

stance of fossil wood (wood-opal). Several forms of opal are deposited by geysers, and are known under the general appellation of sinters. Closely allied to the opals are the forms in which hydrous (soluble) silica appears in the organic world, where it constitutes the frustules of diatoms, the skeletons of radiolaria, etc. Tripoli powder (Kieselguhr), randanite, and other similar earths, are composed mainly or wholly of the remains of diatoms, etc.

Corundum, aluminium-oxide, is found in crystalline rocks, particularly in certain serpentines and schists, gneiss, granite, dolomite, and rocks of the metamorphic series.

3. IRON OXIDES.—Four minerals, composed mainly of iron oxides, occur abundantly as essential and accessory ingredients of rocks. Hæmatite, Limonite, Magnetite, and Titanic iron.

Hæmatite (Fer oligiste, Rotheisen, Eisenglanz, $\text{Fe}_2\text{O}_3 = \text{Fe}70, \text{O}30$) in the crystallized form occurs in veins, as well as lining cavities and fissures of rocks. The fibrous and more common form (which often has portions of its mass passing into the crystallized condition) lies likewise in strings or veins; also in cavities, which, when of large size, have given opportunity for the deposit of great masses of hæmatite, as in cavernous limestones (Westmoreland). It occurs with other ores and minerals as an abundant component of mineral veins, likewise in beds interstratified with sedimentary or schistose rocks. Scales and specks of opaque or clear bright red hæmatite, of frequent occurrence in the crystals of rocks, give them a reddish color or peculiar lustre (perthite, stilbite). Hæmatite appears abundantly as a product of sublimation in clefts of volcanic cones and lava streams. It is probably in most cases a deposition from water, resulting from the alteration of some previous soluble combination of the metal, such as the oxidation of the sulphate, and occurs in veins and beds, and as the earthy pigment that gives a red color to sandstones, clays and other rocks. It is found pseudomorphous after ferrous carbonate, and this has probably been the origin of beds of red ochre occasionally intercalated among stratified rocks. It likewise replaces calcite, dolomite, quartz, barytes, pyrites, magnetite, rock-salt, fluor-spar, etc.

Limonite (Brown iron-ore, $2\text{Fe}_2\text{O}_3 + 3\text{H}_2\text{O} = \text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$, 85.56, H_2O 14.44) occurs in beds among stratified formations, and may be seen in the course of deposit, through the action of organic acids, on marsh-land (bog-iron-ore) and lake-bottoms. (Book IV. Part II. Section iii.) In the form of yellow