

## BOOK REVIEWS

Adams, A. E., MacKenzie, W. S., and Guilford, C. *Atlas of sedimentary rocks under the microscope*. Harlow (Longman Group/Wiley), 1984, vi+104 pp., 217 colour figs. Price £9.95.

This is a companion to the *Atlas of igneous rocks and their textures* and from the same stable as the *Atlas of rock-forming minerals in thin section*: Manchester University Geology Department. Like the other two, the text is intended as a laboratory handbook to assist in the study of rocks and minerals in thin section. The text is divided into three parts. The first deals with terrigenous clastic rocks, the second with carbonates and the last with 'what's left'—ironstones, cherts, evaporites (in very considerable detail), phosphates, coals, and coal-balls. Only one example for each of the last two categories is given.

The clastics section concentrates on sandstones with just a few examples of siltstones. The text is essentially descriptive and the authors stress that this is their intention. Interpretation is kept to the minimum necessary. Sequence is logical; grain types are described first, followed by matrix and cement. Good examples from each of the major sandstone groups are then illustrated. Part 2 which deals with limestones, is necessarily more extensive. This is because of the very many bioclast types which are found with regularity. Most of the sections illustrated are stained with a combination of Alizarin Red S and potassium ferricyanide to differentiate between ferroan and non-ferroan varieties of calcite and dolomite. Both staining and acetate-peel preparation techniques are described in full in appendices. The final part deals with a range of less common sediment types, all of which, however, are quite likely to be encountered in sedimentological investigations.

A particular strength of this handbook as far as I am concerned is that the authors have chosen their classification schemes (upon which rock nomenclature depends) carefully. For example, both sandstone and limestone classifications are the same as used in Tucker's *The field description of sedimentary rocks* (Geological Society Handbook Series) and *Sedimentary petrology, an introduction* (Blackwell). Both seem to be fairly widely used by undergraduates who will now be able to use the *Atlas* without introducing conflict or confusion.

I'm sure that students will find this volume helpful. The quality of illustration is excellent and most sections are presented as PPL/XPL pairs. Account is taken of commercial applications by illustration and discussion of porosity. Perhaps this

aspect could have been developed more fully but that, of course, would have increased costs. Whilst I agree with the authors that clay minerals cannot be readily identified using an ordinary light microscope (if at all!), I think that a couple of plates could have been set aside for (say) laminated and unlaminated mudrocks. These implied criticisms are very minor and probably reflect my own prejudices. I strongly recommend this volume to all geology students with a serious interest in sedimentology. It complements perfectly the three or four excellent texts which have emerged in recent years and which have made teaching this important branch of geology both simpler and more interesting.

C. D. CURTIS

Saxena, S. K., ed. *Kinetics and Equilibrium in Mineral Reactions* (Advances in Physical Chemistry, Vol. 3). Berlin, Heidelberg, and New York (Springer-Verlag), 1983, x+273 pp., 83 figs. Price \$42.00.

This book, like previous volumes in the series, presents a heterogeneous assemblage of papers written by various eminent petrologists with a theoretical or experimental bent. Certainly it should fulfil the editor's intent of being highly engrossing and informative to other research workers of this genre and doubtless they will wish to add a copy to their bookshelves. Whether a wider body of mineralogists and petrologists will be prompted to open a library copy and find the time and the will to delve deep is more uncertain. However, if not, they will be missing out since within its pages is to be found some subject matter which is both thought-provoking and of fundamental importance to the advancement of more rigorous petrological analysis and understanding.

Particularly educational are the in-depth review of compositional zoning in crystals by Loomis, with its emphasis on the interpretation of garnet zoning in metamorphic rocks and plagioclase zoning in igneous rocks, and the article on geospeedometry by Lasaga which outlines how the pressure-temperature-time history of metamorphic rocks may be deduced from consideration of the kinetics of the diffusion processes involved in ion-exchange reaction geothermometers. The review article by Bohlen, Wall and Boettcher on geobarometry in granulites presents data and interpretations which should again be of general interest.

The remaining five chapters are on the whole

rather more esoteric. Two of these involve the presentation and discussion of experimental data on cordierite-bearing systems (Aranovich and Podlesskii; Perchuk and Lavrent'eva) and a third (Eugster and Ilton) the extrapolation of experimental solubility data to a consideration of Mg-Fe fractionation between various minerals and the chloride-rich aqueous fluids considered important in many metamorphic environments. Saxena discusses possible relationships between exsolution and Fe-Mg order-disorder in pyroxenes and finally Powell presents a formalism for expressing activity-composition relationships constructed so as to more closely approach the physical reality of atomic distribution in silicate mineral structures than the simple mixing models usually employed.

D. A. CARSWELL

Martin, H. and Eder, F. W. (eds.) *Intracontinental Fold Belts: Case Studies in the Variscan Belt of Europe and the Damara Belt of Namibia*. Berlin, Heidelberg, New York, and Tokyo (Springer-Verlag), 1983, xiii + 945 pp., 300 figs., 24 plates. Price US\$47.70 approx. (DM 120.00).

This major reference work presents the results of a 12-year research programme on the Variscan and Damara fold belts undertaken at Göttingen University and completed in 1980. This work was funded by the Deutsche Forschungsgemeinschaft as a special collaborative programme known as the Sonderforschungsbereich (SFB) 48-Göttingen. The work consists of 41 contributions by various authors and give equal weight to each fold belt, there being 19 papers on the Variscan and 21 on the Damara, together with a generalized comparison.

Although the book assigns equal weight to each fold belt, the treatment of each is different, presumably indicating the differing starting points for the two aspects of the programme. Papers concerned with the Variscan Belt tend to concentrate on specific problems of sedimentary history or stratigraphy, whereas geochronological studies and discussions of metamorphic history dominate the contributions on the Damara Belt. A further difference arises in so far as the treatment of the Variscan is restricted to its outcrop in Central Europe whereas the entire Damara Belt appears to be considered. Because of these points and in the absence of a good review paper on the Variscan (there is an excellent review of the Damara), the book does not provide a balanced comparison between these two fold belts, although the text opens with a very generalized comparison by way of an introduction. In this respect I found the book rather disappointing, leaving the feeling that, although I knew substantially more in detail about

these fold belts, I did not understand their overall structure or their geotectonic significance to any greater degree than when I started reading it. The book is then a set of research contributions, rather than a definitive study, and does not live up to its rather general title.

This substantial text is produced at comparatively low cost, considering its rather specialist appeal, but this results in a small print size and rather numerous typographical errors. The diagrams and tables are of uniform reasonable quality, although some of the diagrams would benefit by being enlarged; the plates are generally excellent.

*Intracontinental Fold Belts* will be a standard reference volume amongst those specialists studying aspects of the Variscan and Damara belts, but will be of only limited interest to other earth scientists although individual papers contained in the volume may become more widely cited.

MERVYN E. JONES

Moseley, F. *The Volcanic Rocks of the Lake District a Geological Guide to the Central Fells*. London (Macmillan), 1983, vi + 111 pp., 64 figs., 58 photos., 17 maps. Price £4.95.

This text provides a simple introduction to the geology of the central fells of the English Lake District, dealing with the Eycott and Borrowdale Volcanics, and describing field excursions which also venture on to the underlying Skiddaw Slates and the overlying Conistone Limestone Group and Silurian sediments. I found reading both the simple introductory chapters and the field excursion itineraries enjoyable and informative and the text generally portrays the author's obvious enthusiasm for this field area, and his great practical experience of these rocks.

This book is aimed at a wide readership—the informed amateur, school and university students, and experienced geologists. To an extent it is successful, and although I would not recommend it to readers with no previous knowledge of the subject, anyone with a limited understanding of geological terminology will be able to understand the introductory chapters and following from this the field itineraries. At the other extreme, the wealth of detail given in the field itineraries will greatly aid the expert planning a field excursion to the area. I have no doubt that this book will become a favourite with undergraduates visiting the Lake District, and I suspect that the excellent maps, cross-sections and annotated photographs will assist undergraduate map makers, to perhaps too great an extent.

The book is well produced, with excellent plates and figures, but the text tends in places to refer to