Book Reviews

Works intended for notice in this column should be sent direct to the Editor (P. P. Ewald, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, N.Y., U.S.A.). As far as practicable books will be reviewed in a country different from that of publication.

Fouriersynthese von Kristallen und ihre Anwendung in der Chemie. By W. Nowacki. Pp. 237, with 120 figs. and 28 tables. Basel: Birkhäuser. 1952. Price 34·30 Swiss francs.

This book, a new member of the series 'Lehrbücher und Monographien aus dem Gebiete der exacten Wissenschaften', developed out of a course of lectures given by the author at the University at Bern, Switzerland. Although the book was published in 1952, it was substantially completed in 1948. It is only the second book to appear on the specifically restricted subject of crystallographic Fourier synthesis; the first, that of A. D. Booth (*Fourier Technique in X-ray Organic Structure Analysis*), is comparatively brief and less detailed. The present book was intended for use both as a textbook for students and as a general work and reference book for those engaged in crystallographic research.

Approximately the first half of the book is devoted to Fourier synthesis of electron density. It deals first with the elementary theory of Fourier synthesis and with the development of equations in forms useful for practical work, then with subjects pertinent to the interpretation of electron-density functions (errors, termination-of-series effects, refinement methods), and finally with the problem of determining signs and phases (trial-and-error, isomorphous replacement, heavy-atom technique, Banerjee–Hughes method, Harker–Kasper inequalities). Most of the remainder of the book deals with Patterson synthesis and the related topics of Harker synthesis and Buerger implication theory. The final section of the book deals with computational and optical methods; procedures involving the use of strips, punched cards, more involved calculating machines, and such optical devices as the fly's eye and the Huggins' masks are described with copious figures and examples.

The book has some serious shortcomings. First, because of the unusually long period between completion and publication, many recently developed methods (such as the increasingly important three-dimensional Fourier and Patterson methods) and theoretical treatments (such as those relating to errors) are missing. Second, the presentation tends to be encyclopedic but not especially critical. Topics are often presented in a somewhat disconnected fashion, the relationships among topics being in many cases not outstandingly clear, and the presentation, taken as a whole, is somewhat lacking in unity. Thus, although a number of different refinement methods are presented, the relationships among them are not made especially apparent, and how the Fourier method itself fits into the actual refinement process is not altogether obvious.

The reader will be very much impressed, as was the reviewer, with the quality of typography and format, with the very extensive lists of literature references, and with the beautiful and extensive figures and tables. The tables are, however, somewhat overdone in the opinion of the reviewer; many of them, taken from the literature where they are still accessible, will not be used often enough to justify the expense of including them. Some of the long and elementary derivations early in the book could likewise have been omitted; altogether four pages are consumed in the derivation of the working expression for electron density in the space group $P2_12_12_1$ alone. Possibly the presentation of derivations in such overwhelming detail may be of some value to the student, but it can be argued that the presentation of such detail in lectures or in exercises to be worked out by the student should be at least as effective.

In summary, the book is a valuable addition to the literature on X-ray crystallography, despite its shortcomings. It will serve well as a source-book and reference book on most aspects of Fourier synthesis as applied to X-ray crystallography. It is a book that is worthy of a place on the bookshelf of many an X-ray crystallographer, though it falls short of being a definitive work on the subject.

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Aspects of Form. Edited by Lancelot Law Whyte. Pp. 249. London: Lund Humphries. 1951. Price 21*s*.

Those who seek a unitary principle which correlates all observations and experiences within the range of human perception and understanding will welcome this volume, which is a general survey of visual form, from physics through biology and psychology to art. It was first intended to be a catalogue to the Exhibition on 'Growth and Form' at the Institute of Contemporary Arts, but it soon became much more than that, and has now been published as an independent symposium. It is significant that an art critic has written the preface and that the first of the scientific contributions is from an authority on crystal growth, S. P. F. Humphries-Owen. Succeeding chapters deal with shapes and shapes-in-time in astronomy, form in zoology, botany, biochemistry (a field where the electron microscope has supplemented X-ray crystallographic studies) and embryology; the use of camouflage, colour and various kinds of display; animal and human behaviour, activity patterns in the human brain, artistic form. These are all written by experts in the particular field discussed and the book, which is well-illustrated, concludes with a chronological survey on form and a selected, but extensive, bibliography.

Crystallographers, both morphological and structural, will find this symposium stimulating and fascinating.

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