and come out regularly, either of three sheets, or five with a Cutt; according as Materials shall occur.

L O N D O N,

Printed by *J. Streater*, and are to be sold by *Samuel Smith* at the *Princes Arms* in *St. Paul's Church-yard*.