

Further, no consideration is given to the possibility of analysis by this technique of unashed material, and it is stated that soils must also undergo the same treatment.

Overall, this is a detailed and wide-ranging book with interesting case-histories, useful appendices, and almost a thousand references. It gives a realistic assessment of biological methods in mineral exploration, concluding that no one method is always successful and that an integrated approach is likely to give the best result. Prospectors should not neglect this approach or this volume.

T. K. SMITH

Hawkesworth, C. J., and Norry, M. J. (eds.). *Continental Basalts and Mantle Xenoliths*. Nantwich, Cheshire (Shiva Publishing Ltd.), 1983. viii + 272 pp., 80 figs. Price £25.00 hardback. £12.50 paperback. (Available in North America from Birkhauser Boston, Inc., Cambridge, Mass.)

This volume arises from a meeting of the Volcanic Studies Group held at Leicester University in January 1983. It consists of ten reviews of recent work on the origin of basalts and their xenoliths, and the nature of their source materials, discussed from a predominantly geochemical point of view.

The first contribution, by Norry and Fitton, sets out the differences between continental and oceanic basalts, and draws attention to the possible roles of mantle heterogeneity and crustal contamination in determining their differences. These themes are taken up by the other contributors, who use a whole battery of isotopic and trace-element criteria to disentangle the effects of variable sources, differential partial melting, contamination, and fractionation.

Three of the reviews deal with the upper mantle sample represented by xenoliths in kimberlites and alkali basalts. The mantle of the subcontinental lithosphere is different from both the mantle of the suboceanic lithosphere and the mantle of the asthenosphere, being much more heterogeneous and preserving features of much greater age than the other two mantle regions. However, as we get to

know more and more about this part of the mantle, it seems less and less likely that any non-orogenic basalts actually originate within it.

The examples of continental basalts which are discussed in subsequent chapters include the Karoo basalts of southern Africa and the Tertiary lavas of Skye, with briefer references to other flood basalt provinces, such as those of the Deccan and Columbia River, but there is not much discussion of highly alkaline continental basalts such as those of East Africa. The final article reviews the special characteristics of basalts erupted at active continental margins.

This small volume provides an excellent overview of the current state of research in the very active field of basalt petrogenesis. There is a lengthy bibliography at the end, which is very up to date and will be particularly valuable to research students in igneous petrology and geochemistry.

A. HALL

Hubbard, C. R., Barrett, C. S., Predecki, P. K., and Leyden, D. E. (eds.). *Advances in X-ray Analysis*, Volume 26. New York and London (Plenum Press), 1983, xviii + 473 pp., 180 figs. Price \$62.50.

These reports on the annual Denver X-ray Conference form an important series of publications in the X-ray literature.

In 1982 the main thematic topic chosen concerned modern approaches to X-ray powder diffraction, accounting for just over half of the proceedings and for all of the invited talks. This part of the proceedings will inevitably be compared with those of the conference held a few years earlier on *Accuracy in Powder Diffraction* (NBS Special Publication 457). On this topic there were improvements in algorithms and in understanding reported, but in my view, no fundamental discoveries.

The traditional specialist workshops covered several topics. X-ray stress determination formed the second theme of the meeting, with thirteen papers presented, followed by some discussion of fluorescence analysis.

M. HART