

black and white ones found in most textbooks. If the author had wished to reproduce colour photographs those showing the relationship between the various types of dispersion and the symmetry in monoclinic crystals would have been useful since crystals cut in the most suitable orientation for showing dispersion are not always readily available. Colour printing could have been used to better advantage in three-dimensional diagrams showing ordinary and extraordinary waves passing through a mineral, because however well these are drawn they can be confusing to anyone but the draughtsman.

The ray-velocity surface is introduced for uniaxial materials and then the Fletcher indicatrix but the derivation of the indicatrix from the ray velocity surface is omitted. For biaxial minerals the Fletcher indicatrix is used straight away and the ray-velocity surface only briefly mentioned.

A greater proportion of this book is devoted to the description and use of the Universal stage (59 pages) than in any previous book of its kind and while this is highly commendable it is perhaps ten years too late. The main use of the Universal stage has been for the determination of the variation in composition of zoned crystals and to a large extent this technique has been replaced by use of the microprobe analyser.

The present reviewer has frequently been critical of the high prices charged for students' textbooks and one wonders how much the price of this book has been affected by the inclusion of colour plates. It is certainly a little more expensive than its British rivals but nevertheless it will be included on the author's list of recommended textbooks for first year geology students because the price is not excessive and the standard is adequate for geology students who do require a highly theoretical treatment of the subject.

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ULMER (G. C.), Editor. *Research Techniques for High Pressure and High Temperature*. Berlin, Heidelberg, and New York (Springer-Verlag), 1971. xli+367 pp., 68 figs. Price U.S. \$10 (DM 33.00).

This book consists of a series of articles written by a number of experts in the field of high-pressure-high-temperature experimentation as applied to the earth sciences. The topics covered are oxidation equilibria at high temperature; oxygen equilibria at high temperature and pressure; pressure and temperature control and measurement using hydrothermal techniques in externally heated pressure vessels; pressure calibration in piston cylinder equipment; internally heated pressure vessels; liquid-vapour equilibria; and high-temperature-high-pressure techniques for sulphide studies.

These topics cover most of the fields in which the graduate student, for whom the book is designed, is likely to be involved and thus it provides a useful source of information for someone entering this field of research. The editor warns his readers that the book should be used as a guide and not as a 'blue-print to build a bomb'.

A few minor criticisms follow—repetition of the same information in different contributions, for example three contributors have produced drawings and descriptions

of Tuttle cold-seal pressure vessels when one would have been enough. The description of a welder for welding precious metal tubes is old fashioned since few laboratories will have a 115 V D.C. supply. An A.C. supply to a variac, the output of which is rectified, is a much more convenient method of attaining the same result. In one article a diagram of a laboratory tube furnace is drawn and since this differs from any commercially produced tube furnace in only one respect—it has a cylindrical nickel jacket to distribute the heat more evenly in the centre of the furnace, the diagram might have been replaced by one showing the arrangement used for rapid quenching of samples at atmospheric pressure or in an atmosphere other than air.

The book is well produced by offset lithography and since this has undoubtedly kept the cost to a very reasonable figure of 10 U.S. dollars, it is to be hoped that more books will be produced in this fashion in future.

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ECKERLIN (P.) and KANDLER (H.). *Landolt-Börnstein. Numerical data and functional relationships in science and technology. New Series. Group III: Crystal and solid state physics. Volume 6. Structure data of elements and intermetallic phases.* Berlin, Heidelberg, and New York (Springer-Verlag), xxviii+1019 pp., 1971. Price DM 620.00 (\$179.10).

Research workers of all varieties in the physical sciences will be familiar with Landolt-Börnstein on the shelves of the reference section in almost all scientific libraries. This beautifully produced 'encyclopaedia' in 25 volumes was started in 1950 and since then has been a rich mine of information on the properties of thousands of compounds. Since 1961, a new series of Landolt-Börnstein has been started and this review gives a welcome opportunity to draw attention to its existence. Clearly such a work as Landolt-Börnstein is beyond the pocket of the individual worker who must content himself with smaller, more restricted, volumes such as the *Rubber Handbook* for his personal use. The high price of the present volume need occasion no surprise, especially as its circulation will probably be restricted to the libraries of research institutes.

This volume gives crystal data for elements and intermetallic compounds; these include borides, carbides, nitrides, sulphides, and arsenides, etc. Compounds containing oxygen or a halogen are excluded from this volume and will be dealt with in a further volume (Group III, vol. 7). The scope of the present volume is thus similar to that of Hansen (*Constitution of binary alloys*, McGraw Hill, New York) on the phase diagrams of alloys.

Among the thousands of compounds listed here, only some 360 minerals occur, listed in an alphabetical index at the back. Volume 7 should give a better yield of mineral data.

Compounds are listed in alphabetical order of chemical symbols, and for each compound listed, the authors give, where known, space group, cell dimension, *Z*, experimental and/or calculated density, melting point or upper transformation temperature, structure type, and literature references. The data have been compiled from *Strukturbericht*, *Structure Reports*, Pearson (W. B. Pearson: *A handbook of lattice*