

McBirney has taken the trouble to put these particular lectures down on paper for a wider audience.

C. J. HAWKESWORTH

Shelley, D. *Igneous and Metamorphic Rocks Under The Microscope. Classification, Textures, Microstructures and Mineral Preferred Orientations*. London (Chapman and Hall), 1992. xv + 445 pp. Price £24.95.

This book is about those parts of hard-rock petrology that use the optical microscope as the analytical tool. Features visible only with the scanning or transmission electron microscopes are not included, and chemical petrology is not considered. The author intends that students use the book initially as a basic guide to petrography and then as a route into the research literature, once their interest in textures and rock fabrics has been kindled.

Part One deals with rock nomenclature and the mineralogical and textural characteristics of individual rock types. The IUGS scheme is used as a framework for the igneous rocks, and a similar hierarchical scheme is adopted for metamorphic rocks. Part Two opens with a discussion of the principles of crystallisation and recrystallisation and is followed by treatments of the nature and origin of twinning, zoning, intergrowths, and volcanic, plutonic and metamorphic textures. Part Three discusses the mechanisms by which preferred crystal orientations develop in metamorphic rocks, principally, but also in igneous ones. It includes instruction in how to use the Universal Stage in such studies and how to interpret data patterns in stereograms. The book closes with an extensive combined index and glossary.

Coverage of textures and rock types is comprehensive and amply illustrated with carefully chosen, high quality, black-and-white photomicrographs. The layout is attractive and the writing style flows smoothly.

In my opinion Parts One and Two are out of sequence. It is eccentric that each rock type in Part One has a statement about the textures present and yet the vocabulary of textures is dealt with in Part Two, or has to be accessed via the glossary. Students may well get frustrated by this arrangement. (They are also likely to be frustrated by the absence of glossary entries defining the terms *texture*, *structure*, and *fabric*!)

The 200 pages of Part Two are the meat of the book. The information on textures is comprehensive and commendably up-to-date, for example Bruce Marsh's introduction of crystal size distri-

bution curves is included, as is Bob Hunter's work on cumulate maturation, both of late 1980's vintage. The majority of references are from the last decade which helps to convey that micropetrography is alive and evolving, though it obscures the fact that many features were recognised up to 150 years ago. Students need to be aware of this, so that some, at least, will investigate old descriptions and interpretations. A short section on the history of micropetrography would have helped to make this point. Only 3 pages are allotted in the chapter *Crystals and crystallization* to nucleation, diffusion and crystal growth. Concepts such as interface attachment kinetics, layer spreading versus continuous growth, spiral versus surface nucleation growth, surface free energy, and compositional convection ought to have been included here. Their absence is a missed opportunity to engage students in these important current ideas about crystal growth in geological systems.

Therefore, while my students will find this book in their library, I am in two minds about urging them to purchase a personal copy.

C. H. DONALDSON

Brown, P. E. and Chappell, B. W. (eds.) *The Second Hutton Symposium on the Origin of Granites and Related Rocks*. Edinburgh (Royal Society of Edinburgh), 1992, 507 pp. Price £55.00.

This volume, which also constitutes volume 83 parts 1 and 2 of the *Transactions of the Royal Society of Edinburgh: Earth Sciences*, contains the proceedings of the Hutton symposium held at Canberra in September 1991. It comprises 43 papers (M.A. 93M/3443-3485) and 70 abstracts, with a worldwide authorship representing a fair cross-section of the most active researchers on granites and related rocks. Naturally there is a strong emphasis on geochemical studies, but a few structural papers are also included.

Many of the authors describe particular granite complexes, and interpret their compositional variation in terms of more or less plausible genetic models. The I- and S-classification continues to be popular, particularly among the Australian authors, and the first paper in the volume is a review by Chappell and White of the I- and S-concept as applied to its type area, the Lachlan fold belt. As well as occasional references to A- and M-type granites, a new alphabetic category, C-type, is introduced by Kilpatrick and Ellis to describe those magmas produced by dry melting at very high temperatures which give rise to igneous charnockites. Lower crystal orthopyroxene-