somewhat mathematical in spite of the author's claim that he has 'avoided over-rigorous arguments and mathematical complexity', the book appears rather austere. This appearance, together with its extremely high price, might well discourage many readers. This is a pity because the book contains a great deal of good material that all students should make an effort to absorb.

H. LIPSON

Department of Physics
University of Manchester
Institute of Science & Technology
Manchester M60 1QD
England

Röngtenbeugung an Kristallen. By K. H. JOST. Pp. xii + 404. Berlin: Akademie-Verlag, 1975. Price not known.

This book deals with the interpretation of X-ray diffraction patterns from crystals, within the framework of the usual kinematic scattering theory. It does not deal with crystal structure analysis, nor with diffraction phenomena that require the use of dynamical theory for their interpretation, and hence it may be regarded as somewhat limited in its scope. However, the topics that are discussed – basic X-ray physics, crystal symmetry, space-group determination, X-ray diagrams of ideal and non-ideal crystals, intensity measurements and corrections (including a short section on diffractometers), powder diagrams – receive a competent and thorough treatment.

There are any number of excellent introductory books on X-ray diffraction topics available in English, but not too many recent ones in German. Within its limitations, this book should therefore serve a useful purpose and it can be safely recommended to anyone who prefers reading German to English.

One chapter of the book is especially praiseworthy. It is the one dealing with crystal imperfections and their influence on diffraction diagrams and it contains an excellent, short, introductory account of order–disorder (OD) crystals that is not to be found in any other book at this level in any language. This can be highly recommended as preliminary reading for the study of the papers by Professor Boll-Dornberger and her colleagues on this subject, and it may even spur readers who normally prefer English to grasp for their German dictionaries.

J. D. DUNITZ

Organic Chemistry Laboratory
Swiss Federal Institute of Technology
8092 *Zürich*
Switzerland

Neutron diffraction - Monographs on the physics and chemistry of materials. By G. E. BACON. 3rd ed. Pp.xiii + 636, Figs. 388, Tables 33. Oxford Univ. Press, 1975. Price £28.00

This is a much expanded version of a, by now classical, monograph. Previous editions in 1955 and 1962 contained 299 pages and 117 figures, 426 pages and 190 figures, respectively. The scope and outline of the first edition is retained: The first part is devoted mainly to the principles and techniques of neutron diffraction and the second part to its application. The first part has two new chapters, one on magnetic form factors and one with the title *Observation of magnetic scattering*. I find the latter title not very illustrative or precise since the chapter discusses how different types of magnetic order manifest themselves in the diffraction pattern. Most of the chapters have been revised so as to make place for new features in methods and applications. In this respect the major additions are found in two excellent sections on helimagnetism and polarization analysis, but also other sections on the profile refinement method, the gravity mirror refractometer and the Pendellösung fringes have been included. I was happy to see that the magnetic interaction vector **q**, which previous editions and most other books on the subject have had wrong, now is correctly defined such as to give the proper sign to the polarization-dependent term in the cross section.

One question to ask is whether a broad field such as neutron diffraction should be covered by one author and not by several contributors. On the whole a scholarly written monograph like the present one seems preferable. The result is a unified, clear exposition of an important research method. It is an almost impossible task for one single person, however, to keep abreast in a widely expanding research field. It is certainly forgivable that some new developments have been overlooked. One example is the magnetic structure of magnetite for which important developments after 1958 are not included. Less forgivable, perhaps, is the omission of references to important work on resolution by Brookhaven and Risø research workers and to the spectrometer intercomparison work by the Neutron Diffraction Commission. This writer may be biased, but he certainly believes that pyrolytic graphite deserves more place in a discussion on monochromators than does lead. For graphite, information on reflectivities and the great advantage of vertically bent monochromators would seem in order. It is probably wise that the author has retained the framework of the first edition, but in some cases it creates difficulties. Chapter 5 on fundamental measurements of scattering amplitudes is now largely one on experimental techniques in which important innovations, such as neutron guide tubes, are discussed in subsections not even indicated in the list of contents.

The layout and technical quality of this book are very good. The great number of figures are of a good quality and easy to understand (although not Fig. 186!). I have detected only one misprint which, however, occurs several times, $Co_{0.92}Fe_{0.8}$ instead of $Co_{0.92}Fe_{0.08}$. On the whole this book defends its position as a classical, high-quality monograph and deserves its place on the bookshelf of every diffraction scientist.

T. RISTE

Institutt for Atomenergi
Kjeller pr. Lillestrøm
Norway

Low-dimensional cooperative phenomena. Edited by H. J. KELLER. Pp.viii + 350, Figs. 132, Tables 16. New York: Plenum Publishing Co., 1975. Price $30·10.

One element in the controversy about large international conferences and the publication of their proceedings is the relevance of those proceedings when the majority of the

papers are refurbished and republished after the conference, thus leaving the published proceedings largely as a record of work in progress. The format of the proceedings of the NATO Advanced Study Institute shows how separation of the major review papers from the more detailed contributed papers can lead to a vastly more effective and useful text.

The Study Institute was devoted to a discussion of low-dimensional cooperative phenomena, both in the field of one-dimensional conductivity and of magnetic phase transitions in geometries of less than three dimensions. The publication of the review papers of the Study Institute in these rapidly developing fields offers the reader the chance to pin together some understanding of the fundamental issues such as the TCNQ, KCP and TMMC salts and, in fact, to set a physical structural picture to such assemblies of initials. Not only does it succeed in so doing, but it also manages to allow the physicist interested in following up some of the investigations to penetrate the chemical literature and the excellent reviews of preparative aspects of these chemical systems will equip such a physicist with knowledge appreciably greater than the mere memory of the magic initials for the necessary discussions with his chemical colleagues. The significance of mixed valency states is emphasized in parallel to the structural considerations necessary for low-dimensional electrical conductivity and the power of NMR and ESR methods is apparent not only obviously in the magnetic systems but also in the highly conductive systems as they are affected by fluctuations, interchain coupling and impurity pinning of collective Fröhlich charge density waves.

The possibility of high-temperature superconductivity is not discussed except in one paper by Little, which is rather similar in content to papers he has given in the past, but it is clear that one-dimensional metals with anomalously high conductivities are now available. Whether any long-range phase coherence effects suitable for SQUID type interferometry or, more improbably, any Meissner effect may possibly be found in these systems is certainly not answerable at this time.

It is quite revealing just how limited repetition of explanations for a fundamental physical phenomenon, such as the Peierls instability, in similar but not identical terms by various authors really does induce the depth of understanding necessary, for instance, to allow discussion of it in an undergraduate lecture course as an indication of recent developments in solid state physics.

The list of contributors to the discussion sessions and the inclusion of the titles of their contributions would allow the reader to follow up more recent developments in the subject but with a pair of topics of such vital current interest as these any recent issue of *Physical Review Letters* would serve that purpose better. However, the review articles of the proceedings do give a much better background to these articles than could be derived from the frequently sketchy introductory references quoted. That glimpse at *Physical Review Letters* may also serve to dissuade the reader who day-dreams of possible experiments when faced with the list of suitable systems so tantalizingly presented in the articles on the preparative aspects of such molecular systems. It is distressingly hard to catch up experimentally in an interdisciplinary field such as this and, in any case, the Study Institute was held in late 1974 and a lot has happened since then – but a lot that is now much more comprehensible after reading these proceedings.

ALEXANDER D. C. GRASSIE
School of Mathematical and Physical Sciences
The University of Sussex
Falmer
Brighton BN1 9QH
England

Atlas of optical transforms. BY G. HARBURN, C. A. TAYLOR and T. R. WELBERRY. Pp. 33, Figs. 2. Plates 32, London: Bell, 1975. Price £6.00.

A review of this book by B. Chaudhuri has been published in the May issue of *Acta Crystallographica*, Section B, page 1622.