

fluorescence analysis; electron probe microanalysis; chemical analysis by electron spectroscopy of photoelectrons and of Auger electrons; scanning electron microscopy; ion probe microanalysis.

For each method, theory and instrumentation are treated in considerable depth (precision and sensitivity, limitations, advantages, and disadvantages are well explored) and a brief section indicates some examples of applications to minerals. Each chapter has a bibliography leading the reader to more specialized books, and there are appendices on 'reciprocal space' and Fourier Transforms. The book concludes with a subject index and a list of published papers referred to in the text.

Books on techniques are bound to be a little behind the 'state of the art' and this one, with few references later than 1972, somewhat more so. For example, in discussing mineral identification by X-ray diffraction it does not refer to the change of management and title of the ASTM scheme to JCPDS (Joint Committee on Powder Diffraction Standards), and more important, to the newer developments like computer searching and the Mineral Data publications. Also, the now important energy dispersive method is not mentioned in the chapter on electron probe analysis (though it is dealt with in principle elsewhere).

An outstanding feature of this book is the high standard of its production. Text and figures are clearly and elegantly presented, the use of black and red in headings and drawings being particularly effective. Another outstanding feature is the price! Reviewers are becoming inured to high prices and are making fewer remarks about them, but this book is so ultra-expensive (even making allowance for the depressed state of sterling) as to bring forth comment once more. One wonders not which individual can afford it but which institutional libraries will buy it!

J. ZUSSMAN

O'Donoghue (M.), Editor. *The Encyclopedia of Minerals and Gemstones*. London (Orbis Publishing), 1976. 304 pp., 63 figs., 450 coloured photos. Price £7.95.

This richly illustrated book aims to present a simple and clear exposition of the nature, occurrence, and properties of minerals and to give detailed information on all the mineral varieties important to the collector or lapidary. The text consists of eight chapters contributed by individual experts (M.A. 77-1370), together with a glossary, mineral identification tables, and a bibliography. It would be easy to compare this work with the genuinely encyclopedic volume of Roberts, Rapp, and Weber (M.M. 40-105) with over 2800 entries at many times the price, but the intended market is different: the present book is aimed for those who know nothing about minerals or gems and for the experienced mineral collector. Nevertheless the text is authoritative and includes chapters on the geological relationships to be found among rocks and minerals with details of rock classification, economic minerals, the preparation and cutting of gemstones, and the cleaning and storing of minerals. Unfortunately throughout these chapters there is no reference to the numerous excellent colour photographs interspersed in the text. In the main section, 'The mineral kingdom', which contains information on the composition, properties, occurrence, and uses of over a thousand species, this matters not at all as each photograph has a caption with locality details (but no indication of true size of the specimen). But it is the excellent Italian colour printing of the well-chosen mineral specimens that will appeal to most mineralogists—and applying the acid test of whether the well-crystallized species can be identified readily by a glance at their photographs, the reproduction sets a uniformly high standard of fidelity.

R. A. HOWIE