

Principles of protein X-ray crystallography (2nd edition). By Jan Drenth. Heidelberg: Springer-Verlag, 1999, pp. xv + 341. Price DM129.00. ISBN 0 387 98587 5.

Those who liked the first edition of this book will be pleased with the changes in the second. It contains the same 15 chapters of the first edition, with very similar section and chapter headings. Significant advances in the field have been added: 'Cryocooling' has been added to chapter 1 ('Crystallizing a protein'), 'Weighted averaging of multiple-refined dummy atomic models' to chapter 8 ('Phase Improvement') and 'Shake-and-Bake' as well as the 'Principle of Maximum Entropy' have been added to chapter 11 ('Direct Methods'). Correspondingly, discussion of equipment or procedures less frequently used today has been reduced or omitted: 'The Precession Camera' is gone from chapter 2 ('X-ray Sources and Detectors'), 'The Projection of Electron Density along an Axis' is replaced by 'Scattering by a Plane of Atoms' in chapter 4 ('The Theory of X-ray Diffraction by a Crystal') and 'The Matthews Patterson Summation', 'The Rossman Method' and 'Other Common Origin Methods' have been dropped from chapter 7 ('The Solution of the Phase Problem by the Isomorphous Replacement Method').

This second edition is an appropriate text for a graduate course in macromolecular crystallography as well as being a valuable reference for the laboratory. The style continues informal and clear. Drenth often uses the second person when 'addressing' his students. Terms or concepts that must be used before full definition or clarification are noted and referenced. The text is well prioritized, if not intended to treat each

topic in great depth; it usually provides enough mathematical or physical background to show the plausibility of a procedure. Adequate references are given to original literature, though some would have benefited by being updated from those used in the first edition. The book is well written, illustrated and indexed.

Inevitably, individual instructors might choose to shift emphasis or to add a few topics. Growing crystals is now often the rate-limiting step in structure determination. The relevance of the second virial coefficient in exploring crystallization conditions, the rationale for crystal screens, the rate of approach to saturation and the rationale for crystallization of integral membrane proteins might have been treated in greater detail. Others may want an elaboration of the interface of X-ray crystallography with neutron and electron crystallography and with electron microscopy of two-dimensional crystals. Some might argue that a course in protein crystallography should include helical diffraction theory. The rationale of and tricks for solving difference Patterson functions would be helpful. The use of charge-coupled device X-ray detectors and of bent mirrors for monochromatization and focusing might be elaborated. However, at 341 pages, *Principles* is a small book. It reflects a consensus of the core of basic protein crystallography courses as taught in many universities around the world.

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books received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally, a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

Structure and dynamics of biomolecules.

Edited by Eric Fanchon, Erik Geissler, Jean-Louis Hodeau, Jean-René Regnard & Peter A. Timmins. Oxford University Press, 2000, pp. xv + 416. Price £67.50. ISBN 0 19 850453 5.

This is Volume 4 in the series *2 Neutron and Synchrotron Radiation for Condensed Matter Studies* accompanying the HERCULES training courses conducted for users of large experimental systems in Europe. The emphasis is mainly on the experimental techniques employed at these facilities. The book contains 19 articles by 32 contributors and is an update of a 1994 volume that was devoted only in part to biological structures. It should be of value to a much wider audience with a general interest in the titular topics.