

found in *Mineralogical Abstracts* 33, 18, 1982, but the general comment may be made here that those papers dealing with nickel-bearing deposits recognize that processes of magmatic differentiation leading to volcanism in one case, and including contamination with metal-enriched shale in the other were necessary to the generation of nickel deposits in Archaean time, while in the cases of sea-bottom copper, lead and zinc deposits diagenetic additions or additions of hydrothermal fluids to the marine basin, such as I advocated for the Kupferschiefer twenty years ago (Dunham, 1964) still appear to be necessary. A case is made by B. Lehmann and H.-J. Schneider for recognizing as strata-bound the tin deposits at two mines in Germany, and Poland, and at the Sullivan Mine, British Columbia, and also at Rooiberg, South Africa, but all of these show features transitional to normal igneous-hydrothermal origins, perhaps in part exhalative. Finally this volume includes three very useful papers for the inclusion of two of which the editor makes an apology. All seem entirely relevant to the subject in hand; they include a discussion of metalliferous deep-sea sediments by M. A. Meylan and others; and by U. Förstner, one on recent heavy-metal accumulation in limnic sediments, and the other on trace metals in fresh and mine waters.

Volume 10 contains (i) a supplementary bibliography of strata-bound and stratiform ore deposits covering the years 1974–8; (ii) a tabular summary, compiled by P. Laznika, of the deposits on a worldwide scale, listing metal, locality, minerals, orebodies, stratal relationship, age, environmental facies, deformation/metamorphism, lithology, genesis, tonnage, grade, and reference. Altogether 1472 orefields or individual deposits are listed, but it is admitted that classification of some are controversial. The localities are indicated on outline maps; (iii) a bibliography related to these data; (iv) references and subject indexes. As a test of the accuracy and usefulness of the data summary, a few British examples were scrutinized. The Furness–South Cumbria hematite field (pp. 212–13), if typical, leaves much to do be desired. The gangue minerals quartz and dolomite are not mentioned, the ore is described as ‘conglomeratic’ (whereas it is in fact brecciated *in situ*), the lithology of the wallrock is put down as *ironstone* (it is of course limestone) and the genesis is stated to be ‘residual infiltrated’ (there is no warrant of any kind for a residual origin). The authority is stated to be my 1952 paper; it is inaccurately quoted and in any case was long ago superseded by Rose and Dunham (1977). A little further down the page, the essential difference between the Frodingham ironstone and the other British Jurassic sedi-

mentary ores, namely that it contains primary goethite oolites, is missed. One looks in vain for any mention of the Northern Pennine Pb/F/Ba Orefield; yet one of the first descriptions of stratal control of discordant ore-shoots, perhaps the first of all (Forster, 1809) came from this field, production from which is of the same order as a medium-sized Mississippi Valley field. The bibliographies in this volume, lengthy as they are, are far from complete and do not even cover many items listed in the first seven volumes. Perhaps, in an effort to make the case for separating stratiform/strata-bound deposits, too great a task has been attempted.

Nevertheless, Editor Wolf and his colleagues must be congratulated on an undoubted *tour de force*. Although I cannot help doubting whether it was worth it to bring together such diverse deposits as the cumulate chromites, the Kupferschiefer, the Witwatersrand palaeoplacers and the bauxite soil-mantle, it is true that one aspect of geological science has been given a Handbook in the tradition of the great German chemical treatises. Perhaps Dr Wolf, now consultant at the Directorate of Mineral Resources, Jeddah, Saudi Arabia will now consider restoring the balance with an encyclopaedia of the non-stratiform, non-strata-bound mineral deposits?

REFERENCES

- DUNHAM, K. C. (1964) Neptunist concepts in ore genesis. *Econ. Geol.*, **59**, 1–21.
 FOSTER, W. (1809) A treatise on a section of the strata from Newcastle-upon-Tyne to the mountain of Cross Fell in Cumberland, with remarks on mineral veins in general. Foster: Newcastle, 151 pp.
 ROSE, W. C. C., and DUNHAM, K. C. (1977) Geology and hematite deposits of South Cumbria. *Mem. Geol. Surv. GB*, 170 pp.

KINGSLEY DUNHAM

Cabri, L. J., Editor. *Platinum-Group Elements: Mineralogy, Geology, Recovery*. CIM Special Volume 23. The Canadian Institute of Mining and Metallurgy, 1981. v + 267 pp., 158 figs. and 3 colour plates. Price \$40.

This is a very welcome contribution to the mineralogy and geochemistry of the platinum-group elements. The editor has assembled a team of seven authors, but as he is involved personally in seven of the eleven chapters the book very much reflects his outlook on the subject. The large page format, the numerous tables, diagrams, and illustrations immediately impress the reader with the quantity of data collected together on a relatively young topic in mineralogy.

After the short introductory chapter, Chapters 2 to 4 consider respectively the chemistry, phase relations, and geochemistry of the platinum-group elements. These provide a solid grounding in the properties and abundances of these elements from which the following six chapters on the study and properties of the known Pt-group minerals logically follow.

Sample preparation and analytical methods are dealt with in Chapters 5 and 6 while the substantial Chapters 7 and 8 contain the mineralogical data under three broad headings—X-ray crystallographic and density data, ore microscopy, and analyses of named minerals. The second section is the largest, providing a useful compilation of reflectance spectra for most of the minerals. The splitting of data here into three sections could prove troublesome in that much extra searching is required to extract, for instance, the chemical analysis pertaining to a specific reflectance spectrum. Nevertheless the information is all there and the authors are to be congratulated on their achievement in collating so much information on a rapidly developing subject. Numerous illustrations, both of polished sections (including sixty in colour on three plates) and of scanning electron micrographs, are included. Doubtful, discredited, or incompletely characterized *named* species receive very short shrift—none of their optical or chemical properties are given, and they do not appear in the index. However unnamed minerals receive much more lavish treatment, with a separate chapter and full individual discussion.

The final two chapters deal with platinum-group element deposits and recovery of the elements from their ores, completing a very comprehensive survey of the subject. The book is going to be essential to all workers concerned with these minerals and their deposits, and the price seems reasonable.

A. M. CLARK

Neumann, H.-J., Paczynska-Lahme, B., and Severin, D. *Composition and Properties of Petroleum*. New York (Halsted Press) and Chichester (John Wiley and Sons Ltd.), pp. 137, 79 figs. Price £9.50.

This Volume 5 in the series *Geology of Petroleum*. It is divided into four parts covering (1) composition, (2) analysis, (3) properties, and (4) classification of petroleum, natural gases and oil-field waters.

Part one begins with the chemical components of petroleum and natural gas and helpfully gives both European and American terms. Gas hydrates are summarized in a page, and there is a short but comprehensive section on the composition of oil-field waters. The first part of the book concludes

with a section on the chemical aspects of the origin of petroleum and natural gases. Unfortunately this section, which should be interesting to geologists and mineralogists, has been condensed and omits mention of most modern research.

The second part of the book is a comprehensive summary of the different methods used in the analysis of crude oils. In the third part the properties of petroleum are described, initially in terms of phase behaviour and then finally in the reservoir. Although this treatment has obvious parallels with works on reservoir engineering (as in volume 3 of this series) the presence of this subject may prove useful to the reader who is not otherwise concerned with reservoir engineering.

The last part of the book on classification of petroleum, natural gases and oil-field waters containing useful information in a condensed form.

This may prove to be a useful reference work. It is somewhat hindered by the translation which, although understandable, has ungainly patches. The interesting glossary includes the German terms for the various entries.

H. C. POTTER

Evans, A. M., Editor. *Metallization Associated with Acid Magmatism*. Chichester and New York (John Wiley and Sons), 1982. xiv + 385 pp., 155 figs., 7 sketch-maps. Price £21.00.

This volume contains twenty-six papers submitted for the International Symposium on Problems of Mineralization Associated with Acid Magmatism held at Exeter University in December 1979.

The majority of the papers presented deal with tin and tungsten mineralization and the petrology and evolution of granitic plutons with which it is associated, several of them being concerned with south-west England. The behaviour of tin during granite differentiation is discussed by M. Stone, based on studies on the Tregonning-Godolphin granite, and hydrothermal activity in the St. Just area of west Cornwall is analysed by N. J. Jackson *et al.* who conclude that the principal ore-bearing main stage fluids were overwhelmingly of meteoric origin and mainly of low to moderate salinity (10–20 eq. wt. % NaCl) in the minimum ture range 280–450 °C. Tourmalinization in Cornwall is discussed by B. Charoy and also by P. Allman-Ward *et al.* and mineralization zonation near the granite batholiths in both Cornwall and northern England is compared by J. McM. Moore who advocates the concept of multiple generation of single-pass hydrothermal convective cells. J. P. N. Badham compares tin and copper mineralization in felsic igneous rocks and asks where the tin exhalites are. Other European tin and tungsten