introduced by picture pages displaying equipment, laboratories or personnel evocative of their period, and the contrast between typical laboratory equipment in use in the early '30's and the early '40's, for example, can be quickly assessed from these pages.

Part III consists of concise, self-contained reports on the present state of the subject on an international basis. The following six excellent articles are included in 105 pages: *Theory of forward elastic scattering* (A. F. Moodie), *Surface crystallography by LEED* (M. A. Van Hove), *Gas electron diffraction* (K. Kuchitsu), *Electron diffraction in TEM* (S. Amelinckx), *Inelastic electron scattering* (H. Raether), *Structure determination by HEED* (J. Gjønnes). They trace the historical development of the subject, describe important aspects of contemporary theory and practice, summarize some important results and give some indication of the capabilities of present-day electron diffraction. The articles are of a standard useful to a research student of electron diffraction.

Throughout this volume, readers will find many interesting episodes which are related to the important discoveries and development in electron diffraction. All the electron diffractionists as well as the crystallographers in the other fields and aspiring students should read this book.

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Diffraction studies on non-crystalline substances. Edited by ISTVÁN HARGITTAI and W. J. ORVILLE-THOMAS. Pp. 894. Amsterdam and Budapest: Elsevier, 1981. Price US $109.75, Dfl. 225.00.

Diffraction studies on non-crystalline substances is Volume 13 of Elsevier's *Studies in physical and theoretical chemistry*. The volume is based primarily on lectures given at a conference at Pécs, Hungary in 1978. The book consists of twenty-one chapters written by authors with backgrounds in different areas of diffraction studies. The book is loosely divided into five parts; gases, liquids, amorphous systems, polymers and metallic alloys.

The first part concentrates on electron diffraction from gases with chapters related to the history of electron diffraction, determination of geometrical parameters of free molecules, application to organic molecules, determination of the harmonic potential function, the study of large-amplitude motion and the determination of internal rotation. These six chapters cover the field of electron diffraction from gases quite adequately and with surprisingly little redundancy.

The three chapters on liquids discuss some of the more formidable applications of liquid diffraction. The chapter on the structure of molecular liquids describes the determination of the molecular pair-correlation function. This function contains information not only related to the separation of two molecules but also on their mutual orientation. The second chapter on liquids reviews the recent diffraction studies of aqueous electrolytes, giving major attention to the calculation of the partial pair-correlation functions of the different interactions. This chapter also gives an interesting account of the recent diffraction studies of water. The final chapter on liquids describes the use of molecular dynamics to arrive at computer simulations of liquid structure.

Approximately half the book is devoted to diffraction studies of solids. Appropriately, the first chapter by A. Guinier discusses a number of systems that he refers to as intermediary states between order and disorder. The chapters dealing with polymers stress applications of wide-angle scattering although both X-ray and light small-angle scattering are briefly reviewed. The chapter by P. W. Schmidt develops in detail the use of integral transforms for the determination of the particle-size distribution for a system of non-identical particles of similar shape. This is the only chapter in the book that deals extensively with a topic concerned with small-angle scattering. The fifth part of the book covers, with varying degree of detail, the major methods that have been used to study the structure of amorphous metallic alloys. In addition to a discussion of the large-angle X-ray and neutron scattering studies, mention is also made of small-angle scattering and a non-diffraction method, extended X-ray absorption fine structure. The final chapter describes various applications of the electron microscope to the study of amorphous solids. Electron microdiffraction, a technique for examining regions of about 20 Å, is the primary topic.

Most of the chapters are written in the style of a review article with the authors relying on the references for derivations of the relevant theory and detailed description of the experimental methods. The strength of the volume lies in the topics discussed, which for the most part are current and include many of the major recent contributions to the various areas.

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Experimental high-resolution electron microscopy. By J. C. H. SPENCE. Pp. xii + 370. Oxford University Press, 1980. Price £35·00.

As the two micrographs in the frontispiece of this book show very clearly, it is possible in electron microscopy to have detail at the atomic level for solid materials.

This itself is not particularly new; but in the last few years there have been important contributions to this expanding field. The good quality of the better commercial microscopes now permits, in principle, every microscopist who is interested in applications in materials science, mineralogy, solid-state physics and solid-state chemistry, ... to conduct research at this level.

The author's objective is to transmit the maximum of his experience in this field.

I think this book will be of real value because its structure is well conceived and there is an orderly development of the subject in every chapter. It is not necessary to absorb all the mathematical formulae to understand the important points. The first chapters recall the fundamentals of electron optics, with special emphasis on wave optics and coherence. High-resolution images of periodic and non-periodic specimens – the really important topics – are treated in the fifth and sixth chapters. The reader will find a variety of results, well chosen and explained in full detail; he will certainly acquire the ambition and desire to undertake (or continue) research of this kind. The final chapters are, in effect, a compendium of advice for the more straightforward cases.

In conclusion, this book is a very good one, and unquestionably successful.

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Recent developments in condensed matter physics, Vol. 3: Impurities, excitons, polarons and polaritons. Edited by J. T. DEVREESE, L. F. LEMMONS, V. E. VAN DOREN and J. VAN ROYEN. Pp. xvi + 420. New York: Plenum, 1982. Price US $55.00.

This volume contains a convenient grouping of contributed papers given at the first European Physical Society Condensed Matter Division's Conference, held in Antwerp, 9–11 April 1980. It is a very interesting and useful volume, and should be read by all who wish to remain abreast of current research. Some concern might be raised that the shear diversity of topic could dilute the worth of the volume 'spread so thin that...'. But no, and, to the very contrary, categories were so chosen and the breadth was so scaled that the topic sections are as coherent as can be expected. More importantly, the overlap integral between the contents of this volume and the interests of the average solid-state physicist is sufficiently large to recommend that everybody spend some time with it, at the very least. There will undoubtedly be one or two papers that will be of great interest, and one is always happy to learn about new, but related, work.

The content is somewhat wider than the title would suggest and includes, in addition, sections on semiconductors and semimetals, electron structure and dielectric properties.

The section on semiconductors and semimetals includes papers on bismuth, electron transport and associated parameters such as quantum oscillations, impurity scattering, hopping conduction, recombination and luminescence.

The section on impurities and defects contains experimental results obtained using EPR, NMR and Mössbauer spectroscopies, the calculation of ionic and electronic states of impurities in a wide variety of hosts including II–VI compounds and also silicon, exciton defect, exciton–exciton interactions with some interesting theoretical contributions. The electronic-structure section covers experimental and theoretical studies of oxides (including NiO!), garnets, 4-*f* ions. Dielectric properties include oscillator-strength calculations, non-linear optical properties and the final section, polarons and the experimental evidence for their existence in oxides, includes very interesting theoretical papers using a Brownian-motion approach and path-integral calculations, polaritons in CuCl and CuBr and optical bistability.

Having explored this volume, one is highly motivated to investigate the other volumes covering the Conference: Vol. 1, *The invited papers*, Vol. 2, *Metals, disordered systems, and interfaces* and Vol. 4, *Low dimensionality systems; phase changes and experimental techniques.*

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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.

Structural crystallography in chemistry and biology: benchmark papers in physical chemistry and chemical physics. Vol. 4. Edited by J. P. GLUSKER. Pp. xx + 421. Hutchinson Ross Publishing Co., distributed by Academic Press, New York, 1981. Price £33·00, US $50.00. A review of this book, by M. F. Perutz, has been published in the February 1983 issue of Acta Crystallographica, Section B, page 139.

Structural studies on molecules of biological interest. Edited by G. DODSON, J. P. GLUSKER and D. SAYRE. Pp. xviii + 610. Oxford: Clarendon Press, 1981. Price £39·00. A review of this book, by S. Abrahamsson, has been published in the February 1983 issue of Acta Crystallographica, Section B, page 141.