

Accounts of BOOKS.

Propositiones Hydrostaticæ ad Illustrand. Aristarchi Samii Systema destinatae, & quædam Phænomena Naturæ Generalia. Auth. Francifco Jefop, Arm. Lond. 4to. 1687.

THIS Book contains an Hypothesis, and Demonstration thereupon, concerning the Nature of Bodies and their motions. The Author defines a dense Body to be that which hath least Vacuity. A Bubble a rarer Fluid in a more Solid: a Drop a denser Fluid in a more Rare. His Position is, That a dense Body is more potent than a rare. His Supposition is, That in a Body mixt of these two, both endeavour to recede from the Center of it: And thence his first Proposition is, That the most dense Parts will get out most, the less dense will remain in inner Stations, which he calls natural. 2. He supposes, any other Body immers'd in this will find and take its natural Station, according to its comparative Density: the endeavour to go to this natural Station, if downwards, is Gravity; if upwards, is Levity. These Bodies are compress'd by External Bodies. Thence, 4. he concludes, Spherical figured Bodies to have least of any figured Bodies of this Compression. 5. Hence, That denser and rarer Bodies will not mix, but 6. the inclosed will be prest by the other into a Spherical Body, a Drop, or a Bubble. 7. If the Figure be altered, it will have an endeavour to restore itself. 8. Lesser Globules will have more of that endeavour; whence a greater broken into lesser Globules produces more of this endeavour outward. 9. That a Globule, in its natural place, is easily dissipated. 10. The nearer a Globule is to its proper place, the less is its Gravity or Levity. But, 11. In a turbid Body the denser parts will settle about the Center, the rarer outwards: those he calls a *Terrella*, these an *Atmosphere*: This Compound will find
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its natural station with respect to others: two of these meeting, may coalesce, and make one *Terrella* and one *Atmosphere*; many of them will make a *Terra*. If two or more of these touch, and do not mix, they will be difficult to be separated: the more there are of these in the same space, the harder they will be to be separated: hence he deduces a Problem, That 'tis possible to diminish Bodies, that the Coherence thence arising shall be greater than a given Power: this he supposes the cause of Hardness. His next Position is, That a heating Globule immers'd in a terminated Fluid, whether Spherical, or Oval, will settle itself in the Center of Gravity of it: but if through this Fluid there be a passage to another Fluid, the heating Body will be put out of that Center into the *Focus* of the Oval: The Conflict between the included and passing Particles will create a *Vortex*, whose included matter shall move exactly as the Elliptical Hypothesis of the Planets supposes, and answer not only to that but to any other Hypothesis.

The Application of this Hypothesis he explains in a Letter to Mr. *Aston*; in which he expresses his Esteem of *Aristarchus*, the vindicating whose Honour, put him, about two years since upon these Principles, which he in the *interim* digested, and sent to the *Oxford* Society; from whom receiving no Objections, he thought good to publish now: and that because they serve to explain not only the *Aristarchian* but the *Ptolomaick*, *Tychonick*, and perhaps any other System of the World, and any kind of Philosophy, not ridiculous at first sight, whether a *Vacuum* be asserted or denied. But as to *Elasticity*, he does not assert these Principles to have given the only cause, nor that they can explain Vegetation without an *Anima*; but he supposes them sufficient to explain Cohesion. He explains a threefold effect of Pressure;

1. That which acts on a Body in its own place: 2. That which presses it towards the Center when out of its place: 3. The difference between the Moment and Impediment tending upwards or downwards. Thus far he communicated

cated to the *Oxford Society*. To this he adds *quatuor Lemmata de novo*, which he applies to the Explication of *Cartesius* his System, supposing the matter between the *Vortices* that join to that of the Sun, to influence that by its Ingress, so as to keep the Sun in the *Focus* of the *Elliptick Vortex*. This premised, he subjoins his first Lemma, where he presents the Sun in the Center of Gravity of its System without *Vortex* or turbinated motion: in the second he directs it to the *Focus* of the *Ellipse*: in the third he generates the *Vortex* by the conflict of the entering and contain'd matter, exactly agreeing with the Phænomena; and turns round the Sun by the motion of the *Vortex*, giving the Planets their exact Motions, which they cannot deviate from.

Lastly, He generates Earths or Planets by the Coalition of many smaller into greater Bodies: these he explains more particularly from his Principles; and then answers two Objections which may be made against it (as he conceives) and a third which a Demonstration of Mr. *Newton's*, upon a Supposition of his, doth directly oppose: to which he answers, That that Hypothesis ought to be corrected; and gives his Reasons which he thinks sufficient. He disapproves of the Hypothesis of the Planets gravitating upon each other, and explains his Reasons from the similitude of a Ship in the Water; and ends his Epistle with this Conclusion, That though the Moon were a thousand times bigger than the Earth, it would not be able to move the least Sand out of its place, if that were the Center of the Earth: the like he supposes of the other Planets, with respect to the Sun.

Tabularum Astronomicarum pars prior, de motibus Solis & Lunæ, necnon de positione fixarum, ex ipsis Observationibus deductis: cum usu Tabularum, &c. Authore Ph. de la Hire Regio Mattheſeos Professore ac Regiæ Scientiarum Academiæ Socio. 4to. Parisiis. 1687.

THIS Author, long since eminent for his Skill in Geometry, does now succeed the accurate Mr. *Picart* in the Royal Observatory at *Paris*, and this Book is the first Fruits of his Astronomical Endeavours. It is chiefly designed to teach an accurate method of *Calculus* for Eclipses, especially Solar; where he makes use of the Contemplation of the Constructions of them, by the parallel of Latitude supposed to be projected into an *Ellipsis*, which is here attributed to the excellent Mr. *Cassini*, tho' first published in *English* by Mr. *Flamsteed* in Sir *Jonas Moor's* Works, under the Title of *The Doctrine of the Sphere*, and there asserted to its first Inventor Sir *Christopher Wren*.

What is most considerable in this Book is, the large Table of the Longitudes and Latitudes of Places, chiefly in *France*, which have been taken by the King's Order, with great exactness, and may possibly be inserted in the next *Transaëtion*. 2. A Table of the right Ascensions and Declinations of sixty three principal fixt Stars, to the Year 1686. compleat, deduced from new and accurate Observations. 3. An Empirical Table of the Moon's Equations in the New and Full; deduced simply from Observations of Eclipses: here the greatest is made $4^{\circ}. 57'. 44''$. and the rest nearly oscillatory, or equal at equal distances either from *Apogæon* or *Perigæon*, which our Mr. *Street*, in his *Astronomia Carolina*, has made precisely so, only his greatest Equation is about three minutes bigger. 4. A Correction of the Moon's Motion, arising

sing from the distance of the Moon from the *Apogæon* of the Sun, or which is all one, from the Anomaly of the Sun; about the Invention whereof, there is a Dispute between this Author and one Mr. *Le Febure*, each of them esteeming it a Discovery worth contending for. Mr. *De la Hire* makes the greatest quantity of this Equation to be thirteen minutes, in the mean distance of the Sun, to be added to the Moon's place in *September* and substracted in *March*; which *Le Febure* allows to be but 11'. 9". If there be any thing due to the first Proposer of this Discovery, it will appear that neither the one or the other of these Pretenders have any just claim to it; for that it is conceived, that the whole matter is fully and amply set forth in the Appendix to the Catalogue of the Southern Stars, published in *London* by *E. Halley* in the Year 1679, and soon after translated into *French*, and printed in *Paris*; witness the *Journal des Scavans* of *Sept. 4. 1679*. There these *Messieurs* might have read, under the Title of *Quædam Lunariorum Theoriæ Emendationem Spectantia*, the following Passage, *Quoniam tantas inæqualitates in Terræ revolutionibus non patiuntur Horologia, necesse est Lunam ipsam citatiori motu ferri in sua orbita, quum Terra est Aphelia, remissiorum in Perihelio ita ut omnium accelerationum summa mense Septembri, ad tredecim minuta circiter assurgat. Retardationes vero omnes aggregatæ, mense Martio, tantundem efficiant. Adhibeatur itaq; ista temporis æquatio quæ Terræ motum diurnum æquabilem statuit; in Calculo vero loci Lunæ, medio Lunæ motui addenda est nona pars æquationis Solis sublativæ, auferenda vero ab eo, si æquatio sit additiva*: wherein is contained not only the Form of this Equation of the Lunar Motions, but the very quantity, *viz.* thirteen Minutes, exactly as Mr. *De la Hire* has it. Hence it should seem, either that this inequality is most justly stated by the exact Coincidence of the Conclusions of two so different Enquirers; or that the latter having seen the afore-cited Passage, and finding it warranted by Observation;

tion, might think it an Invention not unworthy a *Frenchman*: And whereas Mr. *De la Hire* seems to conclude, that this Equation ceases in the Quadratures, and is greatest in the New and Full Moons; when he comes to the consideration of the Lunar Motions *extra Syzygias*, (which is here promised) he will find it no less requisite in the Quadratures than in Eclipses; several undoubted Observations shewing the Necessity thereof.

Among the Precepts for the use of the Tables, there is a pretty Remark concerning Refractions, which this Author saith he hath often experienced, *viz.* That the Beams of the Stars being observed in a deep Valley to pass near the Brow of the Hill, are always more refracted than if there were no such Hill, or the Observations were made on the top thereof; as if the Rays of Light were bent downwards in a Curve, by passing near the Surface of the Mountain.

The Report made to his Majesty by the Company of Parish-Clerks of London, of the Number of Christnings and Burials in the Years 1686 and 1687.

| | <i>Anno 1686.</i> | | <i>Anno 1687.</i> | |
|-----------|-------------------|-------|-------------------|-------|
| Christned | Males | 7575 | Males | 7737 |
| | Females | 7119 | Females | 7214 |
| | In all | 14694 | In all | 14951 |
| Buried | Males | 11828 | Males | 11174 |
| | Females | 10781 | Females | 10286 |
| | In all | 22609 | In all | 21460 |