

are parallel to the cleavage. On p. 27 lazurite is a feldspathoid, on p. 26 it is not. The statement that chrysoberyl has $2V=45^\circ$ is misleading because its optic axial angle is very variable. Garnierite, saponite, sepiolite, and "attapulgit" are not serpentines. There are a few definite spelling errors, such as "ashkroftine" (p. 6), "corundophyllite", "saphirine", "xantophyllite", "rumplite" (p. 9), and "kuntzite". Other spellings strike an English-speaker as strange, such as the acute accent in pricéite and wadéite. If å is used in låvenite (p. 8), why not in åkermanite?; the *umlaut* is used haphazardly in kämmererite (cf. pp. 8, 18), as is the å in låvenite (p. 32).

G. H. F.

ABELSON (PHILIP HAUGE), Editor. *Researches in Geochemistry*. New York (Wiley), 1959, x+511 pp., 73 tables; 3 pl., 127 text-figs. (1 folded insert). Price 88s.

This volume consists of the following 23 self-contained essays, based upon seminars held during 1957-8 at the Geophysical Laboratory in Washington, and at Johns Hopkins University:

Sedimentation on the ocean floor (G. O. S. Arrhenius, 24 pp.); Rates of geochemical reactions at low temperatures and pressures (R. M. Garrels, 13 pp.); Geochemical indicators of marine and freshwater sediments (M. L. Keith and E. T. Degens, 24 pp.); Geochemical prospecting (H. E. Hawkes, 17 pp.); Geochemistry of organic substances (P. H. Abelson, 25 pp.); Some chemical aspects of petroleum genesis (W. E. Hanson, 14 pp.); Mineral assemblages of the Green River formation (C. Milton and H. P. Eugster, 33 pp.); Tritium in hydrology and meteorology (W. F. Libby, 18 pp.); Measurement and use of natural radiocarbon (H. de Vries, 21 pp.); Geochronology (G. R. Tilton and G. L. Davis, 27 pp.); The variations of the O^{18}/O^{16} ratio in Nature and some geologic implications (S. Epstein, 24 pp.); Isotopic fractionation of sulfur in geochemical processes (W. U. Ault, 19 pp.); The use of equilibrium calculations in finding the composition of a magmatic gas phase (K. B. Krauskopf, 19 pp.); The chemical environment of ore deposition and the problem of low-temperature ore transport (P. B. Barton, 22 pp.); Sulfide systems as geological thermometers (G. Kullerud, 35 pp.); Some aspects of the geochemistry of carbonates (J. R. Goldsmith, 23 pp.); Diffraction effects of short-range ordering in layered sequences (F. Chayes, 18 pp.); Hydrothermal investigations of amphiboles (F. R. Boyd, 20 pp.); Reduction and oxidation in metamorphism (H. P. Eugster, 30 pp.); Local equilibrium in metasomatic processes (J. B. Thompson, 31 pp.); Activation analysis applied to geochemical problems

(G. W. Reed, 18 pp.); Chondrites and the chemical composition of the earth (G. J. F. MacDonald, 19 pp.); Equations of state and polymorphism at high pressures (S. P. Clark, 17 pp.).

The contents testify to the breadth of modern geochemical topics treated (although the Editor in his Preface stresses the limited choice imposed by considerations of space), while the list of contributors assures that each is dealt with authoritatively. The style and treatment naturally vary from essay to essay, but most are successful in presenting living pictures of their particular facets of geochemistry: the book is clearly the work of active researchers, and is unusually stimulating in drawing attention to fruitful further lines of inquiry. There are contributions to interest every geologist; tastes differ, but the reviewer found among the most fascinating: Arrhenius on sedimentation; Milton and Eugster on the bizarre mineralogy of the Green River formation; Libby on tritium; and Epstein and Ault on the isotopes of oxygen and sulphur respectively.

Emphasis is naturally on recent American work and occasionally the content of an essay may seem a little narrow in relation to its title (e.g. Reed on activation analysis); nevertheless each contribution finishes with a fairly comprehensive bibliography. The book is well printed and produced, with clear illustrations, but the omission of an index is regrettable. It is to be hoped that the present volume may turn out to be but the first of a series: there is room for such a compilation every few years, and it need not seriously overlap the Pergamon Press "Physics and Chemistry of the Earth" series. E. A. VINCENT