book is needed when there are already so many excellent introductory textbooks on this subject; the applicability of particular statistical techniques to geology is readily apparent without requiring geological examples. From the statistical point of view, the most important difference between geology and other branches of science is that sampling is often more difficult than in other subjects, but the book has very little to say about sampling problems. Several branches of statistics that are of particular interest to geologists, such as multivariate and non-linear regression or factor analysis, are dealt with in a rather cursory fashion. On the other hand, a chapter is devoted to non-parametric statistics, which are hardly mentioned in some other textbooks and which are potentially very useful in geology, especially in geochemistry. The book is very well written, and will appeal to students with a non-mathematical background.

A. HALL

AMSTUTZ (G. C.), editor. *Spilites and Spilitic Rocks.* International Union of Geological Sciences, Series A, No. 4. Berlin, Heidelberg, and New York (Springer-Verlag), 1974. 482 pp., 138 figs., 13 pls. Price DM 66, $25.50.

The spilite controversy continues to rage as fiercely as ever the granite controversy did, though with, as this book shows, very much better manners. In this series of papers by workers concerned with spilites, the tone is polite, people entrenched on opposite sides of the front line acknowledge their indebtedness to each other, and some of the protagonists can be seen to have shifted their positions slightly, but noticeably, in the direction of compromise. For this we are indebted to Professor Amstutz, who convened a symposium on the subject at the ill-fated Prague geological congress, and has edited this book, which grew out of that symposium. Despite being a convinced exponent of the primary (i.e. magmatic or late-magmatic) origin of spilites, he has encouraged representatives of both other camps, the autohydrothermal and the metamorphic, to contribute, and has elicited papers from most of the foremost workers in this field. Space does not allow a detailed account of each contributing paper, for which the reader is referred to *Mineralogical Abstracts* [M.A. 74–2896].

Regretfully, I must say that the result is disappointing. Too many of the authors are allowed to clothe their material in cotton-wool, and to drive their points home with a sponge-rubber hammer. Slack editing, though it may generate harmonious relationships, does not make a readable book. Many of the papers could, with profit, have been shortened by at least a half, and much of the introductory and general material could surely have been amalgamated into a single introduction to the book as a whole.

However, if one struggles against the boredom that many of the papers generate, some interesting points do begin to emerge. For example, while there is little disagreement about the facts about spilites, these facts elicit quite opposite responses from people with different beliefs. The same fact, such as the common occurrence of chlorite pseudomorphs after olivine, can in one paper be strong evidence of a primary origin, and in another just as convincing a demonstration of a metamorphic origin. Is this because of the pervasive nature of unstated preconceptions, is one of the argu-

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.

J. R. CANN

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 $Na+K \approx Al$ 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