

BOOK REVIEW

X-RAY CRYSTALLOGRAPHY, AN INTRODUCTION TO THE INVESTIGATION OF CRYSTALS BY THEIR DIFFRACTION OF MONOCHROMATIC X-RADIATION, by M. J. BUEGER, Associate Professor of Mineralogy and Crystallography, Massachusetts Institute of Technology. New York, John Wiley and Sons, Inc.; London, Chapman and Hall, Ltd., 1942. Pp. xxii+531, figs. 252, and end-paper diagrams. 6"×9". Cloth. Price \$6.50.

Professor Buerger states that this book is devoted to the geometry of the space patterns in crystals; it thus deals with the crystal class, the space lattice (its type and dimensions), and the space group. The field so delimited is one not previously treated with sufficient fullness in any one book to meet practical needs; the author covers it very thoroughly and his book will be very useful to all those having to investigate crystals with x -rays, either as a part of the determination of an atomic arrangement or in the course of systematic crystallographic studies.

The moving film methods, which permit the straightforward determination of the geometric properties mentioned above, occupy the largest part of the book. They include the Weissenberg method, the Sauter method, the Schiebold method, and the DeJong and Bouman method. The earlier rotation and oscillation methods are also discussed in detail. The equi-inclination Weissenberg method receives the largest amount of space devoted to any one method; the reviewer considers this to be in keeping with its comparative utility. In a section entitled "Advantages of taking Weissenberg photographs by the equi-inclination method" Professor Buerger writes "it is uniquely possible for the equi-inclination method to record central lattice rows as straight lines, and thus permit easy reconstruction of the reciprocal lattice, and also, more generally, to record the lattice rows of all layers as curves of similar shape, and consequently permit indexing directly on the film." These important advantages of the equi-inclination method he discovered several years ago. Additional advantages of the equi-inclination Weissenberg method over the methods involving perpendicular incidence might well have been mentioned explicitly at this point; for example, with the equi-inclination method there is no blind area around the rotation axis in any reciprocal lattice layer so that no planes of low indices fail to register on the diffraction photographs.* Besides the chapters devoted to experimental methods, others are devoted to: Some Geometrical Aspects of Lattices; The Diffraction of X -Rays by Crystals; Space-Group Extinctions; The Reciprocal Lattice; Geometrical Interpretation of Bragg's Law: Application of the Reciprocal Lattice to the Solution of X -Ray Diffraction Problems; The Geometry of Oblique Cells and Their Reciprocals; The Experimental Determination of the Lattice Constants of the Crystals Belonging to the Oblique Systems; The Theory of Attaining Precision in the Determination of Lattice Constants; The Precision Determination of the Linear and Angular Lattice Constants of Single Crystals; The Theory and Interpretation of Reciprocal Lattice Projections. The ionization spectrometer method introduced by the Braggs is not discussed, although it was the first method by means of which the dimensions of the unit cell could be rigorously determined and the x -ray diffraction effects unambiguously indexed. It also has an important practical application at the present time.

Under the heading "The choice of elements and setting of a triclinic crystal" three rules are given for attainment of a unique setting. Unfortunately these rules cannot be

* Analysis of intensities is left outside the scope of the book, but since some mention is made of intensity factors it may be noted in passing that it has been shown by the reviewer that the equi-inclination method possesses equally important advantages in respect to the intensities of the diffraction spots.

applied in all cases. Progress toward the result aimed at has undoubtedly been made by Professor Buerger and other crystallographers in recent years and it is reasonable to hope that agreement on suitable rules may be reached in the near future.

A section of great mathematical elegance is that of the interpretation of *x*-ray photographs by means of plane-groups, one of Professor Buerger's own contributions.

The author points out that the term *lattice* is frequently misused at the present time. The term properly means an array of points in space produced by periodic translational repetition of an original point. He rightly states that the term *lattice* should not be construed to mean the actual material crystal structure of packed atoms.

The author's terminology is not altogether felicitous in a few places. For instance, *symmetry operations* are called "elements of repetition" (p. 2); the new term "line lattice" is used with two different meanings (p. 4 and p. 34); the *symbol* of three *indices* (*hkl*) is called the "index."

In conclusion, it may be stated that a large number of excellent line drawings and half-tone reproductions of *x*-ray photographs will assist the reader to grasp with a minimum of effort the rather complicated geometrical relations involved in *x*-ray crystallography.

The material presentation of the book is up to Wiley's usual high standard. The small number of typographical errors can easily be corrected in the next printing.

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CANCELLATION OF OTTAWA MEETING

Because of the war and the attendant difficulties, bringing increased burdens upon the membership of the society, together with the difficulties of travel and arranging accommodations, the Council of the Mineralogical Society of America has voted to cancel the meeting originally scheduled for Ottawa, December 29-31, 1942. This follows the action of the Council of the Geological Society of America which has cancelled the concurrent meeting of that society.

Abstracts for papers to be published will be received as usual, but publication of the official program for the annual meeting will be omitted this year. Abstracts submitted will be published in the March issue of the journal along with the report on the affairs of the society for 1942.

PAUL F. KERR, *Secretary*