BOOK REVIEWS

Guilbert, J. M. and Park, C. F., Jr. *The Geology of Ore Deposits.* Oxford and New York (W. H. Freeman and Co.), 1986. xiv+985 pp. Price £29·95.

Several texts concerned with the geology of ore deposits are currently available to advanced level undergraduates but most have serious shortcomings. Usually they are not of sufficient detail or suffer from adopting an approach which has quickly become dated. This paucity of good textbooks means that new publications are examined with interest by teachers of the subject.

This book is essentially an update on the third edition of 'Ore Deposits' by Park and MacDiarmid. The text is essentially divided into two parts; the first concentrates on the broader aspects of the subject (nature of ore-bearing fluids, alteration, controls on deposition, isotopes, etc.) whilst the second, and larger, part deals with the full range of deposit types. On the whole the chapters are comprehensive, interesting, well illustrated (except for a difficulty in interpreting some scales), and contain good bibliographies. The overall tendency is more towards *descriptions* of deposit types rather than their *genesis*, but this latter aspect is not neglected.

Although the classification of deposit types reflects the increasing trend towards treating ore deposits as environments rather than simple commodities, more imagination could have been used. One is still left with the impression that a Lindgren-type classification underlies the divisions in the book. Thus the penultimate chapter is unfortunately entitled 'Epigenetic deposits of doubtful igneous connection' and includes Mississippi Valley-type deposits and roll-front uranium deposits.

Some sections are rather brief (e.g. ophiolites, sedimentary iron deposits) whilst others are detailed (e.g. subaerial and submarine volcanism). The last section is concerned with 'Metallogenic provinces, epochs and plate tectonics' but is far too brief to be of any real value (even though the authors state that this section has been expanded!).

Unfortunately, the text is marred by a proliferation of abbreviations which are not always easy to decipher—even using the index. Some can be guessed at after a pause for thought, for example PBMD (porphyry base metal deposit), LMI (layered mafic intrusion), PRC (People's Republic of China), and BIC (Bushveld Igneous Complex). Others (Chuqui, moly, Wits) betray a slipshod approach to writing; they are terms which may be used in the mining industry but should not be encouraged in college students. One or two abbreviations take much longer to unravel. After much effort I found out the meaning of MECS-IF; am I the only one who did not know that it stands for 'metazoan-poor extensive chemical sediment-rich shallow sea iron formation'?

Overall though this is a welcome addition to reference texts on ore deposit geology. In my view it is timely and the best currently available, and should be recommended reading for all students in this field of study.

DAVID H. M. ALDERTON

Edwards, R. and Atkinson, K. *Ore Deposit Geology, and its Influence on Mineral Exploration.* London and New York (Chapman and Hall), 1986. xvi+466 pp., 222 figs. Price £40·00 (hardback); £19·50 (paperback).

The authors of this book have deliberately and successfully attempted to combine descriptions of mineral deposits and ore genesis with practical aspects of their exploration, evaluation and exploitation. There are already several textbooks targeted at undergraduate courses in mineral deposit geology but none of them has attempted to relate 'what's in the ground with how you find and exploit it'. All too often students of geology have difficulty relating information in geology textbooks to its application in the commercial world, but this book provides a flavour of some of the problems a geologist in mineral resource investigations might meet, and consequently, will provide students with a better appreciation of what is required of them in their future professional lives.

The introductory chapter establishes the authors' approach, presents several schemes for classifying ore deposits and outlines some of the important political, economic and technical factors pertinent to mineral exploitation. Perhaps it might, in view of the authors stated intentions, have been better to follow this introduction with a chapter on exploration strategies, techniques, and models, but, except for a brief mention in the introduction, these topics are postponed until the final chapter. Chapters 2 to

10 describe the main types of ore deposits under the headings: (2) magmatic deposits; (3) magmatic hydrothermal deposits; (4) hydrothermal vein deposits; (5) placers; (6) sediment-hosted Cu–Pb–Zn deposits; (7) ore deposits formed by weathering; (8) iron ores of sedimentary affiliation; (9) uranium ores of sedimentary affiliation; (10) ores formed by metamorphism. Each type of deposit is treated systematically—typically an introduction followed by a description of its characteristics and genesis, and concluding with a description of appropriate exploration methods and, in some cases, details of evaluation and recovery procedures for specific deposits. Whilst agreeing with the authors that no single scheme for classifying ore deposits is satisfactory, the typological approach they adopted might have been followed more rigorously; for example, porphyry Cu and Mo deposits are grouped under the same chapter heading as volcanogenic massive sulphide deposits yet they formed in totally different environments, have different geological characteristics, origins and ore-forming processes and are discovered by different exploration methods. Perhaps a more radical approach in which ore deposits are grouped according to exploration and exploitation criteria would have been more appropriate for a book of this type. The final chapter outlines how an exploration programme is designed and implemented and includes descriptions of the commonest exploration methods in the context of an exploration strategy. The text is well supported with line drawings and tables, and each chapter contains a useful map showing the world distribution of locations mentioned in the text.

The book is designed primarily for undergraduates who are taking options in economic or mineral deposit geology and their teachers. But the well-illustrated style and pragmatic approach with good reference to case studies in the exploration sections will appeal to geologists in mining and exploration. Reasonably priced (paperback version) and philosophically pitched to fulfil a market need, I have no doubt that this book will be a success.

N. J. JACKSON

Criddle, A. J. and Stanley, C. J. (editors). *The Quantitative Data File for Ore Minerals* of the Commission on Ore Microscopy of the International Mineralogical Association (Second Edition). British Museum (Natural History), Cromwell Road, London SW7 5BD, 1986. xlix + 420 pp. Price £45·00 (hardback).

Since its inception in 1963, the Commission on Ore Microscopy (COM) of the International Mineralogical Association (recently renamed the commission on Ore Mineralogy in recognition of its widening interests) has had the development of techniques in quantitative ore microscopy as one of its main objectives. Much work by members of the Commission and their colleagues has led to major advances in the instrumentation commercially available to measure reflectance spectra of ore minerals, in the provision of reliable standards for use in measurements, and in the systematization of the reporting of quantitative data for ore minerals. These advances led to publication by the COM in 1977 of the first issue of the Quantitative Data File. It is very appropriate that this splendid, much enlarged, second issue is dedicated to the memory of the late Dr Norman Henry, who did much to inspire the development of quantitative ore microscopy and served as editor of the first issue of the Data File.

The first issue of the Data File took the form of a set of cards, 204 in all, and with data in varying degrees of completeness for 155 minerals. Although the data are presented in a similar tabular format in this new issue, it takes the form of a bound volume and there are 420 data sets ('cards') arranged alphabetically by mineral name, 327 for individual mineral species and a further 93 for compositional and structural variants. Most of the data, covering the common ore minerals and many less common and rare species, are previously unpublished and were obtained specifically for the Data File. Individual entries record, in addition to the mineral name, formula and symmetry, as much information as possible regarding provenance of the sample measured, full quantitative chemical analysis (available for 85% of the entries), X-ray data (again available for 85%, and commonly presented by cross-reference to the appropriate entry in the Powder Diffraction File of the JCPDS), and microindentation hardness (Vickers) data (for over 70% of entries). The bulk of each 'card' is taken up with spectral reflectance data; in the vast majority of cases (86% in fact) reflectance values measured in air and oil at 20 nm intervals from 400 to 700 nm are provided. In these cases quantitative colour values relative to the A and C illuminants of the CIE are also given. Ancillary information provided includes details of the polishing method employed, reflectance measuring instrumentation and reflectance standard used. Also shown is the source of the data; as the editors point out, the data originate mainly from laboratories in Europe and represent the work of many scientists. However, this observation understates the contribution made by Criddle and Stanley themselves, who between them account for over 53% of the measurements presented in this new issue.

As well as an introductory section providing