BOOK REVIEW

SEDIMENT-HOSTED STRATIFORM COPPER DEPOSITS. By R.W. Boyle, A.C. Brown, E.C. Jowett, and R.V. Kirkham. Geological Association of Canada Special Paper 36, 1990. viii + 710 pages, $95.00 CAD members, $125.00 CAD nonmembers.

Sediment-hosted stratiform copper deposits are the second largest source of mined copper in the world and one of the most important geochemical concentrations of copper on the planet. They also contain important amounts of Ag and Co, as well as local concentrations of Au, Mn, Ni, Pb, Re, U, V, and Zn, and are hosts to many unusual minerals. In spite of their great economic and geochemical importance, these deposits have received less research attention than their cupriferous cousins the porphyry copper and massive sulfide deposits, and active controversy on many aspects of their geologic features and origin persists today. Much of this controversy reflects the fact that copper is found in specific stratigraphic units over large regions, an observation that led many observers to conclude that the copper was a product of chemical sedimentation or early diagenesis. Evaluation of this possibility by conventional fluid inclusion and isotopic techniques has been hampered by the diabolically fine-grained nature of most ores, and by the location of many important deposits in Poland, Zaire, and the former East Germany, where they are out of reach of most western researchers. Thus, we have been slow to recognize that these deposits are, in fact, products of postsedimentary diagenetic processes involving large-scale, regional flow of warm, oxidizing brines.

This volume, which is based on a highly successful 1986 symposium that was organized by the Mineral Deposits Division of the Geological Association of Canada, will definitely put these deposits into the research limelight. The editors have attempted to produce a volume with balanced coverage, rather than one that focuses specifically on present research advances. The 43 papers in the volume are divided into a section on general aspects, followed by separate sections with descriptions of important deposits in North and South America, Africa, Australia, Europe, the Middle East, and China. Most geologists working on these deposits are represented among the 63 authors, and the only important deposits that are not described are those in the U.S.S.R. and Afghanistan. The section on general aspects of these deposits has some very stimulating papers, although it would have been improved by a more incisive comparison of competing hypotheses for the origin of these deposits. In particular, the reader is left with considerable uncertainty about how to weigh the strong bias toward syngenesis shown by most workers in the African Copper Belt against the similarly strong, but diametrically opposed, bias toward epigenesis manifested by researchers on most other deposits. The descriptive papers vary somewhat in quality, but most provide good descriptions of regional geology, lithology, and conventional ore and alteration mineral assemblages. Geochemical and isotopic data, including microbeam observations, are relatively scarce in this volume, making it a gold (copper?) mine of research opportunities. Photos are abundant and of good quality. Rehashing of previously published material, a common weakness of volumes of this type, is kept to a minimum, and even papers that include significant material of this type manage to offer provocative ideas.

Although this book will be most useful to those with an interest in the geology, geochemistry, and mineralogy of copper, it contains much useful information on related aspects of sedimentary geology, diagenetic processes, and basin evolution. It is probably not appropriate for the personal library of most mineralogists or petrologists, but they should encourage purchases by their local economic geologist, geochemist, and library.

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