

taking up 0.2625 of its weight of water.<sup>158</sup> It often occurs in thin seams or partings in rock-salt; but it also forms large hill-like masses, of which the external parts have been converted into gypsum.

**Ironstone.**—Under this general term are included various iron-ores in which the peroxide, protoxide, carbonate, etc., are mingled with clay and other impurities. They have generally been deposited as chemical precipitates on the bottoms of lakes, under marshy ground, or within fissures and cavities of rocks. Some iron-ores are associated with schistose and massive rocks; others are found with sandstones, shales, limestones and coals; while some occur in the form of mineral veins. Those which have resulted from the co-operation of organic agencies are described at p. 254.

**Hæmatite** (red iron-ore), a compact, fine-grained, earthy, or fibrous rock of a blood-red to brown-red color, but where most crystalline, steel-gray and splendid, with a distinct cherry-red streak. Consists of anhydrous ferric oxide, but usually is mixed with clay, sand, or other ingredient, in such varying proportions as to pass, by insensible gradations, into ferruginous clays, sands, quartz, or jasper. Occurs as beds, huge concretionary masses, and veins traversing crystalline rocks; sometimes, as in Westmoreland, filling up cavernous spaces in limestone. Is found occasionally in beds of an oolitic structure among stratified formations. Some at least of the oolitic or pisolitic ironstones have resulted from the conversion of original grains of calcite in ordinary oolites into carbonate of iron which on oxidation has become magnetite, hæmatite, or limonite.

**Limonite** (brown iron-ore), an earthy or ochreous, compact, fine-grained or fibrous rock, of an ochre-yellow to a dark brown color, distinguishable from hæmatite by being hydrous and giving a yellow streak. Occurs in beds and veins, sometimes as the result of the oxidation of ferrous carbonate; abundant on the floors of some lakes; commonly found under marshy soil where it forms a hard brown crust upon the impervious subsoil (*bog-iron-ore*). Found likewise in oolitic concretions sometimes as large as walnuts, consisting of concentric layers of impure limonite

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<sup>158</sup> See G. Rose on formation of this rock in presence of a solution of chloride of sodium. *Neues. Jahrb. Min.* 1871, p. 932. Also Bischof, "Chem. und Phys. Geol." Suppl. (1871), p. 188.