AN INTRODUCTION TO THE STUDY OF THE COMPARATIVE ANATOMY OF ANIMALS, VOL. I

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GILBERT C. BOURNE

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VOL. I.

ANIMAL ORGANISATION. THE PROTOZOA AND COELENTERATA

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PREFACE

In the following Introduction to the study of the Comparative Anatomy of Animals, I have necessarily been guided by the requirements of the elementary examinations at the leading universities of Great Britain.

Having found by experience that beginners find great difficulty in apprehending the full meaning of the cell-theory at the commencement of their studies, I have departed from the course usually pursued in lectures and practical instruction, and instead of beginning with the study of cells, I have taken the common frog as a type of animal organisation. The general anatomy of the frog is first described in some detail; the microscopic structure of its organs and tissues is next explained, and then the cell-theory and the phenomena of the cell-division are dealt with. In this way I have attempted to lead the student gradually from familiar to new and unfamiliar conceptions.

I have attempted, as far as possible, to verify by personal observation the statements of fact contained in this book, but want of time and opportunity has prevented me from repeating the long and laborious researches of many investigators on such subjects as the reproduction of the Protozoa. Where personal observation has been wanting I have tried to give an adequate account of the best and most recent researches on the subject. In certain cases, however, I have preferred the results of older to those of more recent observers. For example, I have adhered to Maupas' account of the phenomena of conjugation in the Ciliata, because in my judgment the results of the latest researches on this matter require independent confirmation before they can be held to overthrow the results of such careful and consistent work as that of Maupas. Since this book is in part a record of my own observations and not wholly a compilation, I have in several cases departed from the accepted accounts of certain phenomena. Thus the description of the truncus arteriosus

of the frog is based upon models made from my series of sections, and the account of the histology of Hydra is largely new, and based upon my as yet unpublished researches. I have not thought it desirable to burden the elementary student with a list of references to literature, and I must ask original authors to pardon me for making use of their facts and arguments without acknowledgment. But in every case in which figures have been taken from published works full acknowledgment is made. The illustrations have been drawn specially for this book; many by Mr P. J. Bayzand, the skilful artist of the Linacre Department at Oxford. Others are by my friend and pupil Mr E. H. Schuster of New College, Oxford, and the rest have been drawn by myself. Where not otherwise stated the figures are from my own sketches and preparations.

There is a considerable difference of opinion as to the limits of *elementary* teaching in Comparative Anatomy. For my own part, I consider that the more elementary the teaching is in this subject the fuller it should be, and I have not hesitated to enter fully into details where a detailed description seemed necessary, and have discussed certain questions of theoretical importance at considerable length. Students seldom begin the study of Comparative Anatomy at an early age, and they should never begin it until they have mastered the elements of Physics and Chemistry. I have therefore addressed myself, not to children, but to persons whose education is well advanced, and whilst I have tried to write simply and intelligibly, I have not attempted to evade the difficulties of technical language. All technical terms, where used for the first time, are printed in thick type, and are sufficiently explained in the context.

Whilst the faults of this book are entirely my own, I must attribute any merit it may possess to the influence of the three successive occupants of the Linacre chair of Comparative Anatomy at Oxford under whom I have had the honour to serve, the late Professor H. N. Moseley, Professor E. Ray Lankester, and Professor W. F. R. Weldon. Nor must I forget the many lessons I have learned from my whilom colleagues at Oxford, Professor W. Blaxland Benham and Professor E. A. Minchin.

The present volume deals with animal organisation as represented by the Frog, with the Protozoa, and the Cœlenterata. The second volume will deal with the Cœlomate Metazoa. I had hoped to bring out the two volumes simultaneously, but have been called out on military duty since the outbreak of the war in S. Africa, so the completion of the second volume has been delayed.

GILBERT C. BOURNE.

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March 1900.