to the position from which it is believed to have been displaced. The resulting map displays the several slices in their relative original positions; paleogeography drawn on the base is realistic with respect to the width of seaways, and the present outcrops are in their proper place in the ancient geography. A similar base map has been prepared for eastern North America.

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SCIENTIFIC BOOKS

THE DETERMINATION OF CRYSTAL STRUCTURES

International Tables for the Determination of Crystal Structures. Volumes I and II. Gebrüder Borntraeger, Berlin, cooperating with the Chemical Catalog Company, New York. 692 pages. 1935. 33 R.M. geh. 40 R.M. gebd.

THE tables have been prepared by an international committee of some twenty of the foremost x-ray crystallographers, under the editorship of C. Hermann, and with honorary editors, Sir William Bragg and M. v. Laue. As stated in the preface, the tables arose from the need for an international standard work with a nomenclature to which all papers on crystal structure might be referred. The aim is to put an end to the previous state of affairs, in which, in order to read the literature of crystal structure determinations, it was necessary to possess a knowledge of the many tabular works with their various abbreviations and different choices of axes and origins.

The unification of space group terminology has been accomplished by introducing the new system of Hermann and Mauguin. The great advantage of this system over previous ones is found in the fact that the symbol itself gives the complete spatial picture of the symmetry elements. Although the primary purpose of the tables is to present the new unified space group notation, advantage is taken of the opportunity to present a great deal of other information of considerable use to the x-ray crystallographer.

The first two chapters of Volume I explain the new nomenclature and correlate the new notation for crystal classes and space groups with the older schemes of notation. The next two chapters present the crystal classes, equivalent faces, translation groups and the various transformations of axes. Chapter V comprises the greater part of Volume I and presents the 230 space groups. Under each space group the following information is given: the Schoenflies symbol and the new symbol; the special positions; a diagram showing the equivalent points in the general position; a diagram giving the spacial arrangement of the symmetry elements; the point symmetry in the special position; the sub-groups; the structure factor, and the general vanishings. The tabulated structure factors for each space group will certainly be welcomed by all structure workers. In Chapter VI the space group criteria are collected in the most suitable form for space group determination. The final chapters present the point symmetries of the special positions and a table of lattice complexes.

The second volume is devoted to mathematical and physical tables. A chapter on quadratic forms gives the necessary formulae, together with useful tables, such as $h^2 + k^2 + l^2$. The next chapter includes goniometric tables and the extremely useful tables $\sin 2\pi x$ and $\cos 2\pi x$ with x varying in steps of 0.001 from zero to unity. The value of these two tables for structure factor calculations can hardly be overemphasized. The next section includes a very useful summary of the more important intensity formulae, together with tables of atomic scattering factors, absorption coefficients, absorption factors, wave-lengths, glancing angles and atomic and ionic radii. The last chapter is on graphical methods. The choice of subject-matter in this chapter is rather poor, the relative amount of space and emphasis given to the different methods appears to bear no relation to the importance of the method in actual practise. For example, a more complete treatment of the methods of indexing Weissenberg patterns and full-page reproductions of the tetragonal and hexagonal Hull charts would have been decidedly more useful than Figs. 53 and 54, which are intended for graphical indexing of *cubic* powder patterns. Much of the material in this chapter should have been omitted.

As a whole the International Tables constitute an excellent piece of work, which can be most highly recommended. The material is well arranged and the figures and printing first class. The editors and contributors have worked hard to give the science of x-ray crystallography a unified system of notation; it is now up to the workers in this field to cooperate by adopting it.

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THE ANIMAL PARADE

Parade of the Animal Kingdom. By ROBERT HEGNER, assisted by JANE Z. HEGNER. New York: Macmillan, 1935. 675 pp., over 700 illustrations.

A DISTINGUISHED worker among the poor of London once remarked to me that when people became utterly