Thermometers, *Barometers*, *Hygroſcopes*.

Theſe Obſervations being thought very conſiderable as well as curious, 'tis hoped, that thoſe who have conveniency, will give encouragement and aſſiſtance for the making of them; and withall oblige the publick by imparting, what they ſhall have obſerved of this kind: The *Publiſher* intending, that when ever ſuch obſervations ſhall be communicated to him, he will give notice of it to the *publick*, and take care of the improvement thereof to the beſt uſe and advantage. A *Pattern* of the *Table*, propoſed to be made for obſerving the *Tides*, is intended to be publiſhed the next opportunity, God permitting.

An Account
Of ſeveral Books lately publiſhed.

I. *Johannis Hevelii* DESCRIPTIO COMETÆ, *Anno Æræ Chriſtianæ* MDCLXV. *exorti; unà cum* MANTISSA *Prodromi Cometici, Obſervationes omnes prioris* COMETÆ MDCLIV, *ex iiſque genuinum motum accuratè deductum, cum Notis & Animadverſionibus, exhibens.*

This Book (as the Title it ſelf intimates) undertakes two things. *Firſt*, To give an Account of the *Second* of the two late Comets, which appeared, when the *other* was ſcarce exſtinct; Concerning which, the Author doth, from the Obſervations made by himſelf with a *Sextant* of 6 foot, and divided into *minutes* and *ſeconds*, aſſign *both* its true place (as well in reſpect of the *Ecliptick* as the *Æquator*) *and* its proper motion: Adding a fair Delineation of its Courſe, together with the genuine Repreſentations of its *Head* and *Train*, in each day of its apparition; and ſubjoyning a General Deſcription and Diſcourſe of ſome of the more notable *Phænomena* thereof. It was firſt ſeen at *Dantzick* by the Watchmen, the 5th of *April* ſt. n. 1665. and then obſerved by the *Author*, from *April* 6. about 1½ of the Clock in the morning, till *April* 20. at 3. in the morning. During which time, it went with a reaſonable velocity; making 46 deg. in its Orb, *according to the Order of the Signs*, moving from the *Breaſt* of *Pegaſus*, towards the *Head* of *Andromeda*, and the *Left Horn* of *Aries*; having, as 'tis preſumed, taken its riſe from above *Sagittary*, and run through the *Breaſt* of *Antinous*, under *Aquila*, and the *Dolphin*, to the ſaid *Pegaſus*; and ſo on, as is already expreſſed.

The *Head* of it is in the Book deſcribed of a Colour like that of *Jupiter*, all along much brighter than that of the former Comet, though of a ſomewhat leſs magnitude; having in its middle onely *one* round, but very bright and big *Kernel* or Speck, reſplendent like Gold, and encompaſſed with another more dilute and ſeemingly uniform matter: its *Tail* being at firſt, about 17 deg. and afterwards 20. and ſometimes 25 deg. long, and divaricated towards the End.

Next, it is obſerved, that though this Star did afterwards ſlacken its pace, yet it retained the vividneſs of its Colour, both of the *Head* and *Train*; the *Head* eſpecially, keeping at the time as well of the laſt obſervations, as of the

firſt

firſt, the brightneſs of its ſingle *kernel*, though the environing more dilute matter were then almoſt all loſt; it being, according to the Author, more and more attenuated, and grown narrow, the nearer the Star approached to the Sun.

Thirdly, 'tis noted, That this *Comet* did very much digreſs from the *Hypotheſis*, delivered by *M. Auzout*, in regard that, whereas according to that *Hypothèſis*, this Star ſhould not arrive to the *Ecliptick* till after the ſpace of 3 months, it arrived there the 28 of *April*. And then, that its firſt Conjunction with the Sun hapned between the 19 and 20 of *April*, and the ſecond, the laſt of *April*, not (as *M. Auzout*, would have it) the 15 of *May*. So that he concludes, that this Comet never came down to the *Pleiads* and the *Eye of Taurus*, as the Hypotheſis of *M. Auzout* requires, but that from *April* 20. it did immediately take its courſe towards the Ecliptick, deflecting every day more and more from the *Section* of a *Great Circle*, to the *Lucida* of *Aries*, arriving at the *Ecliptick* the laſt of *April*, about the 8th or 10th deg. of *Taurus*; not in *July* about the 8th of *Gemini*, and the *Eye of Taurus*.

Fourthly, He intimates, that if this Comet had appeared ſome few weeks ſooner, it would have confronted the former Comet, being yet in its vigour and of a conſpicuous bigneſs, in the ſame place, where that was, viz. the *Head of Aries*.

Fifthly, He obſerves, that this Star in progreſs of time became *Retrograde*, whence it came to paſs, that in the Months of *June* and *July* it did not appear again before the Riſing of the Sun, though the Sun left it far behind: whereas, if it had proceeded toward the *Eye of Taurus*, it would have appeared again in the morning.

Sixthly, He maintains, that this Comet was not the ſame with the former; which he thinks may be demonſtrated, onely by a due Delineation of both their Courſe upon the *Globe*; where he ſaith it to be evident, that the former could never come to the *Head* of *Pegaſus*, as moving already in *February* in a ſtreight Courſe about the *Head* of *Aries*: Beſides, that the *former* went in the very beginning in a *Retrograde* motion; but *this* perpetually in a direct one: *that*, about the end, very ſlow, its Head leſsning and growing dark; *this* ſwift enough, with its head conſpicuous and bright. To which he adds, that the whole Courſe of the former was made under a quite different *Angle* of the *Orbite* and *Ecliptick*, and a different Motion of the *Nodes* from the latter: As alſo that their *Faces* differed very much from one another; the *firſt* exhibiting all along a matter, which as to its denſity and rarity, altered from day to day exceedingly, whereas the *ſecond* retained (to the Authors admiration, who affirms, never to have obſerved the like) all the time he ſaw it, one and the ſame round, denſe and bright Speck or Kernel.

All which he concludes 1, With an Intimation of his ſenſe concerning two other Comets, pretended to have been lately ſeen, *One* at *Rome*, about the

Girdle

Girdle of Andromeda, in the Months of *February* and *March*, 1664. the other in *Germany* in *Capricorne*, about *Saturne* in the head of *Sagittary*, during the Months of *September* and *October*, 1665. 2ly. With an Advertiſement of what he has done in that important Work for the Advancement of *Aſtronomy*, the due *Reſtitution of the Fixt Stars*, *vid.* That he has almoſt finiſh't it, himſelf alone, without truſting to any other mans labour, that was not directed by him.

The *Second* Part of this Book (the *Mantiſſa* to the *Prodromus Cometicus*) endeavours to juſtifie the Authors Obſervations touching the former Comet, excepted againſt by M. *Auzout*, in ſeveral particulars; as 1. That it had not paſs'd to the *Firſt*, but *Second* Star in *Aries*, and had mov'd in quite another Line, than He had deſcribed. 2. That its *proper motion* about the end of *January* and the beginning of *February*, 1665. had not been rightly aſſigned. 3. That the *Bigneſſe* of its *Diameter* had not been truly delivered; Nor 4. The *Faces* of its *Head* in due manner repreſented.

To all which the Author endeavors to anſwer: 1. By delivering all his Obſervations of that Comet, thereby to ſhew, what care and diligence he had uſed, *particularly* to make out, how great its *Diurnal motion* had been; in what proportion, and how far, it decreaſed, and where and in what degree it increaſed again: Which being, as he conceives, duly and exactly deduced, and demonſtrated, he eſteems it afterwards to be eaſie for every one, verſed in theſe matters, certainly to collect and to judge, what way the Comet, after it became inviſible to the naked Eye, and could be no longer obſerved with *Sextants* and *Quadrants*, had taken, and what Line it had deſcribed. 2, By ſubjecting all thoſe Obſervations, with great diligence and labour, to a rigid *Calculus*, thereby to obtain, for every day, the *Longitudes*, *Latitudes*, *Right Aſcenſions*, *Declinations*, *Proper motion*, *Angle* of the *Ecliptick* and the *Æquator*, and the *Nodes* of that Comet; for the conſtruction of an *Ephemerides* of its whole Motion. From all which he pretends to prove, that he has not erred in his Obſervation of *February* 18. nor been prepoſſeſt by any *Hypotheſis*, nor deluded by any *Fixt Star*, as M. *Auzout* thinketh; but that near the *Firſt Star* of *Aries* there *then* appear'd a *Phænomenon*, moſt like to that Comet, that was ſeen ſome dayes before, if compared with the Obſervations made thereof *Febr.* 12, 13, 14. Though he will not hitherto poſitively determine, whether that *Phænomenon*, which appear'd to him *February* 18. was

indeed that very Comet, which he ſaw with his naked Eye, and obſerved with his Geometrical Inſtruments, the ſaid 12, 13, and 14. dayes of *February*; or whether it was another, and whether he had loſt that Comet, which moved towards the *Second Star* in *Aries*: but leaves it to the Learned World, and particularly to the *Royal Society*, after they ſhall have well examined and conſidered all his Obſervations, and the *Calculus* raiſed therefrom, to judge of this, and the other particulars in controverſie.

II. *Iſaacus Voſſius de* N I L I *et* A L I O R U M F L U M I N U M O R I G I N E. It was *Numb.* 14. of theſe *Tranſactions*, that gave an account of the *Cauſe* of the *Inundation of the Nile*, as it was rendred by Monſieur *de la Chambre*: *This* is to give you another, not only of the *Inundation*, but alſo of the *Origine* of that, and of *other Rivers*, as it is delivered by Monſieur *Iſaac Voſſius*, who undertakes in this Book to ſhew;

1. That thoſe *Subterraneous Channels*, through which ſeveral *Philoſophers* teach, that the Sea diſcharges it ſelf into the Rivers, are not only imaginary, but uſeleſs, in regard 'tis impoſsible for the water to riſe from the Subterraneous places up to the Mountains, where commonly the Sources of Rivers are.

2. He explicates, why, if a Pipe be put into a Baſon full of Water, the water is ſeen more raiſed in the Pipe, than in the Baſon, and riſes higher according as the Pipe is narrower; On the contrary, if the ſame Pipe be put into a Baſon full of Quickſilver, the Quickſilver ſtayes lower in the Pipe, than in the Baſon. The reaſon, which he renders hereof, is, That as the Water ſticks eaſily to all it touches, it is ſuſtain'd by the ſides of the narrow Pipe wherein it is included: And indeed, if the Pipe be quite drawn out of the Water, the Water doth not all fall out, but ſo much of it remains, as the ſides of the Pipe could ſuſtaine: Whence it is, that the Water which is kept up by the Walls of the Tube, weighing no longer upon that which is in the Baſon, is thruſt upwards, and keeps it ſelf raiſed above its Levell; but the Quickſilver not adhering ſo eaſily, as Water, to Bodies it touches, is not ſuſtained by the ſides of the Tube, and ſo mounts not above its Levell, but rather deſcends below it, becauſe the Pipe, which is ſtreight, hinders the endeavor that is in the *Mercury* to riſe to its Level. He adds, that this Obſervation makes nothing for the Explication of the *Origine of Rivers*; becauſe, though it be true, that the Water

by

by this means riſes above its Levell, yet it does never run ou at the top of the Pipe. Having ſaid this, he anſwers to the o ther Arguments, commonly alledged to maintain this Opinion.

3. He pretends, that all Rivers proceed from a *Colluvies* or *Rendevous* of Rain-waters, and that, as the Water, that falls upon *Hills*, gathers more eaſily together, than that which falls in *Plaines*, therefore it is, that Rivers ordinarily take their Source from *Hills*. Thence alſo comes it (ſaies he) that there are more *Rivers*, than *Torrents*, in the *Temperate Zones*; and, on the contrary, more *Torrents*, than *Rivers*, in the *Torrid Zone*: For, as in hot Climats the Mountains are far higher, the Water, that deſcends from them with impetuoſity, runs away in a little while, and formes ſuch Collections of Water, as ſoon dry up; but in cold Climats, the Waters do not run away but ſlowly, and are renew'd and recruited by Rain, before they are quite dryed up; becauſe the Hills are there lower, and ſo the Bed of Rivers hath leſſe declivity.

Having thus diſcourſed of *Rivers* in *General*, he treats of the *Nile* in *particular*; and there

1. Obſerves, That the Order of the Seaſons of the Year is quite inverted under the *Torrid Zone*. For, whereas it ſhould be then Summer, when the Sun is near; and Winter, when the Sun is farther off: Under the *Torrid Zone* 'tis never leſſe hot, than when the Sun is neareſt; nor more hot, than when the Sun is fartheſt off: So that to the people that live between the *Æquinoctial* and the *Tropicks*, Summer begins about *Chriſtmaſs*, and their Winter, about St. *Johns* day. The reaſon whereof is, (*ſaith he*) that when the Sun is directly over their Heads, it raiſes abundance of vapors, and draws them ſo high, that they are preſently converted into Water by the coldneſſe of the Air; whence it comes to paſſe, that then it rains continually, which does refreſh the Air; but when the Sun is farther off, there falls no more rain, and ſo the Heat becomes inſupportable.

2. He proves by many recent Relations, that the *Sources* of the *Nile* are on this ſide of the *Æquinoctial* in *Æthiopia*; of which he gives a very accurate *Mappe*, correcting many faults which *Geographers* are wont to commit in the Deſcription of the Kingdom of the *Abyſſins*, which they believe to be much greater than indeed it is.

3. This ſuppoſed, he eaſily gives an account, why the *Nile* yearly overflows about the end of *June*: For, as at that time there falls much rain in *Æthiopia*, it muſt needs be, that the *Nile*, whoſe ſource is in that Country, ſhould then overflow, when thoſe rains begin, and ſubſide, when they ceaſe.

There are beſides, in this Book, two other *Tracts*, In the *firſt*, M. *Voſſius* endeavours to maintain the Doctrine, he had deliver'd in his Book *De Lumine*, and to ſhew, that the *Soul* of Animals is nothing but *Fire*, that there are no inviſible Atoms; nor ſo much as any Pores, even in the Skin of man. Here he treats alſo of *Refractions*, and alledges the Examples of ſeveral perſons, who have then ſeen the Sun by the means of Refraction, when really He was under the *Horizon*.

In the *ſecond*, He diſcourſes of ſome points of the *Mechanicks*; and relates among other things, that the *Arrows* and *battering Rams* (*Aries*) of the Antients did as much execution, as our *Muskets* and *Canons*; and then, that the Vehemence of the percuſſion depends as much upon the Length of the percutient Body, as upon the velocity of the Motion. He adds, that the Length of a Canon ought not to exceed 13 foot, and that a greater length is not onely uſeleſs, but hinders alſo the effect of the Gun, not becauſe the Bullet is thrown out of the Gun, before all the powder is fired (as ſome believe;) but becauſe the Bullet is then beaten back into the Gun by the Air, re-entring into it with impetuoſity, when the flame is extinct.

III. *LE DISCERNEMENT DU CORPS ET DE L' AME*, par M. *de Cordemoy*.

This *French* Treatiſe (but very lately come to the *Publiſher's* hands) examines the different Operations of the Soul and Body, and the Secret of their Union, pretending to diſcover to every one, what he is, and what is tranſacting within him. It conſiſts of ſix Diſcourſes.

1. In the *firſt*, the Author examines the Notions, we have in *general* of *Bodies* and *Matter*; of *Quantity*; of *Qualities*; of *Place*; of *Reſt*; of *Motion*; of *Vacuity*; of *Forms*: to ſhew what is to be underſtood by theſe Terms, which cauſe all the perplexity that is in the ordinary *Phyſicks*. He begins with taking notice, that hitherto *Philoſophers* have had no *diſtinct* notions of *Bodies* and *Matter*; from the want whereof he conceives, that almoſt all the Errors in Common *Phyſiology* have ſprung.

ſprung? To rectify which, he defines *Bodies* to be * *Extended Subſtances*, and *Matter* an *Aggregate of Bodies*. Whence he inferrs, that *Bodies* are Indiviſible and *Matter* diviſible; a *Body* being nothing but *one* and the *ſame* ſubſtance, whoſe different extremities are inſeparable, becauſe they are the extremities of one and the ſame Extenſion, and, in a word, of one and the ſame Subſtance: but *Matter* being nothing but an Aſſociation or Collection of Bodies, 'tis evident, (*ſaith he*) it muſt be diviſible. This doctrine he ſo much inſiſts upon, that he conceives, Nature cannot ſubſiſt, if a Body in the ſence he takes it, be diviſible; and that *Motion* and *Reſt* cannot be explicated without it. As for *Quantity*, he makes that to be nothing but More or Leſs Bodies; not allowing, that each Body ſhould be a Quantity, though it be a part of Quantity; no more than an *Unite* is a Number, though it make part of a Number: ſo that *Quantity* and *Extenſion* are two diſtinct things with him, the *firſt* belonging properly to *Matter*, the laſt to a *Body*. Touching *Vacuity*, he conceives, that the Bodies, which compoſe a maſs, are not every where ſo near one another, as not to leave ſome interval in ſeveral places. Neither does he think it neceſſary, that thoſe intervals ſhould be fill'd up; nor unconceivable, that there ſhould be no Body between two Bodies, which touch not one another. And when 'tis ſaid, that thoſe intervals cannot be conceived without Extenſion, and that conſequently there are Bodies that repleniſh them, he frankly pronounces that not to be true; and affirms, that though it may be ſaid, that between two Bodies, which touch not one another, other Bodies may be placed of ſo or ſo many feet, &c: yet ought it not to be inferred, that therefore they *are* there, but onely, that they are thus placed, that there *may* be put between them ſo many Bodies, as joyned together would compoſe an Extenſion of ſo many feet. So that one conceives onely, that Bodies *may* be placed there, but not that they *are* there: and as we can have an *Idea* of many Bodies, though none of them be in being; ſo we can conceive, that ſome Bodies *may* be put between others, where really there are none. And when 'tis alledged, that if all the Bodies, that fill a veſſel full, were deſtroyed, the ſides of the veſſel would be cloſed together; He profeſſes, he underſtands not that ratiocination, nor can conceive, what one Body does to the ſubſiſtence of another, more than to ſuſtain themſelves mutually, when they are thruſt by the neighbouring ones: and therefore ſees not, why the ſides of the veſſel ſhould cloſe, if nothing did thruſt them together; but underſtands clearly, that two Bodies may well ſubſiſt ſo far from one another, that one might place a great many Bodies between them, or none at all, and yet they neither approach to, nor recoil from one another.

* *It ſounds hard, To ſay, An* extended *ſubſtance is* indiviſible.

2. In the *Second*, he examines the *Changes*, which he knows in Matter, and makes it his buſineſs to explicate all thoſe that reſpect *Quantity*, *Qualities* and *Forms*, by *Local Motion*, eſteeming their needs no other.

3. In the *third*, he explains the Motion of *Artificial* Engins, and that of *Natural* ones, by one and the ſame Cauſe; endeavouring among other things to ſhew, that the Body of an Animal is moved after the ſame manner with a Watch. That cauſe of motion he makes the *Materia Subtilis*; and the finer or ſubtiler that is, the better and fitter he conceives it to be to preſerve Motion.

4. In the *Fourth*, he teaches, that though Experience ſeems to evince, that the Soul moves the Body, and that one Body moves an other; yet there is nothing, but God, that can produce any motion in the World, and all other Agents, which we believe to be the *Cauſe* of this or that Motion, are no more but the *Occaſion* thereof. In doing this, he advances certain *Axioms*, and Concluſions, which are in ſhort,

a. The *Axioms*: That no ſubſtance has that of it ſelf, which it can looſe, without ceaſing to be, what it is: That every body may looſe of its motion, till it have no more left, without ceaſing to be a Body: That we cannot conceive but two ſorts of ſubſtances, *vid.* a *Spirit* (or *That which thinketh*) and a *Body*, wherefore they muſt be conſidered as the Cauſes of all, that happens, and what cannot proceed from the one, muſt neceſſarily be adſcribed to the other: That to *Move*, or to cauſe motion, is an Action: That an Action cannot be continued but by the Agent, who began it.

b. The *Concluſions*; That no *Body* hath Motion of it ſelf: That the Firſt Mover of Bodies is not a Body: That it cannot be but a *Spirit*, that is the Firſt Mover: That it cannot be but the ſame Spirit, who has begun to move Bodies, that continues to move.

In the *Fifth*, He treats of the Union of the Body and Soul, and the manner, how they act one upon the other; and eſteems it not more difficult to conceive the Action of Spirits upon Bodies, and of Bodies upon Spirits, than to conceive the Action of Bodies upon Bodies: the cauſe of the great difficulty in underſtanding the two former, ariſing (according to him) from thence, that we will conceive the one by the other, not conſidering, that every thing acting according to its own nature, we ſhall never know the action of one Agent, if we will examine it by the notions we have of another, that is of a quite differing nature. Here he notes, that the Action of Bodies upon Bodies is not more

more known to us; than that of Spirits upon Bodies, or of Bodies upon Spirits; and yet moſt men admire nothing but *this*, believing to know the *other*: whereas he Judges, that all things being well examin'd, the Action of Bodies upon Bodies is no more conceivable, than that of Spirits upon Bodies. Mean while the opinion of the Authour touching this ſubject, is, That the union of Soul and Body conſiſts onely in this, that certain motions of the Body are followed by certain *Cogitations* of the Soul, and, on the contrary, that certain Thoughts of the Soul are follow'd by certain *Motions* of the Body. And, having ſuppoſed, that Bodies are ſaid to act upon one another, when they cauſe ſome change ſuitable to Extenſion; and Spirits to act upon one another, when they cauſe ſome change ſuitable to a Thought; he infers, that when a Body acts upon a Spirit, that cannot be by cauſing any change of motion, of figure, or parts, as having none of all theſe; nor when a Spirit acts upon a Body, that cannot be by producing any change of Thought, as having none: But, when this Body, or its motion, or figure, or other thing, depending upon its nature, can be perceived by a Spirit, ſo as, upon that occaſion, this Spirit has thoughts, it had not before, it may be ſaid, that the Body has acted upon this Spirit, for as much as it has cauſed all the change in it, whereof it was capable according to its nature.

In the *Sixth*, After he hath ſhew'd, what is to be underſtood by what we call *Soul*, and by what we call *Body*, he labours to make it out, that we are much more aſſured of the Exiſtence of the Soul, than of that of the Body, which he conceives he can prove from hence, that we cannot doubt, that we think, becauſe even doubting is thinking; but one may doubt, whether one has a body, for ſeveral reaſons, which he alledges, and thinks ſo cogent, that he concludes, it is not evident to him by the light of reaſon, that he has a Body. But ſuppoſing, there be Bodies, he examines, what are the Operations, that belong to the Soul, and what thoſe, that belong to the Body; and laſtly, what thoſe, that reſult from the Union of both: And then explains, how all thoſe operations are perform'd, and particularly, *Senſation*; where he ſhews, that the Nerves, holding at one end to the Brain, whereof they are but Allongations, and being at the other end extended to the extremities of the Body; when an Object comes to touch thoſe exterior ends of the Nerves, the interior ones in the Brain are preſently ſhaken, and cauſe different ſenſations according to the diverſitie of Nerves, and the differing manner, in which they are ſhaken. And to ſhew, that 'tis this ſhaking, that cauſes Senſation, he notes, that if any thing ſhakes the interior parts of the Nerves, though the object be abſent, the Soul has preſently the ſame ſenſations

ſations, as it would have, if it were preſent. As, if one ſhould knock on's head forcibly againſt a wall, the ſhaking, which the blow gives to the Brain, moving the interior extremities of the Nerve, which cauſes the ſenſation of Light, the Soul has the ſame ſenſation, which it would have, if it ſaw a thouſand Candles: On the contrary, if the interior extremities of the nerves are not ſhaken, though the object be preſent, it cauſes no ſenſation; whence it comes, that if a ſtrong Ligature be made upon the middle of the Arm, and the hand be then prickt, no pain is felt, becauſe the ſhaking of the nerves that are pricked, being ſtopped by the Ligature, cannot reach to the extremities of the Nerves, that are within the Brain.

Advertiſement.

The following *Errata*, left by the *Preſs* in *Num.* 16, the *Reader* is deſired thus to correct.

PAge 269. lin 27. read, *motion of B. above the Center*; *G. is alſo*, with a *Semi-colon* after the word *Center*. p. 274. l. 13, r. *it to do to the*. p. 277. l. 24. r. *natural days*. p. 281. l. 16. r. *of his*. ib l. 27. r. *a notion*. p. 293. l. 4. r. *enough without*. ib. l. 43. r. *to the Sine of*. p. 294. l. 1. r. *to the Sine of*.

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