

## Book Reviews

*Works intended for notice in this column should be sent direct to the Editor (P. P. Ewald, The Queen's University, Belfast, Northern Ireland). As far as practicable books will be reviewed in a country different from that of publication.*

**Kristallografie.** By P. TERPSTRA. Pp. 372, with 253 figs. Groningen-Batavia: J. B. Wolters Uitgevers-Maatschappij. 1946. Price fl. 29.40.

Dr Terpstra is the Director of the Crystallographic Institute of the University of Groningen. His latest book is both a manual on goniometry and a text in geometrical crystallography. The only mathematics required is that taught in Dutch secondary schools. Written primarily for the novice, this book will nevertheless appeal to the professional by the thoroughness with which some topics are treated.

The first two chapters (43 pp.) discuss gnomonic and stereographic projections. Numerous constructions are given; many auxiliary devices are described. Of interest is Terpstra's 'ray point' (*straalpunt*), which is used for determining interzonal angles in much the same way as the familiar angle point for interfacial angles. Chapter 3 (59 pp.) gives the Law of Rationality, explains Terpstra's concept of 'normal pattern' (*normaalpatroon*), and indicates how calculations and indexing are made on a stereogram or a gnomogram. Anharmonic and harmonic ratios of four faces in a zone, transformations of axes, cyclographic and triangular-gnomonic projections complete the chapter.

Chapter 4 (43 pp.) deals mainly with point-group symmetry. The Hermann-Mauguin symbols are introduced, but only as synonyms for the Schoenflies ones, still preferred. Six crystal systems are recognized. The rhombohedral extinction criterion— $(2h + k + l)$  divisible by 3—is used to tell on morphological evidence whether a crystal possesses a hexagonal or a rhombohedral lattice. The conflict between the two possible literal notations, namely  $(hki\bar{l})$  with  $i = h + k$  and  $(hk\bar{i}l)$  with  $i = -(h + k)$ , which prevails in America (Donnay, 1947), is also found in this book; the first convention is used, for instance, on p. 122, and the second one on pp. 127 and 129. Rules for the choice of the unit cell are based on Barker's Principle of Simplest Indices; rules for the conventional orientation of the cell, though partly expressed in terms of habit, essentially agree with those proposed by the reviewer (Donnay, 1943*a*, *b*, *c*).

Chapter 5 (24 pp.) is devoted to the Law of Bravais, the reciprocal lattice, and various methods for determining interplanar distances and mesh areas. Fedorov's method is evaluated as an ingenious application of Bravais's principle, which it indeed is. Friedel's celebrated example of wappelite, illustrating the morphological determination of the lattice mode, is followed by a brief reference to the generalization of the Law of Bravais and morphological determination of space groups. Chapter 6

presents (in minute detail, 47 pp.) the Barker system for the determination of measurable crystals. Van Weerden's method for triclinic crystals is explained, and his extensive tables (18 pp.) are reproduced at the end of the book. Prof. Terpstra and his students are well-known 'Barker workers'.

Chapter 7 (45 pp.) gives a complete account of crystallographic calculations, without or with spherical trigonometry, from two-circle or one-circle measurements. Interesting nomographs provide easy checks. Chapter 8, on crystal drawing (19 pp.), tells how to deduce an orthographic parallel perspective from either a gnomogram or a stereogram. Directions are also given to construct crystal models out of cardboard or to cut them from plaster of Paris. Chapter 9 is a thorough discussion (42 pp.) of goniometers. Its last page shows an interesting two-circle model in which the optical axes of collimator and telescope lie in a vertical plane passing through the axis of the horizontal circle. This set-up increases the angle through which the vertical circle (and the crystal) can be swung around the vertical axis, thus making many faces of the 'lower hemisphere' accessible to measurements.

Fifty-one problems, carefully stated (13 pp.), are followed by concise answers (4 pp.). (First prize for concision goes to answer to problem no. 43—'Ja'!) The alphabetical index is accompanied by a detailed table of contents, which gives a good synopsis of the work. The 253 figures, all of them professionally redrawn, are excellent. Printing and bookmaking are remarkable, the more so since this book was published in the Netherlands in mid-1946, despite many shortages.

In the introduction Dr Terpstra warns the students that this is not a book to be swallowed at one gulp and memorized from cover to cover; with this the reviewer agrees. It is a book to be browsed through and enjoyed at leisure. It contains a wealth of information, with many an unusual slant, and numerous valuable references. Written during the war by a man fighting grief and starvation, this beautiful volume stands as a lesson in intellectual courage.

### References

- DONNAY, J. D. H. (1943*a*). *Amer. Min.* **28**, 313.  
 DONNAY, J. D. H. (1943*b*). *Amer. Min.* **28**, 470.  
 DONNAY, J. D. H. (1943*c*). *Amer. Min.* **28**, 507.  
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