

The principal constituents of climate are the following:—the temperature of the earth, of the water, of the air:—the distribution of the aqueous vapour contained in the atmosphere:—the winds and rains by which the equilibrium of the atmosphere is restored when it is in any degree disturbed. The effects of light, of electricity, probably of other causes also, are no doubt important in the economy of the vegetable world, but these agencies have not been reduced by scientific inquirers to such laws as to admit of their being treated with the same exactness and certainty which we can obtain in the case of those first mentioned.

We shall proceed to trace some of the peculiarities in the laws of the different physical agents which are in action at the earth's surface, and the manner in which these peculiarities bear upon the general result.

The Laws of Heat with respect to the Earth.

One of the main causes which determine the temperature of each climate is the effect of the sun's rays on the solid mass of the earth. The laws of this operation have been recently made out with considerable exactness, experimentally by Leslie, theoretically by Fourier, and by other inquirers. The theoretical inquiries have required the application of very complex and abstruse mathematical investigations; but the general character of the operation may, perhaps, be made easily intelligible.

The earth, like all solid bodies, transmits into its interior the impressions of heat which it receives at the surface; and throws off the superfluous heat from its surface into the surrounding space. These processes are called *conduction* and *radiation*, and have each their ascertained mathematical laws.

By the laws of conduction, the daily impressions of heat which the earth receives, follow each other