SCIENTIFIC BOOKS

Die Geschlechtschromosomen. Zellen- und Befruchtungslehre, FRANZ SCHRADER. Borntraeger, Berlin, 1928.

IN the compass of 194 pages Professor Schrader has given a summary in English of the present status of the sex chromosomes. The book gives from first-hand knowledge a judicious summing up of the literature, both from the cytological and genetic point of view, especially the former. The historical background of the various advances in our knowledge of the sex chromosomes is carefully considered. The extensive material, which might so easily make only a dull summary, has not only been carefully catalogued, but the important points have been emphasized and discussed under their respective headings. There is, for instance, an introduction to the whole subject of about sixty pages, covering most of the problems under consideration to-day. This is followed by a systematic review of the sex chromosomes, considered from the point of view of the larger groups of the animal kingdom. Each minor section is introduced by a brief critical discussion, in which the author does not hesitate to express his opinion in regard to the individual contributions. A treatment of this sort, when unprejudiced and cautious, makes the reading more interesting and valuable than if no such discrimination were attempted. A brief summary of the recent results relating to sex chromosomes in plants is added. A sufficient bibliography follows. The latter will be useful in following up the references in the text, although it is difficult to disentangle the literature dealing with the sex chromosomes from the remainder of the literature of cytology.

Never before in the history of the subject has there been so much activity shown in the study of the number of the chromosomes, especially in plants. Scarcely a week goes by without one or more papers in the journals giving new counts. Most of these papers deal only with the number of chromosomes in a given group and are, therefore, purely descriptive. Nevertheless, they are useful in bringing to light suitable material for genetic work. The part played by chromosome changes in many of our cultivated varieties of plants has aroused widespread interest. Schrader's summary will be very helpful to students of this new literature who wish to keep in contact with the historical development of the subject. His familiarity both with the cytological and genetic evidence greatly enhances the value of his review.

T. H. M.

Foraminifera. Their Classification and Economic Use. By JOSEPH A. CUSHMAN. Sharon, Mass., Special publication No. 1, Cushman Laboratory for Foraminiferal Research, 401 pp., 59 plates, 1928.

THIS is the most comprehensive review of the Foraminifera that has appeared in modern times. It is largely devoted to the systematic treatment of the genera of this protean group, but there are special chapters devoted to more general subjects, such as "The Living Animal," "The Test," "Collecting and Preparing Material," "Methods of Study," "Geographic and Geologic Distribution," and "Economic Uses."

The author recognizes 411 valid genera of these shelled protozoans and cites in addition 196 synonyms. Many of the genera are based upon old species inadequately described in the early works of last century, and Dr. Cushman has, therefore, taken the pains to go abroad and reexamine the type specimens for the great majority of all these genera. Consequently, his results have a security that could have been attained in no other way.

In the treatment of each genus its genotype is given, the common synonyms indicated and a brief generic diagnosis is supplemented by an illustration of either the type specimens of the genotype or of some other species especially selected to show the generic characters. The excellent enlarged drawings of these specimens are arranged on fifty-nine full-page plates conveniently distributed through the text.

The present handsome volume is the fruition of the promise given about a year ago in the same author's "Outline of a Reclassification of the Foraminifera." The remarkable progress that Dr. Cushman has made in the systematic arrangement of the Foraminifera is only suggested by his discrimination of forty-five families instead of the ten recognized by previous students. Throughout these families the relationships have been established by a study of the ontogeny of microspheric forms, checked by the chronology of fossil species. The result has been the detection of the repeated development of remarkable homeomorphy and the necessity for the realignment of many species and genera. These and other modifications of shell form are very clearly brought out in a series of illustrated charts which show the mutual relationships of the several genera in each family. There is, in addition, a summary chart showing the interrelations of the forty-five families of the order. The extensive, but selected, bibliography occupying thirty pages of text will be a great aid to all students of the Foraminifera.