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VOL. ______ MINERAL Ni, Cu

G.S.A. MEMOIR J. D. Ridge NO. 131

REGION ______ PT. ______

M.D. ______ PROGRAM R. V. Kirkham B.C. PAGE 24-25

PRIDE OF EMORY area PUB. YEAR 1972

that Warren and Cummings (
If this is true, all of the gold may have been late or, as they think, two generations of gold may have been deposited. It seems just as reasonable to assume two generations of calcite or that the craters near the gold in arsenopyrite contained something else than calcite. Thus, the age of the gold is not certain, but so much of it is in arsenopyrite without associated craters that most of the gold probably was essentially contemporaneous with the iron-arsenic sulfide and should, therefore, be classed as hypothermal. Since the ores were formed in calcareous rocks, the designation hypothermal-2 is used here.

PRIDE OF EMORY

92H/6

Early Mesozoic *Nickel, Copper* *Magmatic-2b*

Aho, A. E., 1956, Geology and genesis of ultrabasic nickel-copper pyrrhotite deposits at the Pacific nickel property, southwestern British Columbia: Econ. Geol., v. 51, p. 444-481

——— 1957, Pacific Nickel property, in *Structural geology of Canadian ore deposits*, v. 2: Canadian Inst. Min., Montreal, p. 27-36

Anon., 1962, Success finally comes to British Columbia's most famous nickel mine: Mining World, v. 24, no. 6, p. 28-31

Cairnes, C. E., 1924, Nickeliferous mineral deposit, Emory Creek, Yale mining division; British Columbia: Geol. Surv. Canada Summ. Rept., pt. A, p. 100-105

Cockfield, W. E., and Walker, J. F., 1933, The nickel-bearing rocks near Choate, British Columbia: Geol. Surv. Canada Summ. Rept. pt. A, p 62-68

Eastwood, G.E.P., and Robinson, W. C., 1965, Pride of Emory (Giant Mascot Mines Limited): B.C. Minister Mines, Ann. Rept. for 1965, p. 213-217

Hill, H. L., and Starck, L. P., 1960, The Giant nickel mine: Western Miner and Oil Rev., v. 33, no. 11, p. 39-42

Horwood, H. C., 1936, Geology and mineral deposits at the mine of B.C. Nickel Mines, Ltd., Yale District, B.C.: Geol. Surv. Canada Mem. 190, 15 p.

——— 1937, Magmatic segregation and mineralization at the B.C. Nickel Mine, Choate, B.C.: Roy Soc. Canada Tr. 3d Ser., v. 31, sec. 4, p. 4-15

James, A.R.C., 1961, Pride of Emory [Giant Mascot Mines, Limited]: B.C. Minister of Mines, Ann. Rept. for 1961, p. 86-88

Monger, J.W.H., 1970, Hope map-area (92H W 1/2), British Columbia: Geol. Surv. Canada Paper 69-47, 75 p.

Stephens, F. H., 1963, Giant Mascot mines: Western Miner and Oil Rev., v. 36, no. 4, p. 34-48

Notes

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R. V. KIRKHAM

ent degrees, fractured. Most of the gangue minerals, therefore, are earlier than the ore, but the sulfides were accompanied by sodic scapolite, dipyre (a more calcic scapolite), and chloropal (a rare montmorillonite-type mineral). The first and most abundant sulfide was arsenopyrite containing tiny inclusions of cobaltite, then came smaller but considerable amounts of pyrrhotite and generally much less chalcopyrite and sphalerite, the latter two containing oriented blebs of the other. Small amounts of loellingite and safflorite formed at about the same time as the arsenopyrite. Nearly all the gold occurs as tiny specks in the arsenopyrite, but some is present in the pyrrhotite in somewhat larger particles. Some of the gold in arsenopyrite is bounded by craters that Warren and Cummings (1937) think may have been filled with late calcite. If this is true, all of the gold may have been late or, as they think, two generations of gold may have been deposited. It seems just as reasonable to assume two generations of calcite or that the craters near the gold in arsenopyrite contained something else than calcite. Thus, the age of the gold is not certain, but so much of it is in arsenopyrite without associated craters that most of the gold probably was essentially contemporaneous with the iron-arsenic sulfide and should, therefore, be classed as hypothermal. Since the ores were formed in calcareous rocks, the designation hypothermal-2 is used here.

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In the Princeton area to the east of the Pride of Emory deposits, ultramafic rocks, similar to those of the Pride of Emory area, cut the Upper Triassic Nicola group and were emplaced, therefore, no sooner than latest Triassic or earliest Jurassic time. The Princeton ultramafics are cut by the Eagle granodiorite for which an age of 143 m.y. has been obtained. An age of 186 m.y. was obtained from a biotite from a small mass of pyroxenite that probably is satellitic to the Giant Mascot stock. Thus, both lines of evidence point to the Pride of Emory ultramafics being either oldest early Mesozoic or youngest middle Mesozoic; the former is arbitrarily chosen here. Monger (1970), however, believes that the ultramafics are contemporaneous with the diorite (or quartz diorite) that encloses them. Similar quartz diorite near Hope has been dated at 76 to 102 m.y. If Monger's reasoning is correct, the ores would be Late Cretaceous, probably pre-Laramide. The age problem needs further study.

The ores at Pride of Emory are contained in two types of pipelike bodies: (1) unzoned or massive and (2) zoned. The application of the term massive to the unzoned deposits does not mean that they are composed of massive sulfides but that they lack zoning; in any ore body, zoned or unzoned, the silicates are more abundant than the sulfides. The unzoned bodies, although more irregular in outline than the zoned, exhibit sharp contacts against the various older rocks in which they are enclosed and contain inclusions of these rocks, show marked flow lines and banding, are drag-folded in places, and have minor hornblende reaction rims against the rocks containing them. If the unzoned bodies were the only ore type at Pride of Emory, the deposits would be classed as magmatic-2b without much question, on the assumption that segregated volumes of molten silicate-sulfide emulsion had been forced into the stock after it was essentially solid. The zoned ore bodies, however, are not as readily assigned to this category, being composed of concentric shells of the different ultramafic rocks, mainly peridotite and pyroxenite, that are roughly cylindrical around the ore masses. The sulfides contained in the zoned ore bodies are also zoned, there being both sulfide-rich and sulfide-poor zones and cores within any given zoned ore body. The silicates that accompany the sulfide-rich zones and cores are generally such that the rock, if it lacked sulfides, would be classed as peridotite. These zoned ore bodies grade gradually outward into the sulfide-poor ultramafic rocks that surround them, the surrounding silicate rocks containing less olivine and bronzite and more augite and hornblende than the zoned ores they enclose. These zoned ore bodies might be classed as hydrothermal replacements were it not that the differences between silicates of the zoned ore bodies and the sulfide-poor rocks surrounding them are not those which hydrothermal (deuteric) alteration has produced elsewhere in the ultramafic stock.

Instead, the relationship of the zoned ore bodies to the rock enclosing them probably is better explained by assuming that emulsions of silicates and sulfides had been segregated at depth and were on occasion introduced into considerably, but not entirely, crystallized portions of the ultramafic stock. Where these emulsified intrusions encountered solid rock, the result was the unzoned type of deposit; where volumes of still not fully crystallized ultramafics were met, there was enough mingling of the two ultramafic types to produce the gradational and zoned relationships just described. As the silicates of the later-intruded sulfide-silicate emulsion crystallized before the bulk of the molten sulfides, the existence of veins and veinlets of sulfides cutting through both the silicates of the later intrusion and of the surrounding ultramafics is not surprising. The classification of both ore types in the Pride of Emory deposit, therefore, is magmatic-2b. It is asking too much of coincidence that two ore types of essentially the same composition should have been developed in the same rock volume, one by magmatic and one by hydrothermal processes.

SULLIVAN

Late Precambrian	*Zinc, Lead, Silver, Tin*	*Hypothermal-1 to Leptothermal*