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Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (M. M. Woolfson, Physics Department, University of York, Heslington, York YO1 5DD, England). As far as practicable books will be reviewed in a country different from that of publication.

Diffusion and defect data. Vol. 8. Nos. 1-4. Edited by F. H. WOHLBIER, Pp. iv + 353, Figs. 42, Tables 126. Eight issues a year. Aedermannsdorf, Switzerland: Trans Tech Publications, 1974. Price (yearly subscription) Swiss F 344.00 (U.S. \$ 108.00).

This publication is an expanded version of the former *Diffusion Data*, which has been published since 1967 as a specialized source of recent work in that field. Issued in two volumes each year, it is a survey of new published work on diffusion and defect properties for all materials which are solid at normal temperature and pressure. The volume reviewed covers more than 1700 publications, each classified by both the material concerned and the property studied. The first section of the work is a compilation of results from just over 300 papers, adjudged to contain 'important new reference data'. Each is summarized in less than 200 words, with important tables and figures reproduced; 42 figures and 126 tables are included. The references are grouped according to the type of material described. Typical headings include *Solid Metals and Alloys, Semiconductors, Nitrides*, and so on.

The second section is a listing of other recent references — more than 1400 in all — classified according to the property studied. Thus there are 158 references under the general heading of

Diffusion Processes, 333 under *Dislocations*, 107 concerned with ion bombardment and implantation. In addition to diffusion and the traditional range of defects, irradiation effects ranging from ion implantation to laser irradiation are included.

The third section collects all the references according to the material studied. Each entry is either a referral to the summary in the first section or a brief synopsis of the paper concerned (less than 100 words). There is also a condensed subject index.

A publication of this type fulfils an obvious need. The task of sifting the veritable mountain of published papers for useful nuggets of information grows more difficult and time-consuming each year. The availability of a publication which sorts the literature and classifies papers according to the materials and the properties studied is a real boon to workers in this field. The reviewer found five recent papers of interest in as many minutes, and a colleague working in an entirely different field reported a similar experience. The typography is clear and pleasing to the eye, making the volume very easy to use. Not everyone would agree with the selection of 'important' references, as it is quite heavily biased toward diffusion work. Nevertheless, the expanded terms of reference have produced a publication which is a useful reference source for anyone interested in defect phenomena, at a price not significantly higher than some of the individual journals it surveys.

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An introduction to X-ray spectrometry. By RON JENKINS. Pp. xi + 163, Figs. 95, Tables 21. London: Heyden & Son, 1974. Price £5.00, \$14.00, DM 41.00.

The past few years have witnessed a rapid growth in the application of X-ray spectrometry to the chemical analysis of media ranging from biological materials to objects of archaeological interest. In part, this has been brought about by the development of energy-dispersive systems together with the increasing application of computers to facilitate data handling.

Clearly, with such a widespread growth of interest in X-ray spectrometry a need has arisen for an introductory

text, readily understandable by workers of varying backgrounds, covering the essential aspects of the subject: instrumentation, methods of calibration and the various techniques of qualitative and quantitative analysis. Ron Jenkins has recognised this need and written a book which explains these topics in a manner that will stimulate the newcomer to the field whilst providing much of interest to the experienced spectroscopist. The treatment of X-ray spectra and the underlying theoretical physics, which together occupy about one third of the book, is adequate bearing in mind the title of the work, and certainly equips the reader with sufficient background knowledge to tackle more advanced treatises. It is pleasing to note that the recently introduced energy-dispersive instruments are described and their performance compared and contrasted with the more conventional wavelength-dispersive spectrometers.

The text is competently written, the format pleasing, and priced at £5.00 the book surely represents good value for money. Although not primarily written with undergraduates in mind it could be used in conjunction with a short special course on the subject; most probably, however, this book will find greater appeal in research and industrial laboratories.

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Applied mineralogy. Vol. 5. Apatite. By DUNCAN McCONNELL. (General editors: V. D. FRECHETTE, H. KIRSCH, L. B. SAND and F. TROGER). Pp. xvi + 111, Figs. 17, Tables 31. New York: Springer-Verlag, 1973. Price S 324, DM 47, US \$ 14.90.

The only acceptable approach to publishing science is to be involved with the subject and uninvolved with the personalities who prosecute it. In this way, the inanimate is savagely scoured and polished to purity, while the animate are gently left to all their warts and imperfections. To depart from this standard is to diminish impartiality and to substitute the easy cash of emotion for the hard currency of reason. It is unfortunate that Duncan McConnell, whose contributions are well known to mineralogists and medicals alike, should persist in

such transpositions in a formal book which is at once a source of data and a seat of opinion and omission. The volume has many useful and verifiable passages. The tabulated mineralogical variations and substitutions are helpful in establishing the geology of the species and there are reasonable arguments about the carbonate apatites. The excursion into teeth and bones, however, is less instructive. While the sub-title invokes *Biological Occurrences* and the preface proffers a 'formal education in the biological sciences' there are only thirteen unhappy pages on this substantial subject, no references of recent date [Fleisch & Neuman (1963) is but a historic echo of Wuthier, Bisaz, Russell & Fleisch (1972) and Neuman & Mulryan (1971)], and no mention of many major contributors to our knowledge of the inorganic phase of bone, dentine and enamel (Bachra, Bonar, Dallemagne, Eanes, Glimcher, Leach, Montel, Posner, Richelle, Rowles, Termine, Scott, to name but twelve). A casual reader of the book would suppose that biological apatites were studied by few and abandoned by most ten years ago. Except that to the astute, the coloured excitements of 'self-mesmerism of vibrational spectra' in the preface and the exclamatory (but unreferenced) denunciation of amorphous fallacies on p. 72 might just conceal a large and well documented canvas painted in many formal shades of grey by those who do not omit to quote McConnell in a dispassionate search for the truth about apatite.

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Dislocations and plastic deformation. By I. Kovács and L. Zsoldos. Pp.xii+343, Figs. 158, Tables 9. Oxford: Pergamon Press, 1974. Price £3.50.

Since many first-class texts devoted to the topic of dislocations are already

currently available to the English-speaking public, it is almost inevitable that any new monographs in this general area will be measured against the yardstick of attainment and presentational felicity of the definitive monographs associated with the names of Nabarro, Friedel, Amelinckx, Cottrell and Read (for the expert) or with Hull and Weertman and Weertman (for the novice). This extended translation from the original Hungarian published in 1965 sets out, in the first six chapters, to provide a concise account of the nature – geometry, topology, energetics and movement – of dislocations both in crystalline solids and in an elastic continuum. It then proceeds, in the remaining three chapters, first to deal with the influence of defects (both of point and line character) on the physical properties of metals, second with the hardening of alloys and the work-hardening of metals, and third with the influence of heat treatment on the structural-defective character of metals.

There can be little doubt in view of its overall lucidity and fluency, and not least because of the numerous excellent diagrams and the several elegant high-resolution micrographs, that this book has much merit. Admittedly it does not chart new territory and much of the ground that is described in detail is familiar to readers of earlier texts: there are also a few minor omissions – no reference is made to deformation studies or dislocation behaviour of molecular crystals or minerals, for example – but even for readers not primarily interested in plastic deformation this book will serve as a quarry for much useful and readily retrievable basic information of general interest to the physical scientist. It is culturally satisfying to commend a book written by two authors from the stirring city of Budapest, the cradle from which emerged two of the trio of individuals who first conceived dislocations.

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Book Received

The following book has 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.

Mechanische anisotropie. Edited by H. P. Stüwe. Pp.vi+314, Figs. 92, Tables 18. Vienna. Berlin, New York: Springer-Verlag, 1974. Price S 486, DM 68, U.S. \$ 27.80.

The problem of the mechanical strain of bulk materials has been studied for a long time. Early theoretical studies were based on ideally isotropic behaviour of workpieces but subsequently anisotropic media were also considered. In the twenties of this century a second field of investigation, concentrating on the anisotropy of elastic and plastic behaviour, has become accessible through the growth of large crystals and by structure and texture research employing X-ray diffraction. Today these investigations are performed with great frequency with special consideration given to the importance of lattice defects.

Representatives of both these areas of research used to report their results at conferences of the 'Society of Applied Mathematics and Mechanics' but unfortunately this cooperation ceased, leaving both groups quite isolated. Because of this regrettable situation an attempt to reinstate cooperation has been made by the 'Erich-Schmid-Institute für Festkörperphysik' of the Austrian 'Akademie der Wissenschaften'. On the 17–18 May 1973 a colloquium on elastic and plastic anisotropy was held in Vienna and was attended by scientists of both groups.

The present volume is based essentially on the lectures and discussion at this conference, covering experimental as well as theoretical results. By presenting this compilation the author hopes to extend the common knowledge of the two groups and to assist the collaboration of scientists studying the anisotropic behaviour of bulk materials.