

PART IX. ORE DEPOSITS<sup>1</sup>

Metallic ores and other minerals that are extracted for their economic value occur in certain well-marked forms which have been variously classified; but for the purposes of the geological student it is most convenient to consider them from the point of view of geological structure and history. Thus arranged, they naturally group themselves into three great series; 1st, those contemporaneously deposited among stratified formations; 2d, those contemporaneously formed with the other ingredients of crystalline (massive and schistose) rocks; 3d, those subsequently introduced by infiltration or otherwise into fissures, caverns, or other spaces of any kind of rock.

1. Contemporaneous ores of stratified rocks have been deposited in water, together with the sandstones, limestones, or other strata among which they lie. In some cases, they are mere mechanical sediments, such as the auriferous gravels of California and Australia (placer-works) or

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Bull. Soc. Geol. France (2), iii. 1846; Daubrée, Ann. des Mines, 5me serie, xvi. p. 155; Bischof, "Chemical Geology," chap. xlviii.; J. Roth, Abhandlungen Akad. Berlin, 1871; 1880; Gümbel, "Oestbayerische Grenzgebirge," 1868; H. Credner, Zeitsch. Gesammt. Naturwiss. xxxii. 1868, p. 353; N. Jahrb. 1870, p. 970; A. Inostranzeff, "Studien über metamorphosirte Gesteine," Leipzig, 1879.

<sup>1</sup> The best English work on this subject is "Ore Deposits," by J. A. Phillips, 1884. The following works on ores and mining may also be consulted: B. von Cotta, "Die Lehre von Erzlagerstätten," 1859-61; A. von Groddeck, "Die Lehre von den Lagerstätten der Erze," 1879; W. Forster, "Treatise on a Section of the Strata from Newcastle-on-Tyne to Cross Fell"; W. Wallace, "Laws which regulate the deposition of Lead Ores," 1861; F. von Sandberger, "Untersuchungen über Erzgänge"; numerous valuable papers by J. W. Henwood and others in Trans. Roy. Geol. Soc. Cornwall; G. F. Becker, "Geology of the Comstock Lode," U. S. Geol. Survey, Monographs iii. iv.; also "Quick-silver Deposits," 8th Ann. Rep. U. S. Geol. Survey, 1886-87, p. 965, and Monograph xiii.; R. D. Irving, "Copper-bearing rocks of Lake Superior," Ann. Rep. U. S. Geol. Survey, 1881-82, p. 93 and Monograph v.; "Gîtes Minéraux," E. Fuchs et L. Delaunay, Paris, 1893.