

Darwin's writings laid the foundations for modern studies of evolution, and theoretical developments in the mid-twentieth century fostered the Modern Synthesis. Since that time, a great deal of new biological knowledge has been generated, refining evolutionary theory. But while the study of evolution is thriving both as a basic and applied science, the broad scope of evolution—operating across genes, whole organisms, clades, and ecosystems—presents a significant challenge for researchers seeking to integrate abundant new data and analyses into a general theory of evolution.

This book gives us that framework and synthesis for the twenty-first century. Presenting a series of chapters by experts across numerous fields within evolutionary biology, ranging from biogeography to multilevel selection, speciation, and macroevolutionary theory, *The Theory of Evolution* explores evolution's theoretical foundations and their growth, and will enhance future research and understanding.

"This splendid volume lays out key elements of the theory of evolutionary biology, which arguably is the theory that ultimately ties together all the biological sciences. . . . All biologists would profit from a careful reading of this well-crafted volume, and students in particular would benefit from grappling with its clear exposition of many core issues in evolutionary biology."

Robert D. Holt, coeditor of *Metacommunities: Spatial Dynamics and Ecological Communities*

"Theory is of increasing interest among biologists and importance in the field of biology. This multiauthored book explores the nature of theory in evolutionary biology as a whole as well as in subdisciplines. No such book exists presently. A major theme is the pressing need to better integrate philosophical inquiry into evolutionary biology. There are several subthemes with that. One of these is the inference of process from pattern—a vital activity in science, but one wherein one can easily be led astray."

Norman A. Johnson, author of *Darwinian Detectives: Revealing the Natural History of Genes and Genomes*

CONTRIBUTORS: Joel Cracraft, Scott V. Edwards, Patrick Forber, Gordon A. Fox, Steven A. Frank, Rosemary Gillespie, Charles Goodnight, Robin Hopkins, David Jablonski, Maureen Kearney, Jun Ying Lim, Alan C. Love, James Mallet, James McInerney, David P. Mindell, Marco J. Nathan, Maria E. Orive, Patrick C. Phillips, Timothée Poisot, Andrew J. Rominger, Samuel M. Scheiner, and Vassiliki Betty Smocovitis

SAMUEL M. SCHEINER is a theoretical biologist with work in various areas of evolution, ecology, and general biology. He is coeditor, most recently, of *The Theory of Ecology*, also published by the University of Chicago Press.

DAVID P. MINDELL is an evolutionary biologist and visiting scholar at the University of California, Berkeley, Museum of Vertebrate Zoology. He is the author of *The Evolving World: Evolution in Everyday Life*.

Cover design: Isaac Tobin

Cover photo: Cover photo-art of a Ferruginous Pygmy-Owl by Diane Mindell Epstein.

the university of chicago press

www.press.uchicago.edu

ISBN-13: 978-0-226-67116-1

ISBN-10: 0-226-67116-X



9 780226 671161

9 0000