COLLEGE ZOOLOGY

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PREFACE

THIS book is intended to serve as a text for beginning students in universities and colleges, or for students who have already taken a course in general biology and wish to gain a more comprehensive view of the animal kingdom. It differs from many of the college textbooks of zoology now on the market in several important respects: (1) the animals and their organs are not only described, but their functions are pointed out; (2) the animals described are in most cases native species; and (3) the relations of the animals to man are emphasized. Besides serving as a textbook, it is believed that this book will be of interest to the general reader, since it gives a bird's-eye view of the entire animal kingdom as we know it at the present time.

Within the past decade there has been a tendency for teachers of zoology to pay less attention to morphology and more to physiology. As a prominent morphologist recently said, "Morphology . . . is no longer in favor . . . and among a section of the zoological world has almost fallen into disgrace" (Bourne). The study of the form and structure of animals is, however, of fundamental importance, and is absolutely necessary before physiological processes can be fully understood; but a course which is built up on the "old-fashioned morphological lines" is no longer adequate for the presentation of zoological principles.

In writing this book the author has attempted, not only to describe the most important structural features of the various types of animals, but also to point out the vital phenomena as expressed in the functions of the organs. Furthermore, an endeavor has been made to compare the animals in each phylum with those of the members of nearly related phyla, so that the

student may realize the unity as well as the variety in animal life.

So far as possible in a limited space, the relations of the animals to other animals, to plants, and to environmental factors in general are considered, and the animals of special economic importance are emphasized. By this method the student is brought into closer contact with and gains a broader idea of natural phenomena. Questions naturally arise in the student's mind, such as, "Where does the animal live?" "What does the animal do?" and "What is this or that particular organ for?" and stimulate interest in the work leading to more careful observations and more accurate inferences.

Each phylum is introduced by a more or less complete account of the anatomy, physiology, and ecology of one, or in certain cases, two or more types. These types were selected with the following requirements in mind: (1) they must represent as nearly as possible an average of the phylum; (2) they must illustrate clearly the characteristics of the phylum so as to serve as an introduction to a comparative study of other members of the group; (3) they must be common native species which can be obtained for direct observations in the laboratory; (4) they must occupy an important position in the animal series; and (5) they must be of special importance to man. Very few types fulfill all of these requirements; in several cases two types have been employed because one was not considered adequate.

It is impossible in one small volume to describe as many different animals under each phylum as might be desired, or to give a full classification of each group. However, a general idea of the various kinds of animals and their habitats can be obtained from the short account included in each chapter. The species mentioned are in most cases the commonest and most representative of those living in North America.

More space has been devoted to the Chordata than to any other phylum, and the classes under the subphylum Vertebrata have been treated in a somewhat different manner from those of the invertebrates. It is customary in studying the

vertebrates to select one species as a type to be examined in considerable detail, and then to compare species belonging to the other classes with it. The animal usually chosen for detailed study is the frog, and this form has therefore been treated more fully in this book than any other vertebrate type. The vertebrates are, as a rule, larger than the invertebrates, are fewer in number, and are usually more interesting to beginning students; they are, on the whole, better known than the invertebrates and more easily observed. For these reasons they have been discussed largely from the natural history standpoint, and it is hoped that this treatment will give students a better idea of the everyday events in the lives of the more common vertebrates than can be obtained from a purely morphological course.

A book covering such a large field as this one must necessarily be more or less of a compilation, and the facts and figures must be selected from numerous textbooks and scientific periodicals. The sources from which the author has obtained a large part of his material are as follows:—

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In an endeavor to avoid as many errors as possible, the manuscript of most of the chapters has been read by zoologists who are authorities in the special field treated therein. It is a great pleasure to thank these gentlemen in this place for the invaluable assistance they have rendered. I am indebted to Professor A. S. Pearse for reading Chapters I–IX; to Mr. Peter Okkelberg for reading the entire manuscript; to Professor G. N. Calkins for reading Chapter II; to Professor H. V. Wilson for reading Chapter IV; to Professor Charles W. Hargitt for reading Chapters V and VI; to Professor W. C. Curtis for reading Chapters VII and IX; to Dr. G. R. La Rue for reading Chapter VII; to Dr. B. H. Ransom for reading Chapter VIII; to Dr. Hubert Lyman Clark for reading Chapter X; to Professor J. Percy Moore for reading Chapter XI; to Mr. H. B. Baker for reading Chapter XII; to Professor A. E. Ortmann for reading the part of Chapter XIII relating to the Crustacea, Onychophora, and Myriapoda; to Professor Vernon L. Kellogg for reading the part of Chapter XIII relating to Insecta; to Mr. J. H. Emerton for reading the part of Chapter XIII relating to the Arachnida; to Professor Alexander G. Ruthven for reading Chapters XIV–XIX; to Professor B. M. Allen for reading Chapter XIV; to Mr. R. E. Richardson for reading Chapters XV–XVII; to Professor Lynds Jones for reading Chapter XX; and to Mr. Marcus W. Lyon, Jr., and Mr. N. Hollister for reading Chapter XXI. I am also indebted to Dr. A. F. Shull for reading a large part of the proof, and to my wife for her especially valuable assistance in reading proof and preparing the index.

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