

BOOK REVIEWS

Kristjansson (L.), Editor. *Geodynamics of Iceland and the North Atlantic Area*. Dordrecht and Boston (D. Reidel Publishing Co.), 1974. viii+323 pp., 141 figs. Price \$30.00, Dfl. 75.

There is much of interest to petrologists in this volume [M.A. 76-1343], which contains the proceedings of a NATO Advanced Study Institute held in Reykjavik in July 1974. There are papers on many aspects of crustal structure in the North Atlantic region, including the results of magnetic, bathymetric, gravity, seismic, and heat flow studies. About a third of the book is devoted to petrology and geochemistry.

Aumento and Sullivan describe deep drillings into the North Atlantic crust at three sites: on the axis of the Mid-Atlantic ridge at 45° N., on the Bermuda seamount, and on São Miguel Island, Azores, and draw a diagrammatic cross-section of the Mid-Atlantic ridge based on the petrology of the core samples. Keen and Clarke compare the chemistry of Tertiary basalts west of Greenland with those of Iceland and the Reykjanes ridge, and assuming the latter to be a 'hot spot' postulate an analogous former hot spot in the Baffin Bay region. Brooks and Jacobsson review the chemical variation in North Atlantic ridge basalts. The predominant types are FETI (Fe, Ti-rich) and MORB (mid-ocean ridge basalt) tholeiites, with quantitatively insignificant alkali basalts in areas of deep-seated fracturing. An independent origin of the MORB and FETI tholeiites is favoured, rather than differentiation of one to give the other. Sigvaldason and Steinthorsson discuss the origin of Icelandic tholeiites in more detail, and like several of the other authors have chosen to adopt the idea of hot spots and mantle plumes. Two papers by Walker describe the structure of eastern Iceland and eruptive mechanisms in Iceland. Arnorsson discusses the composition of thermal fluids in Iceland, distinguishing between high-temperature areas where water is heated by shallow intrusions, and low-temperature areas where water is heated by hot rocks during deep convection. Temperature, rock composition, and seawater influx are believed to be the main controls of fluid composition, and the high sulphide contents of some hot waters maybe have a juvenile source. A. HALL

Gonser (U.), Editor. *Mössbauer Spectroscopy* (Topics in Applied Physics, vol. 5). Berlin, Heidelberg, and New York (Springer-Verlag), 1975. xviii+241 pp., 95 figs., 1 pl. Price DM 70 (\$30).

This book is intended to provide an introduction to the principles and applications of Mössbauer spectroscopy in solid-state science. In the reviewer's opinion the book achieves this object reasonably well, although the scope of the subject has necessitated the omission of several topics that would have been of mineralogical interest.

The first chapter (by U. Gonser) begins with a description of γ -ray resonance spectroscopy and the significance of Mössbauer's discovery of the recoil-free fraction of emitted γ -rays. It proceeds with a clear discussion of the important Mössbauer parameters, isomer shift, quadrupole splitting, nuclear Zeeman effect, etc., and concludes with a brief description of the techniques of spectral measurement.

The remaining five chapters [M.A. 76-100] are devoted to the application of Mössbauer spectroscopy in the following disciplines:

Chemistry. The dependence of quadrupole splitting and isomer shift on oxidation state, bond type, and molecular symmetry.

Magnetism. The sign of the internal magnetic field. Magnetic structure and magnetic transition studies.