Stanton (R. E.). *Analytical Methods for use in Geochemical Exploration.* London (Edward Arnold), 1976. v+55 pp., 1 fig. Price £2·20.

This book presents details of a large number of analytical procedures, covering most of the elements likely to interest the exploration geochemist. Colorimetric, Atomic Absorption, and to a much lesser extent XRF. and Emission Spectrographic methods are described, the work being a sequel to the author's previous book, giving only colorimetric methods (M.A. 18–153). The great merit of the book is that specific details of the methods are provided, and this should prove of great value to exploration geochemists. In particular a chapter on cold-extraction methods for some of the more commonly studied elements, e.g. As, Cu, Pb, Zn, and Ni will be most welcome. The four pages devoted to XRF and the six pages on Emission Spectrography are somewhat abbreviated, and the section on statistics is so truncated that a reference to a standard text would be preferable. These criticisms aside, the book will undoubtedly be most useful, although the price, £2·20 for only 55 pages, is quite excessive.

J. N. WALSH

Condie (K. C.). *Plate Tectonics and Crustal Evolution.* New York, Toronto, Oxford, Sydney, Braunschweig, Paris (Pergamon Press), 1976. x+288 pp., 150 figs. Price £11·25.

The author of *Plate Tectonics and Crustal Evolution* is a well-known petrologist and geochemist who has now written a book based on a course that he teaches. The course and the volume attempt to combine in a descriptive format the geophysics and geochemistry of plate tectonics and to give them a historical–geological perspective. The volume succeeds very well. The first four chapters discuss the evidence for the structure and behaviour of the earth as a whole and for its crust and mantle. The writing is fairly simple but the concepts are sophisticated and it is assumed that the reader is familiar with the basis of petrology and physical geology, while a working knowledge of elementary physics and chemistry is also expected. The ideas and hypotheses throughout these chapters are supported by numerical data, and suggestions for further reading at the end of each chapter point towards particularly informative references. The latter are quite apart from a comprehensive list at the end of the book.

Chapters 5 and 6 describe the gross structure of major continental provinces and oceanic domains. These chapters are informative, but not surprisingly much of the evidence is directed at the Atlantic and Eastern Pacific realms. The short chapter 7 deals with magmatic associations of different crustal provinces from a geochemical standpoint; it is very well done. Next comes the discussion of the dynamic behaviour of plates in geological time. The discussion is worth while but suffers from a somewhat inadequate exploration of tectonics. At the level of this volume it would not have been remiss to include such features as variations of strain, the state of stress in the crust and the actual, rather than cartoon, sections through orogenic belts.

Chapter 10 is concerned with the origin and growth of the crust from the earliest geological time. The treatment is basically geochemical and is a subject of the author's particular interests. In my view its implications should be familiar to every honours student on either side of the Atlantic Ocean.

The work as a whole is written in a textbook style and therefore there is little but the arrangement and the discussion that can be especially attributed to the author. Nowhere in its almost

three hundred pages can one find a punch-line. Yet, the text is so simply and attractively written that, I am sure, students will find it good to read. The major disadvantage lies in the derivative quality of illustrations and their totally diagrammatic flavour. Furthermore, the figures are grouped at the end of each chapter and therefore one has to refer backwards and forwards too frequently and the index is totally inadequate.

The last shortcoming to be noted is that geographical locations are often not indicated on any maps. Knowing the geographical limitations of a majority of North American students, and for that matter their professors as well, a greater care should be taken with specific locations and location-derived geological names. I assume that the map in the pocket of the volume is supposed to serve this purpose, but it has too few details and is coloured in such violent shades that its use can only be recommended to the colour blind, or distant students wearing polaroid glasses.

Despite these disadvantages, which compound its relatively high price, I have no hesitation in recommending it to senior undergraduates or even beginning graduates and I shall certainly adopt it for a small specialist course in Geodynamics that I offer at the university where I teach.

N. RAST

Nicolas (A.) and Poirier (J. P.). *Crystalline Plasticity and Solid State Flow in Metamorphic Rocks.* London and New York (John Wiley & Sons), 1976. xviii+444 pp., 246 figs., 27 pls. Price £20·00.

A volume in the series 'Selected topics in Geological Sciences' edited by Professor M. H. P. Bott, which intends to cover topics within which there have been recent advances in knowledge. The series is aimed at teachers, undergraduates, postgraduates, and professional Earth scientists.

This particular volume attempts to give the full background of physical metallurgy that is necessary to describe and interpret the shape and lattice fabrics, and textures of strained rocks. It uses work by the authors and others on fabrics, textures, and megascopic structures in peridotites to illustrate the application of the 'physical metallurgy approach' to geological problems. Using the conclusions gained from this application, the authors finally discuss the probability of upper-mantle flow by diffusion controlled dislocation creep and comment on more general problems of the interpretation of structures in metamorphic rocks.

The book constitutes a very useful addition to the geological literature inasmuch as it discusses in depth many of the principles and practices of physical metallurgy, which are of undoubted significance to the geologist. It provides further a stimulating, if controversial, example of the application of these to interpretation of the behaviour of various Alpine and other peridotite massifs and through these the mantle. It is, however, written at too high a level to be readily understood by the average undergraduate, even many postgraduates, and will thus be a main text for only specialized postgraduates and researchers in certain fields of structural geology, metamorphic petrology, tectonics, and geophysics. It is a book that should, however, be on the shelves of libraries wherever geological research is undertaken. It is, to my knowledge, the only book that presents so fully the world of physical metallurgy to the geologist.

D. POWELL