exposition of colloid chemistry and goes on to apply this to clay systems. It is when he comes to the question of the electric double layer that the pace of the book changes, and this is acknowledged by placing the detailed calculations in an appendix. An unusual feature is the lengthy synopsis of 28 pages, which could well have been placed at the beginning of the book instead of being sandwiched between the main text and the Appendixes. This summary will indeed appeal to the wide range of technologists mentioned, as will the numerous references to practical applications that occur throughout. Frequent references are made to the publications of the Clay Minerals Group and to those of the U.S. Annual Clay Conferences. Author and Subject indexes are provided.

R. W. NURSE

WILSON (A. J. C.). *Mathematical theory of X-ray powder diffractometry.* Philips Technical Library, 1963. 128 pp. Price: 30*s*.

This book is the first of a pair planned together by A. J. C. Wilson and W. Parrish. The second (W.P.) is to deal with experimental aspects of diffractometry, while the volume already published (A.J.C.W.) deals with the theoretical side.

The ideal of a perfectly sharp reflection occurring from a perfect crystal using a strictly monochromatic X-ray beam is never attained in practice. The intensity profile actually obtained is the net result of various aberrations, and these are discussed in turn by Wilson. Chapter 1 defines the terms by which an intensity distribution may be characterized (mean, mode, centroid, half width, integral breadth, &c.) and shows that the most amenable to simple handling are the ideas of centroid for peak location and variance for its profile. Chapters 2–5 deal with geometrical aberrations (e.g. slit widths, specimen displacements, &c.), and Chapter 6 with physical aberrations (e.g. refractions, absorption).

For anybody concerned with the measurement of profiles in a study of imperfections, or with obtaining high accuracy from diffractometer measurements of d-spacings, all of these matters are of great importance. For those interested in obtaining moderate accuracy of d-values, the details of this book are less important but even so an awareness of the main sources of error is obviously desirable. Tabulated summaries of the errors due to geometrical and physical aberrations and of the way the aberrations vary with angle are a very useful feature of Chapter 7 on spacing measurements and peak displacements. The mineralogist merely concerned with identification by diffractometry may not concern himself with sophisticated corrections, but even here the distinction

between similar members of a solid solution series may depend upon very accurate d-values.

The author and his school are well known for their work on accurate lattice parameter measurement, and Prof. Wilson himself for his publications on the study of imperfections by X-ray diffraction. The latter subject is treated very succinctly in the last two chapters of the present volume.

Readers will be grateful to Prof. Wilson for the way in which he has gathered together material from a very scattered literature, and so clearly presented their essential features. For those who wish to probe more deeply there is an excellent coverage of relevant references.

The rather large and heavy print is easily read, but the paper used seems not opaque enough to cope with it. Otherwise the production of this volume, involving a large number of mathematical expressions, is extremely good. There is no doubt that this book merits a place on the shelf of anybody seriously concerned with using a diffractometer for accurate measurements. J. ZUSSMAN

AHRENS (L. H.), PRESS (F.), and RUNCORN (S. K.), editors. *Physics and Chemistry of the Earth, Vol.* 5. Oxford (Pergamon), 1964. 398 pp. Price: 100*s*.

This book is the fifth volume in a series of progress reports in the fields of geochemistry and geophysics. There are six contributions in this volume:

The significance of the chemical bond for controlling the geochemical distribution of the elements, Part I (L. H. Ahrens); Recent information on the earth's interior from studies of mantle waves and eigenvibrations (B. A. Bolt); Geophysical studies of rift valleys (R. W. Girdler); Geomagnetic micropulsations (J. A. Jacobs and K. O. Westphal); Chemical thermodynamics in Mineral Studies (H. Ramberg); and The geochemistry of the alkali metals (K. S. Heier and J. S. Adams).

The paper by B. A. Bolt is a comprehensive and up-to-date survey and contains a theory of surface waves and eigenvibrations from which valuable period tables are compiled. On the experimental side, the problem of isolating long-period waves is discussed, and geophysical inferences are drawn from the results. 'Geophysical studies of rift valleys' (R. W. Girdler) is a useful compilation of data on rift valley structure and genesis, for which the author favours a tensional origin. Jacobs and Westphal present an account of the nature, form, frequency,