author describes as essays on minerals in history, national mineral policy, environment, mineral economics, energy, exploration, mineral production technology and crystal gazing. I am not sure that Addison or Steele would recognize the essay form but this part of the book is biased, riveting, misleading, provocative, and enlightening in turn. In the first essay the author sets the historical scene, but in its simplicity serves mainly to remind me of *1066 and All That*, but it does put the importance of geological raw materials into very sharp focus. The following chapters continue the examination of the economics and politics of mineral exploitation. The environment is dealt with in a most forthright manner, pointing out the obscenity of environmental controls in one country which rely on raw materials being produced in another. This part of the book should be read by all geology students, too many of whom have little idea of the importance of geology to global affairs, but they should not believe everything they read. These chapters certainly set out the principles of free (but fair) enterprise, north American style.

The second half of the book (178 pages) reviews briefly the most important mineral commodities. For a change, reasonable justice is done to the non-metallic minerals. Table 4 shows that on a worldwide production scale, ten of the top twelve products are non-metallic. Only iron and manganese (3rd and 10th) are in this list. Each section deals with one commodity (e.g. aluminium or clay) and gives various properties and characteristics, the history of production, occurrence, economics, production methods, and outlook. Each section has a very poorly drawn graph showing the world and US production. There is much of use and interest in this section of the book.

This book is a good read for anybody interested in the minerals industry. Students of geology should read it to discover the depth of involvement of their subject in world affairs, teachers of applied geology should read it to broaden their outlook, and applied geologists should read it; they will love it or have apoplexy.

A. C. DUNHAM

Atkinson, R. L. *Tin and Tin Mining.* Princes Risborough (Shire Publications Ltd.). 32 pp., 46 figs. Price £1·25.

This booklet (No. 139 in the Shire Album series) gives a popular illustrated account of tin mining, mainly in relation to the Cornish industry. Many fascinating photographs taken in the late-nineteenth century are reproduced and illustrate the methods of working then employed and show the use of such devices as a kibble and the 'man-engine'.

R. A. HOWIE

Middlemost, Eric A. K. *Magmas and Magmatic Rocks: an introduction to igneous petrology.* London and New York (Longman), 1985. ix + 266 pp., 35 figs., 22 plates. Price £13·95 (paper).

The rapid and continuing geological developments of the past several years mean that there is an equally continuing need for up-to-date textbooks at a price that students can afford. This book represents an attempt to provide a comprehensive text that fills this gap for igneous petrology. The first four chapters provide a review of principles and processes. Chapter 1 (a fifty-page megachapter!) takes a rapid sprint through the historical background; the internal structure of the earth; the nature of magmas—their generation, movement, and storage; emplacement and eruption mechanisms; field relations; radiogenic and stable isotopes; mantle composition and geochemistry (amongst other topics). The remaining chapters are considerably shorter—between six and twenty pages each. Chapters 2 to 4 cover magmatic differentiation, the classification of igneous rocks and their abundance and distribution. Chapters 5 to 14 deal with a variety of different rock groups in more detail, whilst the final chapter attempts to set terrestrial igneous activity within a planetary context.

Given the breadth of the subject addressed by this book it would be easy to tabulate examples where the author has failed to do justice to, or include, a reader's pet subject, the textures and fabrics of igneous rocks being a notable omission in this reviewers opinion. A far more serious drawback, however, is that the attempt to cram coverage of such a large number of topics into only 260 pages means that the author has failed to do justice to almost any of them. The book reads as though the overriding aim throughout its construction was to keep it short and hence low in price. The net result is a highly condensed and poorly illustrated text with little in the way of explanatory diagrams or discussion to assist a student reader.

The paucity of diagrams is serious as it aggravates the problems posed by the compact text. Some topics such as phase diagrams (three diagrams only in the book), experimental petrology and petrogenesis (one diagram), or isotopes and trace element geochemistry (no diagrams), are rendered nearly incomprehensible by this approach. That the author considers geochemistry important is shown by the inclusion in most chapters of tables of average or representative

analyses of the rock types discussed. Both these and the text contain detailed lists of trace element abundances and ratios but their significance is difficult to grasp when packaged in this manner. The early chapters give no assistance in interpretation to the reader at this point as the principles of trace element and isotope geochemistry are disposed of in chapter 1 in four pages, packed with symbols and numbers and totally devoid of illustrations. Similar examples could be adduced for most topics. Not only does the book contain no locality maps, but the last eleven chapters contain only seven diagrams in all—two of which are merely expanded tables. The only adequately illustrated chapter is the one dealing with classification (one of the author's pet subjects).

These deficiencies are only slightly compensated for by the inclusion of twenty-two colour plates, ten dealing with aspects of field relations and the tectonic setting of igneous activity, and twelve photomicrographs reproduced from the *Atlas of Igneous Rocks and their Textures* by Mackenzie *et al.* (also published by Longman). Their main contribution to the book, however, is to provide the reader with a sorely needed colourful interlude to the rather indigestible text. I would have preferred to see a larger number of carefully described black and white diagrams included at appropriate points in the text than photographs of volcanic eruptions from which much detail has been lost as a result of the small scale of the reproduction.

Despite these drawbacks the book is likely to prove popular. The concise chapters on specific rock groups, together with the extensive reference list, will be perceived by many readers as providing a much needed precis of a voluminous literature. Whilst it would not be my first, or even second, choice textbook to recommend to students, no other available text competes with it in terms of price and inevitably they will vote with their cheque books. In this they will unfortunately be encouraged by the publishers somewhat misleading advertising (lavishly illustrated . . . provides a step-by-step guide).

M. A. MORRISON

Thorpe, R. S., and Brown, G. C. *The Field Description of Igneous Rocks.* Milton Keynes (Open University Press) and New York (Halsted Press), 1985. vi + 154 pp., 107 figs., 16 maps. Price £6·50.

This latest in the Geological Society of London Handbook Series offers an intensely practical guide to the study and description of all types of igneous rocks in the field. It is written to complement textbooks on igneous petrology and deals with observations ranging from the scale of hand specimens and outcrops to regional mapping of field relationships. It is copiously illustrated with diagrams, photographs, and maps; its genuine 'handbook' size (18 × 11.5 cm), flexible cover, and realistic price should make it an affordable part of field equipment for all geology students.

R. A. HOWIE