especially copper and gold, now and then appear in sufficient quantity to constitute commercially important ingredients of veins and rock-masses.

Graphite is found chiefly in ancient crystalline rocks, as gneiss, mica-schist, granite, etc.; some of the Laurentian limestones of Canada being so full of the diffused mineral as to be profitably worked for it; in rare instances coal has been observed changed into it by intrusive basalt (Ayrshire). In some cases graphite results from the alteration of imbedded organic matter, especially remains of plants; but its presence, and that of diamond, among ancient crystalline rocks and in meteorites can hardly be thus accounted for. Occasionally it is observed as a pseudomorph after calcite and pyrites, and sometimes inclosing sphene and other minerals.[8]

Sulphur occurs 1st, as a product of volcanic action in the vents and fissures of active and dormant cones. Volcanic sulphur is formed from the oxidation of the sulphuretted hydrogen, so copiously emitted with the steam that issues from volcanic vents, as at the Solfatara, near Naples. It may also be produced by the mutual decomposition of the same gas and anhydrous sulphuric acid. 2d, in beds and layers, or diffused particles, resulting from the alteration of previous minerals, particularly sulphates, or from deposit in water through decomposition of sulphuretted hydrogen. The frequent crystallization of sulphur shows that the mineral must have been formed at ordinary temperatures, for its natural crystals melt at 238·1° Fahr. Its formation may be observed in progress at many sulphureous springs, where it falls to the bottom as a pale mud through the oxidation of the sulphuretted hydrogen in the water. It occurs in Sicily, Spain and elsewhere, in beds of bituminous limestone and gypsum. These strata, sometimes full of remains of fresh-water shells and plants, are interlaminated with sulphur, the very shells being not infrequently replaced by this mineral. Here the presence of the sulphur may be traced to the reduction of the calcium-sulphate to the state of sulphide, through the action of the decomposing organic matter, and the subsequent production and decomposition of sulphuretted hydrogen, with consequent liberation of sulphur.[9] The sulphur deposits of Sicily furnish an excel-

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[8] Vom Rath. Sitzungsber. Wien. Akad. x. p. 67; Sullivan in Jukes' "Manual of Geology," 3d edit. (1872), p. 56.

[9] Braun, Bull. Soc. Géol. France, 1st ser. xii. p. 171.