

heat, cold, and water in its manifold states, liquid, vaporous, and solid. In their action they may be combined, or act separately. The atmospheric agencies are oxygen, nitrogen, carbonic acid, vapor, and winds. The aqueous agencies are frost, snow, ice, glaciers, icebergs, springs, rivers, lakes and oceans. We shall not attempt to designate the separate action of these agents, but merely point out their most important combined effects.

All these agencies, where they act mechanically, remove materials from higher to lower levels. Mountains diminish in size, valleys receive accumulations, but only to assist the fragments in their progress towards the ocean. Thus the general tendency is to transport the continents into the ocean.

*Disintegration of Rocks.*—Water acts upon rocks and soils both chemically and mechanically; chemically, it dissolves some of the substances which they contain, and thus renders the mass loose and porous; mechanically, it gets between the particles and forces them asunder; so that they are more easily worn away when a current passes over them. Congelation still more effectually separates the fragments and grains, and thus renders it easy for rains and gravity to remove them to a lower level. In a single year the influence of these causes may be feeble; but as they are repeated from year to year, they become, in fact, some of the most powerful agencies in operation to level the surface of continents.

As rain in falling through the air absorbs carbonic acid, it acts with greater energy in the decomposition of rocks, especially those which are calcareous. It also penetrates into their pores and crevices, and initiates the process of metamorphism, by changing the mineral structure of rocks. Easily decomposing crystals, as pyrites or calcite, may be entirely removed, and their cavities be filled with some other mineral, which will assume the exact form of the original crystal, and thus be a *pseudomorph*.

It is a fact established by the experiments of Professors W. B. and R. E. Rogers, that pure water will dissolve more or less every variety of rock except quartz, on which nothing will act but hydrofluoric acid, unless it be converted into silicates. Much more decided will be the action of water if it contain, as it commonly does, carbonic acid. Other energetic chemical agents are produced which, along with carbonic acid, are carried we know not how deep into the earth, not only disintegrating the surface, but effect-