

and limestone formation, intruded by greenstones ranging from a coarse-grained hornblende diorite to a greenish aphanitic rock. The fractures were probably formed by the intrusion of the greenstone and served as channels for the circulation of the ore-bearing solutions which formed the ore-bodies by replacement of the sediments. On Grey Copper hill freibergite float carrying 900 to 1,000 ounces of silver to the ton was found, as well as a narrow vein carrying tetrahedrite. On McKay hill a 12½-foot vein of galena with tetrahedrite and zincblende, including several quartz stringers, has been cut and other veins are indicated by float. The veins cut amygdaloidal volcanics. Similar deposits are found on other hills.

The mode of occurrence of the silver-lead deposits of Slocan has been described in some detail by A. M. Bateman⁶. The deposits lie within a series of folded and squeezed interbedded slates or argillites, quartzites and finely crystalline limestone intruded by a batholith of granodiorite. Three types of deposits have been recognized:—(a) narrow quartz veins chiefly in the granodiorite with high silver and low lead and zinc content, (b) massive zinc deposits formed by replacement along fractures in limestone, and (c) silver-lead fissure veins. The last are the most important and the ore is valuable chiefly for silver and lead, zinc occurring in subordinate quantities. The veins occupy fault fissures, though a few are in master joints. The ore is found in shoots of restricted extent. The factors determining the points of deposition of the ore in shoots have not been learned. The ore-bearing solutions were not given off from the granodiorite but came from the unconsolidated interior of the batholith or from the same source as the igneous rocks. A zonal distribution of minerals has been observed. The ores in the granodiorite are highly siliceous, the total amount of metallic minerals is small; zinc is scarce, lead is subordinate, and the chief metal is silver; the ores in the sediments near the contact are less siliceous and contain more galena and sphalerite with less tetrahedrite and ruby silver, and in the more distant deposits the relative proportion of galena and sphalerite to quartz is greater.

Gold, silver, lead, zinc and copper have been found in veins near Whitesail lake and Tahtsa river, in the vicinity of the eastern edge of the Coast Range batholith. The silver-lead-zinc deposits on Chikamin and Sweeney mountains are, according to J. R. Marshall¹, the most important discoveries so far made.

Sodium and Magnesium Salts.—L. H. Cole² presents the results of work in surveying, drilling and sampling of the Ingebright, Regina Beach and Salt Lake deposits of Saskatchewan. Analyses of representative samples show that the salts of these deposits run high in sodium sulphate. In the twelve lakes drilled by the Mines Branch of the Department of Mines, 50,000,000 tons of hydrous sodium and magnesium salts, mainly sodium sulphate, have been proved, and private reports by engineers and chemists on other deposits give estimated tonnages of another 20,000,000 tons.

Miscellaneous.—A number of shorter articles that should not be overlooked have been published. Horace Freeman, in the *Engineering and Mining Journal-Press*, describes the results of experimental work in the fusibility of sulphides of the metals and of the double sulphides of the metals and sodium sulphide, of the solubilities of the double sulphides, their reaction with water and the effects of oxidation. The bearing of these experimental results on the problems of solution and deposition of ore minerals is also discussed.