

aqueous vapor is precipitated, and on the connection existing between these deposits and the changes of temperature, and the direction and succession of winds.

4. *The electric condition of the atmosphere.* The primary cause of this condition, when the heavens are serene, is still much contested. Under this head we must consider the relation of ascending vapors to the electric charge and the form of the clouds, according to the different periods of the day and year; the difference between the cold and warm zones of the earth, or low and high lands; the frequency or rarity of thunder storms, their periodicity and formation in summer and winter; the causal connection of electricity, with the infrequent occurrence of hail in the night, and with the phenomena of water and sand spouts, so ably investigated by Peltier.

The horary oscillations of the barometer, which in the tropics present two maxima (viz., at 9 or $9\frac{1}{4}$ A.M., and $10\frac{1}{2}$ or $10\frac{3}{4}$ P.M., and two minima, at 4 or $4\frac{1}{4}$ P.M., and 4 A.M., occurring, therefore, in almost the hottest and coldest hours), have long been the object of my most careful diurnal and nocturnal observations.* Their regularity is so great, that, in the daytime especially, the hour may be ascertained from the height of the mercurial column without an error, on the average, of more than fifteen or seventeen minutes. In the torrid zones of the New Continent, on the coasts as well as at elevations of nearly 13,000 feet above the level of the sea, where the mean temperature falls to $44^{\circ}\cdot6$, I have found the regularity of the ebb and flow of the aerial ocean undisturbed by storms, hurricanes, rain, and earthquakes. The amount of the daily oscillations diminishes from 1.32 to 0.18 French lines from the equator to 70° north latitude, where Bravais made very accurate observations at Bosekop.† The supposition that, much nearer the pole, the height of the barometer is really less at 10 A.M. than at 4 P.M., and, consequently, that the maximum and minimum influences of these hours

* *Observations faites pour constater la Marche des Variations Horaires du Baromètre sous les Tropiques*, in my *Relation Historique du Voyage aux Régions Equinoxiales*, t. iii., p. 270-313.

† Bravais, in Kaemtz and Martins, *Météorologie*, p. 263. At Halle ($51^{\circ} 29'$ N. lat.), the oscillation still amounts to 0.28 lines. It would seem that a great many observations will be required in order to obtain results that can be trusted in regard to the hours of the maximum and minimum on mountains in the temperate zone. See the observations of horary variations, collected on the Faulhorn in 1832, 1841, and 1842 (Martins, *Météorologie*, p. 254.)