Legend

Paleocene and Eocene (?)

Tertiary Intrusions

Bulkley

7 – porphyritic granodiorite, quartz monzonite – quartz latite aplite

Upper Jurassic

Bowser Group

6 mudstone, siltstone, greywacke conglomerate and hornfels equivalents

Pre-Upper Jurassic (?)

5 granodiorite

4 porcelaneous felsite

3 massive, spherulitic and banded felsite

Hazelton Group

2 mainly intermediate pyroclastic rocks and hornfelsic equivalents

2A – quartz, feldspar-rich lapilli tuff – probable Jurassic equivalents

1 mainly massive, intermediate and basic volcanic rocks; some felsite, and hornfelsic equivalents probable Jurassic

Symbols

Geological boundary: defined, assumed

Bedding 150

Flow banding 80° N

Fault

Thrust fault: defined, concealed

Approx. Structural contour

Limit of intrusion on surface

Adit

Road

Glacier

Geology 741

Metamorphism of Ores

By way of background, study the translation of pp. 36-76 of Ramdohr's Die Erzmineralien und ihre Verwachsungen". Corresponding pages of the translation are 37-76. Study the illustrations, captions of which are given in translation in the folder.

The systematic analysis of metamorphic processes and the types of metamorphism recognized in the study of metamorphosed silicate rocks should be the same for ores. However, as Ramdohr points out, much less is known about the metamorphism of ores, particularly sulfide ores.

At the moment, studies of the metamorphism of ore mineral in North America are focussed on the massive sulfide deposits formed in the Appalachians from new Brunswick to east Tennessee, in southeastern Ontario, and in the Shasta district of California. Actually there are two separate questions involved, but answers given to the one question to sime extent depend on answers to the other. The questions are:

(1) Are the deposits hydrothermal in the classical sense, or are they volcanic exhalative?

(2) Are the present textures of the ores primary, metamorphic, or both?

For background on this controversy, read Kalliokoski, J.,

Kalliokoski, J., 1965, Metamorphic features in North American massive sulfide deposits, Econ. Geol., vol. 60, p. 485-505. Has a good list of references.

Känkel, A. R., 1962, The Ore Knob massive sulfide deposit, North Caroline, Econ. Geol., v. 57, p. 1116-1121.

Carpenter, R. H., 1965, A study of the ore minerals in cupriferous pyrrhotite deposits in the southern Appalachians, Univ. of Wis. thesis (Ph.D.). On shelf in Room 9.