



Experimental Petrology and Ore Genesis Conference

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The annual conference on experimental petrology and ore genesis was held in the Department of Geology, University of Western Ontario on Saturday, January 11, 1975. These conferences are held in the Spring Term of each year at an Ontario or Quebec university; the first one being held at Western in 1968. They are designed primarily as a forum for graduate students, government and industrial scientists as well as university faculty to present research "in progress" for informal discussion. Sessions are also held on experimental and analytical techniques as well as research contemplated.

Two innovations were made in this year's meeting, no "keynote" speakers were invited to talk on a central theme, and the conference lasted only a single day. Both of these changes were made because of the forthcoming GAC-MAC-GSA meetings in Waterloo in May where there will be several symposia in which world-renowned petrologists will be lecturing. Despite the lack of a central theme and the short duration of the meeting, more than 80 participants from Ontario, Quebec and Michigan heard 12 papers on wide-ranging topics in igneous petrology, metamorphic petrology, geochemistry and mineral deposits geology.

The morning session was devoted to papers on petrological and geochemical subjects. The increasing use of computers in models of igneous processes was apparent in papers by Professors T. H. Pearce and P. L. Roeder of Queen's University. Pearce discussed the use of molar-oxide ratio diagrams to test specific hypothesis of fractionation using computer simulation to confirm the mechanisms suggested by molar oxide ratio diagrams. A computer file for data on experimental results of basaltic rocks and on use of this file for various hypothetical fractionation models for basalts was presented by P. L. Roeder.

Professor E. C. Appleyard (University of Waterloo) reviewed the geological, petrological and geochemical evidence to indicate that the alkaline rocks of the Haliburton-Renfrew area of Ontario might be produced by local anatexis promoted by fluxing from evaporite horizons. He suggested that experimental studies might be done on this problem. In a paper on similar rocks from the York River area east of Bancroft, Ontario, Professor G. M. Anderson (University of Toronto) speculated that the nepheline gneisses of this area may have been produced by processes of alkali ion exchange metasomatism.

P. C. Fung and D. M. Shaw (McMaster University) discussed the partitioning of K, Rb and Tl among coexisting pairs of minerals in rocks of different types. Preliminary results suggest that Rb and Tl are concentrated in K-rich minerals principally K-feldspars and micas.

Five of the seven papers in the afternoon session were devoted to mineral deposits geology and ore geochemistry. Professor R. W. Hodder (University of Western Ontario) and some of his students opened the session with a discussion of fundamental problems involved in the partitioning of transition metal ions during late magmatic and hydrothermal stages of igneous activity. Dr. M. N. Hutchison (University of Toronto) discussed thio complexes of Pb and the transport of galena in hydrochemical solutions. From experimental results over a range of temperatures, pressures, concentrations and pH conditions, Hutchison concluded that Pb thio complexes are probably insignificant in

the transport of Pb in hydrothermal solutions at near pH values. Based on solution equilibria calculations in the Fe-S-O system, Dr. R. Large (University of Toronto) suggested that zonation of massive sulphide volcanogenic deposits from a copper-rich base to a zinc & lead rich top, such as occur in Noranda and Matagami areas, may be produced by mixing of upward moving reduced chloride rich hydrothermal solution with sea water percolating downwards through the volcanic pile.

Using experimental techniques and data on natural assemblages, two papers were presented on metal-sulphide systems. Dr. S. A. Kissin of the Mines Branch, Dept. of Energy, Mines and Resources has re-investigated the system stannite-kesterite while Dr. O. P. Malik (University of Toronto) and Professor D. H. Watkinson (Carleton University) discussed phase relations at 25°C within a portion of the Fe-Ni-S system and suggested how sulphide assemblages within iron-nickel ores might indicate grades of metamorphism and the extents of pre-metamorphic alteration.

Conditions of metamorphism in the rocks of the McMillan Pass scheelite deposit, Southern Yukon were discussed by L. A. Dick (Queen's University). Dr. E. Essene and D. B. Dewitt (University of Michigan, Ann Arbor) presented a paper on the sphalerite barometry applied to disseminated sphalerite-pyrrhotite-pyrite assemblages in regionally metamorphosed Grenville marbles. Their results suggest pressures of approximately 3.7 kb in the western Haliburton, Ontario region to approximately 4.9 kb at Balmat, New York.

The meeting at Western this year marked the beginning of a "second cycle" of this annual gathering. The large audience informality, diverse range of papers presented (and perhaps also the absence of any registration fee) continues to make this annual meeting one of the popular scientific highlights each spring. Next year the meeting will again move eastwards where either University of Toronto or McMaster are likely hosts.

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