

was on the Siberian coast of the Polar Sea, he observed, during an Aurora Borealis, certain portions of the vault of heaven, which were not illuminated, light up and continue luminous whenever a shooting star passed over them.

The different meteoric streams, each of which is composed of myriads of small cosmical bodies, probably intersect our Earth's orbit in the same manner as Biela's comet. According to this hypothesis, we may represent to ourselves these asteroid-meteors as composing a closed ring or zone, within which they all pursue one common orbit. The smaller planets between Mars and Jupiter present us, if we except Pallas, with an analogous relation in their constantly intersecting orbits. As yet, however, we have no certain knowledge as to whether changes in the periods at which the stream becomes visible, or the *retardations* of the phenomena of which I have already spoken, indicate a regular precession or oscillation of the nodes—that is to say, of the points of intersection of the Earth's orbit and of that of the ring; or whether this ring or zone attains so considerable a degree of breadth from the irregular grouping and distances apart of the small bodies, that it requires several days for the Earth to traverse it. The system of Saturn's satellites shows us likewise a group of immense width, composed of most intimately-connected cosmical bodies. In this system, the orbit of the outermost (the seventh) satellite has such a vast diameter, that the Earth, in her revolution round the Sun, requires three days to traverse an extent of space equal to this diameter. If, therefore, in one of these rings, which we regard as the orbit of a periodical stream, the asteroids should be so irregularly distributed as to consist of but few groups sufficiently dense to give rise to these phenomena, we may easily understand why we so seldom witness such glorious spectacles as those exhibited in the November months of 1799 and 1833. The acute mind of Olbers led him almost to predict that the next appearance of the phenomenon of shooting stars and fire-balls intermixed, falling like flakes of snow, would not recur until between the 12th and 14th of November, 1867.

the 11th and 12th of November, 1799, a similar fiery manifestation had been observed in the heavens. But it was on the 21st of October, 1766, and not in the beginning of November, that the earthquake occurred. Possibly some traveler in Quito may yet be able to ascertain the day on which the volcano of Cayambe, which is situated there, was for the space of an hour enveloped in falling stars, so that the inhabitants endeavored to appease heaven by religious processions. (*Relat. Hist.*, t. i., chap. iv., p. 307; chap. x., p. 520 and 527.)