

PREFACE

Introduction to Animal Biology was written in direct response to the demand for a short text to accompany a one-term course in zoology. It is designed to present to the beginning college student the principles of animal biology needed to appreciate the world in which we live and to be used as a foundation for students who plan to continue studies in the biological sciences. Although this text is based upon the fifth edition of our larger *General Zoology*, *Introduction to Animal Biology* is more than a simple abridgment of that text. To introduce a fresh perspective, a careful selection of the most important concepts and examples in each chapter was made by one of us who had not written the chapter originally. The subjects retained were then reviewed by all of us and reorganized and rewritten as deemed necessary. Each part thus emerges as more of a combined effort than has been true in the earlier editions of the larger book. Not all sections have been reduced to an equal extent, for we recognize that some parts are of greater importance in a one-term treatment of the subject than are others. In addition, we have made improvements in the coverage of certain subjects, we have updated material and we have made some changes in the organization of the subjects within the text. Despite the necessity for brevity in a short text, we have attempted to highlight the major principles and concepts of zoology, to emphasize adaptive design in functional morphology, to direct the attention of the student to major trends in the evolution of processes and of animal groups and to provide some sense of diversity within the major phyla of animals. For each topic we have tried to provide an overview to which factual detail may be appended and related.

The unifying theme throughout this text is the common problems at the cellular, organismal and population levels that are faced by all animals from the simplest to the most complex. All are composed of cells and we begin Part I by exploring the common problems of exchanging materials between cell and environment, of obtaining energy and of synthesizing a variety of molecules. Part II deals with the common physiological problems that all animals must meet to survive and with the similarities and differences in the way this is accomplished by different animals. All animals must be protected and supported, move, exchange gases, transport materials within their bodies, control and regulate their internal environment, sense changes in their internal and external environment and make appropriate responses. All must be able to reproduce their kind if the species is to survive. Part III considers the hereditary factors that enable animals to perpetuate their kind and, at the same time, provide variability so that the group can evolve and adapt to its ever-changing environment. Evolution has resulted in the tremendous adaptive diversity that is explored in Part IV. Members of each phylum have occupied all of the habitats and niches that their basic morphology and physiology permit. Part V considers the population level of zoology. The behavioral interactions

of animals with other members of their own and different species are considered in Chapter 36 and the ecological interactions of animals and plants with each other and with their chemical and physical environment are dealt with in the concluding chapter. We have included a glossary at the end of the book that provides the derivations and meanings of the more important zoological terms. An additional feature of this book is the series of colored pictures of selected animal types that should assist the student in appreciating what the animals look like in their native environment.

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