

districts. Further, the intersection of the domain by a NNW-trending line may be intended to represent the mythical Pennine Anticline, but I can assure Dr Routhier that the metallotect control in the Pennines is something far more sophisticated. The critical comments notwithstanding, there is a wealth of interesting data in these maps which the student of global-scale distribution of economic minerals will certainly wish to ponder upon. The global coverage is not complete; Mexico and Central America, Canada, and the great mass of the Soviet Union, the last-mentioned with an extensive literature on metallogenic provinces, have not been included; but there is quite enough food for thought.

Dr Routhier complains that his writings are not, generally speaking, read in the English-speaking world, and I think there is substance in his complaint. He had in fact hoped to publish an English-language edition of this memoir, but in the end had to be content with English subtitles and explanations on his ninety-seven diagrams. While sympathizing, I feel bound to point out that, while he is familiar with some of the American literature, his bibliographies suggest that he does not follow the British literature. It is striking, for example, that the fluor spar-producing regions of Derbyshire and West Durham, which have been and are as productive as any European district, are omitted from the fluorine map, and the only references given in the relevant chapter are to four Irish deposits, none of which carries workable fluor spar.

For myself, I regard Routhier as one of the most stimulating writers on ore genesis of our times, a worthy successor indeed to de Launay. His *staccato* logic is memorable; he seeks laws and assertions through the mass of detail to an extent that no English writer dare attempt. I propose to complete this review by summarizing the laws of metallogeny that he has derived from the seven-year long research of which the memoir is a record.

1. Concentrations of a metal come into existence at the intersection of a metallic domain (a volume of lithosphere able to descend to the mantle, having over a long period of time a metallic potential) with metallotects which reveal that potential.

2. Many belts can be broken down into sub-domains oriented transversally, in which the rich zones occur.

3. The association of several metals or substances in a deposit can often be considered as due to the superposition of two or more domains.

4. Domains may be independent of major structures, and in the continental plates may pass from one structural region to another.

5. In strongly polymetallic domains, the metals are distributed, on very variable scales, in hori-

zontal and vertical zonality, the most consistent, Cu-Zn-Pb, conforming with the chalcophile order.

6. In relation to time, the first accumulation of metals after 3750 m.y. before present was of Fe (Isua, Greenland); then during the Archaean, Fe, Au, Cr, Pt, Ni; during the Lower Proterozoic, more Fe and Au but also Cu which culminated in the Upper Proterozoic. During Middle Proterozoic time, Pb and Zn appeared at about 1500 m.y., Sn and W at 1.1 m.y.

7. Starting from the moment when a domain became specialized in one or other metal, subsequent events reveal a tendency to perpetuate this specialization. Certain metals or substances appear to be spatially, or spatio-temporally persistent; examples include Sn, W, F, Pb, Zn.

8. The great accumulations of metals reflect strong horizontal and/or vertical gradients in temperature, pressure, and metal-content. Practically the result is that the indications of strong gradients, abrupt lithological changes, or structural transition are metallotects which can be used as guides to ore.

The final figure (97) is headed 'for excitement'. There is much in this lengthy and interesting study to stir the imagination and incite the argumentative.

KINGSLEY DUNHAM

Embrey, P. G., and Fuller, J. P., Editors. *A manual of new mineral names 1892-1978*. London (British Museum [Natur. Hist.] and Oxford University Press) and New York (Oxford University Press) (1980). x + 468 pp. Price £24.00 (\$49.50).

This work is an alphabetically arranged, collected edition of the thirty *Lists of new mineral names* (started by L. J. Spencer and continued by M. H. Hey) that have been published since 1897 in this magazine, with editorial comments and references to significant later investigations. In some respects the result may be considered as a companion volume to Chester's *A dictionary of the names of minerals* (New York, 1896), as the dates run on with minimum overlap. Names of valid species are printed in bold-face type at the start of an entry, but these represent perhaps less than a third of the entries.

This is much more than a routine listing of minerals, synthetic phases given mineral-like names, gem simulants, and industrial products. The editors give the derivation of the names and often their own views on the correct form, e.g. that böhmite is more correct than boehmite, or that yanshynshite is an unnecessary name for a variety of thorumgummit. A variety of incidental but useful data is often added: e.g. for jonesite the optical and physical properties, or for lueshite the fact that it

occurs with mica at the contact of a carbonatite and a cancrinite-bearing syenite. Inevitably definitions quoted from the original listing have become in some cases inappropriate due to later classification: thus pyroxmangite should not now be considered to be a pyroxene but a pyroxenoid with a Siebenerketten configuration.

The style makes this book eminently readable and one soon finds one needs to keep it handy for quick reference. It is a pity, though understandable on financial grounds, that not all mineral names are to be found, only those propagated since 1897. Thus one really needs to keep Hey's *Chemical index of minerals* and its appendices, or at least Fleischer's *Glossary of mineral species*, also to hand. One spots occasional infidelities or omissions such as spessartite (rather than spessartine), under spandite: Harry von Eckermann (eckermannite) died in 1969, and joesmithite was named in honour of J. V. Smith.

Altogether a useful and enjoyable book, giving much information wrested from hidden or obscure sources, but one which by its very nature will become dated as the discovery of further new minerals is reported. It invites comparison with the recent work by Mitchell (MM 44, 114), though the latter is more directly concerned with the several ways in which mineral names are assigned and lacks the mineralogical data and original references of the present volume.

R. A. HOWIE

Derry, D. H. *A concise world atlas of geology and mineral deposits*. London (Mining Journal Books, 15 Wilson St., London, EC2M 2TR) (1980). 110 pp., 8 figs., 10 coloured maps. Price £20.00 (post-free surface mail).

This really is jet-age geology. Relax with your seat-belt loosened and peer down from 30,000 feet on to a colourful panorama of Permian sediments, Cretaceous ophiolites, Palaeozoic volcanics; here a coal basin or a porphyry copper, there a major thrust or site of a terrible earthquake. Down to 500 feet over rocks 500 million years of age, and even after landing you can turn the page and say to your friendly Mongolian taxi-driver 'take me to number two Ul, Leniadom'; for at the back of this excellent book are the names and addresses of 153 geological surveys, institutes, mine departments, etc., all over the world. And who more likely than the author will you encounter by chance in the transit lounge; the much-travelled Duncan Derry 'a very successful explorer for, and developer of, minerals, he has worked in all continents . . . maintaining a keen and critical interest . . . in both the practice and theory of the geological sciences' to quote from the Foreword by Kingsley Dunham.

The book begins with an introduction to geology, based on plate tectonics and simple enough to ensure the book can reach a wide readership of both geologists and interested laymen; and there is a copious glossary at the back of the book. Landscape, structure, vulcanicity, seismicity, and the evolution of life are displayed with the help of some neat little world maps and diagrams, as a setting for a brief introduction to the world's mineral wealth.

The main part of the book consists of ten coloured geological maps each accompanied by a description of the geological history and mineral resources of a major mass of land. Notes are added to the maps to highlight unique and interesting geological features or events and major structures are shown on both land and sea. The mineral information is shown by words and symbols indicating mineral fields and provinces, but here and there a note is added about some individual deposit or mine for some reason of historical, geological, or economic interest. The scales and projections of the maps have been skilfully chosen to show as much on a page as possible and with minimum distortion of shape. Putting the whole of the Americas on one double page spread is a triumph of cartographic art, but the detail gets a little crowded around Toronto and Salt Lake City. The whole world (save a few ocean areas) is shown, including two intriguing polar views of the Arctic and Antarctic.

World mineral resources are summarized in a special section showing charts of the top dozen or so countries by annual production in 1979 with estimates of reserves. Twenty-seven mineral commodities are included; metals, non-metallic minerals, and energy minerals.

Atlases have been a persistent feature of geological publication and they are always welcome. This one is nicely designed, the text well written, and the cartography and colour printing of a very high standard. Compared with the mammoth Geological World Atlas published by UNESCO, Derry's is more portable and at £20 more purchasable. Being 260 mm by 335 mm it fits in the side pocket of my airline bag, and despite its weight of just over a kilo (the binding is a little heavy) I am certain by copy has many miles to go.

COLIN J. DIXON

Schmidt, W., and Malzahn, H. *Industriemineral diamant*. Leipzig (VEB Deutscher Verlag für Grundstoffindustrie) (1980). 502 pp., 111 figs., 14 pls. Price 47.00 M.

Mankind has been fascinated with diamond for at least two millennia. Today the interest is greater