In chapters five and six, the problem of formulating a physically motivated interatomic potential function is confronted. Although the author claims the book to be self-contained, these chapters are not a good place to learn the quantum theory of solids. For the investigator with a strong quantum background, who would like to have a go at the thermodynamic properties of crystals, these chapters develop the basic mechanics necessary to such an approach. In specific, elementary band theory, and the pseudopotential theory of metals are developed in the framework of the first four chapters, but little feeling is given for the nature of the approximations or the physics of the bonding.

The final two chapters and the appendices discuss the details of actual lattice-model calculations and the procedures for data-fitting. The concrete examples of these final chapters are a necessary complement to the rather formal development of the earlier chapters. The anharmonic analysis is of particular interest.

Anyone who has attempted lattice-model calculations of thermodynamic properties quickly realizes that, even if he understands the basic procedure, the practical matters of first lattice summation, and then proper selection and weighting of wave-vectors in the thermodynamic sums can be formidable obstacles. Realizing this, the author has devoted an appendix to the complete description of these procedures, detailed to the extent of a computer program to determine wave vector weighting factors for a number of Bravais lattices. Although this is an extremely useful chapter, a word of warning is in order; in attempting thermodynamic calculations on the face-centered cubic lattice, this reviewer found several errors in the Brillouin-zone boundary weighting factors given by the author on page 456. I have not checked the other lattices.

In summary, the strong point of this book is that it puts recent developments in the thermodynamics of strained crystals, anharmonicity, elementary band theory, and pseudopotential theory into a single, consistent framework. Its weakest point is that very little background and virtually no references to the vast literature on these topics are given. The author has picked a logical trail through this literature, but has given few hints to those who would like to gain additional insight from peripheral reading.

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X-ray crystallography. By G. H. W. MILBURN. Pp.217, 70 Figs., 13 Tables. London: Butterworths, 1972. Price £6·00.

The author states his intention that the book should provide the reader with the basic knowledge needed to solve crystal structures by X-ray diffraction methods. In particular it should be a textbook of interest to final-year science students or to first-year postgraduate crystallographers.

The subject is divided into four parts. The first chapter of Part 1 outlines in 25 pages, including long tables and figures, the basic concepts of the crystal lattice, Miller indices and symmetry, the reciprocal lattice and its relation to X-ray diffraction and Fourier transform theory. The reviewer feels that no inexperienced reader can get a real understanding of the subject from just a list of statements without any proof. Some misleading statements must also be pointed out, as for instance: (i) the recombination of the scattered rays into an image corresponds to a Fourier transformation not only in the case of X-rays as stated on page 17; (ii) the definition of the structure factor as the 'resultant of j waves scattered in the direction of the reflection hkl by the j atoms in the unit cell', is, to say the least, confusing without a previous explanation of the real process of interaction between X-rays and crystals.

The second chapter of Part 1 and Part 2 deal with the practical aspects of structure determination. The choice and the setting up of the crystal, the use of oscillation and Weissenberg methods, the determination of the unit-cell parameters and symmetry are described in some detail. In Part 2 the measurement of intensities is treated with reference both to photographic and diffractometer techniques, with more emphasis on the latter. This section is nothing more than a list of recipes the reader should follow to get data and very little effort is made to give an explanation of the physical facts beyond the experimental procedures. Four types of four-circle diffractometers are described in much the style of the commercial brochures which one can get free of charge from the manufacturers.

Part 3 deals with the treatment of the measured data and with methods of overcoming the phase problem. In the introduction the author emphasizes the need for 'a computer with large store' to carry out a crystal-structure analysis, but one feels very sorry for the British electronic industry seeing that a 1972 book quotes only the somewhat outdated KDF9 and Atlas computers. Formulae are given for the Lorentz–polarization and spot-shape corrections and reference is made to some of the methods for correcting for absorption and extinction (in the latter only old work by Zachariasen is quoted and not his recent developments). The very unusual order, where the Patterson synthesis, comes first, then the Fourier synthesis and finally structure factors, does not help the clarity very much. The use of the Patterson function in connexion with heavy atoms is described in detail and I think it is the clearest part in the book. The section on vector-search methods is very ambitious in the sense that in three and a half pages it tries to give an account of the work by Buerger, Tollin, Jacobson, Rossman & Blow, Hoppe *etc.* (even the double Patterson is mentioned) on the interpretation of the Patterson function. Fourier and least-squares techniques to complete and refine a structure are described with some practical examples. The chapter on direct methods illustrates, after a short historical and theoretical introduction, some of the procedures used for sign determination in centrosymmetric structures. An account is also given of the application of direct methods to non-centrosymmetric structures; I am afraid that the use, in this paragraph, of the quasi-normalized structure factors to derive phase relationships will cause confusion to the reader unaware of the statistical basis of direct methods. Several misprints, that a cursory examination of the proofs should have revealed, make this chapter difficult to read. An account of isomorphous replacement and anomalous-scattering methods concludes Part 3.

Part 4 is a description of some computer programs used in Crystallography. For each program the purpose and the kind of input–output data expected are illustrated.

My overall impression of this book is that it does not fulfil the author's aims of being a tool for anyone, in particular students, seeking to learn about X-ray diffraction by crystals. This impression has been checked by submitting some chapters of the book to final-year students (already exposed to crystallography). It was agreed that a major fault in this book is the very little attempt to explain the physical and mathematical principles supporting X-ray crystallography. Fewer arguments, treated in more detail, would have provided a useful student textbook of the same size and price.

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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.

Solid-state physics literature guide. Vol. 5. Bibliography of magnetic material and tabulation of magnetic transition temperatures. Compiled by T. F. CONNOLLY and EMILY D. COPENHAVER. Pp.180. New York: Plenum Press, 1972. Price $23.00.

An extensively referenced compendium of magnetic transition temperatures, this comprehensive and up-to-date volume offers lists – alphabetically arranged by compound – of both Curie and Néel temperatures. In addition to citing the 2478 references received by RMIC through May 1972 from which the entries in this volume are taken, it also provides a listing of books, recent reviews, and other compilations and sources of information on magnetics literature.

Index of crystallographic supplies. Edited by REUBEN RUDMAN. Pp.vii+57. Utrecht: Oosthoek, 1972. Price *f*10, ($3.50 or £1.35).

This is the third edition of the *Index of Crystallographic Supplies* prepared on behalf of the International Union of Crystallography by its Commission on Crystallographic Apparatus. The first was compiled in 1956 and the second in 1959.

The information included in the Index was gathered from replies to a questionnaire which was sent to a wide range of manufacturers and suppliers throughout the world. It is not intended as complete and exhaustive but it should provide a convenient starting point for the location of the appropriate sources of equipment and materials of use to crystallographers.

The present text does not present itemized detail but provides general information which should be of particular assistance to crystallographers in smaller countries or in more isolated locations who may wish to track down sources of crystallographic supplies.

Copies of this publication have been distributed free of charge to all subscribers to *Acta Crystallographica* and *Journal of Applied Crystallography*. Additional copies can be purchased from A. Oosthoek's Uitgevers Mij N. V., Doomstraat 5-13, Utrecht, The Netherlands. In the event of foreign exchange difficulties, UNESCO coupons will be accepted. Orders can also be placed with Polycrystal Book Service (P. O. Box 11567, Pittsburgh, Pa. 15238, U. S. A.) or with any bookseller.