highly structured approach is used, most chapters starting with a list of objectives and ending with self-assessment questions.

The first chapter is a general introduction on 'The Nature of Minerals'. The next seven chapters deal with the principles of crystallography and crystal chemistry in which mainly cubic minerals are used to introduce the concepts of symmetry, clinographic projection of crystals, coordination, crystal structure (diamond, sphalerite, pyrite), and the relationship between cleavage and internal structure. A practical approach is used including problem exercises and answers; this approach would be particularly valuable if students used the text together with crystal models and mineral specimens.

A very brief chapter on space groups is followed by one on stereographic projection with examples restricted to cubic symmetry. The next five chapters deal with the other crystal systems using as examples: zircon, cassiterite (tetragonal); baryte, olivine (orthorhombic); orthoclase, hornblende, augite (monoclinic); albite (triclinic); beryl (hexagonal); and calcite, quartz (trigonal). Photographs of natural minerals, crystal drawings and stereographic projections are used to illustrate each example. The concept of the parametral plane is introduced to index crystal faces and axial ratios are calculated from interfacial angles. The calculated ratios are compared with X-ray determinations but no attempt is made to relate any differences to measurement error or to compositional differences between the sample used to determine interfacial angles and that used for X-ray measurements.

The next chapter deals with crystal growth and twinning and the final chapter with the structures of common silicate minerals. Appendix A contains the answers to self-assessment questions while appendix B describes the construction of reference axes for clinographic projection. Appendix C summarizes the X-ray powder method for mineral identification and appendix D gives tables classifying minerals by chemical composition and structure (for silicates). Finally, appendix E gives tables for identifying minerals.

The book has an attractive and clear format and is abundantly and well illustrated with drawings, black and white photographs of natural crystals, and eight colour plates. The book *should* have been a useful addition to introductory mineralogy texts although I suspect that more expert crystallographers than I will criticize the approach as being 'out-of-date'. However, the text is *full* of typographical and editorial errors, admittedly most are minor and might only be spotted by expert proofreaders but many are misleading. Much more serious are the misleading statements and factual errors of which I give a few examples (there are many more):

On page 88 it is stated that 'the hydrogen atom has one proton but it may occur with one, two or *three* neutrons' (my italics). On p. 94 the atomic weight of Zn is given as 63.37 (wrong), on p. 143 it is given as 65.38 (correct) and S as 30.066 (wrong, 32.06). Chapter 17 on silicates is particularly suspect. On pages 258 and 262 the cleavages in diopside and tremolite are drawn through the six-coordinated cation sites. On pages 267 and 269 the labelling implies that in muscovite all tetrahedral sites are occupied by Si while Al is only in sixfold sites. On pages 272 and 273 cristobalite is referred to as crystobalite while sanidine is referred to throughout section 17.14 as sanadine. The same section identifies orthoclase as an ordered low-temperature feldspar and there is *no* mention of microcline anywhere in the book. On p. 277 the incongruent melting of enstatite is said to form forsterite and *liquid silica*. On the same page it is implied that gabbros may contain coexisting olivine and pyroxene [orthopyroxene] only under conditions of disequilibrium.

I strongly urge the authors and publishers to correct the equivocal statements and errors as soon as possible. When this has been done the book could be a worthwhile addition to the reading list for many first year university courses especially considering the very reasonable price of £6·95 for the soft cover version.

C. M. B. HENDERSON

Nutalaya, P., Editor. *Proceedings of the Third Regional Conference on Geology and Mineral Resources of Southeast Asia, Bangkok, November 14–18, 1978*. Bangkok (Asian Inst. Techn.) and New York (John Wiley and Sons), 888 pp., 305 figs., 1 coloured geol. map, 1979. Price £27·00.

This volume, which is published in Bangkok and distributed by John Wiley and Sons, is a record of the Third Regional Conference on the Geology and Mineral Resources of Southeast Asia held in Thailand in 1978 and edited by Dr Nutalaya of the Asian Institute of Technology. It is worth noting that the Department of Mineral Resources also produced a special issue of the Journal of the Geological Society of Thailand (*Geology and Mineral Resources of Thailand*, J. Geol. Soc. Thailand, 3, no. 1, 1978) to record separately another contribution to this conference. The book edited by Dr Nutalaya consists of about 80 papers on the geology of southeast Asia which is defined rather liberally since there are contributions on facets of the geology of India, Sri Lanka, Taiwan,

Australia, Korea, Thailand, Singapore, Malaysia, Afghanistan, Japan, Burma, Indonesia, Papua New Guinea, Kampuchea, Laos, and Vietnam. While browsing through this lengthy tome the thought occurred to me that perhaps the natural boundaries in regional geology should be plate margins and that a text on the geology and mineral resources of a single plate might have a more coherent theme. This volume provides a collection of studies ranging from abstracts to full papers on a tremendous range of different topics (see MA 80-2796 [1]-[41]). Despite the fact that this diversity makes it a volume to dip into, rather than read steadily from cover to cover, taken as a whole it does provide a good starting point and background to the geology of this part of the Earth and should be useful to all those interested in this. It is particularly refreshing to see two papers on aspects of the geology of Burma (one is by U Khin Zaw on fluid inclusion studies of the Hermingyi tin-tungsten deposit and the other by Dr Goosens on the Metallogenic provinces) since so little recent geological information on Burma has been published with the notable exceptions of the two recent publications by IGS (Garson *et al.*, 1976 (MA 77-2211)) and Mitchell *et al.*, 1977 (IGS Overseas Geol. Mem. **51**) and by Mitchell, 1981 (MA 82-82M/0201). The standard of the production is adequate although the English is not always perfect. There are a number of bibliographies and the book will prove an invaluable source of reference.

R. D. BECKINSALE

Dawson, J. B. *Kimberlites and their Xenoliths.* Berlin, Heidelberg, and New York (Springer-Verlag), 1980. xii+252 pp., 84 figs. Price DM 88.00 (US $52.00).

Over the past 15 years, following the discovery of the Siberian kimberlite province, and a new opening up of the South African deposits to outside researchers, there has been an enormous increase of information on kimberlites, exemplified by two international conferences in 1974 and 1977. Proceedings of the First Kimberlite Conference make a heavy tome, while those of the Second required two volumes. In spite of these, and all the other publications on the subject, coverage has become not only profuse but lopsided—most of the literature in English relating to southern Africa examples, with most of the Russian literature devoted to Siberian kimberlites. There has been a growing need for a small book providing a synoptic view of kimberlite, and for members of the Society it is apt that this should be provided by our 1980 Hallimond Lecturer.

After an interesting, brief historical introduction, chapters 2-6 are devoted to the distribution, geology, petrography, geochemistry, and mineralogy of kimberlites. Chapter 7 fills a third of the book, and deals with the xenoliths in kimberlite. A short chapter 8 covers the megacrysts (large single crystals and intergrowths) found in kimberlites. Dawson elects to follow the time-honoured path of descriptive discourse. Although this offers the advantages of an ostensibly neutral position, inevitably, in summarizing complicated matters, the examples and the emphasis must be personal choices. The route also has some danger in that connections might be missed. For instance, the eruptive state of kimberlite at high crustal levels is of vital concern, and shallow intrusions are rightly given special treatment in the petrography chapter, but the only seemingly acceptable case of a kimberlite lava flow is not. Interpretive discussion is largely reserved until the last two short chapters, 9 (subcontinental crust and mantle) and 10 (kimberlite genesis). Considerations of these must be left to the cognoscenti, a short review such as this allowing comment only on a few factual matters.

The most crucial matter must be kimberlite itself. Chapter 2 gives a sorely needed account of the distribution and tectonic setting of kimberlites, but even here uncertainties start to creep in about whether particular cases can correctly be called kimberlite. In fact, any reader without previous acquaintance with kimberlite would be advised to make a quick perusal of chapters 4, 5, and 6 before serious reading of chapters 2 and 3, because the only prior description has been a reference to mica-peridotite in the Introduction. Even with the aid of these later chapters, which describe the attributes of kimberlite, it may appear surprising (and tantalizing) to find no explicit petrographic-mineralogical-chemical definition. In several places kimberlite is described as a 'complex, hybrid rock', and it becomes clear that precise definition is a major unresolved problem. A range of minerals may be present but there seem to be no agreed limits on proportions (even presence or absence)—mica-peridotite hardly seems appropriate to a rock that may contain up to 50% phlogopite, or none at all (p. 104)! It must surely be this lack of an agreed definition that permits some of the needless modern controversy about the relationship of kimberlite to other magmatic rocks. If no-one can say precisely what kimberlite is, then its genealogy *can* be anyone's guess. Of course, everyone must agree that kimberlite is the stuff that fills 'diamond pipes', but this offers a disconcertingly wide range of composition, and if you then go further and admit the possibility of kimberlite without diamond, all the nomenclatural demons are out of