

accuracy in determination of 2V, etc. 3. The determination of retardation and the principal birefringences with very high accuracy by the use of compensators. 4. Determination of the relation between thermally induced structural changes and optical properties.

It is very difficult to be adversely critical of this work. However, the impression is unfortunately given in chapter 6, by the placing here of a section on the use of half-shade plates etc., that extreme accuracy of extinction measurements is only necessary when generating data for use with EXCALIBUR. This section would be of far more value if placed near the beginning of the work, perhaps as a separate short chapter on extinction determination, the corner stone of the whole work: these techniques would then be more obviously associated with *all* extinction measurements regardless of their ultimate use.

F. E. TOCHER

Jeffery, P. G. and Hutchison, D. *Chemical Methods of rock analysis*. 3rd edition. Oxford and New York (Pergamon Press), 1981. xvi + 380 pp., 27 figs. Price £25.00.

The third redaction of a book implies the status of a standard text, but for those unfamiliar with previous editions an outline of the contents may be helpful. The work may be divided under three main headings. (1) Preparation of material for analysis, including decomposition procedures. (2) Schemes of analysis both classical and rapid. (3) A series of chapters in the determination of individual elements.

It is normal for successive editions of a book to grow both in size and price but in the present economic conditions it has been necessary to 'slim down' this third edition to avoid an unacceptable cost. Happily, this has been achieved without affecting its basic value. The reduction in the number of pages has, for the most part, been effected by reducing the number of Tables (48 to 4), Figures (104 to 27), and by eliminating the structural representations of spectrophotometric reagents. Excision of the chapter on statistical considerations is personally considered a significant loss. Whilst recognizing the authors' view that such matters are widely known it is only by repeated exposure that an equally wide application can be attained. Less serious, though a source of some regret, is the elimination of the short sections on occurrence at the start of each element chapter, which served to place the elements in their geochemical contexts and to act as a bridge between

the analyst and the user of analytical results. The appearance and appeal of the book is to that extent changed towards a series of 'cook-book' instructions.

The good news is that this edition contains much material that is new, not only in element determinations (particularly those for the precious metals) and references up to and including 1979, but also extending the coverage of full analysis schemes based upon atomic absorption spectrophotometry. The continuing trend away from separation by precipitation and measurement by weighing is recognized by the substitution or addition of methods involving solvent extraction or ion-exchange, commonly followed by flame or electrothermal AAS.

The regret expressed by the authors in the preface, that they were not able to deal with the physical methods used for the analysis of geological materials, is surely misplaced. The particular value of this book is that it offers alternatives to such techniques whose precision may be excellent but whose accuracy can only be checked by recourse to chemical methods such as those presented. The needs of those laboratories which do not have the high capital investment or which cannot justify such expenditure on instrumentation should not be set aside lightly. It could be argued that there is a great need for methods of chemical determination which could win wide acceptance as 'standard methods' against which the performance of any new procedures or new instruments could be measured. Such a compilation would take some time and no little effort to achieve, but there is no reason why procedures equivalent in standing to those of the British Standards Institute and other organizations should not eventually emerge—which might ease the task of those who set up standard materials. It would not be unreasonable to regard this series of books as a first step in this direction—subject to revision with new methods being introduced strictly on merit.

In their apologies for the method of preparation of the book, i.e. directly from the authors' typescripts, the publishers express the hope that this method will in no way distract the reader. Far from being a distraction, the thin, and therefore seemingly pale type demands a high degree of concentration, certainly from those of us advancing in years. A welcome and positive contribution by the publishers is the recognition that this is no library book, but one which deserves and will earn its place on the laboratory bench, to which end they have supplied a more resistant cover.

Even taking into account the reservations expressed above, the overall worth of the book remains. It is recommended alike for those preparing or attending introductory courses in geo-

chemical analysis and to those working full time in the field.

F. BUCKLEY

Evans, A. M. *An Introduction to Ore Geology* (Geoscience Texts, vol. 2). Oxford (Blackwell Science Publ.), 1980. viii + 232 pp., 130 figs. Price: Cloth £16.00, Paper £7.50.

This is the second of the Geoscience Text series edited by A. Hallam in which authors who are experienced teachers as well as of high academic standing have been asked to provide a brief introduction to their subject mainly for undergraduates.

The book is divided into three parts—I Principles (72 pp.), II Examples of the More Important Types of Ore Deposit (115 pp.), and III Mineralization in Space and Time (22 pp.). In Part I, after an introductory chapter on definitions, there is a discussion of the nature and morphology of ore deposits including forms of orebodies; textures and structures of ore and gangue minerals, fluid inclusions and wall rock alteration; major theories of ore genesis; geothermometry, geobarometry, stable isotope studies, palaeomagnetic and radiometric dating and zoning; metallogenic provinces and epochs.

Part II begins with a brief account of the classification of ore deposits. The author points to the recent swing from genetic to environmental-rock association classifications and adopts the latter himself but does admit to a 'whiff of genesis and morphology'. The features outlined are based mainly on Lindgren's 1913 scheme of hypothermal, mesothermal, epithermal, and telethermal deposits.

The rest of Part II consists of eleven chapters in which are described the principal occurrences of ores in a wide variety of different environments—orthomagmatic, carbonatite, pyrometasomatic, disseminated and stockwork, stratified sulphides and oxides in sedimentary and volcanic areas, vein associations, strata-bound, sedimentary, residual and supergene enrichment, metamorphic. The very names of the chapters often have a genetic ring.

Part III has two brief chapters on plate tectonics and the global distribution of ore deposits and ore mineralization through geological time.

This summary of contents of the book indicates that the treatment must necessarily be brief, sometimes almost perfunctory, since some of the topics covered need a volume to themselves. Even major deposits warrant only a page or two so that many of the details and discussion of conflicting opinions on the genesis of the deposits may be lacking.

In a book of this size there must necessarily be some omissions and there will be some who find their own speciality either omitted or briefly

touched upon. However the author has in the main achieved his aim of providing a balanced, short and cheap (certainly for the paperback edition) introduction to an ever expanding and complex subject.

The book is concisely written, well illustrated with clear line drawings and well laid out; there are very few typographical errors. There is a comprehensive bibliography to which the student can turn either because his appetite has been whetted by the succinct summary descriptions or to have some of the more fundamental aspects—such as dating or stable isotopes or fluid inclusions—more fully explained.

It is a timely work in several ways. It emphasizes how an orebody may be the result of a whole series of processes acting over a long geological history; it points to the effects of technological change which have made many uneconomic mineral deposits into workable ore bodies (e.g. Cu concentration 3% in 1900, 0.4% at present); and it comes at a time when many of the long established theories, e.g. the epigenetic origin of many ores, are being questioned and a syngenetic origin is being suggested.

Dr Evans is to be congratulated on this volume which can be strongly recommended to a wide range of readers as a good introduction to ore geology.

R. BRADSHAW

Ballance, P. F. and Reading, H. G., Editors. *Sedimentation in Oblique-Slip Mobile Zones*. (Special Publ. Intern. Assoc. Sedimentologists, no. 4). Oxford and Boston (Blackwell Scientific Publ.), 1980, vi + 265 pp., 121 figs. Price £14.50.

This well-produced volume contains thirteen papers (MA 81-1135) presented in a symposium held at Auckland University in January 1979. We are not told the title of the symposium, but it probably included the phrase 'strike-slip faulting': this or very similar phrasing is used in the titles of six of the papers. The clumsy title of the present book is an example of writing by committee; in the introduction it takes Dr Spörli more than 200 words to define an oblique-slip mobile zone. Those afraid that this book involves some totally new concept may be assured that the title should have been 'Sedimentation in regions of active major strike-faults'. Since these will usually have a vertical component in part, much of the sedimentation is similar to that associated with many other major faults: high sedimentation rates, conglomerates, turbidites, debris-flows, slumps, wedge-shaped layers, mostly set in elongate basins. Of course it is not all quite so simple as this, as the papers by Bluck and Ballance show.