The authors wish to thank Mrs J. Thomson, Imperial College, London University, for preparing the specimens, Dr J. Adam, A.E.R.E. Harwell, for help and advice, and Mr H. D. Mallon, R.M.C.S., Shrivenham, for making the metallographic examination.

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Über die Kristallstruktur des Rhodonits (Mn, Ca) SiO_3. Über die Kristallstruktur des Pyroxmangits (Mn, Fe, Ca, Mg) SiO_3.

Von F. LIEBAU, W. HILMER und G. LINDEMANN. Von F. LIEBAU. *Institut für Anorganische Chemie der Deutschen Akademie der Wissenschaften zu Berlin, Berlin-Adlershof. Deutschland.*

(*Eingegangen am* 3 *Oktober* 1961)

In den Arbeiten von F. Liebau, W. Hilmer & G. Lindemann (1959*a*) und von F. Liebau (1959*b*) sind infolge von Verschiebungen des Ursprungs während der Untersuchungen Fehler aufgetreten, die wie folgt zu ändern sind:

1.) In den Figuren 3 und 4 beider Arbeiten ist die Richtung der *w*-Achse bzw. der *z*-Achse um 180° zu drehen.
2.) In Tabelle 3 der Rhodonitarbeit sind für die Kationen und die Siliciumatome die angegebenen *z/c*-Werte durch $1-(z/c)$ zu ersetzen, die der Sauerstoffatome durch $1/2-(z/c)$.

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Unit cell and space group of L-proline monohydrate. A correction.

By V. SASISEKHARAN, *Department of Physics, University of Madras, Madras 25, India.*

In the paper by Sasisekharan (1959) the *h*0*l* systematic absences are incorrectly reported; they should be

*h*0*l* reflections—only *h* even present.

The space-group deduction is unchanged.

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Reference

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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.

Organic Chemical Crystallography.

By A. I. KITAIGORODSKII [Kitajgorodskij]. Pp. x+541. New York: Consultants Bureau. 1961. Price $17·50.

This book is the translation of a Russian text published in 1955 (with a few sections added). The first chapter is a consideration of molecular sizes and shapes, based on Sutton's book 'Interatomic Distances', and on intermolecular distances from X-ray crystallographic results. By comparisons of related molecules some rough computations of deformation forces are made. Then follow some calculations of the volume increments when certain common groups are added to a number of molecules. The chapter concludes with a well-written account of molecular symmetry.

Chapter 2 gives a clear account of lattice and space-group theory. It is interesting here to see that credit is given only to Fedorov for the elucidation of the space group, and that the modern symbolism is described as the 'International' rather than the Hermann–Mauguin system. The Schoenfliess system is also given, but not by name, and it is appropriately described as 'illogical'.

Chapter 3 is a detailed study of the symmetry of objects in chains, layers and in three-dimensional lattices. The author uses his own notation, and the discussion is made difficult to follow by the introduction of special terms, such as 'unit', 'strip', 'axis of gravity' all of which are not very clearly defined. However the general conclusion is plain enough, it is that some space groups permit close-packing much more readily than others. The author then compares his results with the statistical findings of Nowacki, and does not hesitate to sweep away some of the early space-group determinations when they disagree with his theories. In this chapter also is a table of 'packing coefficients' in aromatic compounds, i.e. the ratio of inherent molecular volume to the total cell volume. The author attaches considerable significance to this quantity.

Chapter 4 gives detailed studies of intermolecular distances in some structures containing molecules of various symmetries. Cubic symmetry is first dealt with, the examples being adamantane and hexamethylenetetramine, and some cases of freely rotating molecules are also considered. Following on tetragonal and hexagonal symmetries the study is made of axial molecules: in the case of the I_2 molecule, for example, a detailed and somewhat curious 'shape' is worked out. Some consideration is then given to the conditions for axial rotation of molecules, and then molecules of lower symmetries are discussed. A lengthy study is made of long chain compounds, a number of possible structures being deduced and compared with observed arrangements where possible. The clathrate compounds are next described, and here the author suggests strong disapproval of the structure of the 'empty' hydroquinone, as its packing coefficient is too small. Finally the chapter concludes with a discussion of isomorphism and solubility in the solid state, again insisting on the importance of structure and packing in these phenomena.

Chapter 5 is the concluding chapter of the book and consists of more than 280 pages of description of the detailed structures of 209 compounds or types of compound. These are quite full and critical accounts. In the case of ascorbic acid, for instance, the author says: 'Determination by trial; hence of low accuracy ($\pm 0{\cdot}07$ Å), also because there is no centre of symmetry': he goes on to complain that the ring is flat and contradicts the results from other structures. However there is some doubt about the validity of this criticism since the ascorbic acid ring contains a double bond, and is thus not strictly comparable with the other ring structures quoted.

It is refreshing to find a book like this which although something of a compendium, yet has a definite thesis, and the thesis strongly declaimed is that shape is of prime importance in organic structures and should be more thoroughly studied. Some readers would probably prefer a little less geometry and a little more chemistry, and indeed the author in his foreword is aware of this likely line of attack. However it is undoubtedly the crystallographer's work to promote the application of geometrical ideas as far as possible, and this book is a notable contribution in this direction.

The translation is extremely well done, although the use of the word 'spacing' for 'distance' is unfortunately common. There are very few errors. The diagrams (more than 500 of them) are excellent and the author has also used many space-filling models to illustrate his material. The book will be welcomed as a vigorous contribution to the literature of X-ray crystallography.

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The Rare Earths. Edited by F. H. Spedding and A. H. Daane. Pp. xi + 641. London: Wiley. 1961. Price £5·18·0.

This collective work has twenty-four chapters and involves about thirty authors. It is divided into four sections: Occurrence and extraction of rare earths (71 pages), Preparation of rare-earth metals (98 pages), Properties of rare-earth metals and alloys (276 pages), and Applications of rare-earth metals and compounds (159 pages). There is a good subject index (27 pages), but no author index.

The third section is crystallographically the most interesting. Chapter 13 contains a summary table of the structures of the metals, and chapter 14, by K. A. Gschneider Jr., discusses the structures and their allotropic relationships in some detail (25 pages). Cerium leads, with four allotropes, lanthanum has three, and about half the rest have two, some being high- or low-temperature forms. Neutron-diffraction studies and magnetic structures are treated only briefly. Chapter 16, Rare-earth metal phase diagrams, by C. E. Lundin, is the longest in the book (162 pages). This gives, after an introduction, 95 binary phase diagrams and brief particulars of what is known about another 300 or so binary systems. The unit cell, and sometimes other structural information, is given when known, and there are many references. 'Alloys' is interpreted liberally, to include borides, hydrides, nitrides, oxides, phosphides, sulphides, selenides, and tellurides. It is probable that it is for this chapter that the book will be consulted most frequently, though some of the technical applications make fascinating reading ('burnable poisons are actually long-term shim controls').

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Chemical Crystallography. An Introduction to Optical and X-ray Methods. By C. W. Bunn. Pp. XIII + 509. Second Edition 1961. Oxford: Clarendon Press. Price 60*s*.

The scope and plan of this book are unchanged from the first edition (1945), but the later chapters are now brought up to date by the inclusion of material on intensity statistics, optical-transform methods, the determination of absolute configuration, and a few other recently developed topics.

The first part of the book deals with the identification of materials by means of the study of crystal shape and symmetry, by optical examination (refractive-index determination), and by X-ray powder photography. Excellent accounts are given of all these subjects, written in a clear and logical yet 'down to earth' fashion which could only be done by someone really familiar with the practical aspects of the subject. At the same time the underlying theory is very well displayed and with the advantage of appropriate illustration from actual crystals.

The second part of the book deals with single crystal methods, starting with the determination of cell dimensions by means of rotation photographs (including the 'tilted-crystal' procedure) and the uses that can be made of such measurements. Then follows a chapter on the measurement of X-ray reflexion intensities and the underlying theory, and on the determination of space groups. Trial-and-error methods are fully illustrated and structure-factor charts and graphs discussed, along with optical-transform methods. The effect of structure on physical properties is outlined, so that these properties can be made use of in structural work. A number of