BOOKS RECEIVED.

ZOOLOGY FOR HIGH SCHOOLS AND COLLEGES, by A. S. Packard, Jr., M.D., Ph.D. Second edition revised. Henry Holt & Company. New York. 1880.

The second edition of Professor Packard's manual of Zoology supplies a want that has been long felt among Naturalists, for a work of convenient size and form on this subject, with ample illustrations judiciously selected.

In compiling his book the author has freely used the larger works of Gegenbaur, Huxley, Peters and Carus, Claus, Rolleston and others, and even paraphrased or adopted the author's language *verbatim* when it suited his purpose.

In order to secure a greater accuracy of statement, and to render the work more authoritative as a manual of Zoology, Professor Packard has submitted the manuscript of certain chapters to naturalists distinguished by their special knowledge of certain groups. Thus the manuscript of the Sponges was read by Professor A. Hyatt; of the Worms and Mollusca, by Dr. Charles S. Minot; of the Echinoderms, by Mr. Walter Faxon; of the Crustaceæ, by Mr. J. S. Kingsley; of Fishes, by Professor T. Gill, whose classification, as given in his "Arrangement of the Families of Fishes," has been closely followed, his definition being often adopted word for word. The manuscript of the Batrachians and Reptiles was read by Professor E. D. Cope; of Birds and Mammals, by Dr. Elliott Coues, U. S. A.

The work being thus the joint production of so many eminent naturalists, it may be considered a thoroughly reliable guide to the advanced student who desires a general review of the animal kingdom, covering the most advanced teachings up to the date of publication.

The illustrations to this work, five hundred and fifty in number, is one of its most attractive features, and the author acknowledges his obligations to the publisher for his liberal co-operation in producing them. A fair proportion are original. We notice that Dr. C. S. Minot has drawn the full-page illustrations of the typical vertebrates, and that Mr. J. S. Kingsley and Professor W. K. Brooks contributed drawings of the nervous system and otocyst of the clam, while acknowledgment is made to Professor F. V. Hayden, Professor S. F. Baird and others for assistance given.

The work is presented in a handsome, large 12 mo. volume of over 700 pages, printed in large type and on excellent paper.

In regard to the manner in which the subject is treated and the general scope of the book, Professor Packard has designed a work to be used quite as much in the laboratory, or with specimens in hand, as in the class-room. He states that if Zoology is to be studied as a mental discipline, or even if the student desires simply to get a genuine knowledge at first hand of the structure of the leading types of animal life, he must examine living animals, watch their movements and habits, and finally dissect them, as well as study their modes of growth before and after leaving the egg or the parent, as the case may be. But the young student in a few weeks' study in the laboratory cannot learn all the principles of the science. Hence he needs a teacher, a guide, or at least a manual of instruction. This work, which is an expansion of a course of lectures for college students, has been prepared also to suit the wants of the general reader who would obtain some idea of the principles of the science as generally accepted by advanced zoologists, in order that he may understand the philosophical discussions and writings relating to modern doctrines of biology, especially the law of evolution and the relations between animals and their surroundings.

Such is the programme of the author of this book, and we congratulate him on the practical and exhaustive manner in which he has carried it out. The inductive method has been selected, and the student is first presented with the facts; is then led to a through study of a few typical forms, taught to compare these with others, and finally led to the principles or inductions growing out of the facts. He is not assailed with a number of definitions or diagnoses applicable to the entire group to which the type may belong before he has learned something about the animals typical of the order or class; but these are placed after a description of one or a few examples of the group to which they may belong. The simplest, most elementary forms are first noticed, beginning with the Protozoa and ending with the Vertebrates, believing that this is the more logical and philosophical method, and that in this way the beginner in the science can better appreciate the gradual unfolding of the lines of animal forms, which converge towards his own species, the flower and synthesis of organic life.

Professor Packard concludes the above explanation of the general plan of the work by advising the student to commence with Chapter VIII., on Vertebrates, and to master, with specimen in hand, the description of a frog, in order that he may have a standard of comparison, a point of departure, from which to survey the lower forms.

The concluding chapters of the work relate to the comparative anatomy of the organs, the development and metamorphoses of animals, the geographical distribution and geological succession of animals, the origin of species, man's place in nature, instinct and reason in animals. These subjects are lightly touched on, and the problems involved sketched in outline only, the author referring the reader to the works of specialists who have given these matters exhaustive consideration.

Professor Packard has been long prominently identified with practical scientific work covering this department of science, and his present work can be accepted without hesitation as an authoritative manual on the subject. We have read this manual of Zoology with peculiar satisfaction, because it is illustrated by our own more familiar natural objects. The first steps of the student of Zoology are plainly set forth, and by the aid of excellent wood engravings and intelligent descriptions, the various forms of life from the lowest to the highest are made clear to his understanding.

We take pleasure in advising students of Zoology to make use of this work as the best guide that can be secured, and the general reader may study it with advantage, for it treats of a subject of interest to us all, and deals with problems of the highest importance to mankind.

We have received a copy of the Proceedings of the Iowa Academy of Sciences, which covers a report of the work done from its organization in 1875 up to June, 1880.

The President of the Academy is Professor Charles E. Bessey, M. Sc., Ph. D., author of the recently published Manual of Botany, and a Professor in the Iowa Agricultural College.

We recognize among the list of Fellows, many names which are familiar to us, as specialists in various departments of Science, and we regard the Academy as being fortunate in possessing so strong an organization.

At the annual meeting in June last, a series of valuable papers were read, and we regret that the abstracts presented in the report are too brief to enable us to reproduce them with advantage.

We hope to be able to publish later, comprehensive abstracts of papers read before this Academy of Sciences.