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.

G. MARSHALL KAY

COLUMBIA UNIVERSITY

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.

B. E. WARREN

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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

depraved, it seemed that the last good reaction which survived was the love of flowers. This deep-seated feeling manifests itself very early in life and perhaps may be described as essentially a love of beauty, of form and color. But the animal world adds a third element, that of movement, and all who have to do with children know how great is their delight in the activities of living things. The beauty, mystery and romance of animal life are inexhaustible, and their contemplation should be a constant source of delight throughout life. To the pageant passing before the unaided eye we now add the marvels revealed by the microscope and I well remember how, as a child, I regarded with extraordinary interest every puddle by the roadside after being shown the life in a drop of water.

There have been many natural history books, but there certainly was room for a new one, relatively complete and up to date, containing the many beautiful photographic illustrations which are now available. This has been supplied by Professor Hegner, and probably it will appear, when all his numerous services to education are recounted, that this work has been the most far-reaching in its effects. It begins with the Protozoa, including Volvox but not the Mycetozoa, and continues through the various groups, to end with the gorilla. We miss some interesting forms, such as Peripatus, and it would really seem that the closing chapter should have dealt with the Hominidae. The book seems remarkably accurate, and I have not found a single misprint. It is easy to point out various omissions; thus we are told that the San Jose scale appeared in 1880 near San Jose, California, but nothing is said of its origin. The sea-slugs are described as having protective coloration, but nothing is said of the splendid warning colors of certain genera. Such omissions are inevitable and presumably for the most part deliberate, to avoid increasing the size of an already large book. I do not quite understand why all the land slugs are described as "garden slugs." The information given relates principally to the habits of the animals, and it seems to me that the author has been remarkably successful in presenting an abundance of facts with a minimum of technical expressions. Some popular writers are so anxious to appeal to the unthinking multitude that they leave out the materials for thought. Hegner has an entirely different aim; he wishes to stimulate thought and observation, and he knows full well that the active-minded young person will gladly enter the open door to mysteries at first (and indeed, at last) not fully understood. There is one matter concerning which I feel some doubt. The first chapter begins with a rather long pseudoserious account of Noah and his Ark, and the last ends: "Noah must have heaved a sigh of relief when the gorillas finally entered the ark and the gangplank was hauled in. We hope they all had a pleasant time on board. We know that every species landed safely on Mount Ararat, since it has been our privilege to describe their descendants in this book."

Now it is a fact that in my own case, Noah was associated with the beginnings of zoological knowledge. I had a Noah's Ark, full of animals carved in wood, and many a parade was staged on the nursery floor. Somewhat later, I used to lustily sing:

Oh, Noah of old he had an ark,
Hurrah, hurrah!
He set it afloat in Regents' Park,
Hurrah, hurrah!
And they all came marching in.

The animals came in one by one,
Hurrah, hurrah!
The elephant eating a penny bun,
Hurrah, hurrah!

And so on through many verses now forgotten. But in spite of this extreme levity toward Noah, I did not find him in my natural history books, and I do not think I wanted him there. I notice that the first part of Hegner's work is rather abundantly leavened by humorous allusions, but toward the end these seem to give out. On the whole I doubt their value, and prefer the more sober style. But I wonder whether this feeling will be at all generally shared by readers, young or old. Something might have been added concerning the use of moving pictures to depict the activities of animals. Such pictures will admirably supplement Hegner's "Parade," and will serve to further develop the interest which he has stimulated.

T. D. A. COCKERELL
UNIVERSITY OF COLORADO

REPORTS

YALE LABORATORIES OF PRIMATE BIOLOGY, INCORPORATED

INCORPORATION in Florida of the Anthropoid Experiment Station of Yale University, which is located at Orange Park, Florida, is hereby announced and the following summary statement is offered concerning the history, status and objectives of the establishment.

In 1925 Yale made provision for the systematic use of chimpanzees in biological research by creating as a section of the Institute of Psychology a Primate Labo-