

it somewhat of a Sky-colour, he was, upon owning his surprize thereat, informed, that a dozen of them being put in, they would dye it to almost a full *Azure*. Which is touch't here, that, the Experiment being so easie to make, it may be tried, when the season furnishes those Insects; mean time, it seems not more incredible, that this Creature should yield a Sky-colour, when put in water, than that *Gochineel*, which also is but an Insect, should afford a fine *red*, when steep'd in the same Liquor.

*An Account
Of Some Books.*

I. Le Tome troisieme et dernier des Lettres de M. *DES-CARTES*.

As the two first *Tomes* of M. *Des-Cartes* his Letters, contain Questions, for the most part of a *Moral* and *Physiological* Nature, propos'd to, and answer'd by him; so *this* consists of the Contests, he had upon several Subjects with divers Men eminent in his time.

To pass by that sharp Contest, he was engaged in by some Professors of Divinity at *Utrecht*, who endeavoured to discredit his Philosophy, as leading to Libertinisme and Atheisme, notwithstanding he made it so much his business, as to assert the Existence of a Deity, and the Immortality of a Soul: We shall take notice of what is more to our purpose, *vid.* the Differences, he had touching his *Dioptricks* and *Geometry*.

As for his *Dioptricks*, though a great part of the Learned World have much esteem'd that Treatise, as leaving little to be said after him upon that Subject; yet there have not been wanting Mathematicians, who have declared their disagreement from his Principles in that Doctrine. The first of them was the Jesuit *Eourdin*, Mathematick Professor in the Colledge of *Clermont* at *Paris*; but this difference was soon at an end. A second was Mr. *Hobbs*, upon whose account he wrote several Letters to *Mersennus*, containing many remarks conducing to the Knowledge of the Nature of *Reflection* and *Refraction*. But the Person, that did most learnedly and resolutely attack the said *Dioptricks*, was Monsieur *Fermat*, writing

writing first about it to *Mersennus*, who soon communicated his Objections to *M. Des-Cartes*, who failed not to return his Answer to them. But *Fermat* replied, and *Des-Cartes* likewise; and after many reciprocations, in which each party pretended to have the advantage, the matter rested; until *M. Fermat* taking occasion to write afresh of it to *M. De la Chambre*, several years after *Des-Cartes*'s death, upon occasion of a Book, written by *M. De la Chambre*, of *Light*; discoursed with this new *Author* after the same rate, as he had done before with *Des-Cartes* himself, and seemed to invite some-body of his friends, to re-assume the former contest. Whereupon *M. Clerfelier* and *M. Rohault* took up the Gantlet, to assert the Doctrine of the deceased Philosopher, exchanging several Letters with *M. Fermat*, all inserted in this *Tome*, and serving fully to instruct the Reader of this Difference, and withal to elucidate many difficult points of the Subject of *Refractions*; especially of this particular, *Whether the Motion of Light is more easily, and with more expedition, perform'd through dense Mediums, than rare.*

Besides this, though one would think, Disputes had no place in *Geometry*, since all proofs there, are as many Demonstrations; yet *M. Des-Cartes* hath had several scuffles touching that Science. As *M. Fermat* had assaulted his *Dioptricks*, so He reciprocally examined his Treatise *De Maximis & Minimis*, pretending to have met with *Paralogismes* in it. But the Cause of *M. Fermat* was learnedly pleaded for, by some of his Friends, who took their turn to examine the Treatise of *Des-Cartes*'s *Geometry*; whereupon many *Letters* were exchanged, to be found in this Book, and deserving to be considered; which doubtless the Curious would easily be induced to do, if Copies of this Book were to be obtain'd here in *England*, besides that one, which the *Publisher* received from his *Parisian* Correspondent, and which affords him the opportunity of giving this, though but Cursory, Account of it.

As to *Physicks*, there occur chiefly two Questions, learnedly treated of in this *Volume*, though not without some heat between *M. Des-Cartes* and *M. Roberval*. The one is, touching the Vibrations of Bodies suspended in the Air, and their Center of Agitation: about which, there is also a Letter inserted of

M. *Des-Cartes* to that late Noble and Learned English Knight, Sir *Charles Cavendish*. The *other* is, whether Motion can be made without supposing a *Vacuum*: where 'tis represented, That, if one comprehend well the Nature, ascribed to the *Materia subtilis*, and how Motions, called *Circular*, are made, which need not be just *Ovals* or *true Circles*, but are only called *Circular*, in regard that their Motion ends, where it had begun, whatever irregularity there be in the Middle; and also, that all the Inequalities, that may be in the Magnitude or Figure of the parts, may be compensated by other inequalities, met with in their Swiftneſs, and by the facility, with which the parts of the *Subtle Matter*, or of the first *Cartesian* Element, which are found every where, happen to be divided, or to accommodate their Figure to the Space, they are to fill up: If these things be well understood and considered, that then no difficulty can remain touching the Motion of the parts of Matter *in pleno*.

Besides all these particulars, treated of in this *Tome*, there occur many pretty Questions concerning *Numbers*, the *Cycloid*, the manner of *Working Glasses for Telescopes*, the way of *Weighing Air*, and many other Curiosities, Mathematical and Physical.

I. I. ASTRONOMIA REFORMATA, *Auctore*
 JOHANNE BAPT. RICCIOLI, *Soc.*
Fesin.

For the Notice of this Book, and the Account of the Chief Heads contained therein, we are obliged to the *Journal des Sçavans*; which informs us,

First, That the Design of this Work is, that, because several *Astronomers*, having had their several *Hypotheses*, there is found so great a diversity of opinions, that it is difficult thence to conclude any thing certain; this Author judged it also necessary, to compare together all the best Observations, and upon examination of what they have most certain in them, to reform upon that measure the Principles of *Astronomy*.

Secondly; That this *Volume* is divided into two Parts; whereof the *First* is composed of *Ten Books*; in which the Author
 confi-

considers the principal Observations, hitherto made of the Motion of the Planets and the Fixed Stars, of their Magnitude, Figure, and other Accidents; drawing thence several Conclusions, in which he establishes his *Hypothesis*. The *Second* contains his *Astronomical Tables*, made according to the *Hypotheses* of the First Part, together with Instructions teaching the manner of using them.

Thirdly, That Astronomers will find in this Book many very remarkable things, concerning the *Apparent Diameter of the Sun* and the other Stars, the Motion of the *Libration of the Moon*, the *Eclipses*, *Parallaxes*, and *Refractions*: And that this Author shews, that there is a great difference between *Optical* and *Astronomical* Refraction, which *Tycho* and many others have confounded; undertaking to prove, that, whereas these *Astronomers* have believed, that the remoter any Star is, the less is its Refraction, on the contrary the Refraction is the greater, the more a Star is distant. And among many other things, he ingeniously explicates the two contrary Motions of the Sun, from East to West, and *vice versa*, by one onely Motion upon a *Spiral*, turning about a *Cone*.

Fourthly, That he represents, How uneasy it is to establish sure Principles of this Science, by reason of the difficulties of making exact Observations. So, for example, in the Observation of the *Equinox*, every one is mistaken by so many *Hours*, as he is of *Minutes*, in the Elevation of the *Pole*, or the Diameter of the Sun, or the Refraction, or in any other circumstance. In the Observation of the *Solstice*, the error of one only *Second* causeth a mistake of an *Hour* and an *half*: mean time 'tis almost impossible to avoid the error of a *Second*; and even the sharpest sight will not be able to perceive it, except it be assisted with an Instrument of a prodigious bigness. For to mark *Seconds*, though Lines were drawn as subtil as the single threads of a Silk-worms Clew, (which are the smallest spaces to be discerned by the sharpest Eye) by the Calculation made by this Author there would need an Instrument of 48. feet *Radius*, since Experience shews, that there needs no more at most, than 3600. threads of Silk to cover the space of an *inch*. But, suppose one could have a *Quadrant* of this bigness, who can assure himself, that dividing it into

324000. parts (for so many *Seconds* there are in 90. *Degrees*) either in placing it , or in observing , he shall not mistake the thickness of a single thred of Silk ? He adds , that Great Instruments have their defects, as the small ones: For in those, that are *Movable* , if the thred, on which the Lead hangs, is any thing big , it cannot exactly mark *Seconds* ; if it be very fine , it breaks, because of its great length, and the weight of the Lead: And in the *Fixed* ones, the greater the *Diameter* is , the less the Shadow or the Light is terminated ; so that it is painful enough , exactly to discern the extremities thereof. Yet 'tis certain , that the greater the Instruments are , the surer *Astronomers* may be: Whence it is, that some *Astronomers* have made use of *Obelisks* of a vast bigness, to take the *Altitudes* ; and Signior *Cassini* , after the example of *Egnatio Dante* , caused a hole to be made on the highest part of a Wall of 95. feet in a Church at *Bononia* , through which the beams of the Sun falling on the Floor , mark as exactly as is possible, the height of that Luminary.

Fifthly , That the Author reasons for the *Immobility of the Earth* after this manner. He supposes for certain , that the swiftness of the Motion of heavy bodies doth still *increase* in their descent ; to confirm which principle , he affirms to have experimented , That, if you let fall a Ball into one of the Scales of a Ballance , according to the proportion of the height, it falls from, it raiseth different weights in the other Scale. For example, A Wooden Ball , of $1\frac{1}{2}$ ounce , falling from a height of 35 inches, raiseth a weight of 5. ounces ; from the height of 140 inches , a weight of 20 ounces ; from that of 315 inches , one of 45 ounces ; and from another of 560 inches, one of 80 ounces, &c. From this principle he concludes the Earth to be at Rest ; for, *saieth he*, if it should have a Diurnal Motion upon its Center, Heavy Bodies being carried along with it by its motion , would in descending describe a *Curve Line* , and, as he shews by a *Calculus* , made by him, run equal spaces in equal times ; whence it follows , that the Celerity of their Motion would not increase in descending , and that consequently their stroke would not be stronger , after they had fallen thorow a longer space.

III. ANATOMIE MEDULLAE SPINALIS,
 ET NERVORUM *inde provenientes*,
 GERARDI BLASII, M. D.

The Author shews in this little *Tract* a way of taking the entire *Medulla Spinalis*, or Marrow of the Back, out of its *Theca* or Bony Receptacle, *without Laceration*; which else happens frequently, both of the Nerves proceeding from it, and of the Coats investing it; not to name other parts of the same. This he affirms to have been put into practice by himself, by a fine Saw and Wedge; which are to be dexterously used: and he produceth accordingly in excellent Cuts, the Representations of the Structure of the said *Medulla* thus taken out, and the *Nerves*, thence proceeding; and that of several Animals, Dogs, Swine, Sheep.

He intermixes several Observations, touching the *Singleness* of this *Medulla*, against *Lindanus* and others; its *Original*, *vid.* Whether it be the Root of the Brain, or the Brain the Root of it: its difference of *Softness* and *Hardness* in several Animals; where he notes, that in *Swine* it is much softer than in Dogs, &c.

He exhibits also the Arteries, Nerves, and Veins, dispersed through this *Medulla*, and inquires, Whether the *Nerves* proceed from the *Medulla* it self, or its *Meninx*; and discourses also of the *Principle* and *Distribution* of the Nerves; referring for ampler information in this and the other particulars, to that Excellent Book of the Learned Dr. *Willis*, *De Anatomia Cerebri*.

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