

input) and  $N$  sets of two data cards containing the chemical analysis for each rock. The output consists of weight percentages, equivalent molecular weights, cation proportions, cation percentages, and the norm of the rock.

Another programme for molecular norm calculation is in existence (Vitaliano *et al.*, 1965). However, since it was written for a first-generation, somewhat outdated, computer (the IBM 650) it is felt that there was a need for a more modern programme.

A listing or source deck or both may be obtained from the authors.

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#### *References*

- BARTH (T. F. W.), 1962. *Theoretical Petrology*. New York (Wiley).  
VITALIANO (C. J.), HARVEY (R. D.), and CLEVELAND (J. H.), 1965. *Amer. Min.*,  
vol. 50, p. 495.

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## BOOK REVIEWS

BAYLY (BRIAN). *Introduction to petrology*. New Jersey (Prentice-Hall),  
xix+371 pp., 1968. Price 93s.

Occasionally a textbook appears on petrology that represents a deviation from established pedagogic methods. This is one of them. The book is divided into five main parts dealing with crustal processes, igneous, sedimentary, and metamorphic rocks, and a large appendix. As the author notes in the preface, those already familiar with elementary petrology, mineralogy, physics, and chemistry will gain most from the book. This is certainly true and students with no knowledge of geology and/or physical science would probably find the book hard going since there is no attempt to supply the usual digest of factual material to be memorized. The discussions rely, and rightly so, upon the application of experimental data to petrology and one fault of the book as an introductory text is insufficient mineralogy and a lack of actual field examples, the latter admitted by the author. Readers already familiar with the hardware of petrology will be stimulated by this type of approach: beginners bewildered. There is no formal treatment of rock-forming

minerals except at the back of the book in the form of a very short appendix. Hence a reader is led through chapters dealing with heat and pressure in the crust, energy, magma (granite and basalt), magmatic rocks (form and texture), and classification (based upon Nockolds, 1954) to p. 51 without having been told what the common rock constituents are (except for quartz and coesite on p. 20). The relationships that exist in igneous rock series and between magma and tectonic setting are not sufficiently stressed. There are also interesting omissions in terminology: 'tholeiite', for example, is never used although it is involved by implication (pp. 94–98). Chapter 11 on the physics of magmatic processes deals, among other things, with the cooling of intrusions and includes an intriguing and not too serious discussion of the size of volcanic vents in relation to the weight, size, and travel distance of their pyroclasts. The appendices (pp. 311–351) contain data tables on the elements, densities of some common minerals, silicate mineral series, igneous rock classification (based upon Streckeisen, 1965), calculation of CIPW norms (with worked examples), peritectic relations and discontinuous reaction series, triangular diagrams (how they are constructed and utilized). Many of these topics could have been better incorporated into the text, particularly the mineralogical information in an expanded form.

The section devoted to sedimentary rocks adopts the same approach. A minimum of space is taken up with classification and the accent placed upon chemical (solubility,  $pH$ ,  $Eh$ , etc.) and physical (suspension, turbulence, etc.) processes in sedimentary rock genesis. Ternary and quaternary diagrams are used to illustrate various aspects of the compositions of sediments. Metamorphic rocks also receive a physical-chemical treatment and the reader must still refer to the appropriate appendix for mineralogical information.

The illustrations are good but sometimes rather small due to overcrowding of some text figures. The drawing of pillow-lava on p. 39, for example, is difficult to interpret and appears to have the wrong scale attached to it.

Despite its title this book may appeal more to advanced students and teachers of petrology than to beginners since it presents the subject in a way that only the former group can fully appreciate and understand. Errors are largely ones of omission, which must be inevitable in a book of 371 pages that attempts to cover igneous, sedimentary, and metamorphic petrology.

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