

a substance which, when pure, is of a white color and known by the name of *Kaolin*; in its impure state, however, it is colored and accompanied by Lime, Sand, Oxyds of Iron, &c., forming the various kinds of *Clay*.

A knowledge of the composition of Granite, therefore, explains to us the origin and formation of two massy deposits: Sandstone and Clay, which almost every where cover and often extend to thousands of feet below the surface of the globe, and which also form the fundamental constituents of the soil.

The second class of crystalline rocks, headed: Silicates, containing Lime and Protoxyd of Iron, consists either of rocks containing Felspar, associated with Hornblende, or Felspar associated with Augite; and their degradation under the influence of the atmosphere, is especially due to the influence of the atmospheric Oxygen on Protoxyd of Iron. Hornblende, as well as Augite, contains Protoxyd of Iron, a substance to which both minerals owe their dark and somewhat green color, and which greedily attracts oxygen from the air, in order to procure for itself a higher degree of oxydation—that of the Peroxyd of Iron. The immediate consequence of this change, is the formation of new combinations, which produce an alteration in the position of the atoms, (the smallest parts of the rocks;) so that the original solidity of the rocks is diminished and a continued crumbling into small pieces, and in the course of time a complete disunion of them takes place. Common Coppéras also contains the Protoxyd of Iron, and exposed to the influence of the air, is modified in an analogous manner.

If Sulphurets (combinations of Metals with Sulphur) occur in crystalline rocks, which is frequently the case, the degradation of them takes place still more readily, inasmuch as these ingredients also absorb Oxygen and become transformed into Sulphates, soluble in water.

The capacity then of the crystalline rocks for decomposition, is in proportion to the quantity of Silicate of Potash they contain, and also of such other substances as absorb Oxygen, and in this way have a change of their chemical composition. We always find that the larger the quantity of these substances, the more quickly and thoroughly is the exposed rock decomposed.

FORMATION AND CONSTITUENTS OF THE SOIL.

We have thus represented to us in a sensible form, the influence by which the gradual degradation of the primitive crystalline rocks was effected; and also the consequences of this process, which gave rise to the formation of new masses of an earthy and friable character, permeable to the roots of plants, and thereby rendering them their necessary mechanical support. We find these masses, either in their original place, still covering the crystalline rocks by