

chapter on petrography could be omitted, and the section on mineral recognition is of little value. The classification scheme adopted in this book (based on texture and mineralogy) is similar to those published elsewhere, although I see no reason for spilites and keratophyres to be in a special category; a similar treatment is not given to other meta-igneous rocks.

More important, perhaps, is the general absence of modern geochemical systematics—particularly isotopes and trace elements—and their application to magma genesis. Sr-isotopes are barely considered, Nd-isotopes are not mentioned, and trace element modelling is treated very scantily indeed.

The development and implications of recent hypotheses and theories concerning evolution of mantle inhomogeneities, models of magma genesis, selective crustal assimilation, and magma chamber processes, are not considered in any depth, although to be fair even a book of such breadth cannot be all things to all men.

A book, therefore, to enjoy for its lucidity but not for its presentation and treatment of modern developments in igneous petrology. Alas, students of petrology must apparently still await that elusive bridging text if, indeed, it can be written.

A. D. SAUNDERS

Gillen, C. *Metamorphic Geology: An introduction to tectonic and metamorphic processes*. London (George Allen and Unwin), 1982. xiv + 144 pp., 69 figs. Price: hardback £12.00, paperback £4.95.

This book is intended to serve as an elementary text on the subject of metamorphism and mountain building for non-specialist students of geology. The emphasis is on processes, and the links between orogeny and metamorphism are explained. Textures and field relations are introduced followed by a discussion of the factors controlling metamorphism. Case studies of areas of metamorphic rocks are presented in the context of modern theories of the Earth's activity. The book is well illustrated with diagrams and should fulfil its intent. A legitimate criticism, however, is that there is a lack of emphasis on the chemistry of the rocks and minerals concerned (and the only formula given for garnet is incorrect).

R.A.H.

Tankard, A. J., Jackson, M. P. A., Eriksson, K. A., Hobday, D. K., Hunter, D. R., and Minter, W. E. L. *Crustal Evolution of Southern Africa: 3.8 Billion Years of Earth History*. New York, Heidelberg, and Berlin (Springer-Verlag), 1982. xv + 523 pp., 182 figs. Price \$55.00 (DM 118.00).

To my mind this is a successful book and one of the best which has yet appeared on the geology of a southern continent. It sets out to trace the history of southernmost Africa; essentially the area covered by the State of South Africa with excursions where geologically necessary into neighbouring countries.

Between them the six authors have the necessary knowledge to follow each of the three main themes which reappear throughout the history of that part of the world. The book opens with descriptions of the Archaean metamorphic complexes and comes back to that subject in a later chapter concerned with the high-grade rocks formed in Proterozoic times. It then traces the long succession of sedimentary basins opening with an account of what they picturesquely call the Golden Proterozoic and taking up in succeeding chapters the history of the earliest Red Beds, the Palaeozoic sediments of the Cape, the Karroo, and the sediments that accompanied and followed the break-up of Gondwanaland. In each of these chapters the description of the sediments is accompanied by an analysis of the conditions under which they formed. These accounts are consistently good throughout the book, from the account of the Transvaal Epeiric Sea to the record of the Karroo deposits with their 80 billion tons of bituminous coal. The book is worth buying simply for these accounts of a unique succession of sedimentary basins. The third ingredient is the igneous activity, largely basaltic, sometimes alkaline, and to a small extent granitic, which from time to time erupted through the fractured South African crust from earliest Precambrian times through the formation of the Bushveld complex, and the intrusions of alkaline rocks including the economically important kimberlites up to the vulcanicity which formed the ocean floors as Southern Africa separated from other southern continents. The book is clearly written, very well planned and well illustrated. In short it is a success, a worthy memorial to du Toit to whom it is dedicated.

JOHN SUTTON

Tahirkheli, R. A. Khan. *Geology of the Himalaya, Karakoram and Hindukush in Pakistan*. Peshawar (National Centre of Excellence in Geology, Univ. of Peshawar), 1982. 51 pp., 20 figs., 23 colour plates, 1 coloured geol. map (~ 1:1 400 000). Price Rs. 150/-.

This publication (produced as a Special Issue: Vol. 15, *Geological Bulletin, University of Peshawar*) concerning the geology of three of the best known mountain chains of the world takes account of the recently discovered Kohistan Island arc [M.A. 80-2570, 81-2085, 82M/4000] which lies between

the Indo-Pakistan and the Eurasian plates. It presents the first attempt at a regional geological mosaic of approximately 165 000 cm² in northern Pakistan which was cradled by the tectonics emerging from this plate collision and which culminated in the Pamir knot, Nanga-Parbat-Haramosh loop and the Hazara-Kashmir syntaxis. The earlier data are reviewed and together with new field observations are synthesized to give a stratigraphic scheme for each geological domain together with twenty geological cross-sections to describe and illustrate the tectonic interpretations.

R.A.H.

Brown, G. C., and Mussett, A. E. *The inaccessible Earth*. London and Boston (Allen and Unwin), 1981. xii+236 pp., 133 figs. Price: hardback £18.00, paperback £9.95.

In this book about the interior of the Earth, the contributions of geophysics and geochemistry are given approximately equal weight. There are chapters on density within the Earth, the formation of the solar system and the abundances of the elements, the accretion and chemical layering of terrestrial planets, the Earth's core, and the mantle and oceanic crust, and the continental crust and its evolution. Thus although there might be thought to be an overlap with *Inside the Earth: evidence from earthquakes* by B. A. Bolt (following review), in fact this book has only one chapter directly concerned with the contribution of seismology and is much more directed to a cosmological and geochemical approach leading to a discussion on the nature of the mantle and on the composition of the crust, its behaviour, and its evolution. The intended readership is generalist rather than specialist, but the text succeeds in amalgamating recent evidence not only from geophysics and geochemistry but also from parts of astronomy and meteoritics. This breadth of input makes it very useful for undergraduate use. In addition to over 200 references at the end of the book, suggestions for further reading are given at the end of each chapter and short notes are appended on such topics as seismic velocity-depth profiles, Rb/Sr dating and ⁸⁷Sr/⁸⁶Sr initial ratios,

mean atomic weight, and heat flow. The book is nicely produced and illustrated and sensibly priced.

R.A.H.

Bolt, B. A. *Inside the Earth: Evidence from Earthquakes*. Oxford and San Francisco (W. H. Freeman & Co., Ltd.), 1982. xvi+191 pp., 77 figs. Price: board £16.90, paper £7.70.

This useful text gives an introduction to seismology with the aid of numerous simple diagrams and a text free of mathematics (some elementary and commonly used mathematics is given in panels). Each chapter is enlivened with a photograph of people famous in the earthquake field: Oldham, Jeffreys, Gutenberg, Bullen, Lehmann, Benioff, Birch, and Byerly. There are exercises (and answers) and a guide to further reading. The text aims to give a clear explanation of a central part of geophysics to undergraduates, and in this it should succeed.

R.A.H.

Haynes, R. M., ed. *Environmental Science Methods*. London and New York (Chapman and Hall), 1982. x+104 pp., 201 figs. Price £9.95.

This text for first year students includes sections dealing with particle size analysis, the petrological microscope, and geological maps. It also ranges over mathematics, statistics, computing, remote sensing, and surveying.

R.A.H.

Tennissen, A. C. *Colourful Mineral Identifier*. Poole (Blandford Press) and New York (Sterling Publishing Co. Inc.), 1982. 224 pp., 6 figs., 117 colour plates. Price £3.95.

This genuinely pocket-sized (4 × 5½ ins.) book is based on a translation of a German text and uses the same colour photographs by W. Lieber. It gives basic notes on properties and occurrences; most of the photographs show the specimens enlarged—generally ×2 to ×10—but one of a rare orange analcite is shown ×40. Most of the photographs are reasonably faithful representations.

R.A.H.