

PHILOSOPHICAL TRANSACTIONS.

Munday Septemb. 9. 1666.

The Contents.

Observations made in several places (at London, Madrid and Paris,) of the late Eclipse of the Sun, which hapned June 22. 1666. Some Enquiries and Directions, concerning Tides, proposed by Dr. Wallis. Considerations and Enquiries touching the same Argument, suggested by Sir Robert Moray. An Account of several Books lately publish'd: Vid. 1. Johannis Hevelii Descriptio Cometæ, A. 1665. exorti; una cum Mantissa Prodromi Cometici. 2. Isaacus Voffius de Nili & aliorum Fluminum Origine. 3. Le Discernement du Corps & de l'Âme, par Monsieur de Cordemoy.

Observations made in several places, Of the late Eclipse of the Sun, which hapned on the 22 of June, 1666.

THE Observations that were made at London by Mr. Willughby, Dr. Pope, Mr. Hook, and Mr. Philips, are these:

The Eclipse began at 5h. 43'		h.	
It was dark- ned.	} diam. _____ 4 digits _____ 5 dig. _____ 6 dig. _____ 7 dig. _____ 6 dig. _____	at 6. 00	5 dig. _____ at 7. 06
		at 6. 07	4 dig. _____ at 7. 13
		at 6. 13	3 dig. _____ at 7. 20
		at 6. 21	2 dig. _____ at 7. 26
		at 6. 39½	1 dig. _____ at 7. 32
		at 6. 57	0 dig. _____ at 7. 37

Its Duration hence appears to have been one hour and 54 m. Its greatest Obscurity somewhat more than 7. digits. About the middle, between the Perpendicular and Westward Horizontal Radius of the Sun, viewing it through Mr Boyle's 60. foot-Telescope, there was perceived a little of the Limb of the Moon without the Diske of the Sun: which seemed to some of the Observers to come from some shining Atmosphere about the Body either of the Sun or Moon.

They affirm to have observ'd the Figure of this Eclipse, and measured the

R

Digits

Digits, by casting the *Figure* through a 5 foot *Telescope*, on an extended paper, fix't at a certain distance from the Eye-glasse, and having a round figure; all whose *Diameters* were divided, by 6 *Concentrick* Circles, into 12 *Digits*.

THE Observations made at *Madrid* by a Noble Member of the *Royal Society*, His Excellence the Earle of *Sandwich*, as they were sent to the Right Honourable, the Lord Vice-Count *Bronnker*, are these;

The *Eclipse* began at *Madrid* about 5 of the Clock in the morning, at 5 h. 35'. the *Suns* *Altitude* was 6 deg. 55'.

The *Middle* of it was at 6 h. 2'. the *Suns* *Altitude*, 15. deg. 5'.

The *End* was exactly at 7 h. 5'; the *Suns* *Altitude*, 25. deg. 24'.

The *Duration*, 2 h. 4'.

37. Parts of the *Suns* diameter remained light.

63. Parts of the same were darkened.

THE Observations made at *Paris* by Monsieur *Payen*, assisted by several *Astronomers*, as they were printed in *French*, and addressed to Monsieur de *Montmor*, are these;

The *Eclipse* began there, at 5 h. 44'. 52". *mane*. It ended at 7 h. 43'. 6". So that its *Whole* *Duration* was 1 h. 58'. 14". The *greatest* *Obscuration* they assign to have been 7. dig. 50. m. but they adde, that it seem'd to have been greater by 3 minuts; which M. *Payen* imputes to a particular motion of *Libration* of the *Suns* *Globe*, which entertain'd that *Luminary* in the same *Phasis* for the space of 8. *min.* and some *seconds*, as if it had been stopped in the midst of its *Course*; rather than to a tremulous *Motion* of the *Atmosphere*, as *Scheiner* would have it.

They intimate that they took the time of each *Phasis* from half *digit* to half *digit*, as well by a *Pendulum*, as by the *Aititudes* of the *Suns* *Center* above the *Horizon*, corrected by the *Verticall* *Paralaxes* and *Astivall* *Refractions*, by which they judg'd, that though the *Time* by the *Pendulum* may be sufficient for *Mechanicall* *Operations*, yet 'tis not exact enough for establishing the *Gröunds* of true *Astronomy*.

They further conceive that the apparent *Diameters* were almost equal; seeing that in the *Phasis* of 6. *Digits*, the *Circumference* of the *Moons* *disk* passed through the *Center* of that of the *Sun*, so as that two *Lines* drawn through the two *Horns* of the *Sun*, made with the *Common* *Semi-diameter* two *Equilateral* *Triangles*.

Next, they affirm, That there was so great a *Variation* in the *Paralaxes*, by reason as well of the *Refractions* of the *Air*, which environs the *Earth*, as of the *Alteration* of the *Air*, which encompasses the *Moon*, that the *Horns* of the *Sun*, there formed by the *Shaddow* of the *MOON*, appeared in all kinds of *Figures*; Sometimes inclined to the *Vertical*, sometimes *Perpendicular* to the *Horizon*, and at last *Parallel*; the *Convex* part respecting the *Heaven*, and the *Concave*, the *Horizon*. By the crossing (so they go on) of the

Horns

Horns with the *Angles of Inclination*, it will be easie to those, that have exactly observed them, and that are skill'd in the higher *Astronomical* Calculations, to compute the *true Place* of the *Moon* in her *Orbite*, that so it may be compared with that of the *Tables*, and with that, which has been observ'd in other places, for the more precise determining of the *Difference* of *Meridians* (that being the way, esteem'd by *Kepler* the most certain) and for making a good Judgment of the defect or exactness of the *Celestial Tables*.

Then they observe, That the *Beginning* and the *Middle* of this *Eclipse* hapned to be in the *North Eastern Hemisphere*, and the *End*, in the *South-Eastern*. The *first Contact* (as 'twere) of the two *Disks* was observ'd in the *Superior Limb* of the *Sun's Disk* in respect to the *Vertical Line*, and in the *Inferior* in respect to the *Ecliptick*: But the *Middle*, and the *End* were seen in the *Superior Limb*, in respect both to the *Vertical* and the *Ecliptick*: And (what to this Author seems extraordinary) both the *Beginning* and the *End* of this *Eclipse* hapned to be in the *Oriental* part of the *Sun's Disk*.

Lastly, they take notice, that by their *Observations* it appears, that there is but little exactness in all the *Astronomical Tables*, predicting the *Quantity*, *Beginning* and *Duration* of this *Eclipse*; Those of *Lansbergius* importing, That the *Obscuracion* should be of 10. dig. 48'; those of *Ricciolo*, of 9. dig. 1'; and those of *Kepler*, of 7. dig. 30'. 16": Again, that the *Duration* should be of 2 h. 2'. Lastly, The *Beginning* did anticipate the *Ricciolan Tables* by 5. *minuts*; the *End* by 23; and the *Middle*, almost by 11. In the mean time the Author notes, that the *Rudolphin Tables* come nearest to the *Truth*; and withal assures the *Reader* of the goodnesse of the *Instruments* employed in his *Observations*, and of the singular care, he, together with his skilful *Assistants*, took in making them.

Some Inquiries and Directions concerning Tides, proposed by Dr. Wallis, for the proving or disproving of his lately publish'd Discourse concerning them.

The Inquisitive *Dr. Wallis*, having in his lately printed *Hypothesis* of *Tides* intimated, that he had reason to believe, that the *Annual Spring-tides* happen to be rather about the beginnings of *Febr.* and *Nov.* than the two *Equinoxes*, doth in a late Letter to the *Publisher*, written from *Oxford* in *Aug.* last, desire, *Sea*; some understanding Persons at *London*, or *Greenwich*, but rather nearer the *Sea*; that or upon the *Sea-shore*, would make *particular* *Observation* of all the *Spring-Tides* (*New-Moon* and *Full-Moon*) between this and the *End* of *November*; and take account of the *Hour*, and of the *Perpendicular height*: that we may see, whether those in *September*, or those of *November* be highest: And it were not amiss, the *Low waters* were observed too. Which may be easily done by a mark made upon any standing *Post* in the *Water*, by any