

lands in the temperate zone.* Sometimes, however, the stratum of cloud from which the thunder proceeds sinks to a distance of 5000, or, indeed, only 3000 feet above the plain.

According to Arago's investigations—the most comprehensive that we possess on this difficult branch of meteorology—the evolution of light (lightning) is of three kinds—zigzag, and sharply defined at the edges; in sheets of light, illuminating a whole cloud, which seems to open and reveal the light within it; and in the form of fire-balls.† The duration of the two first kinds scarcely continues the thousandth part of a second; but the globular lightning moves much more slowly remaining visible for several seconds. Occasionally (as is proved by the recent observations, which have confirmed the description given by Nicholson and Beccaria of this phenomenon), isolated clouds, standing high above the horizon, continue uninterruptedly for some time to emit a luminous radiance from their interior and from their margins, although there is no thunder to be heard, and no indication of a storm; in some cases even hail-stones, drops of rain, and flakes of snow have been seen to fall in a luminous condition, when the phenomenon was not preceded by thunder. In the geographical distribution of storms, the Peruvian coast, which is not visited by thunder or lightning, presents the most striking contrast to the rest of the tropical zone, in which, at certain seasons of the year, thunder-storms occur almost daily, about four or five hours after the sun has reached the meridian. According to the abundant evidence collected by Arago‡ from the testimony of navigators (Scoresby, Parry, Ross, and Franklin), there can be no doubt that, in general, electric explosions are extremely rare in high northern regions (between 70° and 75° latitude).

The meteorological portion of the descriptive history of nature which we are now concluding shows that the processes of the absorption of light, the liberation of heat, and the variations in the elastic and electric tension, and in the hygrometric condition of the vast aërial ocean, are all so intimately connected together, that each individual meteorological process is modified by the action of all the others. The com-

* Arago, in the *Annuaire du Bureau des Longitudes pour 1838*, p. 246.

† Arago, *op. cit.*, p. 249–266. (See, also, p. 268–279.)

‡ Arago, *op. cit.*, p. 388–391. The learned academician Von Baer, who has done so much for the meteorology of Northern Asia, has not taken into consideration the extreme rarity of storms in Iceland and Greenland; he has only remarked (*Bulletin de l'Academie de St. Pétersbourg*, 1839, Mai) that in Nova Zembla and Spitzbergen it is sometimes heard to thunder.