

SMALES (A. A.) and WAGER (L. R.), editors. *Methods in Geochemistry*. Interscience Publishers Ltd. (New York and London), 1960, viii and 464 pp., 103 figs. Price 94s.

During the last decade an enormous amount of geochemical research has been carried out and one of the main reasons for this has undoubtedly been the increasing and successful application of new laboratory techniques to geochemical problems.

The results of these investigations, but not necessarily the methods, have been published in a large number of journals all over the world, and the editors of the book under review have now decided to present these methods together with examples of their use, in one volume. The plan of the editors has been to invite specialists to write readable and informative accounts of particular techniques, and the book is, therefore, divided into eleven chapters, chapter 1 (written by the editors) being an introduction. The authors and titles of the remaining chapters are: 2, L. R. Wager and G. M. Brown, 'Collection and Preparation of Material for Analysis'; 3, E. A. Vincent, 'Analysis by Gravimetric and Volumetric Methods, Flame Photometry, Colorimetry and Related Techniques'; 4, S. R. Taylor and L. H. Ahrens, 'Spectrochemical Analysis'; 5, H. I. Shalgosky, 'Fluorescent X-ray Spectrography'; 6, K. I. Mayne, 'Stable Isotope Geochemistry and Mass Spectrometric Analysis'; 7, R. K. Webster, 'Mass Spectrometric Isotope Dilution Analysis'; 8, S. Moorbath, 'Radiochemical Methods'; 9, D. Mapper, 'Radioactivation Analysis'; 10, S. Moorbath, 'Polarography'; 11, F. W. Cornish, 'Some Modern Chemical Separation Methods'.

The authors of chapters 2, 3, 4, 5, 10, and 11 have had the advantage of writing on subjects that are to a large degree complete in themselves, and they have carried out their task well enough, although parts of chapter 2, and in particular the section on the preparation of meteorites for analysis, are dealt with too briefly. The substance of chapters 6, 7, 8, and 9 on the other hand overlap to some extent and in an effort to preserve conciseness and lucidity there have been some lapses, possibly editorial. The same matter is explained in more than one chapter, not always equally efficiently, and instances can be found where the author has assumed that the reader has prior knowledge of the subject. Thus, in chapter 6, page 157, figure 1 is incomplete and the text gives no help in understanding it, and on page 176 the formation of ^3He by the reaction $^{14}\text{N} (n, 3\alpha)^3\text{H}$ is not obvious. Occasionally, also, the reader encounters such terms as 'spike' and 'hold back carrier': these terms merit a few words in explanation. These four chapters are probably the

most important in the book and it might well have served the editors' purpose better if the authors had been asked to collaborate. In chapter 11, where the methods of separation discussed are those of ion exchange, solvent extraction, and paper chromatography, the reader may think that too much space has been devoted to theoretical considerations. The chapters are supplemented by copious references, which, except for those at the ends of chapters 6, 8, and 10, are arranged alphabetically.

Apart from these criticisms there can be no doubt that the editors have succeeded in presenting a concise and informative account of modern analytical methods in geochemistry and the book can be recommended unreservedly.

A. A. M.

DE JONG (W. F.). *Kompndium der Kristallkunde*. Wien (Springer-Verlag), 1959. 258 pp., 227 text-figs. Price \$10.50 or 75s.

— *General Crystallography: A Brief Compendium*. London (W. H. Freeman & Co., Ltd.), 1960. x+281 pp., 231 text-figs. Price 38s.

These two books are independent translations, with some revision and rewriting, of the original Dutch edition of 1951.

They provide a clearly written, highly condensed account of modern crystallography in its proper setting as a department of physics. The author does not hesitate to go into the details of mathematical explanation where necessary, and thus provides data that are not to be found in many more voluminous textbooks. The book is sub-divided into four main parts: 'Geometric Crystallography', 'Crystal Structures', 'Crystal Chemistry', and 'Crystal Physics'.

The first part is the most extensive and gives a clear survey of the basic laws of geometrical crystallography, as well as symmetry elements and their derivation. After some aspects of direct and indirect lattices, different methods of calculating angles are discussed. Fourteen pages are devoted to different methods of crystal projection, the main emphasis being laid on the stereographic projection. The discussion of its practical application is a welcome addition.

A prominent feature of the second part is the mathematical interpretation of the refraction of X-rays in the crystal structure. All the important methods used for structural determination are briefly mentioned and illustrated with most informative diagrams. There are few textbooks of this size that give as de Jong does a clear survey of Weissenberg and retigraph methods, and enter into the mathematical background of Fourier analysis and Patterson synthesis.