

bitumen, with compositional data for uraniferous bitumens. After a pair of papers describing the geology of the Grants uranium region (New Mexico) and the Oklo reactor system, Nagy provides a comparative overview of occurrences of bitumen in the Witwatersrand, Elliot Lake and Oklo deposits, providing abundant data and valuable references. Elliot Lake is revisited by Mancuso *et al.*, the overall result being a set of contrasting papers covering related material in a rather pleasing and complementary way. This section is completed by consideration of thorium-bearing nodules in the Irish Basin, and a description of reduction spots.

Base metal and manganese deposits provide the next location for bitumen hunters, with five papers. Spirakis and Heyl kick off with a very thorough and stimulating review of MVT ore-forming processes, stressing their belief in the importance of the role of thiosulphate as a transporting ligand which is readily reduced by reaction with organic matter. The papers which follow are largely case-history based, ranging from Greenland through China to the European Kupferschiefer.

Finally, the value of bitumens in exploration for metals and hydrocarbons is addressed in four papers. Curiale's examination of the metal contents of bitumens is particularly valuable, providing many data (especially for V and Ni). Parnell examines the occurrence of ore mineral inclusions within bitumens in the Irish Carboniferous, and the role of radioactivity (as a consequence of the presence of U and Th) is examined as a cause of hydrocarbon polymerisation and as a means of dating bitumen genesis.

Overall, as might be expected for a multi-author volume of this type, its value is rather patchy. At best, the reader is provided with a convenient source of reviewed information (including sometimes copious data), and a lead into the literature. With my own bias, I found eight papers (occupying 40% of the pages) which would make me want to put the book on my shelves and use it for reference purposes. I would recommend the book without hesitation to those who are entering this field, and I would make it compulsory reading for those who work on MVT, precious metal, U/Th and Hg mineral deposits. It is expensive for individual purchases but should be recommended widely for libraries. As would be expected, the quality of production is generally good. Consistent with the importance of microscope work, the standards of photography are good, and some colour photomicrographs are included. However, a number of line drawings (especially of gas chromatograph traces) have

faded away to become scarcely legible. There is a pleasing consistency in style, which is remarkable considering the diversity of origin of the material.

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Bakoń, A. and Szymański, A. *Practical Uses of Diamond*. Warsaw (Polish Scientific Publishers PWN Ltd.) and Chichester (Ellis Horwood Ltd.) 1992. 248 pp. Price £49.00.

Aimed mainly at diamond technologists, this book contains useful data summarised for tool manufacturers and for other users of diamonds in industry; and there is also a brief chapter on diamond jewellery. The diagrams, tables and graphs are particularly helpful. The variety of practical uses of diamond, both natural and synthetic, arise from the extreme physical properties of diamond: the hardest known substance, having the highest thermal conductivity, as well as possessing a large refractive index and high dispersion. For a material which varies so much from specimen to specimen and even within the same crystal, this condensation of information can however give the wrong impression. Birefringence is not necessarily stronger in Type I (which contains nitrogen) than in Type II diamond; and Type IIb (semiconducting) diamond is not "very pure" since it contains boron. Natural diamond cubes and rhombic dodecahedra are rarely flat-faced.

The authors have bravely attempted to cover nearly every aspect of diamond technology within the compass of a small book, but with the result that many terms and ideas are left unexplained. The average reader would need some prior knowledge to understand fully the scientific sections. Disjointed snippets of information have produced a somewhat halting style, but it is possible that some fluency has been lost in translation. It is a pity that, on every occasion, three- and four-fold axes of rotational symmetry are referred to as 'ternary' and 'quaternary' rather than as triad and tetrad axes respectively, that 'vortex' has been used instead of 'vertex' and that 'diamond ferrous' has been printed instead of 'diamondiferous'.

The book's greatest asset is the bringing together of information on both Eastern and Western technology; and there is a valuable list of 223 references, although not all the authors have been given. There is a useful compilation of synthetic products from all over the world (South Africa, USA, Japan, Europe and the former Soviet Union), but the colour plates would have been

more informative if they had had scales to indicate their sizes.

There are a dozen pages of interest to the mineralogist, and a couple on the industrially important diamond thin films. The book will find its place as a handy compendium on diamond tools, drills and abrasives. MORETON MOORE

MacKenzie, W. S. and Adams, A. E. *A Colour Atlas of Rocks and Minerals in Thin Section*. London (Manson publishing Ltd.) and New York (John Wiley & Sons Inc.), 1994. ISBN: 1-874545-17-0 (paperback), price £15.00, 192 pp., 180 colour photos.

This new work aims to provide a clear and accessible introduction to the use of thin sections in the study of petrography and is suitable for students not intending to take geology as a main subject. After a brief introduction to optical mineralogy, there are sections on silicate minerals, igneous rocks, sedimentary rocks and metamorphic rocks. The main thrust of this book is represented by the 180 colour photographs; some are of thin sections which have been used to illustrate other publications, but all the photographs here were produced especially for this handbook, using 6 × 9 cm transparencies. The results are a great improvement, particularly for thin sections depicting textures and some of the more fine-grained metamorphic rocks.

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