

number of observations made in the United States of North America, between the thirty-fifth and the forty-second degrees of latitude, it would appear that all these meteors came from the same point of space in the direction in which the Earth was moving at the time. On the recurrence of falls of shooting stars in North America, in the month of November of the years 1834 and 1837, and in the analogous falls observed at Bremen in 1838, a like general parallelism of the orbits, and the same direction of the meteors from the constellation Leo, were again noticed. It has been supposed that a greater parallelism was observable in the direction of periodic falls of shooting stars than in those of sporadic occurrence; and it has further been remarked, that in the periodically-recurring falls in the month of August, as, for instance, in the year 1839, the meteors came principally from one point between Perseus and Taurus, toward the latter of which constellations the Earth was then moving. This peculiarity of the phenomenon, manifested in the retrograde direction of the orbits in November and August, should be thoroughly investigated by accurate observations, in order that it may either be fully confirmed or refuted.

The heights of shooting stars, that is to say, the heights of the points at which they begin and cease to be visible, vary exceedingly, fluctuating between 16 and 140 miles. This important result, and the enormous velocity of these problematical asteroids, were first ascertained by Benzenberg and Brandes, by simultaneous observations and determinations of parallax at the extremities of a base line of 49,020 feet in length.* The relative velocity of motion is from 18 to 36 miles in a second, and consequently equal to planetary velocity. This planetary velocity,† as well as the direction of the orbits of shooting stars was seen in North America, although the numbers were not quite so considerable. (Poggend., *Annalen*, bd. xxxiv., s. 129.)

On the 13th of November, 1835, a barn was set on fire by the fall of a sporadic fire-ball, at Belley, in the Department de l'Ain. (*Annuaire*, 1836, p. 296.)

In the year 1838, the stream showed itself most decidedly on the night of the 13-14th of November. (*Astron. Nachr.*, 1838, No. 372.)

* I am well aware that, among the 62 shooting stars simultaneously observed in Silesia, in 1823, at the suggestion of Professor Brandes some appeared to have an elevation of 183 to 240, or even 400 miles. (Brandes, *Unterhaltungen für Freunde der Astronomie und Physik*, heft i., s. 48. Instructive Narratives for the Lovers of Astronomy and Physics.) But Olbers considered that all determinations for elevations beyond 120 miles must be doubtful, owing to the smallness of the parallax.

† The planetary velocity of translation, the movement in the orbit, is in Mercury 26.4, in Venus 19.2, and in the Earth 16.4 miles in a second