

white Tail, much narrower than the Mock-Sun, but which I took to be a Segment of the white Circle which I once saw entire in *London*. Had the Air been clear, I doubt not but much more of the Phenomena of the *Parbelia* might this Time have been observed: and I hope, that from our Neighbourhood some Member of the *Society* may furnish us with a fuller Relation. But how to explain these Appearances, and account for the Magnitude of these Circles, is what seems still wanting.

III. *An Account of two Mock-Suns, and an Arc of a Rainbow inverted, with an Halo, and its brightest Arc, seen on Sunday and Monday, Octob. 22, & 23. 1721. at Lyndon, Comitatus Rutland, communicated by the Rev. Mr. William Whiston, M. A. sometime Professor of the Mathematicks in the University of Cambridge.*

ABOUT Ten o'Clock in the Morning, on *Sunday, Octob. 22. 1721.* being at the House of *Samuel Barker, Esq;* of *Lyndon* in the County of *Rutland*, after an *Aurora Borealis* the Night before (Wind W. S. W.) I saw an Attempt towards two *Mock-Suns*, as I had done sometimes formerly, of which I immediately inform'd *Mr. Barker*, though without any great Expectations of what followed. About $\frac{1}{2}$ or $\frac{3}{4}$ of an Hour after, I went to view the Heavens, and then found the Appearance compleat; and when *Mr. Barker* and others of the Family were call'd, we all saw it, and all saw

saw indeed what we had none of us seen before; I mean two plain *Parbelia*, or *Mock-Suns*, tolerably bright and distinct; and that in the usual Places, *viz.* in the two Intersections of a strong and large Portion of an *Halo*, (*Fig. I.*) with an imaginary Circle, parallel to the Horizon, passing through the true Sun. I call this Circle here *imaginary*, because it was not itself visible, as it sometimes has been at such Appearances. Each *Parbelion* had its Tail, of a white Colour, and in direct Opposition to the true Sun; that towards the East was 20 or 25 Degrees long; that towards the West about 10 or 12 Degrees; but both narrowest at the remote Ends. The *Mock-Suns* were evidently red towards the Sun, but pale or whitish at the opposite Sides, as was the *Halo* also. Upon casting our Eyes upward, we saw an Arc of a curious *inverted Rainbow*, about the Middle of the Distance between the Top of the *Halo* and our *Vertex*. I mean this, when Allowance is made for the usual Inequality, that appears between the same Number of Degrees, nearer to and remoter from that *Vertex*. This Arc was as distinct in its Colours as the common Rainbow; and, with the like Allowance as before, of the same Breadth. The red Colour was on the Convex, and the blue on the Concave of the Arc; which seemed to be about 90 Degrees long: Its Center in or near our *Vertex*. On the Top of the *Halo* was a kind of inverted bright Arc, though its Bend was not plain. The lower Part of the *Halo* was among the Vapours of the Horizon, and not visible. The Angles, especially as more exactly measured on *Monday*, near Noon, when the same Appearance return'd again, but more faintly, were as follows: Sun's Altitude $22^{\circ} \frac{1}{3}$; perpendicular Semidiameter of the *Halo* $23^{\circ} \frac{1}{3}$; Distance of the *Rainbow* from the Top of the *Halo* $23^{\circ} \frac{1}{3}$; Semidiameter of the Arc of the

the *Rainbow*, if our *Vertex* be suppos'd its Center, 21°. The *Phanomenon* lasted each Day for an Hour and an half, or two Hours. What was most remarkable on *Monday* was that the Wind, which on *Sunday* had been almost insensible, was now become sensible, and changed to N. N. E. that the *Halo* was sensibly become *oval*; its shorter Axis parallel to the Horizon; and the two *Mock-Suns*, which were then but just visible, especially that on the East, were not in the *Halo*, but a Degree or two without it, which I ascribe to the unusual Shortness of the Horizontal Diameter; which Position of the *Mock-Suns* does not appear to have been hitherto taken Notice of by any, though it was now very sensible.

On *Thursday* Morning, *Octob.* 26. as I was coming in the *Northampton* Coach towards *London*, about 9 o'Clock, the *Halo* returned larger and clearer than before; and the two *Mock-Suns* just attempted an Appearance therein, as on *Sunday*; but the Air becoming thicker and thicker towards Rain, I saw them no more. I add nothing to this Account, but only, that *Aug.* 30. before, I saw at the same Place *Rutland* a remarkable *Halo*, whose upper Part had its inverted Arc reddish within, and pale without, but brighter and more vivid than ever I saw in my Life: That we had there, *Sept.* 11. in the Evening, the lightest and most remarkable *Aurora Borealis*, with its unaccountable Motions and Removals, that ever I saw; excepting that original one, *March* 6, 1711: That it was seen in *Northamptonshire*, at the *Bath*, and elsewhere: That the *Vertex* of the Columns which shot upwards, was not our *Vertex*, but evidently 15 or 20 Degrees distant towards the South; and that the Wind was in *Rutland* North, as I observed myself; at the *Bath* West, as Mr. *Molyneux* observed; and, as I am inform'd by Sir *Robert Clarke*, in *Northamptonshire*

amptonsbire South ; all at the same Time, which deserves particular Reflection. But then, if any Reader expects here the *Solution* of all these *Phænomena*, he is to know, that as to these *Northern Lights*, Dr. *Halley* has communicated his Thoughts to the Publick in the *Philosophical Transactions* soon after the first Appearance ; and I communicated mine about the same Time in a small Pamphlet. And as to the *Halo's*, *Mock-Suns*, *Inverted Arcs of Rainbows*, and other *Phænomena* of the like Nature, *Monf. Huygens* has most accurately explained them in his *Posthumous Works*, from p. 293 to p. 366. and *Sir Isaac Newton* himself has touched upon them in his *Opticks*, 1st *Edit.* p. 134. to which the *Inquisitive Reader* may have Recourse for his Satisfaction. Only if any enquire farther, Why the *Northern Lights* have of late been so unusually frequent, I must declare, I am far from having satisfied myself, and so shall not pretend to offer any Thing for the Reader's Satisfaction.

London, Nov. 6. 1721,

Will. Whiston.



Fig. 1.

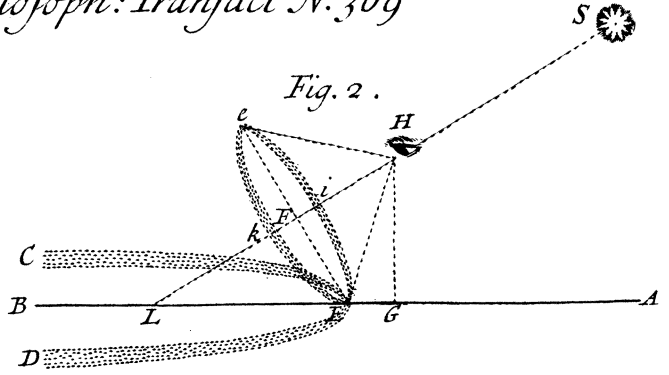


Fig. 2.

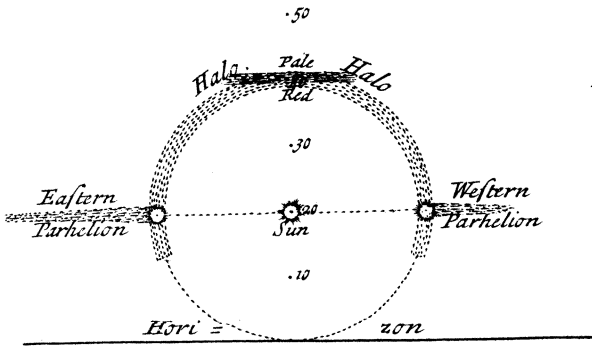


Fig. 3.

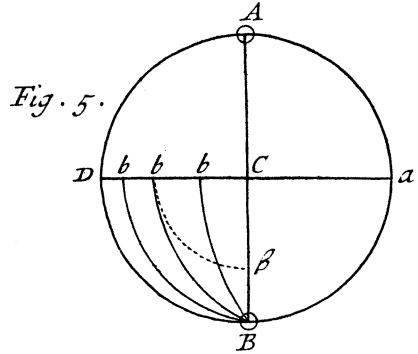


Fig. 5.

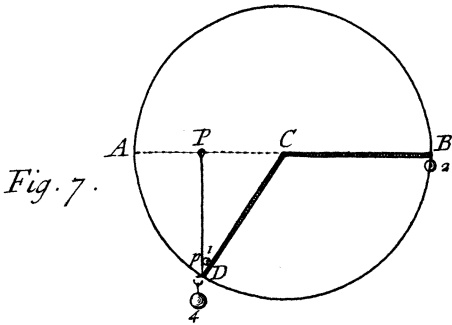


Fig. 7.

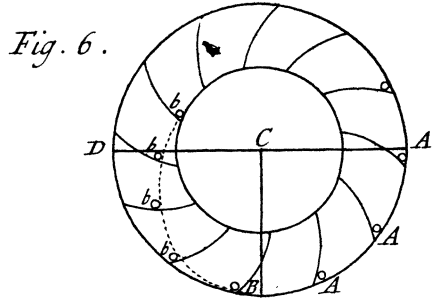


Fig. 6.

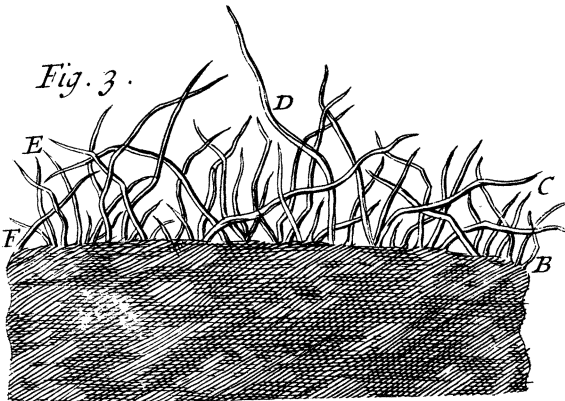


Fig. 3.

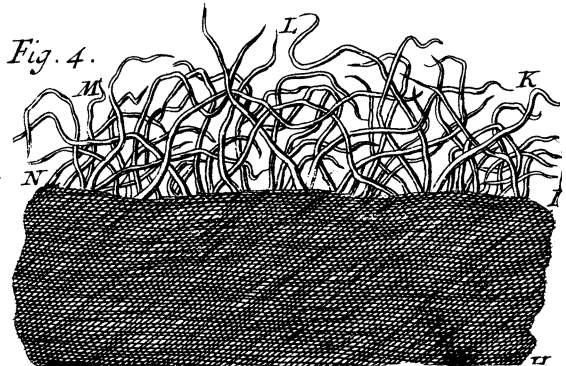


Fig. 4.