

papers, each giving a survey of the topic of relevance. In Chapter 1, Howie points out the central themes of the dynamical theory, related to, *e.g.*, the optical potential, the cross-over of the dispersion surface, and various calculation techniques. This chapter includes many papers on the critical-voltage effect as well as the phenomenon of electron channelling. It is remarkable that the dynamical theory has been successfully applied to the channelling effect of electrons of energy as high as 15 MeV (Worm *et al.*). In Chapter 2, dealing with short-range order diffuse scattering, Watanabe describes a number of examples of diffuse scattering reflecting the form of the Fermi surface for some disordered alloys. As described by Goodman in Chapter 3, accurate measurement of structure factors and the determination of crystal symmetries are two of the most beautiful features of recent electron diffraction research. It is interesting to see that the accurate structure factors thus becoming available may be useful, *e.g.* in detecting the solid-state bonding effect (Smart & Humphreys). In the same chapter, Cowley emphasizes the important and unique capability of electron diffraction in crystal structure determination, especially for extremely small samples. In this connection, he also points out a number of difficulties to be overcome in order to realize the full potential of electron diffraction. Incidentally, this chapter also contains a few papers relating to electron channelling.

Pendry, reviewing recent advances in LEED in Chapter 4, gives a compact summary of the layer methods that are now current in LEED, and also discusses the relativistic effects in LEED which become significant for heavier atoms through spin-orbital coupling. He also mentions the impact of LEED theory on neighbouring problems such as EXAFS. The same chapter contains two experimental papers dealing with spin-polarized LEED (Müller *et al.*, Unertl *et al.*), which suggest a fruitful area of electron diffraction study for the future. The paper by Mulvey in Chapter 5, being a review of the development of instrumentation for electron diffraction, is of special interest as it reminds us of historical experiments performed by Davisson & Germer, Thomson & Reid, Kikuchi and others. Chapter 6 is headed by a review paper by Hirsch. It is worth mentioning that two papers in the final chapter deal with liquid structure.

Besides the papers briefly referred to in the above, readers will find many other attractive papers in this volume which are equally to be appreciated. Scientific standards of the papers compiled are uniform and generally high. In this volume, readers have a useful survey of the important aspects, if not the whole, of the recent advances in electron diffraction research.

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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.*

**Кристаллография.** By М. П. Шаскольская (**Crystallography.** By M. P. SHASKOL'SKAYA). Pp. 391. Vysshaya Shkola publishing house, Moscow, 1976. Price 1 r. 52 k. A review of this book, by Z. Kaluski, has been published in the February 1979 issue of *Journal of Applied Crystallography*, pages 139–140.

**Environment international. A journal of science, technology, health, monitoring and policy.** Editors, A. A. MOGHISSI and B. D. MOGHISSI. Pergamon Press. Vol. 1 (1978) subscription, US\$72.60 p.a.

**The harvest of a quiet eye. A selection of scientific quotations.** By A. L. МАСКАУ. Pp. xii + 192. The Institute of Physics, Bristol and London. Price £5.20.

**Elements of X-ray diffraction** (2nd edition). By B. D. CULLITY. Pp. xii + 555. Addison-Wesley, 1978. Price US\$21.95, £16.50. This book was first published two decades ago in 1956. Its production now, as a second edition, is a measure of its success and usefulness.

It is a pity that the title of this book is not more explicit, for it is in fact addressed rather narrowly to the problems of materials science and technology, and of metallurgy in particular. A more correct title would have been '*Elements of X-ray Diffraction for Students of Metallurgy*'.

It is also a pity that students of metallurgy are given so poor a glimpse of what X-ray diffraction achieves in the way of structure determination. Only 20 pages are allotted to crystal structure determination and, in this section, the one example that is given is a zinc blende structure solved from a powder pattern whose intensities are listed in terms of '*...s, w, vs...*' giving a mildly antiquarian atmosphere. However, apart from this one important area, it must be said that the coverage of the book is impressively comprehensive.

The first edition of this book was reviewed in this journal in 1957 [Preston, G. D. (1957) *Acta Cryst.* 10, 389]. Virtually all that was said then remains true of this second edition, except that quite a large number of new techniques, such as energy-dispersive analysis, time-analysis diffractometry, the Auger effect, and so on, have been brought in, giving this edition a highly up-to-date flavour – for metallurgical applications.