reviews

Desert island crystallography

U. W. Arndt

Crystals, X Rays and Proteins. By Dennis Sherwood. Pp. xxii+702. (Longman: London, January 1976.) £12.50.

A (highly) intelligent school leaver about to take up an appointment as an X-ray crystallographer in a biochemical laboratory and wrecked on a desert island on his way, would find the present volume invaluable in equipping him for his new post by the time of his rescue. Dr Sherwood takes the reader in a methodical way through all the necessary steps to the solution of an unknown crystal structure. He starts with an explanation of the fundamentals of crystallography, of wave motion, of diffraction and Fourier transform theory and develops the necessary mathematical methods on the way. He then deals with the theory and practice of crystallographic structure determination—intensity measurement, extinction, Patterson methods, phase determination, refinement and direct methods are dealt with in successive chapters. The final section deals with biopolymers and diffraction by helical structures. In spite of the title, the chapter on protein crystallography as such is the least adequately covered. An appendix discusses a practical example of the solution of an organic structure.

The presentation is clear and fairly mathematical although it is a little doubtful whether it could be followed in its entirety by a reader who had not met any of the concepts before reading this volume. The author adheres throughout to a treatment in which he first states what he is going to say, then says it and finally discusses what he has said. The chapter summaries, in particular, are useful. Other good features are the annotated bibliography and the glossary and index. References are mostly to monographs and reviews, rather than to original papers The illustrations are plentiful and informative, although more modern X-ray photographs of biological materials might have been chosen. The text seems reasonably free of errors and misprints. It is a little strange to find within the same covers an illustration of wave interference in a ripple tank and a derivation of the Harker–Kaspar inequalities, but the author has fulfilled his stated intention of saying something of use for every class of reader in every section. Although the coverage of the theory of X-ray crystallography is fairly complete the reader will have to look elsewhere for a description of experimental methods.

This is a book to keep at home or in the office far from the departmental library, to read up on or verify X-ray crystallographic theory. It is of less value in a library since all the topics which the book covers can be found in readily available standard textbooks, although quite a number of separate ones may have to be consulted.