BOOK REVIEWS

Gallagher, M. J., Ixer, R. A., Neary, C. R., and Prichard, H. M., eds. *Metallogeny of Basic and Ultrabasic Rocks.* London (Institution of Mining and Metallurgy), 1986. viii + 522 pp. Price £24·00.

This volume presents 35 papers drawn from a symposium on the metallogeny of basic and ultrabasic rocks held in Edinburgh, 9–12 April 1985 and organized by the British Geological Society, the University of Edinburgh, the Open University, the Institution of Mining and Metallurgy, the Royal Society's National Committee for the IGCP, the Applied Mineralogy Group of the Mineralogical Society and the Geological Society of London. The papers are predominantly the results of original research work, although a number of review contributions are included.

The volume is divided into 6 sections, termed sessions following the format of the meeting. Session 1 comprises 4 papers dealing with aspects of mineralization associated with ocean-floor processes. In this session is a review of volcanism and mineralization on the East Pacific Rise by Hekinian and Bideau. Session 2 comprises 7 papers concerned with aspects of gold and base metal mineral deposits; these papers are essentially concerned with particular deposits. Sessions 3 and 4 are a collection of 15 papers describing chromite mineral deposits, again principally related to particular deposits, although also included are papers which give account of a structural classification of ophiolitic chromite deposits, constraints offered by mineral chemistry on ophiolitic mantle sequences and their evolution, and factors affecting the distribution of chromite deposits in folded belts. Six papers on platinum group minerals comprise Session 5 and deal more with theoretical aspects than with description of particular deposits. A review paper on the distribution, transport and concentration of platinum group elements by Stumpfl is included in this session. Session 6 reports on three exploration case histories.

Each paper has its own bibliography (much more satisfactory than a single bibliography at the end of the volume), and at the end of each session is a record of discussion from the Edinburgh meeting. At the end of the volume is an extensive subject index and separate name index.

The volume has an A4 page format, is limp bound and has been produced from camera-ready copy. This has the obvious advantage of speeding up the process of publication which is of necessity when conference proceedings are involved. The editors have done a good job to get the volume produced in reasonable time (indeed extremely rapidly when compared with certain other conference volumes published in recent years). However, one unfortunate consequence of using this method of production is that the text-figures have suffered to varying degrees. Well drafted figures are all reproduced with good clarity. However poorly presented figures are sometimes of rather limited use, whilst virtually all photographs and photomicrographs are of a poor quality. In addition in the review copy forwarded to me one text page appeared blank (p. 334), whilst two pages (pp. 305–6) appeared twice, so best to check your personal copy!

Nevertheless the disappointing quality of the photographs and photomicrographs should not be allowed to detract too much from the fact that the volume has appeared relatively quickly, and this will no doubt ensure that the volume is of interest to workers involved in the field of metallogeny associated with basic and ultrabasic rocks. At the price of £28·00 it represents good value for money.

R. E. BEVINS

Nesse, W. D. *Introduction to Optical Mineralogy.* New York, Oxford (Oxford University Press), 1986. x + 325 pp., 192 figs., fold-out Interference Colour Chart. Price: £30·00.

This text covers, in one volume, the principles of optical mineralogy, basic techniques, and descriptions of common rock-forming minerals. The book is similar in scope and depth to texts by Shelley (M.M. 50–184), and the now rather dated Kerr (M.M. 42–166). It is more advanced and comprehensive than Gribble and Hall (M.M. 50–355). The book assumes a basic training in mineralogy, and a knowledge of crystallography.

The first two chapters introduce light and the petrographic microscope. Throughout the next five chapters the author intersperses the treatments of principles and techniques, starting with refractometry, then progressing successively through isotropic, uniaxial, and biaxial optics. The text is very lucid and well set out. Particularly clear lists of instructions on technical procedures are given, and

an unusual feature is the occasional tip for colour-blind students. Some of the terminology I do not like. The use of 'polar' instead of 'polariser' (admittedly used by some other writers too) is, I think, an unhelpful abbreviation not sanctioned by any dictionary, American or British. And the use of 'plane light' instead of 'plane polarised light' surely runs the risk of being mistaken for plain ordinary light. Also 'optic plane' and 'optic angle' are less clear than the usual fuller terms. The use of *X*, *Y* and *Z* axes for the isotropic and uniaxial indicatrices is likely to confuse students. British students familiar with length-slow accessory plates will be surprised by the statement on p. 46 that accessory plates are constructed length-fast.

The figures are very well drawn, though an exception is Fig. 6.1*b* which either has the *c*-axis in the wrong position or an incorrect perspective. The diagrams illustrating cleavage attitudes in thin section are perhaps misleading as in my experience even moderately oblique cleavages will not be visible.

On the whole, the amount of information given in these chapters will serve the needs of most students at all levels. The only surprising omissions are the lack of any information on liquids which could be used by those who wish to make their own sets of immersion oils, and the lack of reference to the Universal Stage. Although the Spindle Stage is more appropriate for purely mineralogical work, the U-stage is still widely used in petrology, especially in the increasingly fashionable area of preferred orientation studies.

More than half the book consists of systematic mineral descriptions. They are up to date, and clearly set out with a perspective drawing of optical and crystallographic features for each mineral. There are, in addition, diagrams of typical sections, and, where appropriate, tables or figures showing relationships between composition and optical properties. The descriptions are complemented by comprehensive identification tables (the addition of a column with R.I. would have made Fig. C.1 in the tables even more useful). There are few obvious errors, but I noted consistent misspellings of chlorophaeite, piemontite, and thomsonite (elsewhere Hutchison and dischroism too), and the garnet drawing on p. 166 is misorientated. Also, the inclusion of volcanic glass under tectosilicates without explanation seems odd. I looked especially carefully at the feldspar descriptions, and whilst one could quibble at a few points (e.g. granophyre is not quartz and K-feldspar; microcline and orthoclase are often euhedral as well as anhedral; ambiguities in the bottom right of the Carlsbad-albite diagrams need to be pointed out), the whole section is comprehensive and well put. The number of minerals included is as many as most students will ever need, though I was surprised to see colemanite in but aenigmatite, eudialyte, and phillipsite out.

Overall this book impresses one for its careful assembly and presentation. For students wanting optical mineralogy in one volume this is clearly a book to be considered.

D. SHELLEY

Gübelin, E. J., and Koivula, J. I., 1986. *Photoatlas of Inclusions in Gemstones.* ABC Edition, Zurich, pp. 532, 15 illus. in black and white, 1449 in colour. Price SFr 320.00; £110 from Gemmological Instruments Ltd., London.

This book is the successor to Gübelin's *Internal World of Gemstones* published in 1974. In this volume the superb photography by Gübelin is reinforced by the innovative photographic genius of Koivula who has won awards for his photographic research and is a senior research gemmologist with the Gemological Institute of America. The result is a photographic feast coupled with the results of their own research work and enhanced with chapters by other leading scientists. Despite the scientific input, the average reader will find everything explained in lucid, not too technical, terms.

Essentially the book is divided into six uneven parts. Part I (30 pages) contains the introduction and a very informative section (with good diagrams) on photomicrography and the specialized illumination of the gemstone. The uses of phase-contrast microscopy and the shadowing technique are described here. Part II (68 pages) discusses the genesis, of mineral inclusions in gemstones and this is followed by three specialist contributions from Dr E. Roedder on 'The origin of fluid inclusions in gemstones'; Dr Henry O. A. Meyer on 'The inclusions in diamonds and the genesis of diamond' and 'The formation of quartz and its inclusions' by Dr H. A. Stalder. These sections are accompanied by a series of fine colour photographs.

Parts III (102 pages) and IV (218 pages) form the real core of the Photoatlas. Part III (arranged alphabetically as is Part IV) deals with a series of individual mineral species inclusions found in a variety of host gemstones. The species described include (among many others) amphibole, apatite, chromite, feldspar, glass, goethite, graphite, ilmenite, magnetite, quartz, sphene, tourmaline and multiple inclusion scenes, aggregates and twins. The fantasy of inclusions and their odd shapes in gemstones leads the authors to create in the imagination an old fashioned stove, a shrew and a prehistoric bird amongst other extraordinary resemblances.