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of metals away from the orebodies.

Environment of ore formation is similar in the deposits. Sea water was cycled into a geothermal system within the volcanic pile; it was heated and underwent reduction and chemical exchange with the basaltic rocks within the hydrothermal system. The ore solutions perc lated slowly onto the sea floor and accumulated in depressions near the fumaroles. Capping by lava flows or sediments preserved the deposits from erosion. Similar cupriferous massive sulfide deposits are found at Løkken, Norway; Besshi, Japan; Cyprus; Whalesback Mine, Newfoundland; and Goldstream, British Columbia.

SIGNIFICANCE OF LEAD ISOTOPES TO METALLOGENY OF POLYMETALLIC SULPHIDE DEPOSITS, SOUTHERN COAST PLUTONIC BELT, SOUTHWESTERN B.C.

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Massive sulphide deposits have been known in the southern Coast Mountains of B.C. for more than half a century, principally through the Britannia deposits from which a total of 53 million tons of ore were produced grading 1.1% Cu, 0.65% Zn, 0.20 oz Ag/ton and 0.02 oz Au/ton. Recent work has shown that some of these, including the Britannia and Seneca deposits, are of volcanogenic origin, whereas controversy surrounds the origin of others such as the Northair deposits.

Lead isotope abundances for many of these deposits cluster near the mean crustal growth curve and the geochron, with dispersion little more than experimental error. This uniformity of lead isotope ratios encompasses (1) within-deposit uniformity, (2) uniformity among deposit types (volcanogenic, skarn, vein), and (3) uniformity regardless of host rock age (Jurassic, Cretaceous and Tertiary).

Geochemical attributes (Pb-U-Th environments) of source rocks for Jurassic and Cretaceous volcanogenic deposits are similar, suggesting that the two terranes now separated geographically were derived from either similar sources or the same source. Furthermore, the similarity of lead isotopes ratios from stockwork feeders and layered massive sulphides as at Seneca substantiates the genetic relation of the two morphological types of sulphide concentrations.

These data are consistent with a metallogenesis for polymetallic sulphide deposits in the region in which an initial phase of volcanogenic mineralization occurred over a time span that extended at least from the mid-Jurassic (Seneca) to Cretaceous (Northair, Fitzsimmons Ck.). Subsequent tectonic events resulted in metamorphism and deformation of these deposits and locally led to mobilization of sulphides into veinlets containing predominantly quartz and/or carbonate. Two such ages of mobilization are recognized. At the Northair deposit abundant coarse-grained sulphide-bearing veinlets are attributed to a thermal event about 80 Ma ago, corresponding to emplacement of many of the local plutons that make up the Coast Plutonic Belt in this area. A second mobilization episode has occurred in the last few million years associated with Garibaldi volcanic rocks and is typified by the Van Silver showings (Millsite and, in part, Silver Tunnel).

GEOTHERMAL RESOURCES OF THE GARIBALDI VOLCANIC BELT, SOUTHWESTERN B.C.

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The basic technology for gerating electricity from geothermal steam was developed and applied more than 70 years ago, but an abundance of cheap conventional