

JENKINS (R.). *An introduction to X-ray spectrometry*. London and Rheine (Heyden & Son, Ltd.), 1974. xi+163 pp., 87 figs. Price £5.00.

This is the latest in a long series of books and papers on X-ray spectrometry by the author, who has played a major part in encouraging the use of the technique through his work in the Phillips application laboratories and as editor of *X-Ray Spectrometry*. In a previous book (*Practical X-ray spectrometry*, by Jenkins and De Vries: A.M. 54-1227) the author and his collaborator gave the basic practical information necessary for the use of the technique for chemical analysis. In this new work, the author provides background information on the physics of X-ray spectrometry, thus complementing the more practical approach of the earlier book.

The principal chapters are on X-ray spectra, the physics of X-rays, instrumentation, qualitative analysis, errors in X-ray analysis, quantitative analysis, and the study of chemical bonding. The chapter on spectra describes very clearly the origin of the various lines in the X-ray spectrum, and illustrates the differences between the spectra of different elements. The longest chapter, on instrumentation, is particularly interesting in discussing the choices to be made in arriving at the most efficient instrumental configuration for analytical purposes, and deals with methods of excitation, designs of X-ray tube, X-ray detectors, and with crystal and energy-dispersive spectrometers. The last chapter, on the study of chemical bonding, compares X-ray emission and absorption with the various kinds of electron spectroscopy, and lists the applications and relative merits of each technique.

The book is well written and illustrated, and anyone concerned with the use of X-ray fluorescence in rock and mineral analysis will find much of interest therein.

A. HALL

FOX (WILLIAM). *Tin. The working of a commodity agreement*. London (Mining Journal Books Ltd.), 1974. 418 pp., 16 figs., 17 tables. £9.25 (£11.00 air post paid).

This book describes the economic background to the mining of tin, and shows very clearly how the exploitation of mineral deposits is governed by economic factors. After a detailed review of the world's major tinfields, the development of tin mining up to 1971 is treated within a historical framework. The major producing tinfields at present are in S.E. Asia, Nigeria, Zaire, and Bolivia. Most of the production is from alluvial deposits, except in Bolivia where lode mining is still dominant.

A. HALL

TILL (R.). *Statistical methods for the earth scientist*. London (Macmillan), 1974. 154 pp., 50 figs. Price £5.00.

This is an introduction to the principles of statistics, and describes the application of some of the simpler and more widely used statistical tests. It is intended as a textbook for an elementary course in statistics for students of geology. It is not clear why such a

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-