

The Encyclopedia of World Regional Geology. Part 1: Western Hemisphere (Including Antarctica and Australia). (Encyclopedia of Earth Sciences, Vol. 8.) Edited by Rhodes W. Fairbridge. Pp. xv+704. (Dowden, Hutchinson and Ross: Stroudsburg, Pennsylvania; Wiley: New York and London; 1975.) \$44.40; £22.30.

THIS is an unusual and successful book written by some 90 authors. Most contribute one or two articles, although the Editor weighs in with a valiant 60 ranging from Antarctica to the Windward Islands. Oceanic islands are done particularly well throughout. It is a true encyclopedia covering the out of the way as effectively as the well known in contributions extending from a column or two on an atoll, to 140 pages on the US. Long contributions are subdivided so any district can be readily picked out, and regional reviews link accounts of individual countries. Ocean floors are not covered: the book sticks to dry land. It will provide basic answers to almost any enquiry requiring knowledge of the geology of a part of the Western Hemisphere. Professor Fairbridge and his colleagues have done a first class job. I look forward to the promised companion volume on the Eastern Hemisphere. **J. Sutton**

Twentieth Century Physics. By Joseph Norwood. Pp. ix+405. (Prentice-Hall: Englewood Cliffs, New Jersey, 1975.) \$16.95.

IN this useful book an attempt is made to present in outline our present understanding of the interactions involving matter. The topics covered are special and general relativity, old quantum theory, wave mechanics and atomic, nuclear and particle physics. On the whole the attempt is successful: the author has striven hard to present arguments which are as simple as possible while at the same time powerful enough to enable results to be derived (or, sometimes, made plausible) rather than merely stated. There is a set of problems at the end of each chapter and this is a particularly valuable feature of the book. Unfortunately, the whole is marred by frequent inaccuracies and an informality of style that sometimes degenerates into sloppiness. For example, Kepler's Laws are wrongly stated, geodesics in space and space-time are confused, it is asserted that terms in $1/C^2$ are small because their value is 10^{-17} (no units being introduced), and so on. In spite of these shortcomings the book will be useful as an auxiliary text for physics undergraduates. **Michael Berry**

Radio and Microwave Spectroscopy. By David J. E. Ingram. Pp. 167. (Butterworth: London and Boston, December 1975.) £4.50.

THIS is very much a book intended for undergraduates in physics or chemistry and must be judged accordingly. This is not easy for someone who knows more about the topics covered—gas microwave rotational spectroscopy, electron resonance and nuclear magnetic resonance. Certainly the language is straightforward, no previous knowledge is expected and the level is appropriate with a text comparatively free of mathematics. The examples are largely taken from Dr Ingram's earlier book, *Spectroscopy at Radio and Microwave Frequencies* (1955), and the diagrams do not give a fair view of modern sophi-

Books brief

stication and one (3.1c) is such a poor photographic reproduction of an oscilloscope screen that it should never have been passed at the galley proof stage. And certainly in 1976 one can no longer maintain, (p109), that for proton chemical shift references "The two protons most commonly used for this purpose are the protons in water . . . and the protons in benzene . . ."; tetramethylsilane is not mentioned. In places, ideas are simplified to a point where explaining more correct views as students advance may be difficult. Thus, zero field parameters in triplet states are referred to as "effective" and then allowed to depend on the direction of the zero amplitude magnetic field (p151). This short book is more appropriate for a weak student in a hurry to get an overview than for more able students. It is also an example of how difficult it is to write a really good elementary text. **D. H. Whiffen**

Graph Theory: An Algorithmic Approach. (Computer Science and Applied Mathematics: A Series of Monographs and Textbooks.) By Nicos Christofides. Pp. xv+400. (Academic: New York and London, October 1975.) £12.50; \$31.00.

THIS book presents a comprehensive and up-to-date account of algorithmic development, which has been going on quietly for over 20 years. The problems of optimisation associated

with graphs are well known, and the lack of mathematical progress in solving them is universally appreciated. What has happened, with the advent of the computer, is the development of some quite powerful and numerically effective methods for solving some of these problems. This book expounds, in a clear style and with ample illustration, the detailed steps of the most important algorithms known at present. The first four chapters are concerned with the theory of graphs, and with the introduction of ideas important in the numerical study of graphs. The chief topics treated are reachability, connectivity, colouring and set covering. There are chapters on the location of centres and medians, on trees, and on shortest paths. Chapters nine and ten are concerned respectively with Eulerian and Hamiltonian circuits, and there is a detailed discussion of some of the classical problems of operational research mathematics, relating to scheduling and the travelling salesman. Chapter eleven deals with flow in networks and the last chapter deals with matchings, transportation and assignment.

No practitioner (whether of operational research or of the social sciences generally) concerned with numerical studies can afford to neglect this book. **L. S. Goddard**

Chromatographic Analysis of the Environment. Edited by Robert L. Grob. Pp. x+734. (Dekker: New York, 1975.) \$49.50.

CHROMATOGRAPHY is undoubtedly a prime method for the analysis of trace components in the environment, and a good book on the subject would be welcomed. The present multi-authored work starts with an introduction to theory and practice, and follows with 18 chapters covering most of the possible permutations of air, earth, water and waste with gas, liquid, paper, thin layer and ion exchange chromatography. One or two of the chapters are very good but too many are narrowly based and simply catalogue methods—many of them rather old. There is a monumental author index of 38 pages and a very poor subject index, which is the reverse of what is required in a book of this kind. This book fails to give the kind of overall picture of environmental analysis required at this stage in the subject and will mainly be useful to those already expert who wish to have comprehensive reference lists before undertaking development of new methods.

John H. Knox