

In Part II the minerals are described, using tables of properties of individual species (with an optical orientation diagram for most) embedded in a general discussion of each mineral group. These discussions are illustrated by excellent stereoscopically paired drawings of the structures that give a vivid and valuable 3-D picture (these stereoscopic drawings are also a feature of Part I of the book).

The authors are to be congratulated on using SI units, in the face of American conservatism on this issue. Estimates of effective ionic radii by both Shannon and Prewitt and Whittaker and Muntus are conveniently listed in an Appendix.

M. H. BATTEY

Shelley, D. *Optical Mineralogy* (Second edition). Amsterdam, Oxford, and New York (Elsevier), 1985. xviii + 322 pp., 175 figs., 40 colour photos. Price (hardback) US. \$37.50.

The flavour of this revised version is much the same as the 1975 edition of *Manual of Optical Mineralogy* (MM 40-800), but the chapter on principles has been enlarged to include a more thorough treatment of retardation, interference figures, and dispersion of the optic axes. The section on techniques is expanded to fill three chapters instead of one, and the use of the spindle-stage is now included.

The division of the book is roughly half on principles, techniques and determinative tables, with the second half being devoted to descriptions of individual minerals or mineral series. The mineral descriptions have been brought up to date and there are more orientation diagrams than hitherto, but information on paragenesis is brief in the extreme.

The text and line drawings are clear and attractively presented and a fold-out chart for interference colours is appended; there are some 130 references and a useful index. In this edition a separate section of 40 photomicrographs in colour (many of them matched pairs respectively in plane- and crossed-polarized light) is included, but unfortunately they are of postage-stamp size and much less useful than if they had been, say, twice as large. This criticism apart, this book can be strongly recommended for first- or second-year undergraduate use; in the reviewer's experience, the first edition was the most popular of several elementary texts for explaining to students the mysteries of optic axial figures and the construction of oriental diagrams, and it is good to have it again available.

R. A. HOWIE

Fander, H. W. *Mineralogy for Metallurgists: an Illustrated Guide*. London (Institution of Mining and Metallurgy), 1985. xx + 77 pp., 213 figs. Price £33.00.

This slim volume is dominated by 136 colour photomicrographs of ore samples, mostly ores in their natural state but some which have also been subjected to beneficiation processes. Each plate is annotated, with brief additional comments highlighting aspects of the mineralogy which could be relevant to the upgrading processes. In addition there is a brief text introducing the methods of study and the types of mineral deposits encountered.

The book was conceived as a textbook for students of metallurgy and as a reference for writers of reports and papers. The photographs are well produced and cover a wide range of ore deposits. Even though the coverage was not meant to be comprehensive there is a distinct bias in the types of deposit covered—perhaps reflecting the author's experiences in Australia. For instance, Au and Sn/W deposits are well represented (making up almost 50% of the total) whilst Ni, Pt, Cr, and U minerals are virtually absent. Although the photos all have scales, the conditions under which they were taken are not always apparent.

I am doubtful whether this volume will serve the needs of a student text in metallurgy or as a reference work. There is not enough detail relating the illustrations to the metallurgical processes which are to be employed and the coverage is not comprehensive enough. The high price for so little information would exclude it from consideration as a student text.

However, notwithstanding its shortcomings, and as someone engaged in teaching mineralogy, I will find this an extremely useful publication for students of geology and mineralogy. It is always an uphill struggle convincing students of the need for detailed descriptions in ore microscopy. This volume is a useful visual representation of the importance of textures and mineralogy in the metallurgical industry and is therefore recommended for all geology libraries. Ironically this does not appear to be the market it was originally aimed at!

D. H. M. ALDERTON

Wolfe, J. A. *Mineral Resources, a World Review*. New York and London (Chapman and Hall), 1984. xvi + 293 pp., 50 figs. Price £10.95.

This claims to be an unusual book and it certainly is. The first part (87 pages) consists of what the

author describes as essays on minerals in history, national mineral policy, environment, mineral economics, energy, exploration, mineral production technology and crystal gazing. I am not sure that Addison or Steele would recognize the essay form but this part of the book is biased, riveting, misleading, provocative, and enlightening in turn. In the first essay the author sets the historical scene, but in its simplicity serves mainly to remind me of *1066 and All That*, but it does put the importance of geological raw materials into very sharp focus. The following chapters continue the examination of the economics and politics of mineral exploitation. The environment is dealt with in a most forthright manner, pointing out the obscenity of environmental controls in one country which rely on raw materials being produced in another. This part of the book should be read by all geology students, too many of whom have little idea of the importance of geology to global affairs, but they should not believe everything they read. These chapters certainly set out the principles of free (but fair) enterprise, north American style.

The second half of the book (178 pages) reviews briefly the most important mineral commodities. For a change, reasonable justice is done to the non-metallic minerals. Table 4 shows that on a worldwide production scale, ten of the top twelve products are non-metallic. Only iron and manganese (3rd and 10th) are in this list. Each section deals with one commodity (e.g. aluminium or clay) and gives various properties and characteristics, the history of production, occurrence, economics, production methods, and outlook. Each section has a very poorly drawn graph showing the world and US production. There is much of use and interest in this section of the book.

This book is a good read for anybody interested in the minerals industry. Students of geology should read it to discover the depth of involvement of their subject in world affairs, teachers of applied geology should read it to broaden their outlook, and applied geologists should read it; they will love it or have apoplexy.

A. C. DUNHAM

Atkinson, R. L. *Tin and Tin Mining*. Princes Risborough (Shire Publications Ltd.). 32 pp., 46 figs. Price £1.25.

This booklet (No. 139 in the Shire Album series) gives a popular illustrated account of tin mining, mainly in relation to the Cornish industry. Many fascinating photographs taken in the late-nineteenth century are reproduced and illustrate the methods

of working then employed and show the use of such devices as a kibble and the 'man-engine'.

R. A. HOWIE

Middlemost, Eric, A. K. *Magma and Magmatic Rocks: an introduction to igneous petrology*. London and New York (Longman), 1985. ix + 266 pp., 35 figs., 22 plates. Price £13.95 (paper).

The rapid and continuing geological developments of the past several years mean that there is an equally continuing need for up-to-date textbooks at a price that students can afford. This book represents an attempt to provide a comprehensive text that fills this gap for igneous petrology. The first four chapters provide a review of principles and processes. Chapter 1 (a fifty-page megachapter!) takes a rapid sprint through the historical background; the internal structure of the earth; the nature of magmas—their generation, movement, and storage; emplacement and eruption mechanisms; field relations; radiogenic and stable isotopes; mantle composition and geochemistry (amongst other topics). The remaining chapters are considerably shorter—between six and twenty pages each. Chapters 2 to 4 cover magmatic differentiation, the classification of igneous rocks and their abundance and distribution. Chapters 5 to 14 deal with a variety of different rock groups in more detail, whilst the final chapter attempts to set terrestrial igneous activity within a planetary context.

Given the breadth of the subject addressed by this book it would be easy to tabulate examples where the author has failed to do justice to, or include, a reader's pet subject, the textures and fabrics of igneous rocks being a notable omission in this reviewer's opinion. A far more serious drawback, however, is that the attempt to cram coverage of such a large number of topics into only 260 pages means that the author has failed to do justice to almost any of them. The book reads as though the overriding aim throughout its construction was to keep it short and hence low in price. The net result is a highly condensed and poorly illustrated text with little in the way of explanatory diagrams or discussion to assist a student reader.

The paucity of diagrams is serious as it aggravates the problems posed by the compact text. Some topics such as phase diagrams (three diagrams only in the book), experimental petrology and petrogenesis (one diagram), or isotopes and trace element geochemistry (no diagrams), are rendered nearly incomprehensible by this approach. That the author considers geochemistry important is shown by the inclusion in most chapters of tables of average or representative