



*Second Edition*

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# *ANIMAL BEHAVIOR*

*CONCEPTS,  
PROCESSES,  
AND METHODS*

*DRICKAMER  
VESSEY*

*Second Edition*

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*ANIMAL BEHAVIOR:  
CONCEPTS, PROCESSES, AND METHODS*

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*For John A. King, on the occasion of his retirement*

—LCD

*For my wife, Kristin, and for Dr. David E. Davis*

—SHV

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## PREFACE

The study of animals and their behavior has been approached from several perspectives: ethology, comparative psychology, behavioral ecology, and, more recently, evolution. In this text, although we place some emphasis on evolution as a foundation for the study of behavior, we expose the student to a number of approaches and viewpoints and show that these different approaches are complementary, not mutually exclusive.

This text is suited for undergraduates taking their first course in animal behavior and assumes only a limited knowledge of general biology. Our approach and the overall themes regarding concepts, processes, and methods also make the book useful for more advanced undergraduate and graduate students. The nineteen chapters cover all the topics encompassed by modern animal behavior. Because each chapter is self-contained, instructors can select the coverage that suits their personal approach or the needs of their particular course.

Our presentation centers on the questions researchers ask about animal behavior and on the methods they use to answer these questions. We first define and elaborate on the concepts and processes that underlie behavior; and then, in the context of appropriate research examples, we present the methods animal behaviorists use. In this manner the student is introduced to a variety of viewpoints that have contributed to the richness of the discipline.

The text is divided into five major parts. Part I covers the background for the study of animal behavior, including history, methods, approaches, genetics, and evolution of animal behavior. In Part II the mechanisms and processes that control behavior are dealt with. Part III examines the behaviors of individuals and groups

from proximate and ultimate perspectives. Part IV treats topics in behavioral ecology; and Part V is devoted to the evolution of behavior and of social behavior. The first half of the book emphasizes *how* (proximate) questions, the latter half of the text places stronger emphasis on *why* (ultimate) questions. We feel that this organization of the study of animal behavior—from questions pertaining to events inside the animal to discussions of complex environmental interactions—gives a more complete picture of the discipline of animal behavior today than would have been afforded by a functional scheme of classification (for example, maintenance activities and coping with the environment) or by an organization based on Niko Tinbergen's scheme of four questions about behavior (causation, development, evolution, and function).

### CHANGES IN THE SECOND EDITION

The preceding paragraphs introduced the first edition of our book. Reactions to that edition encouraged us to keep the philosophy and approach that made it successful. This revision allowed us to fine-tune the material and to make changes that will improve its usefulness. Some of the following changes were suggested by colleagues who used the book:

- All chapters have been updated to reflect the latest research. The end-of-chapter references now include articles published in 1985.
- All chapters have been revised to make the presentation and flow of material even clearer and more accessible.
- The discussions of genetics (Chapter 5) and of the nervous system (Chapter 6) have been carefully fine-tuned and made more accessible.
- Chapters 8 and 9, entitled "Biological Timekeeping" and "Development of Behavior," respectively, have been thoroughly revised, reorganized and expanded.
- Chapter 11, "Sexual Behavior and Reproduction," and Chapter 19, "Evolution of Societies," have also been extensively revised and reflect the most current understanding of these topics.
- "Habitat Selection," (Chapter 15) now introduces Part IV and is followed by "Feeding Relationships." This reversal of order from the first edition makes for a more logical flow of presentation.
- Finally, new drawings and photographs make this edition more pedagogically effective and attractive.

As in the first edition, discussion questions, extensive references, and a list of annotated suggested readings follow each chapter and provide points of departure for further exploration. A subject index and an author index facilitate access to the

material. Finally, we have paid careful attention to the illustrations, which are meant to support and enhance the textual material and to convey a sense of the excitement of the field; we hope we have succeeded in this attempt.

### ACKNOWLEDGMENTS

We would like to extend our sincere thanks to a number of individuals who have helped us in many ways during the several years that it has taken to complete this book. Special thanks go to our colleagues who read all or part of the manuscript at different stages and provided helpful criticism. To the following who reviewed the first edition: Terry Christenson — Tulane University; Victor DeGhett — SUNY College at Potsdam; Kenneth Able — SUNY at Albany; Robert Mathews — University of Georgia; Ronald Barfield — Rutgers – The State University; Irwin Bernstein — University of Georgia; David Barash — University of Washington; H. B. Graves — The Pennsylvania State University; and Gordon Gallup, Jr. — SUNY at Albany; to Donald Dewsbury, University of Florida, and George Waring, Southern Illinois University, who shared their and their students' experience with the first edition. Their comments helped us shape the revision. And thanks to the following, who read all or parts of the second edition manuscript at different stages and provided helpful criticism: Patricia DeCoursey — University of South Carolina – Columbia; Maureen Powers — Vanderbilt University; George Waring — Southern Illinois University; Arthur Coquelin — University of California – Los Angeles; Terry Christenson — Tulane University; Carl Bassi — Vanderbilt University.

Jerry Lyons encouraged us to write the book, many years ago; Jean-François Vilain deserves special mention for his help and patience through the good times and bad of these two editions. Final manuscript editing and preparations were handled in a competent and able manner for both editions by Robine Storm van Leeuwen; her touch is evident throughout the book. Nancy Murphy and Jeanne Bolden of East of the Sun helped greatly with the production of this edition. To these people we are most grateful. We would also like to thank Kristin Vessey for her editorial advice and typing and Karen Drickamer for her typing. Both our wives deserve a special thanks for their enduring patience as we labored to put the manuscript together.

*Lee C. Drickamer*  
Williamstown

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