

## BOOK REVIEWS

Orlov (Yu. L.). *The Mineralogy of the Diamond*. Chichester and New York (Wiley-Interscience), 1977. xii + 235 pp., 84 figs. Price £17.00.

This is an updated and expanded English edition of the author's text originally published in Russian in 1973. The different habits of diamonds in meteorites, impactites, and kimberlites are explained in terms of typomorphological classification and physical properties of the diamonds. The structural defects and morphology of diamond are considered in detail, including the modification of plane-faced growth forms by dissolution and the corrosive modification of growth and dissolution forms. The optical and other physical properties of the various subtypes are described and particular attention is paid to their absorption spectra and luminescence. The study of inclusions in diamond crystals is becoming increasingly important for the information it provides on the genesis of diamonds; details are given of inclusions of diamond, garnet, olivine, enstatite, diopside, chrome spinel, rutile, magnetite, coesite, graphite, and various sulphides. After discussing the synthesis of diamond and the phase diagram for carbon, a largely rewritten chapter discusses the genesis of diamonds in terrestrial igneous rocks.

Diamonds in kimberlites are considered to have several different origins: they are genetically related to mantle rocks of markedly different compositions. Any particular xenolith contains only one variety of diamond (based on its morphology, internal structure, and properties), i.e. for every type of deep-seated diamond-bearing rock it is considered that there is a characteristic type of diamond crystal. Orlov thus considers it possible to consider the polygenetic nature and typomorphism of diamond even within the limits of a particular type of deposit. The effects exerted on crystal morphology and on certain physical properties by such epigenetic processes as plastic deformation, dissolution, and natural radioactivity (which produced green surface colouring) are all to be taken into consideration, but their study then should make it possible not only to determine where the diamonds crystallized but also to ascertain the composition of the parent rocks.

The author has performed a useful service in collecting together and reviewing the highly fragmentary material published by workers in many different fields of science and technology using various modern techniques to study diamonds. His views on the genesis of diamonds and the close relationship between their morphology and other

properties and the type of rocks containing them will be of great interest not only to mineralogists but to geochemists and petrologists concerned with kimberlites, eclogites, and related problems.

R. A. HOWIE

Bardet (M. G.). *Géologie du diamant. Vol. III. Gisements de diamants d'Asie, d'Amérique, d'Europe et d'Australasia*. Mém. Bur. de Recherches Géol. Minières (Paris), no. 83, 1977. 169 pp., 40 figs., 1 pl. Price 180.00 F (\$36.00).

The first part of this Memoir [M.M. 40-425] dealt with generalities about the diamond and the second part [M.A. 78-120] was concerned with African deposits. This third and final part is devoted to deposits in the rest of the world, mainly the USSR and North and South America, but including details of diamond-bearing rocks in India, Borneo and Malaysia, Australia, and China. The chapter on the USSR deposits deals with the kimberlites and alluvial diamonds of Siberia and also with the diamonds of the Urals, Timan, and the Russian platform, though the figures illustrating this chapter are somewhat diagrammatic. The largest section deals with the diamonds of South America, covering the Guyana Shield and the Brazilian platform (20 million carats to date) and the diamonds found in the Cretaceous detrital sedimentary rocks of Brazil. The detrital diamonds of the Panna district of India and of the Majhgawan kimberlite pipe are briefly described (having produced the Kohinoor, Regent, Orloff, and Hope diamonds). In a brief concluding chapter the relationship between diamondiferous kimberlites and the establishment of stable cratons is touched upon; the correspondence of the breakup of Gondwanaland and the appearance of such kimberlites is striking. The hypothesis of Nixon *et al.* [M.A. 74-1852; in *Lesotho Kimberlites*, pp. 312-18], involving partial fusion of the mantle during plate movements offers some explanation of Cretaceous kimberlites: can such a hypothesis be extended to the Precambrian?

R. A. HOWIE

Perel'man (A. I.). *Geochemistry of elements in the supergene zone* (Transl. from Russian by R. Teteruk-Schneider; Edited by A. A. Levinson). Jerusalem (Israel Program for Scientific Transl.) and Chichester (John Wiley & Sons Ltd.), 1977, x + 266 pp., 60 figs. Price £19.50.

The title invites comparison with Garells and Christ's (1965) *Solutions, Minerals and Equilibria*