

ability of a mineral in fine specimens leads to the coverage of the plagioclase series in just over two pages while benitoite has almost equal space; zoisite is dismissed as 'a comparatively rare member of the epidote group seldom yielding cabinet specimens of interest', wollastonite is given nine lines without mention of its optical properties, but the more showy species rhodonite is accorded full treatment. The sections on occurrence tend to be geographical rather than petrological, thus marring the attraction of this text for students of geology, but in all fairness the introduction to the descriptive section describes it as being aimed to suit the needs of the amateur.

Although this book could not be unreservedly recommended for student use, it will nevertheless appeal strongly to many mineralogists, with its excellent illustrations of well-crystallized mineral specimens with full details of localities.

R. A. HOWIE

DEER (W. A.), HOWIE (R. A.), and ZUSSMAN (J.). *An Introduction to the Rock-forming Minerals*. London (Longmans), 1966. x+528 pp., 183 figs., 50 tables, 1 pl. Price: 70s. (cloth), 45s. (paper).

This book is a condensed edition of the authors' definitive five-volume work on rock-forming minerals and has been produced specifically as a text-book for students. The treatment of the subject is the same as that in the larger work, each rock-forming mineral being discussed from the point of view of structure, chemistry, optical and physical properties, distinguishing features, and paragenesis. Like the five-volume work, the chief value of the book is in the way in which it links descriptive rock mineralogy with petrogenesis. It could perhaps be described as a text on interpretive as well as determinative rock mineralogy.

The book follows the same structural classification as the larger work. The authors are to be commended for the way in which they have accomplished what must have seemed an impossible task of condensation from some 1800 pages of the five-volume work to the 528 pages of this students' edition. The pyroxene group, for example, which originally comprised some 200 pages of volume two, has been telescoped to 48 pages. This has been accomplished mainly by a reduction in the number of chemical analyses from 241 to 17. Similarly the amphibole group has been condensed from 172 to 44 pages. While the specialist on a particular group of minerals may feel slighted at the necessary reduction of detail, those for whom the book is intended will not be

unduly upset about the omission of doubtful species like 'karinthine', 'barroisite', etc. The book contains an Appendix giving the method for calculating the chemical/structural formula of minerals and a table of molecular weights for use in such calculations.

The sensibly priced paperback edition will add to the popularity of the book, which should find acceptance as a standard students' text.

T. W. B.

ADLER (I.). *X-ray Emission Spectrography in Geology (Methods in Geochemistry and Geophysics, 4)*. Amsterdam (Elsevier), 1966. xii+258 pp., 82 figs, 4 pls. Price: 90s.

The author includes under his title both X-ray fluorescent analysis and electron microprobe analysis. Both techniques are proving of immense value to geologists with a variety of interests.

The generation of X-rays and their properties are adequately and clearly discussed in general terms in Chapter 2. This is followed in Chapters 3 and 4 with more detail, still clearly and simply expressed for the non-physicist, on the conditions necessary for the excitation of any particular X-radiation and on the properties of the various detection devices available. Chapter 5 deals specifically with the dispersion of X-rays, including collimation, the reflectivity and resolution of the various analysing crystals and the ranges over which they are most effective in commercial spectrometers. One of the many assets of X-ray fluorescent analysis is its adaptability to meet the needs of a particular type of analysis and get the optimum results. To make full use of this adaptability it is essential to know which collimator or counter or crystal is most suitable. Dr. Adler explains the range and value of each such variable with excellent clarity.

Qualitative, semi-quantitative, and quantitative analysis of rock and mineral samples is discussed in Chapters 6 and 7 and a number of case analyses are quoted in detail from the literature. Matrix effects, including particle size effects and the absorption and enhancement effects, an understanding of which is vital to accurate quantitative analysis, are discussed only briefly. The problems these raise are of particular importance to the geologist and a much fuller description of the various methods of sample preparation in use and a discussion of their relative merits would have been appropriate and timely. Nor would worked examples for correction of the absorption effect, including tables of various constants, have been out of place.

The last four chapters are devoted to electron microprobe analysis.