

the sky illuminated by them with a feeble glow.\* Many shooting stars move merely as luminous points, and leave no tail behind them. The combustion, attended with rapid or slow disappearance of the tails, which are generally many miles in length, is so much the more remarkable, as the burning tails sometimes bend and sometimes move onward. The shining for some hours of the tail of a fire-ball which had long disappeared, observed by Admiral Krusenstern and his companions during their voyage round the world, vividly calls to mind the *long shining* of the cloud from which the great aërolite of Ægos Potamos is said to have fallen, according to the certainly not quite trustworthy relation of Damachos. (*Cosmos*, vol. i., p. 133, and note †.)

There are shooting stars of very different magnitude, increasing to the apparent diameter of Jupiter or Venus; on the occasion, also, of the fall of shooting stars seen at Toulouse (April 10th, 1812), and the observation of a fire-ball at Utrecht, on the 23d of August of the same year, they were seen to form, as it were, from a luminous *point*, to shoot out in a *star-like* manner, and then to expand to a sphere of the size of the Moon. In very abundant falls of meteors, such as those of 1799 and 1833, there have been undoubtedly many fire-balls, mixed with thousands of shooting stars; but the *identity* of both kinds of fiery meteors has not been by any means proved hitherto. Relation is not identity. There still remains much to be investigated as to the physical relations of both—as to the influence pointed out by Admiral Wrangel, † of the shooting stars upon the development of the *polar light* on the shores of the Frozen Sea, and as to the number of luminous processes indistinctly described, but not, on that account, to be hastily denied, which have preceded the formation of fire-balls. The greater number of fire-balls appear *unaccompanied* by shooting stars, and show no periodicity in their appearance. What we know of shooting stars, with regard to their divergence from definite points, is at present only to be applied to fire-balls with caution.

*Meteoric stones* fall the most rarely in a quite clear sky, without the previous formation of a black meteor-cloud, without any visible phenomenon of light, but with a terrible crackling, as upon the 6th of September, 1843, near Klein-Wenden, not far from Mühlhausen; or they fall, and this more frequently, shot out of a suddenly-formed dark cloud, accompa-

\* Forster's *Mémoire sur les Etoiles Filantes*, p. 31.

† *Cosmos*, vol. i., p. 126, and note \*