

forms, viz: such as are gradually precipitated, from their solution in water, and lie in more or less parallel layers.

This variance in the origin and general geological character of the two grand formations, must necessarily be accompanied by a variance in their chemical nature; and we really find a state of things to exist equally as distinct as the mode by which they were produced.

Whilst the various minerals of which the volcanic or igneous formations are composed, contain silica as their principal ingredient, either in a free state, or united to alumina, (clay,) and the alkalies, (potash and soda,) or lime, (oxyd of calcium,) and the protoxyd of iron—the Neptunic (aqueous) formations, on the contrary, show lime or some other base, as their principal constituent, united to carbonic acid, muriatic, or sulphuric acid. The former (the igneous class,) is characterized by a predominating acid, viz: the silicic acid, and comprehends the numerous varieties of minerals known by the name of silicates; the latter, on the contrary, are characterized by the existence of strong bases, viz: lime, magnesia, potash, soda, &c., which united to weaker or stronger acids form the large class of pure and alkaline earths. These two classes do not differ in regard to their geological or agricultural importance; that is, in the share which they take in the formation of the crust of the earth. We find that granite, gneiss, mica-slate, syenite, basalt, and many others, representing the class of silicates, in equal extent with pure alkaline and saline earths, amongst which, lime-stone, dolomite, anhydrite, (gypsum without water,) gypsum and common salt, are of most importance. The share, therefore, which both take in the formation of the soil, is of equal importance.

An investigation into the causes which produce the gradual destruction of these masses of rocks, will show that they are either of a mechanical or chemical nature; both of these, co-operating, produce the effects which we see around us in the formation of the soil. We have to examine these causes in the influence of water and air, for it is water and air, these two great universal agents, that possess all the power necessary to rend asunder the firmest masses of rocks and convey their fragments to distant regions, in which they appear as a more or less fertile soil.

The degradation of rocks, is the consequence of chemical action; of the cotemporaneous influence of carbonic acid, of oxygen in the atmospheric air, and of water upon their constituents. One of the most characteristic elements of the Silicates, is Silica; existing in them either in a free state, as quartz, or it is united to potash, &c. in mica, feld-spar, and other minerals; in the former state it is insoluble, in the latter, when separated by means of acids or any other cause it is soluble. In this form silica acts as an acid; but its affinity for the bases is so slight that even carbonic (a very