

between the cells of the bark, and also between the bark and the wood: while no such separations are apparent when the leaf-buds are entirely inactive. These separations are various in size, and irregular in form; their parietes consist of rows of cells, piled up one above another, like the bricks of a wall: and their cavities all communicate with one another. From these and other anatomical facts, which are given in detail by the author, he concludes that the propulsion of the sap along the vessels, resulting from the operation of endosmose, will explain the descent of the cambium, which, being the nutritious portion of the vegetable fluids, corresponds in its nature to the chyle in animals.

March 23, 1843.

GEORGE RENNIE, Esq., V.P., in the Chair.

A paper was read, entitled, "Notice of an Extraordinary Luminous Appearance seen in the Heavens on the 17th of March, 1843," in a Letter to S. H. Christie, Esq., Sec. R.S., by Sir John F. W. Herschel, Bart., F.R.S.

Collingwood, March 17, 1843.

MY DEAR SIR,—This evening, at half-past seven o'clock, I received notice from one of my servants of a luminous appearance in the sky, visible towards the S.W., which I immediately ran out to observe, and which, as it differed in some remarkable particulars from any phenomenon of the kind I have ever before observed or seen described, I think it not unlikely to prove interesting to the Royal Society.

The evening was one of uncommon serenity and beauty: the moon, only thirty-eight hours after the full, having considerable south declination, was not yet risen. In consequence, the sun being already far enough below the horizon to leave only a faint glow of twilight in the west, the stars shone with unsubdued brilliancy, no cloud being visible in any quarter. Orion in particular was seen in all its splendour; and commencing below that constellation, and stretching obliquely westward and downwards, nearly, but not quite to the horizon, was seen the luminous appearance in question. Its general aspect was that of a perfectly straight, narrow band of considerably bright white cloud, thirty degrees in length, and about a degree and a quarter, or a degree and a half in breadth in the middle of its length; its brightness nearly uniform, except towards the ends, where it faded gradually, so that to define its exact termination at either end was difficult. However, by the best judgement I could form, it might be considered as terminating, to the eastward or following side, at, or a very little beyond, the stars ι , κ , λ Leporis, which stars (being of the fifth, or at most 5.4 magnitude) were pretty conspicuously visible; from which circumstance the degree of brightness of the ground of the sky in that region may be well estimated. Between these stars and μ Leporis, the luminous band then com-

menced, involving neither of them, but more nearly contiguous to κ and λ than to μ . From thence its course was towards π Eridani, which star must have been covered by it, and was not seen; this judgement of its direction having been formed by noticing that it passed clearly above γ Eridani, and as clearly below and parallel to the direction of δ , ϵ Eridani, which two stars being dimmed by the vapours of the horizon and the twilight, were so little conspicuous as perfectly to account for π not having been noticed. At the point of its passage between γ and δ it was still considerably bright, and as it terminated with somewhat more abruptness at a point beyond ϵ (then about 12° high) than at its upper extremity, I am rather disposed to consider this end as somewhat curtailed by the vapours. Making no allowance, however, for this, and estimating its visible termination at a point on a celestial globe nearly opposite ζ Eridani (which star however was not noticed at the time), the length above assigned to the luminous band (30°) has been concluded by measurement on the globe.

I am thus particular in describing the course, situation and dimensions of the band, not only as terms of comparison with other observations of it, should any have been made, but for another reason, in which consists the peculiarity of the phenomenon, and which is my sole motive for making this communication. The above situation and course, relatively to those stars, *remained perfectly unaltered the whole time it remained visible at all*, which it did for upwards of an hour from the time I first saw it, *accompanying the stars in their diurnal motion*, until the preceding end at length was extinguished in the horizon vapours with the stars adjacent, and until the light of the rising moon dimmed and at length effaced the rest, though I apprehend its intrinsic lustre to have been in progress of diminution during the last quarter of an hour or twenty minutes.

I should not forget to mention, that neither in the north-west, nor elsewhere, were any streamers or other appearances of Aurora Borealis perceptible during any part of the evening. The only other luminous appearance, the milky way excepted, was that of the zodiacal light, which I have seldom seen to greater advantage in this climate, and which extended high enough to involve the Pleiades, then about 55° from the sun.

I have said that the general aspect of the phenomenon was that of a bright white cloud. In fact, my first impression was that such was its nature; an impression immediately dissipated and ultimately converted into the contrary certainty by the following considerations and observed facts. For, in the first place, no ordinary cloud at such an angular elevation above the horizon could have received from the sun, even at the earliest hour when it was observed, any thing like sufficient illumination to have presented so luminous an appearance; that luminary being then between 9° and 10° below the horizon, and the moon not yet being risen, even at eight o'clock, when I judged the light of the band by contrast with the increasing darkness of the ground of the sky to have attained its maximum, at which hour the depression of the sun was nearly 12° .

Moreover, 2ndly, about a quarter of an hour after the band was first observed, being then on the roof of my house and having a very uninterrupted view of the western horizon, I noticed the formation of a small streak of cloud about the same apparent altitude, somewhat to the north of the pyramid of the zodiacal light, and therefore nearer to the place of the sun below the horizon. The direction of this streak was horizontal, not oblique, and its hue black, not white. This cloud enlarged and became projected as a dark space within the zodiacal light, and soon after others of a less defined character formed elsewhere, all, however, without exception, dark instead of luminous.

3rdly. At the rising of the moon, about half-past eight, the light of our band, already probably on the decrease, was almost wholly effaced. On the other hand, by this time numerous lines and cirrous streaks of light cloud which had been for some time in progress of formation, and had been either wholly unseen before or only noticed by their effacing the stars behind them, became illuminated, and appeared as white streaks and patches, such as are usually observed in moonlight nights.

4thly, and lastly. Although the night was very calm, yet on watching narrowly the motions and changes of these real clouds with respect to the stars, they were perceived to *rise very slowly from the west, i. e.* in a direction nearly or quite contrary to that of the declining band.

From these united considerations, and from the extreme fixity of the band among the stars, I consider it impossible to regard it as a cloud illuminated by the sun through the medium of atmospheric refraction. The latter reason, too, is equally conclusive against its being classed with ordinary auroral bands and arcs, which, though they keep their position well enough to be regarded as at rest by a careless observer, yet, when compared with stars, are always perceived to be drifting, as it were, in some certain direction, or otherwise changing in figure and dimension.

If we look to an origin for this phenomenon beyond our atmosphere, we become involved in speculations, which, however interesting, it is not the object of this communication to enter into. On the other hand, its purpose will be answered if either it should be the occasion of eliciting corresponding observations of the same, or notices of similar phenomena already observed, or should lead to increased watchfulness on the part of meteorologists to avail themselves of occasions (which perhaps occur oftener than we are aware) of noting anything analogous in future.

I have the honour to remain,

My dear Sir,

Your very faithful and obedient Servant,

J. F. W. HERSCHEL.

Saturday, March 18, 1843.

P.S.—There having been no post today, and the above not having been finished in time for despatch last night, an opportunity is af-

forded me for stating that the phenomenon above described has again reappeared this evening, at the same hour and in the same situation, or rather a very little more to the north, so as to graze and partly to involve the stars κ , λ Leporis. It was also traceable in R. A. some little way beyond those stars on the following side. The horizon being more obscured by vapour tonight than last night, neither γ , δ , nor ϵ Eridani could be seen.

The fixity of this object among the stars on the 17th, induced me to express to a member of my family this morning an idea that it might possibly be seen again tonight, in which event its extra-atmospheric origin would become quite evident. If a thread be stretched on a celestial globe along the central line of the band as nearly as the above observations will enable us to fix it, and prolonged to meet the ecliptic, *it will strike on the actual place of the sun*. The inference seems almost unavoidable, that our band is no other than the tail of a magnificent comet, whose head at the times of both observations has been below the horizon. I await, therefore, with extreme interest, the event of further observation, but although to afford others an opportunity of observing it, it will be necessary for me to make a more immediate and public announcement, I am still desirous to place on record my first impressions respecting so remarkable an appearance, in the mode originally intended, both as a mark of respect to the Royal Society, and as pointing inquiry to other luminous "streaks" and "columns" in the sky, which have been spoken of to me as having been seen during the last summer and autumn on more than one occasion, and which in point of fact caused me to desire every inmate of my family to give me immediate notice of the appearance of anything unusual in the heavens, and thus led directly to the observations above detailed.

A paper was also in part read, entitled, "Researches into the Structure and Developement of a newly discovered parasitic Animalcule of the Human Skin, the *Entozoon folliculorum*." By Erasmus Wilson, Esq.: communicated by R. B. Todd, M.D., F.R.S.