

## Book Reviews

*Works intended for notice in this column should be sent direct to the Editor (A. J. C. Wilson, Department of Physics, University College, Cathays Park, Cardiff, Great Britain). As far as practicable books will be reviewed in a country different from that of publication.*

**Crystals and the Polarising Microscope.** By N. H. HARTSHORNE and J. A. STUART. Pp. xv + 557, with 339 figs. London: Arnold. 3rd ed. 1960. Price £4.

It is not necessary to remind readers of *Acta Crystallographica* of the power of optical techniques in the study of solid matter, but there are many chemists to whom these techniques, used by the petrologist for nearly a century, are unfortunately still unknown. It is to such chemists that Hartshorne and Stuart are preaching, and it is a tribute to the value of their missionary work that yet a third edition of this book has been called for.

The earlier editions (the first was published in 1934) will be well known to readers of this journal. Much of the material from the second edition reappears here, but every chapter has been carefully revised and about 100 pages of new material have been added to take account of advances in instrumentation and techniques developed in the last ten years. The microscopes described are all ones in which polarizing films replace calcite prisms, and the authors devote considerable space to a full discussion of the way in which the potentialities of such instruments may be fully exploited. It is their contention that the polarizing microscope is basically a *microscope* and that for this reason more attention than is customary should be paid to the principles underlying resolution and to the methods of illumination, both of which topics are now treated at very considerable length. It is, perhaps, a pity that the discussion deals exclusively with British microscopes and that some of the distinctive features of microscopes from Germany and elsewhere are therefore not mentioned. A separate chapter is now devoted to universal-stage methods, and the chapters on liquid crystals and on special methods have been considerably enlarged. More space is also devoted to the use of the microscope in the study of fibres, biological tissues and high polymers. There is still, however, nothing about the methods of reflected-light optics, and the authors might well consider adding a chapter on this topic of rapidly growing importance in the next edition.

As a manual of polarization microscopy the book is unrivalled and deserves careful study by the petrologist as well as by the chemist for whom it is primarily written. Unfortunately, however, the chemist needs more than a manual of techniques: he needs also a sound understanding of the theory of the propagation of light in crystals. For this reason the book is designed to serve also as a text-book of crystal optics, and it is in this respect that it is most vulnerable to criticism: the theoretical treatment, although admittedly more thorough than that found in many other works, nevertheless falls short of that which would satisfy a physically trained reader. Quite apart from these considerations, the increased price of the work puts it completely out of reach of the student, and this emphasizes the fact there is still need for a text-book of crystal optics, elementary in its approach and yet with something of the satisfying rigour of, say, Preston's *Theory of Light* long since out of print.

The volume is a beautiful example of book production for which the printer, the Pitman Press, deserves special commendation. The work has been completely reset in slightly smaller type and with the lines less widely leaded, the result being a marked improvement in legibility and in the appearance of the page. The many figures are admirably drawn and excellently reproduced, but the legends would be more readable if less generously capitalized. It is surprising to find that *Acta Crystallographica* is not listed (and that *Mineralogical Magazine* is) among the journals in which the physical properties of chemical substances are often recorded. The frequent use of '*op. cit.*' in the references is a needless irritation to the reader: the reference on p. 349, for example, can be traced only by turning back page by page for no fewer than 38 pages. It is a pity that we are not told more about the 'universal crystal' tantalizingly referred to in the legend of Fig. 236; or is it that three generations of proof readers have nodded?

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### **Index of Manufacturers of Apparatus and Materials Used in Crystallography.** International Union of Crystallography, 2nd Edition 1959.

The precursor of this work published in 1956 was a slim pamphlet compiled by Prof. Guinier. Both this and its contemporary 'Index of Products and Suppliers for Crystallographic, X-ray Diffraction, Electron Diffraction and associated studies' of the American Crystallographic Association have proved their value, and appropriately the second edition is on a more ambitious scale. It has been amplified in various ways. It is bilingual (French and English), it has drawn on the A.C.A. sources, and an entirely new bibliographical section has been inserted. The format is much improved and enlarged. The editor has had a rather difficult problem in deciding where to draw the line between crystallography and the rest; the solution is a reasonable compromise. Another borderline problem has been solved: the Beevers-Lipson strips are a 'machine', not a 'book'. The text-book section seems satisfactory, although a single chronological list is perhaps not the best way to index it. An alphabetical author index giving only the date would have been a useful addition while occupying only about two extra pages.

The text is carefully revised. Users will be grateful to Dr A. J. Rose and his collaborators for their painstaking efforts and to the Société française de Minéralogie et de Cristallographie who advanced the money for publication.

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