

ments mistaken, or are both sides wrong in believing this to be any sort of evidence at all? Other questions that receive a thorough, but not always explicit, airing include the problem of how far explanations should be uniformitarian, in the broadest sense, how much weight should be placed on admittedly incomplete experimental information, and how widely an investigation should range beyond the specific object of its study (e.g. in investigating the sediments in which spilites are enclosed).

Such questions are fundamental to many branches of earth science, and, in particular, to any eventual real understanding of spilites, but they are not answered, and often not asked, here. To say, as several of the authors do, that there are spilites and spilites, is a tactful gesture of compromise, but is not necessarily good science, especially when the evidence and the arguments are as controversial as they are.

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SØRENSEN, H., editor. *The alkaline rocks*. London and New York (Wiley-Interscience), xii+622 pp., 137 figs., 1 pl., 31 geol. sketch-maps, 1974. Price £20.00 (\$34.95).

'The alkaline rocks constitute a group that is difficult to mark off sharply from their more abundant sub-alkaline relatives.' This quotation from Bowen appears on the title-page to the Introduction and indicates the dilemma that Professor Sørensen must have faced when he planned this book. The editor, after discussing the various ways in which petrologists have used the term alkaline rocks, has adopted Shand's definition that an alkaline rock is one in which the ratio of alkalis to alumina to silica exceed that of 1:1:6, either alumina or silica being deficient. Although many other workers have used this criterion to define alkaline rocks one can look in vain in Shand's *Eruptive Rocks* for use of the term 'alkaline rock'. Shand undoubtedly recognized that the term alkaline rocks was too wide to be used in his system of nomenclature and thus in his later writings he preferred to classify rocks firstly on the basis of their silica saturation and secondly on the basis of the ratio of alumina to alkalis or alkalis plus CaO. The sub-division of rocks into peraluminous, metaluminous, subaluminous, and peralkaline was introduced by Shand and this aspect of his classification has been fairly widely adopted. Sørensen prefers the division into agpaitic and miaskitic with intermediate types in which  $\text{Na} + \text{K} \approx \text{Al}$  and this usage has perhaps been more common in continental Europe.

The subject-matter has been divided into a number of sections including Petrography and petrology; Regional distribution and tectonic relations; Alkaline provinces; Conditions of formation; Petrogenesis. Although there are thirty-two authors' names and forty-one chapters, the editor has been fairly successful in delineating the coverage of the various topics by this large number of individuals. However, like the rocks themselves, the attempt to compartmentalize the treatment of them results in considerable overlap between sections. Thus the section on 'Regional distribution and tectonic relations' cannot be sharply divided from the section on 'Alkaline provinces' and similarly the section on 'Conditions of formation' incorporates much which could have appeared in the following section on 'Petrogenesis'. The section on

petrogenesis is interesting in that most of the major theories for the formation of nepheline-bearing rocks have been written by experts in each particular field. The following processes are discussed: melting within the mantle, melting in the deep crust, fractional crystallization, limestone assimilation, role of volatiles, liquid fractionation, resorption of silicates, and metasomatic processes. Not one of these chapters, however, mentions the potassium-rich rocks, and it is fortunate that the chapter on potassium-rich alkaline rocks in the section on petrography and petrology does treat their origin although of necessity the treatment is brief.

The editor has been very successful in obtaining contributions from Russian authors and thus making available, to petrologists who cannot read Russian, information not readily accessible to them.

There is an index of rock names, a subject index, a geographical index, and an author index. In addition there is a glossary of rock names of 'alkaline and related rocks'. Unfortunately the references are to be found at the end of each chapter instead of a complete list of references at the end of the book. This reviewer believes that if all the references are put together at the end of the book they are easier to locate. In addition, to find a particular reference may sometimes require looking through a dozen or more lists of references instead of one list.

This book covers too much to be considered suitable to recommend to an undergraduate although the keen student may wish to read many of the chapters; the price has ensured that the only way a student will be able to obtain it will be as a present from an indulgent relative because it seems doubtful whether he will be able to borrow it from one of his teachers. It seems a pity that publishers are unable to judge the potential sales of a book of this high quality which should be bought by every geology department library.

W. S. MACKENZIE

TENNISSEN (A. C.). *Nature of Earth materials*. London and Englewood Cliffs, New Jersey (Prentice-Hall), viii+439 pp., 332 figs., 1974. Price £6.25.

This is a very simple introductory survey of mineralogy and petrography (hand-lens only) with 65 pp. on the uses of some metals, minerals, and rocks. The first 95 pp. cover chemical bonding, morphological crystallography, physical properties (except optics), and mineral classification. Standardized 18-line descriptions of 114 minerals follow. Each of these is accompanied by a half-tone illustration, but these are of uneven quality and are mostly of little help in recognition. Chapters 4, 5, and 6 discuss the nature of igneous (53 pp.), sedimentary (52 pp.), and metamorphic (28 pp.) rocks—a concise survey of well-selected technical terms. The last chapter on utility of Earth materials includes a short account of the nature of ore-deposits.

The pace of development is intentionally slow, but the style is somewhat prolix. In dealing with concepts the attempt to make things simple sometimes means the sacrifice of sharp and accurate statement, which is a pity. A book at this level is useful, but one might go to an equal depth in the subject with a good deal more economy.

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