

XVI. *An Account of an Anthelion observed near Oxford. In a Letter to the Reverend Tho. Birch, D. D. Secretary to the Royal Society, from the Reverend John Swinton, B. D. of Christ-Church, Oxon. F. R. S.*

Good Sir,

Read Feb. 19,
1761.

Returning home with the Revd. Mr. Jane, Student of Christ-Church, from Cudfden, where we had been to make a visit to the Bishop of Oxford, on Thursday, July 24th, 1760; we reached the top of Shotover-hill, about 10' past 7 o'clock in the evening. At 7^h 12' I accidentally discovered a luminous appearance, not much unlike the sun when seen through clouds, about four or five times as big as the solar disk. [*Vid. Tab. II.*] The sun was then pretty resplendent, though a full exertion of its rays was somewhat obstructed by a thin waterish cloud. Soon after a very distinguishable *Mock-Sun*, opposite to the true one, which I take to have been an *Anthelion*, appeared. This was not however completely formed, that part of its disk remotest from the sun being indistinct and but ill defined. Nor could the figure of the lucid tract round it, though approaching a circle, be with any precision ascertained. This uncommon meteor was seated in the E. but the sun had a westerly situation. From 7^h 12' to 7^h 18' the phænomenon shone very conspicuously, though almost surrounded by dark thickish clouds. The disk of the *Spurious Sun* seemed as large and bright as that of the true one, but was not



not so well defined. Between 7^h 18' and 7^h 28' the meteor was more than once partially obscured, by the circumjacent clouds; a very thick black one, which had been visible from the moment I first perceived the phenomenon, then extending itself almost from the western limb or edge of it to the sun. From the beginning to the end of the *Mock-Sun's* appearance to us, about 18', there was much clear sky above the sun, even up to the zenith, and thick dusky clouds below it; but the tract both above and beneath the meteor was, for the most part, covered with such clouds. This might perhaps be the reason why only some very faint traces of one of the two coloured arches, by whose intersection the *Antbelion* was formed, which generally attend this kind of phenomena, were to be discerned. When in its most refulgent state, the *Antbelion* was as yellow as the sun; but the lucid tract surrounding it was of a paler yellow, or whitish cast, interspersed with a few reddish and subfuscous spots. The whole, when least affected by the neighbouring clouds, seemed in extent to be quadruple, if not quintuple, the space occupied by the disk of the sun. In fine, the phenomenon was sometimes brighter, and sometimes more obscure; varying, through the whole course of its duration, according to the variation of the atmosphere and the clouds. At last, after several short successive intervals of brightness and partial obscurity, it was absorbed by the black cloud above-mentioned, nearly connecting it with the sun; and, just as we came to the bottom of the hill, about 7^h 30', totally disappeared.

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The wind, during the whole continuance of the *Antbelion*, was almost full N. as it had been the greatest part of the day. The weather was for this time of the year remarkably cold, and much colder than it had been for above a month before. There was even that morning a smart white frost, and in some places small collections of particles of snow, though four or five of the preceding days were excessively hot. The wind was not high on the 24th, but somewhat sharp. It was a bright sun-shiny day, resembling a clear frosty day in December; but not, by several degrees, so cold. The following night the air seemed still replete with the same sort of particles that had chilled it the day before. Hence will farther appear the probability of the most received opinion, relative to the formation of this kind of meteors; which makes them to proceed from a multitude of minute icy or snowy particles suspended in the air, and either refracting or reflecting the solar rays in such manner as to multiply the image of the sun. However the theory of *Antbelia*, for want of a proper number of observations, seems not yet to be arrived at such a degree of perfection as by every lover of physiology could be desired.

Instances of *Antbelia* are extremely rare. I have hitherto been able to meet with only two of them, viz. that observed near Dantzick (1) by Hevelius, Sept. 6th, N. S. 1661. and that seen at Wittemberg in Saxony, Jan. 18th, N. S. 1738. a description of which was soon after communicated to the Royal

(1) Johan. Hevel. *Phænomen. Aer.* p. 174, 176. Gedani, 1662.

Society (2) by J. Frid. Weidler, Professor of Mathematics there. The former of these meteors appeared from 6^h to 6^h 15' in the evening, the sun being then posited in the W. and the *Antbelion* in the E. the other from 9^h 30' to 9^h 45' in the morning, the sun being at that time S. and the phænomenon N. *Antbelia* therefore being so seldom observed, and yet observations of them being so necessary, in order to ascertain the theory of this species of meteors; I was inclined to believe, that the account now transmitted you, rude and imperfect as it is, might yet not be altogether unacceptable to the Royal Society. I can only answer for the fidelity of the relation, and wish a more perfect one had been drawn up by a person better qualified to observe the phænomenon here described, that it might have been more worthy the attention of the learned and illustrious body, to whom I have the honour of communicating this paper. If the meteor could have been viewed from the first to the last moment of its existence, perhaps other circumstances, proper to be known, for the happier investigation of its cause, might have occurred. But this amounting to little more than a bare possibility, I shall content myself with having just hinted it here; and only beg leave to add, that

I am, with the highest regard and esteem,
S I R,

Your most obedient
humble servant,

Christ-Church, Oxon.
July 28, 1760.

John Swinton.