tion in the mantle is denigrated on p. 65, only to be accepted again on p. 204. This writing technique may be fun for the author and make the book very stimulating over all, but it is lethal for the hurried lecturer or sloppy student (or vice versa); beware!

R. N. THOMPSON

Mitchell-Thomé (R. C.). *Geology of the Middle Atlantic Islands* (Beiträge zur Regionalen Geologie der Erde, Band 12). Berlin and Stuttgart (Gebrüder Borntraeger), 1976. x+382 pp., 102 figs. Price DM. 198·00.

The area covered by the title—and by the term Macaronesia used in this book—includes the archipelagos of the Azores, Madeira, the Canaries, the tiny archipelago of Selvagens [Salvage Islands] between Tenerife and Madeira, and the Cape Verde Islands further to the south.

Because of their relative isolation, combined with their petrological interest, work on these islands has appeared not only in Portuguese and Spanish literature but even more widely in books and journals published in other European countries. Although several authors have described the geology of individual islands, notably the Finnish geologist Hausen who produced monographs on each of the main islands of the Canaries, the literature is otherwise widely scattered between official survey documents, volcanological records, congress reports, and the scientific periodicals of half-a-dozen countries in almost as many different languages. The author has thus done a great service in collecting together, reviewing, and condensing all the available geological data. In general the references are to around 1973 but there is an addendum bringing these up to mid 1975.

All are volcanic islands, with volcanism still active in the Azores, the Canaries, and Cape Verde Islands. Alkaline rocks predominate, with phonolites, trachybasalts, and trachytes in the Canaries and a tendency to a less alkaline character in the Azores, which have abundant basalts, andesites, and dolerites. The whole range of volcanic morphology is well displayed, including vast areas of ignimbritic material; dyke swarms proliferate in several islands, and plutonic xenoliths are locally abundant. The Spanish word 'caldera' (cauldron) is believed to have first entered the geological vocabulary when von Buch used the term during his visits to the Canaries in the early nineteenth century: the calderas of Las Cañadas on Tenerife and Taburiente on La Palma being particularly well known. The author is at pains to point out that some Mesozoic and Tertiary sedimentary rocks do occur and even contain fossils, but in general it is the volcanic features that dominate the geology and the whole life-style.

There are few geological items of economic importance (building stone, ceramic clays, salt); water is perhaps the most precious resource. One is struck by how little seems to have been done to utilize geothermal energy, although a study has been made of the Montañas de Fuego–Timanfaya area (Lanzarote) where at a few metres depth temperatures of up to 360 °C are encountered over an area of some 200 km^2, the heat focus being apparently a magma chamber at perhaps 4000 m depth (Arana and Fuster, *Estud. Geol.* **29**, 281, 1973).

It is immensely useful to have all available rock analyses for the various igneous complexes of this whole area assembled together in one volume together with notes on petrography and historic volcanicity, but it is equally useful to have the abundance of black-and-white geological maps of each of the main islands. It is clear that there is a lot of detailed mapping still needed and that a host of geological problems exist including plenty for the geochronologist and geophysicist, as well as the mineralogist and petrologist. Speculation on the exact place of these islands within the framework of global tectonics and in the history of the development of the North Atlantic is perhaps premature; indeed, the author entitles his last chapter 'Caetera desunt' (the remainder is wanting). This book reviews and reports but in general refrains from speculation.

R. A. HOWIE

Greenwood (H. J.), editor. *Short Course in Application of Thermodynamics to Petrology and Ore Deposits.* Vancouver (Mineralogical Association of Canada), 1977. xiii+231 pp., 64 figs. Price $7·50.

This is the handbook that accompanied a three-day short course on thermodynamics held before the April 1977 M.A.C. meeting. It follows an earlier M.A.C. short course on Microbeam Techniques, and courses on Sulfides, Feldspars, and Oxides held by the Mineralogical Society of America. The contents are listed in M.A. 77-3958, and they include fifteen chapters written by a total of ten authors. Three main topics are represented. Chapters 13 to 15 deal with the derivation of thermochemical data, errors in thermochemical calculations, and methods of checking the internal consistency of phase equilibrium results. Four chapters (6 and 10 to 12) are concerned mainly with the application of thermodynamic methods to practical problems. The remaining eight chapters are less applied, although many mineral reactions are used to illustrate the principles involved.