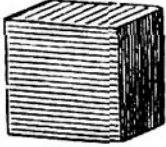


10. *Sulphides, or Minerals Containing Sulphur.*

PYRITE. — Color pale yellow, brass-like, much less yellow than chalcopyrite. Hardness 7, or sufficient to strike fire with steel, whence the name, from the Greek for *fire*. Occurs often in cubes like Fig. 57. The striæ of the adjoining surfaces, when any

57.



are present, are at right angles with one another. Also in other related forms. Frequently very brilliant, but also dull, and sometimes brown from a coating of limonite. Composition: Sulphur 53.3, iron 46.7 = 100; formula, FeS_2 . Common in all rocks, in small disseminated crystals; often in veins, and as the gangue of other ores. It is the "gay deceiver" of the mineral world, being often mistaken for silver ores (which are never yellow) and for gold (which is never brittle or hard), or for chalcopyrite or copper pyrites (which is easily scratched, and has an olive-green powder). Often contains gold invisibly disseminated, and is worked for its gold; not good for making iron, but by oxidation converted into vitriol (iron sulphate), and used for this purpose and for making sulphuric acid.

MARCASITE. — Like pyrite in composition (FeS_2) and hardness, but color paler and crystals prismatic. Pyrite and marcasite are paramorphs.

PYRRHOTITE. — Iron sulphide, containing sulphur 39.5, iron 60.5 = 100; formula, Fe_7S_8 , the atomic ratio being nearly 1 to 1. Differs from pyrite in having a bronze-yellow color, in being easily scratched ($H = 3\frac{1}{2}$ to $4\frac{1}{2}$), and in crystallization. Used for the same purposes as pyrite. Often contains nickel, and is then worked for this metal.

ARSENOPYRITE. — Silver-white, brittle, $H = 5.5-6$, much above that of silver ores. Contains, with iron, arsenic as well as sulphur; formula, FeAsS . Valuable for its arsenic, and sometimes contains cobalt and gold.

CHALCOPYRITE (copper pyrites). — Gold-yellow, brittle (in this unlike gold); powder olive-green. A valuable ore of copper, consisting of sulphur 34.9, copper 34.6, iron 30.5 = 100.

GALENA. — Lead sulphide, of light steel-gray color, brittle. Usually breaks into cubes under the hammer, unless fine granular-massive; $H = 2.5$. The common ore of lead. Contains sulphur 13.4, lead 86.6 = 100; formula, PbS .

SPHALERITE (Blende). — Zinc sulphide. Luster not metallic, but resinous, and the powder nearly white. Colors yellow and brown, looking much like resin, also black, rarely white. Composition: Sulphur 33, zinc 67 = 100; formula, ZnS . A common and valuable ore of zinc.

11. *Oxides.*

HEMATITE. — Often called specular iron ore, because the crystals are brilliant; a steel-gray ore of iron, but also of a deep red color when earthy. Consists of oxygen 30, iron 70 = 100; formula, Fe_2O_3 . Crystals rhombohedral. Powder red, and hence the name (given by the Greeks), from the Greek for *blood*. H of crystals 6. The red ore is *red ocher* (common red paint and red chalk), and a hard, massive, impure kind is a variety of clay-ironstone. A valuable but hard iron ore, *Menaccanite (Ilmenite, or titanic iron)* is a related ore containing much titanium and having a black powder.

MAGNETITE. — Called magnetic iron, because easily taken up with a magnet, unlike other iron ores. Color blackish iron-gray, looking much like hematite, from which it differs in its black powder, and in crystallizing in octahedrons and related forms; $H = 6$. Composition: Oxygen 27.6, iron 72.4 = 100; formula, Fe_3O_4 . Occurs in great beds like the last, and also common in disseminated crystals; often a black iron sand on sea-beaches. A valuable ore of iron. *Franklinite* is a similar ore (from Sussex Co., N.J.), containing nearly 7 per cent of zinc oxide with nearly 10 of manganese protoxide; valuable for its zinc, as well as its iron.