Book Reviews

Works intended for notice in this column should be sent direct to the Editor (A.J.C. Wilson, Department of Physics, The University, Birmingham 15, England). As far as practicable books will be reviewed in a country different from that of publication.

Reports on progress in physics, Volume XXVIII. Edited by A.C. STICKLAND. Pp. iv + 517. London: The Institute of Physics and The Physical Society, 1965.

The 1965 volume of *Reports on Progress in Physics* should be of a more than usual interest to crystallographers. The opening contribution is Sir Lawrence Bragg's account of the early stages of the long way to the X-ray analysis of proteins, in particular of myoglobin. D.W. Pashley writes on *The direct observation of imperfections in crystals*. The exposition is kept elementary and concise and avoids successfully the danger of delving into too much detail. It should therefore be attractive to the non-specialist. In a theoretically orientated article A.A. Maradudin discusses the effects of point defects on the lattice vibrations of crystals, a subject which has recently seen promising advances both on the experimental and on the theoretical side. In a review of the techniques of X-ray microscopy V.E. Cosslett comes to the conclusion that the scanning microscope has left behind in importance all the older methods.

Other articles of interest to the solid state physicist are *Photoconductivity* by T.S. Moss, reviewing in particular the experiments on Group IV elements as well as III–V and II–VI-compounds, *The equation of state of dense systems* by J.S. Rowlinson, discussing mainly some of the modern approaches to the theory of dense liquids, *Thermomagnetic effects in semiconductors and semimetals* by R.T. Delves, and *Solid-state polymerization induced by radiation* by A. Charlesby. N.M. Hugenholtz's *Quantum theory of many-body systems*, which treats one of the most difficult problems of solid state theory with admirable lucidity, deserves special mention.

A. SEEGER

Max-Planck-Institut für Metallforschung
Institut für Physik
7 Stuttgart
Azenbergstr. 1
Germany

Boron. Vol. 2. Preparation, properties and applications. Edited by G.K. GAULÉ. Pp. xvi + 345. New York: Plenum Press, 1966. Price $12.50.

Volume 1 was reviewed in *Acta Cryst.* **14**, 442 (1961), and the general description still holds. The book is photographically reproduced from justified typescript, and the appearance is as attractive as this method of production permits. Volume 1 contained no indexes; it is gratifying to note that Volume 2 has at least a subject index.

There are four parts: Preparation, purification, and analysis (six papers); Structure (four papers); Electronic and mechanical properties (thirteen papers); and Applications (two papers). The section on structure is naturally the one of greatest interest to crystallographers. It contains a description of the previously unknown β-rhombohedral boron structure, by J.L. Hoard and R.E. Hughes. This structure was originally announced in the *Journal of the American Chemical Society* and the short report published there is reprinted with an extra three pages of discussion. H.J. Becher describes tetragonal boron and its relation to certain borides, and R.H. Wentorf describes a high-pressure form at present characterized only by its powder pattern. Many of the other papers contain incidental crystallographic material, and F.E. Wawner's paper on 'amorphous' high-strength boron filaments is of considerable interest.

A.J.C. WILSON

The University
Birmingham 15
England

Methods of X-ray spectroscopic research. By M.A. BLOKHIN. Translated from the Russian to English by F.L. CURZON; edited by M.A.S. ROSS. Pp. xv + 448. Oxford: Pergamon Press, 1965. Price 90*s*.

X-ray spectrochemical analysis is based on the important discovery by Moseley who found the wavelengths of the characteristic line spectra varied in a predictable manner from one element to another. The method was not widely applied because of the requirement to make the specimen in the form of an X-ray tube target. The post-World War II developments of high intensity sealed-off X-ray tubes and high quantum counting efficiency X-ray detectors made it possible to use X-ray fluorescent spectra which simplified the practical problems. Today X-ray spectrochemical analysis is almost as widely used as optical emission spectroscopy for a large variety of chemical studies. Crystallographers often use the method to obtain chemical information to supplement X-ray powder data.

The translation of this book by the distinguished Russian X-ray physicist Prof. M.A. Blokhin of Rostov State University presents an opportunity to study the instrumentation and methodology employed in the Soviet Union. The book deals mainly with chemical analysis using electrons to produce the primary X-ray spectra and X-rays to produce the secondary fluorescent X-ray line spectra. The objective is 'to fill the gap in the literature and to acquaint scientific workers, who specialize in the field of X-ray spectroscopy, with the present-day methods of investigation and with apparatus'. The application to the study of chemical bonding, energy levels and similar problems in solid state physics is not included.

The first two chapters contain a description of several demountable X-ray tubes, methods of smoothing and stabilizing the output, and related vacuum methods. No mention is made of the important problem of anode loading, and the characteristic line intensity is given as $I = ki(V - V_0)^2$ without cautioning that the value of the exponent depends on V/V_0, the self-absorption and the angle-of-view of the anode. The third chapter on the measurement of X-ray intensities devotes 32 pages to film methods including tables of formulae for developers and fixers, and 74 pages to ionization chambers, Geiger counters, proportional and