

BOOK REVIEWS

Dunning, F. W., Mykura, W., and Slater, D., Editors. *Mineral Deposits of Europe. Volume 2: Southeast Europe*. London (Mineralogical Society and Institution of Mining and Metallurgy), 1982. xii + 304 pp. 184 figs. Price £42.00 (£35.00 to Members of either Society).

This is the second of the five volumes (M.M. 43-451) planned on the geology of European ore deposits. There is an introduction on the main geotectonic and metallogenic features of southeast Europe, followed by chapters on Hungary, Yugoslavia, Albania, Romania, Bulgaria, Greece, and Cyprus, and a final chapter giving statistical commodity summaries for each country. In his introductory chapter W. S. Petraschek points out that the economically important ore concentrations were emplaced principally in the Mesozoic and Tertiary eras, some 71% of all deposits of the Balkan-Carpathian region being of Alpine age and 16% Hercynian. In the northern branch of the orogen, Cu is the most important ore, whereas in the southern branch Pb and Zn are paramount.

In most of the territorial chapters the structure and tectonics are outlined and related to the metallogenesis, though in the chapter on Greece the ores are considered on an elemental and commodity basis. Thus in general this work gives useful reviews in English of the geology of each country as well as of the important economic aspects. The fairly extensive references at the end of each chapter should allow the diligent reader to go further into the literature if required (there is generally some indication of the language of the main text and a statement as to summaries in western languages).

In the central mountains of Hungary the post-magmatic copper and polymetallic ores are associated with Tertiary volcanism, but the Mesozoic formations of the Carpathian basin are also rich in metalliferous and non-metalliferous minerals. The Carpathian orogen controls the metallogenesis in Romania, the subject of the longest chapter in the book. There is a remarkable correlation of Alpine metallogenesis between the Apuseni Mountains and the Carpathian arc with each unit showing different evolutionary patterns as well as indicating the persistence of certain genetic and paragenetic conditions.

In Yugoslavia, and to some extent in Greece, several sub-parallel metallogenic provinces can be established roughly along the NW-SE grain of the country. The Alpine metallogeny in the Serbo-Macedonian province produced the most signifi-

cant Pb-Zn, Sb, Bi, and Mo deposits, and the Carpatho-Balkan province in the east passes to the north and southwest into Romania and Bulgaria respectively, but in Yugoslavia includes the important Bor magmatic complex, mainly of volcanoclastics, containing numerous Cu-Mo massive sulphides, and hydrothermal Pb-Zn deposits. The Rhodope zone in Bulgaria is characterized also by important Pb-Zn deposits but is locally relatively rich in Mn. To the north, the Srednogorié zone includes the Panagyurishtë porphyry copper deposits. In Albania the chromite deposits occur in ultrabasic rocks with ophiolitic affinities, metallurgical grade chromite being obtained from the Bulqiza harzburgite massif.

In Cyprus the cupriferous sulphide orebodies that have been mined for some 6000 years are restricted to the Troodos pillow lavas; chromite is the second most important metallic mineral mined and occurs in the Troodos ultrabasic plutonic rocks. In the last chapter A. J. G. Notholt gives mineral production figures and commodity statistics for various years from 1960 to 1979.

The book is beautifully produced and printed and well illustrated by numerous geological sketches and cross-sections. Almost all the deposits are described for the first time in English by authors from the countries concerned and some occurrences are new to the literature. It will be of interest to a wide readership and deserves to be in all libraries concerned with the earth sciences.

R. A. HOWIE

Newton, R. C., Navrotsky, A., and Wood, B. J. *Thermodynamics of Minerals and Melts* (Advances in Physical Geochemistry, 1). Berlin, Heidelberg, and New York (Springer-Verlag), 1981. xiii + 304 pp., 66 figs. Price DM 78.00 (\$35.50).

There is much of considerable interest to the theoretical petrologist gathered between the covers of this book. The material included covers a very wide range of topics. As stated in the preface, the volume is an outgrowth from a seminar series held at the University of Chicago. This history maybe explains one or two features of the book. Obviously the choice of papers was (at least partially) mitigated by who happened to pass through Chicago in 1979. It might be argued that the book lacks a sense of unity. Is the book trying to summarize research work, present new work, educate research workers, or educate students? The papers spread