

bearing granites are also described in a paper by Shimura, Komatsu and Iiyama, who give the results of some high pressure melting and crystallisation experiments on these rocks. Other experimental phase equilibrium studies in a range of metaluminous to peraluminous compositions are reported in papers by Green and by Holtz, Johannes and Pichavant.

Several of the contributions are concerned with the relationship between magmas and restites. For example Ellis and Obata discuss the segregation of melt from migmatites on the basis of petrographic observations and phase equilibria, while Burnham presents geochemical arguments to support the restite unmixing hypothesis, i.e. the idea that granites represent mixtures of melt and restite. A paper by Zeck gives further details of the Hoyazo dacite, a volcanic rock with apparently restitic inclusions.

Stable and radiogenic isotope studies are described by many of the authors, but particularly interesting are several papers on the use of the SHRIMP ion microprobe at the Australian National University for U–Pb geochronology of zircons. The photomicrographs and isotopic data which accompany these papers reveal the complex history of zircon growth in granites, and the great potential of this technique for uncovering the history of their magmatic source regions. Another relatively new area of research is the study of oxidant state of granitic magmas, and the paper by Blevin and Chappell considers how oxidation state among other factors can influence the metallogenic character of granites.

Altogether this is a most valuable collection of papers on recent granite research, and it is pleasing to see that unlike many symposium volumes the contributions are packed with detailed and often new information. The volume is very well produced and illustrated, although it is a pity that it has been priced beyond the reach of most researchers. Granite specialists will be indebted to Bruce Chappell for the organisation of the Second Hutton Symposium. The next meeting in the series will be held at the University of Maryland in 1995.

A. HALL

Floyd, P. A., Exley, C. S. and Styles, M. T. *Igneous rocks of South-West England*. London (Chapman and Hall), 1993. xii + 256 pp. Price £65.00

This volume is one of the Geological Conservation Review series, initiated by the Nature Conservancy Council in 1977, which will eventually document all the geologically important

sites (SSSIs) in Great Britain. Like the other volumes in the series, it highlights the special interest of each site, describes its geology, reviews research on the site, and sums up its importance in simple terms for the non-specialist.

The first two chapters introduce the geology of the region, mentioning the structure and stratigraphy, reviewing the igneous activity and summarising the most important isotopic ages. The four main chapters describe localities illustrating the four principal igneous rock associations of the region: the Lizard ophiolite complex (10 sites); the pre-orogenic (spilitic) lavas, tuffs and intrusions (19 sites); the Cornubian granite batholith (19 sites); and the post-orogenic Exeter Volcanic Series of shoshonitic character (5 sites). Some of the localities are among the best of their kind in the British Isles, e.g. the coastal section through the roof of the Tregonning granite; and others are of international significance, e.g. the tourmaline and topaz-rich rocks associated with the St. Austell granite.

The authors have done an excellent job of describing the sites and explaining their significance. They provide an up-to-date bibliography for the specialist reader and a glossary for the non-specialist. The volume is beautifully produced and very well illustrated, although some of the photographs are rather poorly reproduced. This review will be of lasting value, and many geologists who know the region will want to own a copy; unfortunately it is priced beyond the reach of nearly all its potential readers.

A. HALL

Emeleus, C. H. and Gyopari, M. C. *British Tertiary Igneous Province*. London (Chapman and Hall), 1992. xii + 259 pp. Price £65.00 hardback.

This A4-sized book contains 95 figures (including photographs) and 12 Tables and is published in association with the joint Nature Conservation Committee as part of the *Geological Conservation Review Series*. The production is handsome with good art-quality paper so that photographs produce well, and is printed in a clear double column that reads easily. I found very few typographical errors indeed and the volume is both well written and well edited.

An introductory statement at the beginning of the volume states that the Geological Conservation Review was initiated by the Nature Conservancy Council to publish accounts of the rich geological heritage of the UK, particularly regarding the key earth science sites, which either are, or are being considered for notification as,

Sites of Special Scientific Interest (SSSIs). The statement considers that volumes in this series must be written to the highest scientific standards so that the importance of the site is clear; and that each account of an SSSI must contain an introduction (including information on previous work), a description, an interpretation (of the site's scientific importance), and a conclusion (written in simpler terms for the non-specialist).

Within the terms laid out above, the two authors have done their job admirably. The SSSIs are combined into larger frames of reference so that those related to individual Tertiary Centres are discussed together. Thus the Chapters include in order: 1. A general introduction to the Tertiary Igneous Province with some indication of current researches in this field; 2. Isle of Skye; 3. The Small Isles (Rum etc.); 4. Ardnamurchan; 5. Isle of Mull; 6. Isle of Arran; 7. Others (including the Shiant Isles, St. Kilda etc.). In each of these accounts the various SSSIs are described according to the NCC format and a very accurate picture of the general and specific geology of both the sites and region emerges. I am familiar with Ardnamurchan geology and the authors have given a concise and accurate picture of it in their descriptions. The diagrams are excellent throughout and the photographs well chosen.

The Index is comprehensive with well selected terms and the References are complete, and give an excellent picture of Tertiary research over the past few decades.

My only serious criticism of this book (apart from the price—a mind-blowing £65.00) is the lack of detailed mineralogical data and geochemical analyses of rocks and minerals. Since the NCC statement mentions the scientific importance of sites and justification for a sites inclusion, it is difficult to understand why such data are not given. It is extremely difficult to discuss the petrogeneses of the Tertiary rocks of the various centres without a full discussion of rock and mineral chemistry, geochemical trends, comparisons with other centres, and other scientific information.

I realise that the authors' hands are tied by the statement that the conclusions have to be *written in simpler terms for the non-specialist* but I am of the opinion that the dearth of detailed scientific data detracts from the volume and reduces its importance to the professional geologist and other scientific workers who must be interested in the origin of the main Tertiary magmas and their relationships with other Tertiary magmatic rocks.

As far as it goes, the book gives an excellent account of the British Tertiary Province, but I cannot understand why essential petrological

ingredients have been omitted because of perceived difficulties for the non-specialist reader, when such a volume is likely to have more specialist than non-specialist buyers.

C. D. GRIBBLE

Parson, L. M., Murton, B. J. and Browning, P. (eds.) *Ophiolites and their Modern Oceanic Analogues*. London (Geol. Soc. Special Publication No. 60) 1992. vi + 330 pp. Price £55.00.

It is almost inevitable that papers collected together under such a title should be polarised into two groups, and it is not surprising that most authors attempt to bridge the gap between the two cultures from a firm standpoint on one side or the other. Of course, the correlation between ophiolites and oceanic crust, however widely accepted in general, is fraught with difficulties when it comes down to details. This is largely the result of insufficient three-dimensional information on present-day oceanic crust, and the obscuring of earlier magmatic history by later tectonic events in the case of the ophiolitic complexes. However, this memoir represents a praiseworthy effort to establish firmer connections between the two, and contains a wealth of valuable information, as well as some fascinating speculation. It's a pity that there is not a more extensive introduction—setting the scene, defining the jargon, and emphasising the problems—and perhaps a concluding chapter to re-assess the situation in the light of the contributions presented here.

The eighteen papers (following a very brief preview) are informally grouped by the editors into three categories, although the rationale for this grouping is not particularly clear, and a review of the contents is not helped by the absence of chapter numbers. The first five papers are described as having an essentially tectonic flavour, and comprise two on specific ophiolites (Josephine and Oman), and three on modern oceanic crust (one general, and one each on segments of the East Pacific Rise and Mid-Atlantic Ridge, respectively). The next nine papers are more geochemical in nature and cover such diverse topics as marginal or back-arc basins, boninites, and chromites, as well as specific ophiolite complexes (e.g. Ballantrae, Pindos, Troodos), apparently in no particular order. The final four papers are said to have a varied content, but to represent a 'similarity of methods and concepts'. This coherence is not strong, and three of these papers would have fitted equally well into the earlier 'tectonic' group, and the other is essentially geochemical. This section contains the