

teors in 1833 (November, $\frac{1}{3}$ th) the phenomenon of the year 1799 was called to mind.*

December: $\frac{9}{2}$ th; but in 1798, according to Brandes's observation, December the $\frac{6}{7}$ th; Herrick, in New Haven, 1838, Dec. $\frac{7}{8}$ th; Heis, 1847, December 8th and 10th.

"Eight or nine epochs of periodic meteoric streams, of which the last five are most certainly determined, are here recommended to the industry of observers. The streams of different months are not alone different from each other; in different years, also, the abundance and brilliancy of the same stream varies strikingly.

"The *upper* limits of the *height* of shooting stars can not be ascertained with accuracy, and Olbers considers all heights above 120 miles as being less certainly determined. The *lower* boundaries which were formerly (*Cosmos*, vol. i., p

* *Nearer* epochs of comparison might have been brought forward, if they had been known at that time; for example, the streams of meteors observed by Klöden, 1823, Nov. $\frac{1}{3}$ th, in Potsdam; by Bérard, 1831, Nov. $\frac{12}{13}$ th, on the Spanish coast; and by Graf Suchtelu, at Orenberg, 1832, Nov. $\frac{1}{3}$ th (*Cosmos*, vol. i., p. 124; and Schum., *Astr. Nachr.*, No. 303, p. 242). The great phenomenon of the 11th and 12th of November, which Boupland and I have described (*Voyage aux Régions Equinoxiales*, liv. iv., chap. x., tom. iv., p. 34, 53d ed., 8vo), lasted from two to four o'clock in the morning. Upon the whole journey which we made through the forest region of the Orinoco southward, as far as Rio Negro, we found that the enormous fall of meteors had been seen by the missionaries, and in some cases recorded in the church books. In Labrador and Greenland, it threw the Esquimaux into a state of utter amazement as far as Lichtenau and New Herrnhut (lat. $64^{\circ} 14'$). At Itterstadt, near Weimar, the pastor Zeising saw the same phenomenon that was at the same time visible under the equator, and near the north polar circle in America. Since the periodicity of the *St. Laurentius stream*, August 10th, did not attract general attention until long after the *November period* had, I have carefully placed together all the considerable and accurately-observed falls of shooting stars on the $\frac{1}{3}$ th November known to me up to 1846. There are 15: 1799, 1818, 1822, 1823; 1831-1839, every year; 1841 and 1846. I exclude those falls of meteors which differ by one or two days, such as those of the 10th of November, 1787, 8th of November, 1813. Such a periodicity closely connected with individual days is so much the more wonderful, as bodies of such a small mass are easily exposed to disturbances, and the breadth of the ring in which the meteors are supposed to be contained may surround the Earth for some days. The most brilliant November streams took place in 1799, 1831, 1833, 1834. (In my description of the meteor of 1799, the largest fire-ball has ascribed to it a diameter of 1° and $1\frac{1}{4}$, when it should be 1 and $1\frac{1}{4}$ lunar diameter.) This is also the place to mention the fire-ball which attracted the special attention of the director of the observatory at Toulouse, M. Petit, and whose revolution round the Earth he has calculated. (*Comptes Rendus*, 9 Août, 1847; and Schum., *Astr. Nachr.*, No. 701, p. 71.)