HATCH (F. H.), WELLS (A. K.), and WELLS (M. K.). *Petrology of the igneous rocks* (Textbook of Petrology, volume one): 13th edn. London (Thomas Murby & Co. George Allen & Unwin), 1973. 551 pp., 156 figs. Price £7·40 (hardback), £4·70 (paper).

Since the last edition of this standard textbook in 1961, fundamental advances have been made in understanding the nature of the major structural features of the Earth's crust. The significance of these concepts for petrology is recognized by the inclusion of a new chapter on the geological setting of igneous activity. Changes in ideas on the nature and origin of magmas are reflected in the discussions on the origins of andesites and trachytes and in the rewritten chapter dealing with the distribution and origin of basalts. The numerous excellent petrographic drawings and their detailed legends, which generations of students have come to know, are retained; the scheme of rock-classification used has, however, been slightly modified, particularly in regard to the quartz-bearing rocks, to make it compatible with the proposals made by a Commission of the International Union of Geological Sciences, following Streckeisen. These changes occur in the sections of the book dealing with modes of occurrence of igneous rocks and with their petrography and significance: the other two sections, the one dealing with the igneous rock-forming minerals and the unique chapters describing the igneous activity in the British Isles, remain essentially the same—perhaps they could be referred to as being unaltered, rather than fresh. This new edition of the authors' well-established text will be welcomed by all students and teachers of petrography; its availability in paper-back form will help to temper the inevitable rise in cost.

R. A. HOWIE

TANK (R. W.), Editor. *Focus on environmental geology; a collection of case histories and readings from original sources.* London and New York (Oxford Univ. Press), 1973. xii+474 pp., 119 figs., 3 pls. Price (soft-back) £2·25.

The specialized mineralogical interest of this book is limited; but it is nevertheless of paramount importance to all workers in geological fields. It selects, from papers ranging from 1928 onwards, a series of case histories where geological phenomena have directly affected human life. As propaganda for the science it is invaluable; but it is much more than that, since it brings between two covers detailed descriptions of most of the significant geological disasters of the last four decades. The section on Volcanism first describes three volcanic areas in detail—Parícutin, Taal, and the Cascade Range—followed by one practical paper on the diversion of lava flows. Earthquake activity is described from San Andreas and Alaska, and there follow logically contributions on Earthquake Prediction and Control. Tectonic creep is illustrated from California and Venice; gravitational mass movement from Wyoming and Italy. A contribution on Quick Clays points out the environmental hazards that may result from changes in clay mineralogy.

A second section deals with Mineral Resources, and the economic mineralogist will find much of interest here. It was perhaps unwise, in this rapidly changing field, to reprint a 1965 paper on World Offshore Petroleum Resources, although many of its conclusions are still valid. This section also deals with the impact of mineral exploration on the environment.

A third section, on Urban Geology, is mostly concerned with groundwater and pollution, mostly from North American examples.

This highly successful combination of science, economics, and politics ought to be read by all students; and especially by those who ever doubt their potential usefulness to society. J. E. PRENTICE

HOEFS (J.). *Stable isotope geochemistry* (Minerals Rocks and Inorganic Materials: Monograph Series of Theoretical and Experimental Studies: Vol. 9). Berlin, Heidelberg, and New York (Springer-Verlag), 1973. ix+140 pp., 37 figs., 11 tables. Price DM 39·00 ($17·60).

The book is divided into three main sections; A—Theoretical and Instrumental Background, B—Fractionation Mechanisms of Selected Elements, and C (more than half the text)—Variations of Stable Isotope Ratios in Nature. It may well be a successful book, not only because it is the only general introduction to stable isotope geochemistry available, but because the coverage of the subject is very complete and the layout and figures are neat and clear.

Nevertheless it is fair to state that it has shortcomings, especially in the first two sections. There is no adequate theoretical treatment of equilibrium isotope fractionation and its temperature dependence, which is the foundation of the whole subject. Although this would have necessitated introducing some statistical mechanics I think that students (for whom the book was intended) would find a more rigorous discussion more satisfactory and perhaps easier to understand. Similarly the description of the mass spectrometry essential to acquisition of the raw data of stable isotope geochemistry is skimpy. For example, during the description of an ion source it is stated that (page 13) 'The ribbon-shaped electron beam that ionizes the gas sample when it is leaked into the source is usually twisted by a coaxial magnetic field to increase the efficiency of ionization', which is certainly not correct. It is true that in the Nier-type ion source individual electrons in the beam will follow spiral paths if (as is usual) the electron beam and the source magnetic field are not parallel. Any increase in the path length the electrons travel through the gas will increase the ionization efficiency, but the primary function of the source magnet is simply to collimate the electron beam (as noted on page 12). No proper account of the errors in mass spectrometry or the way they enter the errors quoted with delta-values is given. Thus no explanation is offered for the fact that the error associated with a typical H/D ratio measurement is about an order of magnitude larger than that associated with a typical $^{16}O/^{18}O$ ratio measurement. It is tempting to compare this book with *Potassium-argon dating*