that all rocks and minerals are, in varying degrees, porous and permeable by water, that probably no known substance can, under all conditions, resist solution in water, and that the subsequent solvent power of water is greatly increased by the solutions which it effects and carries with it in its progress through rocks (pp. 519–521). The chemical work done by rain may be conveniently considered under the five heads of Oxidation, Deoxidation, Solution, Formation of Carbonates, and Hydration.

1. *Oxidation.*—The prominence of oxygen in rain-water, and its readiness to unite with any substance that can contain more of it, render oxidation a marked feature of the passage of rain over rocks. A thin oxidized pellicle is formed on the surface, and this, if not at once washed off, is thickened from inside until a crust is formed over the stone, while at the same time the common dark green or black color of the original rock changes into a yellowish, brownish, or reddish hue. This process is simply a rusting of those ingredients which, like metallic iron, have no oxygen, or have not their full complement of it. The ferrous and manganous oxides so frequently found as constituents of minerals are specially liable to this change. In hornblende and augite, for example, one cause of weathering is the absorption of oxygen by the iron and the hydration of the resultant peroxide. Hence the yellow and brown sand into which rocks abounding in these minerals are apt to weather. Sulphides of the metals give rise to sulphates, and sometimes to the liberation of free sulphuric acid. Iron disulphide, for example, becomes copperas, which, on oxidation of the iron, gives a precipitate of limonite, with the escape of free sulphuric acid.

2. *Deoxidation.*—Rain becomes a reducing agent by ab-