

But all of these mechanical influences which act on solid rocks, powerful as they are and as great a share they take in their destruction, would not have been able to effect such changes by themselves as have taken place, and as were necessary to render the surface of our globe fit for the support of vegetable life. Every thing which happens in nature, is based upon endless and mutual actions; no process whatever stands isolated, its whole economy must be understood before even the most simple phenomena in all their conditions and consequences can be explained—so in this instance. The mechanical powers are not the only causes of the degradation of rocks; these are accompanied and assisted by chemical affinity, the activity of which is due to the following facts:

A piece of granite protected against all mechanical influences which could destroy it, would nevertheless lose its cohesion and finally become changed into a white powder, commencing at the surface, and gradually extending to the centre of the stone. This change is due to the influence which the constituents of the atmosphere, most especially Oxygen, Carbonic Acid and Water, exercise upon solid rocks. The different crystalline rocks are composed of only a limited number of single minerals, which by the different manner of their association, as well as by the different quantitative proportions of which they are united, produce the various forms above named. These single minerals are: Quartz, Mica, Felspar, Augite and Hornblende, of which the three first, in their various combinations, form the first class of crystalline rocks, headed: Silicates, containing Alumina and Alkalies. The three latter, on the other side, form the second class of crystalline rocks, headed: Silicates, containing Lime and Protoxyd of Iron.

Granite is the representative of the first class, and an investigation of the causes which lead to its degradation, is sufficient to explain those which effect that of all others of this class. Granite consists of Quartz, Felspar and Mica, of which only the two latter are subject to the influence of the atmosphere. Quartz is a form of Silicic acid, a substance which presents itself in two different modifications. In the one, its pure state, it is isolated, forming Quartz, which is in no way attacked by the atmosphere, and only liable to crumble to pieces under the influence of mechanical powers. When thus broken, it gave rise originally and still adds to the immense deposits of *Sandstone*, which we meet almost every where on the surface of the earth. In its other modification, it forms with Alumina and the Alkalies, Felspar and Mica, and in these it exists in chemical combination, forming a Silicate of Alumina and Potash, a substance which is subject to the influence of the atmosphere. In contact with the Carbonic Acid and the water of the air, it is so decomposed that Carbonate of Potash and an Acid Silicate of Potash are formed, both soluble in water. If these products are washed out by water, nothing will remain, but Silicate of Alumina,