

must be regarded as almost devoid of air, or occupied by an atmosphere that does not even contain $\frac{1}{100000}$ th part of oxygen. The recent investigations of Biot on the important phenomenon of twilight* have considerably lowered the lines which had, perhaps with some degree of temerity, been usually termed the boundaries of the atmosphere; but processes of light may be evolved independently of the presence of oxygen, and Poisson conjectured that aërolites were ignited far beyond the range of our atmosphere. Numerical calculation and geometrical measurement are the only means by which, as in the case of the larger bodies of our solar system, we are enabled to impart a firm and safe basis to our investigations of meteoric stones. Although Halley pronounced the great fire-ball of 1686, whose motion was opposite to that of the earth in its orbit,† to be a cosmical body, Chladni, in 1794, first recognized, with ready acuteness of mind, the connection between fire-balls and the stones projected from the atmosphere, and the motions of the former bodies in space.‡ A brilliant confirmation of the cosmical origin of these phenomena has been afforded by Denison Olmsted, at New Haven, Connecticut, who has shown, on the concurrent authority of all eye-witnesses, that during the celebrated fall of shooting stars on the night between the 12th

* Biot, *Traité d'Astronomie Physique* (3ème éd.), 1841, t. i., p. 149, 177, 238, 312. My lamented friend Poisson endeavored, in a singular manner, to solve the difficulty attending an assumption of the spontaneous ignition of meteoric stones at an elevation where the density of the atmosphere is almost null. These are his words: "It is difficult to attribute, as is usually done, the incandescence of aërolites to friction against the molecules of the atmosphere at an elevation above the earth where the density of the air is almost null. May we not suppose that the electric fluid, in a neutral condition, forms a kind of atmosphere, extending far beyond the mass of our atmosphere, yet subject to terrestrial attraction, although physically imponderable, and consequently following our globe in its motion? According to this hypothesis, the bodies of which we have been speaking would, on entering this imponderable atmosphere, decompose the neutral fluid by their unequal action on the two electricities, and they would thus be heated, and in a state of incandescence, by becoming electrified." (Poisson, *Rech. sur la Probabilité des Jugements*, 1837, p. 6.)

† *Philos. Transact.*, vol. xxix., p. 161-163.

‡ The first edition of Chladni's important treatise, *Ueber den Ursprung der von Pallas gefundenen und anderen Eisenmassen* (On the Origin of the masses of Iron found by Pallas, and other similar masses), appeared two months prior to the shower of stones at Siena, and two years before Lichtenberg stated, in the *Göttingen Taschenbuch*, that "stones reach our atmosphere from the remoter regions of space." Comp., also, Olbers's letter to Benzenberg, 18th Nov., 1837, in Benzenberg's *Treatise on Shooting Stars*, p. 186.