

enables the eye to penetrate further into distance. Sir Alexander Burnes likewise extols as a consequence of the purity of the atmosphere in Bokhara the enchanting and constantly-recurring spectacle of variously-colored shooting stars.

The connection of meteoric stones with the grander phenomenon of fire-balls—the former being known to be projected from the latter with such force as to penetrate from ten to fifteen feet into the earth—has been proved, among many other instances, in the falls of aërolites at Barbotan, in the Department des Landes (24th July, 1790), at Siena (16th June, 1794), at Weston, in Connecticut, U. S. (14th December, 1807), and at Juvenas, in the Department of Ardèche (15th June, 1821). Meteoric stones are in some instances thrown from dark clouds suddenly formed in a clear sky, and fall with a noise resembling thunder. Whole districts have thus occasionally been covered with thousands of fragmentary masses, of uniform character but unequal magnitudes, that

each other, Geneva and Aux Planchettes, the number of the meteors counted were as 1 to 7. (Wartmann, *Mém. sur les Etoiles filantes*, p. 17.) The tail of a shooting star (or its *train*), on the subject of which Brandes has made so many exact and delicate observations, is in no way to be ascribed to the continuance of the impression produced by light on the retina. It sometimes continues visible a whole minute, and in some rare instances longer than the light of the nucleus of the shooting star; in which case the luminous track remains motionless. (Gilb., *Ann.*, bd. xiv., s. 251.) This circumstance further indicates the analogy between large shooting stars and fire-balls. Admiral Krusenstern saw, in his voyage round the world, the train of a fire-ball shine for an hour after the luminous body itself had disappeared, and scarcely move throughout the whole time. (*Reise*, th. i., s. 58.) Sir Alexander Burnes gives a charming description of the transparency of the clear atmosphere of Bokhara, which was once so favorable to the pursuit of astronomical observations. Bokhara is situated in $39^{\circ} 43'$ north latitude, and at an elevation of 1280 feet above the level of the sea. "There is a constant serenity in its atmosphere, and an admirable clearness in the sky. At night, the stars have uncommon luster, and the Milky Way shines gloriously in the firmament. There is also a never-ceasing display of the most brilliant meteors, which dart like rockets in the sky; ten or twelve of them are sometimes seen in an hour, assuming every color—fiery red, blue, pale, and faint. It is a noble country for astronomical science, and great must have been the advantage enjoyed by the famed observatory of Samarkand." (Burnes, *Travels into Bokhara*, vol. ii. (1834), p. 158.) A mere traveler must not be reproached for calling ten or twelve shooting stars in an hour "many," since it is only recently that we have learned, from careful observations on this subject in Europe, that eight is the mean number which may be seen in an hour in the field of vision of one individual (Quetelet, *Corresp. Mathém.*, Novem., 1837, p. 447); this number is, however, limited to five or six by that diligent observer, Olbers. (Schum., *Jahrb.*, 1838, s. 325.)