

V. *A Letter from Dr. Hallet, Physician at Exeter, to Dr. Henry Pemberton, F. R. S. on the same Subject.*

Exon. Octob. 12, 1716.

Octob. 3, 1726, at Nine in the Evening, I saw an *Aurora Borealis* (as 'tis commonly call'd,) in which there was nothing different from former Appearances, excepting that from the luminous Arch which appear'd in the North, were frequently shot off Parts of Arches towards the Zenith, which vanish'd there.

Oct. 8, Coming from the Country near Seven in the Evening, I observ'd a great Light in the East and West, which soon extended it self over our Heads, the North and South appearing dark at the same time. No Cloud was seen all that Day. A great Dew fell on a sudden, with which the Streets were wet, as by a small Rain. Half an Hour after Seven many Streams appeared in the North, which grew very bright, and darted frequently up to the Zenith. A Line drawn through the Bases of them, made an Arch of a Circle, extending from the N. E. to the W. or S. W. But the Streams seem'd to proceed from a clear Sky being distinct from one another at the Bases, and not united by a luminous Arch or Cloud, as in the more usual *Aurora's*. The Streams at the two Extremities of the Arch were brighter, wider and longer when they did not shoot, than those on the Top of it. [See Fig. 1.] There was at the same time a luminous Arch extending it self from the two Extremities of the above-mention'd *Aurora* through the South, at a considerable Altitude. About Eight o'

T 2

clock

clock the Streams began to have an Horizontal Motion, propagating themselves on both sides towards the South; and in a Minute or two the whole Heaven was furrounded with them. Immediately they all extended themselves up to a Point near the Zenith (I think, a little towards the East) where their Points were blended together in a confus'd manner. At the same time, every Stream, which before was white, appear'd striped with all the Colours of the Rainbow; but the most prevailing Colour was a deep Red. It is impossible to express the Beauty of this glorious *Umbrella*, which cover'd the whole Hemisphere with its variegated Rays, the Colours of which succeeded one another in a regular Order. In the Center of these Rays was a confus'd Rolling, Agitation or Ebullition of a luminous Cloud, appearing like Smoak. In about ten Minutes (as I imagine) the Colours disappear'd, and the Streams began to retire from the Zenith; presently after which, they would frequently dart and shoot with great Celerity up to the same Point. This Darting and Flashing, together with a tremulous Motion from all sides of the Horizon, I observed till 12. And I am informed by others, that it continued till Four in the Morning. The most considerable Rays came from the East and West. Next Morning we had a Fog.

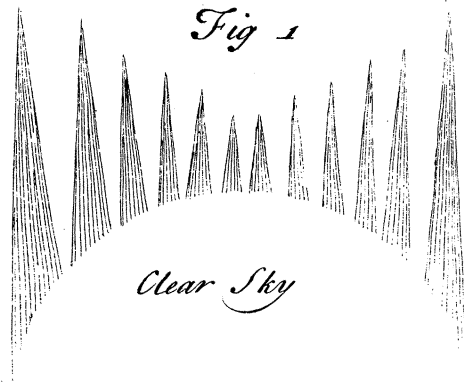
The best Account which I can give of this *Phænomemon* is this: I imagine a thin Cloud composed of a Sulphureous Exhalation, hanging over us in the Air, at a considerable Height, parallel to the Horizon; the Length of it being very great from East to West nearly; the Breadth of it (at first) not so great, but that we might see the Stars from under it to the North and South. The North Side of it, I suppose, first took
Fire,

Fire, and shot its Streams or Flames perpendicularly upwards, which being undisturb'd by Winds, must appear streight and pointed at the Top. The Bases must make an Arch by the Rules of Perspective: For, I think, an Horizontal Right Line, of a vast Length, and at a great distance from us (such as I take the Northern Edge of this luminous Cloud to have been,) seen at a considerable height in the Air, must appear bent down into an Arch. On a sudden the Fire propagated it self to all parts of this Vapour. The whole Heaven must then appear cover'd with the same Streams, which tho' really parallel to one another, must appear bent into a *Cupola*. The shooting and darting of these Flames, and their Concourse, together with a Smoak proceeding from them, must give that confus'd Cloud which was observed in the Center of this Canopy. The regular Disposition of the Colours in every Stream, perhaps, you may account for. I think, the Red appear'd at the right hand in all of them. Somewhere in the *Philos. Transact.* I have met with an Observation of an *Aurora*, in which the Streams were colour'd only where they met, or cross'd one another. Whether the Light of one Stream passing thro' another, may not be separated into Colours by Refraction, I will not determine. You may think of a better Solution. If the Altitude of the Top of the Arch in the North had been taken here, and at the same time at another Place upon the same Meridian, whose distance is known, from thence I imagine, the Height of the Cloud (as I call it) might have been calculated.

I am, &c.

Wm. Hallett.

Fig. 1



Clear Sky

Fig. 2

