with classic localities like Long Valley, the Andes, Donegal and Skye. The use of Sr, Nd and Pb isotopes in identifying sources, and of oxygen isotopes in distinguishing hydrothermal reworking, are all discussed, very much in outline, but nevertheless giving a fine overview of the resources available to the modern igneous petrologist. Finally we have a good chapter on alkaline rocks, firmly founded in 'petrogeny's residua system', and passing via carbonatites into kimberlites and ultrapotassic rocks. The book ends with appendices (in 'camera ready' style) starting with the methods of norm, density and viscosity calculations. These are written out in simple steps which could be easily rendered into computer code. Some further detail on radiogenic isotopes is provided, and 30 pp. of illustrative problems. Finally there is a glossary of rock names.

For coverage, balance and inspirational quality this book ranks very highly indeed. I would certainly recommend it to Honours students. It has some shortcomings in detail which detract slightly from the overall impression, and there are far too few references. Repeatedly I came across interesting asides and wanted to know the source but was left tantalized. There is, however, one unexpected bonus. Look closely at the drawings of thin sections and you will usually find, often in the groundmass, a little representation of McBirney himself, with a fringe of beard, pipe firmly clenched in his teeth, wide-eyed with the interest of it all.

I. PARSONS

Fitton, J. G. and Upton, B. G. J., eds. *Alkaline Igneous Rocks*. Oxford and Palo Alto (Geological Society Special Publication No. 30. Blackwell Scientific Publications), 1987. xiv + 568 pp., 273 figs. Price £65·00.

As noted in the Preface, thic collection of papers has been published just ten years after a similarly titled volume edited by Prof. H. Sørensen. This present volume contains invited papers presented at a symposium, sponsored by the Geological Society of London and the Royal Society of Edinburgh. The papers vary in length from four to eighty-seven pages and cover such a wide variety of topics that it is possible to comment on only a few of the contributions.

Alkaline rocks have been defined in a variety of ways but for the purposes of this volume the definition has been extended to include a variety of rock types which may be associated with alkaline rocks—particularly the carbonatites. In addition the lamprophyres are a group which was not treated by Sørensen but are here considered as alkaline rocks although many of them would not be considered alkaline by any criterion.

N. M. S. Rock considers that the lamprophyres have been neglected in the geological literature but since he believes that the term should be restricted to field use it is difficult to see how the neglect should be overcome. He divides the lamprophyre clan into five branches, two members of which are lamproites and kimberlites. However, S. C. Bergman in writing a chapter on lamproites, believes that the term lamprophyre 'should not be used to encompass such widely separated rock types as kimberlites and lamproites . . .'. J. B. Dawson deals with the relationship between kimberlites and some lamproites and shows that Group II (micaceous) kimberlites are chemically more closely related to the olivine lamproites than to the Group I kimberlites. He believes that the term kimberlite should be used for a clan rather than a rock type.

Bergman's chapter, on 'Lamproites and K-rich igneous rocks' contains a brief commentary on all the known major suites (21) of lamproites together with a review of their mineralogy, major and minor element chemistry and geological environment. With 17 pages of references this must be the most comprehensive review of this rock group available anywhere. It is a pity that most of the photomicrographs are too small to be of much value particularly since no other author has reproduced a photomicrograph of anything in this volume.

A. D. Edgar reviews some of the experimental work relevant to the genesis of alkaline rocks; M. J. Le Bas discusses the nephelinites, ijolites and carbonatites. Le Bas considers that a sodium carbonate magma similar to that of Oldoinyo Lengai is likely to be parented to the more normal carbonate rocks whereas J. D. Twyman and J. Gittins believe that sodium carbonate liquids are the residual fraction resulting from differentiation from an alkali-poor carbonate magma.

A series of papers describing alkaline volcanic rocks from oceanic and continental environments is followed by descriptions of some well known and some lesser known plutonic complexes. The coverage of different continents is very variable since there are only two papers (32 pages) on regions in North America, one by D. S. Barker on the Trans-Pecos area of west Texas and one by G. N. Eby on the Monteregian Hills and the White Mountains. On the other hand 128 pages are devoted to rocks from the African continent.

Interest in alkaline rocks is out of all proportion to their occurrence and it seems probable that they may hold many more clues to the evolution of the earth simply because of the variety of their compositions. It is a remarkable fact that nowhere in his

text-book *Eruptive Rocks* did S. J. Shand use the term 'alkaline rocks' yet N. L. Bowen had a chapter headed 'alkaline rocks' and Daly also used the term extensively. This is probably because Shand defined the term 'peralkaline' and thought that the word alkaline was too vague or too closely associated with geographical subdivisions of eruptive rocks. This reviewer feels that the term 'alkaline rocks' has already been extended to cover too wide a spectrum of rock types.

Those who organize symposia generally like to have the papers published in one volume. For many years publishers did not welcome this type of publication but the situation appears to have changed and many publishers are quite anxious to publish collections of papers. A volume on the topic of alkaline rocks can be guaranteed to generate interest but it is difficult to know how such a volume should be priced. At one time it might be assumed that every University and departmental library might buy such a volume but this may no longer be true as the costs of journals and monographs continue to rise.

Despite these comments and minor criticisms this book represents a very useful addition to the geological literature: the editors are to be congratulated on their selection of papers and on the very useful introduction to the volume.

W. S. MacKenzie

Kwak, T. A. P. *W-Sn Skarn Deposits and related metamorphic skarns and granitoids.* Amsterdam, Oxford and New York (Elsevier), 1987. xvi + 451 pp. Price Dfl. 215.00 ($105.00).

A concise, yet universally agreed definition of the term 'skarn' has long eluded geologists. Most of us have a common feeling for what constitutes a typical skarn; the difficulty lies in deciding where to fix the boundaries. Hoping that this book would offer some insight to the problem, I immediately tackled page 1 under the heading 'What is a skarn?' Unfortunately this question was not answered until page 40, but at least the author immediately made it clear that his boundaries were going to be much broader than might normally be expected. Thus he considers not only the typical replacement of carbonate rocks, but also replacement of such diverse rocks as granites, hornfelses, and basic igneous rocks. (In this he seems justified, but the problems of terminology are compounded when he also decides to include greisens under the skarn classification!)

This book is, in essence, a compilation of the geological characteristics of tin and tungsten mineralisation associated with skarns and similar replacement bodies. For this the author is to be congratulated, for his extensive research has brought together information concerning a variety of deposits from all over the globe. The book therefore constitutes a valuable source of information on this style of mineralisation, and will also be of relevance in the increasingly important study of gold-bearing skarns. Much of the text relates to the mineralogical and petrographic characteristics of the deposits but a certain amount of geochemical (including fluid inclusion and stable isotope) data is also presented. One aspect that continually appears in descriptions of skarns is the zonation of alteration assemblages. This is repeatedly described in the book but, despite the enormous advances in our understanding of the processes governing infiltration and diffusion metasomatism in recent years, the causes of these zonations are only covered in a superficial fashion. Another aspect which also could have been discussed in more depth is that of the source of the transporting fluids and ore components, particularly the roles of granites and magmatic activity as opposed to the influence of the surrounding country rocks.

The book has many diagrams and plates, but the text and references do contain an annoying number of mistakes. In summary, I consider the book to be a good reference source for this type of mineralisation but feel that it is rather lacking in any concepts concerning the genesis of the deposits. I certainly now know more about the diverse characteristics of this mineralisation but must admit to being even more confused about the meaning of terms such as skarn and greisen!

D. H. M. Alderton

McClay, K. *The Mapping of Geological Structures.* Milton Keynes (Open Univ. Press) and New York (Halsted Press), 1988. vi + 162 pp. Price (paper) £7·95.

This small book of 161 pages is another in the Geological Society of London Handbook Series. It is primarily aimed at undergraduate students as a basic guide to the field mapping of deformed rocks and the interpretation of the data obtained during such a project. However, the information as set out will make it a useful text for a much wider audience. The objectives of the book are admirable and, I think, are attained. The nine chapters are easy to follow and are logically set out. The final chapter giving guidelines for the first stages of analysis, interpretation and report writing, whilst not exhaustive, is particularly useful.

The book provides a step by step introduction to the techniques of mapping and the important data