

the earth may be either in a positive or negative state, and that accumulated electricity may pass to or from it, and, being conducted by bodies on the surface of the earth, influence them according to their nature, or the circumstances of the discharge.

#### THUNDER-CLOUDS.

A thunder-storm may generally be prognosticated by atmospheric appearances. A low dense cloud begins to form in some clear part of the atmosphere, and rapidly increasing on its upper edge, spreads itself out in an arched form. A number of small ragged clouds, which may be said to resemble teased flakes of cotton, then make their appearance, and, moving about in various directions, approach and recede from each other; but at last accumulate, and coalesce with the cloud that first appeared. The clouds now begin to thicken, and moving about with great velocity, throw from point to point the vivid flashes, as the heralds of the approaching storm.

The form and colour of the flash, as viewed from the earth, change in appearance, according to circumstances. The density of the medium through which the electricity moves, and the nature of the substances from and to which it passes, are probably the governing causes.

Thunder, that is, the sound which attends the phenomenon of lightning, varies in intensity and character, according to the height and extent of the electric clouds, and the physical peculiarities of the country in which it is heard. When the discharge is made at a short distance from the hearer, an instantaneous crash is produced; when far away, a deep grumbling noise; when it happens over a flat country, or a place where there are no objects to produce a reverberation, a series of regular explosions are produced, increasing or decreasing in intensity with the distance of the cloud; when over a mountainous or broken district, successive claps, irregular both in time and intensity, are generally heard.

The rolling of thunder is produced by the reverberation among the clouds. Arago and others, when making some experiments on the velocity of sound, observed that the explosion of their guns produced a single and sharp sound when the sky was perfectly clear; but when encumbered