

an interesting discussion of the possibility that the seas of the past 600 Ma were stratified and thus not amenable to the Principle of Uniformity. J. Pereira, though hindered by the limitations of the literature, attempts an assessment of the ore resources of China in relation to plate tectonics. A new potash evaporite field, at Sergipe (Brazil) makes its first impact at the capable hands of H. Borchert, while G. K. Strauss, J. Madel, and F. Fdez Alonzo, describing the latest position in the Spanish-Portuguese pyrite belt, produce the interesting fact that of 500 m tonnes of new ore reserves, 50 m can be credited to geological reasoning, 130 m to geophysics, and the rest to systematic driving and boring.

The catholic outlook of the *Festschrift* is even clearer in the particular description of ore problems, grouped under Pre-Cambrian, Palaeozoic, and Mesozoic for discussions of fields, with concluding sections on strata-bound intrusive deposits (an elaborate way of describing chromite layers!) and on geochemical problems, especially those of S, C, and O-isotopes. A remarkable discovery in the past few years in which Professor Maucher played an important part has been that of stratified scheelite deposits in metamorphic contexts in such widely separated areas as the Eastern Alps, Tasmania, and South Korea. This volume adds another case, this time in Argentina, described by M. K. and A. de Brodtkorb. R. Höll contributes on the Alpine Sb-W-Hg deposits and U. Burchard on King Island. G. C. Amstutz who always attempts to find the origin of ores in the enclosing strata runs true to form and deals with the Michigan copper deposits, invoking statistical procedures, which, to me, fail to give objective conviction. The strata-bound magnesite deposits of the Spanish Pyrenees appear to W. Petrascheck and his collaborators as showing many metasomatic features, yet the unravelling of the structure convinces them of a sedimentary origin; while O. Schultz and F. Vartar find sedimentary fabrics in the well-known Alpine magnesites.

Finally the notion of time in ore-genesis could hardly be better illustrated than in H. J. Schneider and B. Lehmann's new conception of the Bolivian tin province, where they identify Pre-Cambrian stanniferous granites, Silurian metasedimentary tin mantos, and two cycles of magmatic regeneration respectively in Early Mesozoic and Cainozoic times.

Except for one excellent article by Paul Ramdohr in German (on titanomagnetite) the papers are all in English. Proof reading has not been perfect, but the volume is well-produced and illustrated.

KINGSLEY DUNHAM

Waters (K. H.). *Reflection seismology*. New York and Chichester (Wiley-Interscience: John Wiley & Sons), 1978. xvi + 377 pp., 211 figs., 2 colour pls. Price \$35.60 (£19.75).

The sub-title of this book is *A Tool for Energy Resource Exploration* and it deals almost wholly with the exploration for petroleum with only passing reference to the investigation of the structure of coal seams. Possible uses of reflection seismology to map bedded ores or in hydrogeology are not specifically dealt with although both the general principles and specific techniques described have applications in these fields.

After dealing with general principles there are chapters on sources and receivers, data gathering, and data processing. In the second half of the book the author deals with more detailed investigations, and includes separate chapters on migration, near surface corrections, and interpretation. He concludes with an account of new techniques now in development. Appendices deal more fully with special subjects following the general accounts in some chapters.

The book is well illustrated throughout and includes many illustrations from unpublished industrial sources. Although the author disclaims the level of the mathematical background he provides it should prove more than adequate for honours students in geology and geophysics and to most practising exploration personnel. However geologists can use this work advantageously without following all the mathematical arguments.

H. C. POTTER

Tsuboi (S.), Mizutani (S.), Suwa (K.), and Tsuzuki (Y.). *Charts of Plagioclase Optics*. Tokyo (Iwanami Shoten), 1977. ix + 137 charts. Price 7200 Yen.

Before the electron probe became widely available the Universal Stage was regarded as the most satisfactory instrument for investigating plagioclases in thin section. On good material it will give a reliable estimate of the composition ( $\pm 2\%$ ), determine the twin laws present, and produce an assessment of the structural state if the mineral is less calcic than An<sub>70</sub>. Unfortunately optical methods, though rapid, do not reveal the potassium content and are of restricted use on finely twinned or unfavourably oriented material. Until the appearance of *Die Orientierung der Plagioclase* by Burri *et al.* (1968), optical methods suffered from an inadequate number of reliably determined chemical compositions. Paradoxically the arrival of the electron probe coincided with a decline in optical studies: there is still an absence of good chemically