

Evolutionary Biology By Douglas J Futuyma

Provides an explanation of evolutionary processes, a refutation of the claims of creationists, and insight into the nature of scientific inquiry

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Extensively rewritten and reorganized, this new edition of *Evolution*--featuring a new coauthor: Mark Kirkpatrick (The University of Texas at Austin)--offers additional expertise in evolutionary genetics and genomics, the fastest-developing area of evolutionary biology. Directed toward an undergraduate audience, the text emphasizes the interplay between theory and empirical tests of hypotheses, thus acquainting students with the process of science. It addresses major themes--including the history of evolution, evolutionary processes, adaptation, and evolution as an explanatory framework--at levels of biological organization ranging from genomes to ecological communities.

American politics grows embittered because it is increasingly torn between two rival constitutions, two opposed cultures, two contrary ways of life. American conservatives rally around the founders' Constitution, as amended and as grounded in the natural and divine rights and duties of the Declaration of Independence. American liberals herald their "living Constitution," a term that implies that the original is dead or superseded, and that the fundamental political imperative is constant change or transformation (as President Obama called it) toward a more and more perfect social democracy ruled by a Woke elite. *Crisis of the Two Constitutions* details how we got to and what is at stake in our increasingly divided America. It takes controversial stands on matters political and scholarly, describing the political genius of America's founders and their efforts to shape future generations through a constitutional culture that included immigration, citizenship, and educational policies. Then it turns to the attempted progressive refounding of America, tracing its accelerating radicalism from the New Deal to the 1960s' New Left to today's unhappy campus nihilists. Finally, the volume appraises American conservatives' efforts, so far unavailing despite many famous victories, to revive the founders' Constitution and moral common sense. From Ronald Reagan to Donald Trump, what have conservatives learned and where should they go from here? Along the way, Charles R. Kesler argues with critics on the left and right, and refutes fashionable doctrines including relativism, multiculturalism, critical race theory, and radical traditionalism, providing in effect a one-volume guide to the increasingly influential Claremont school of conservative thought by one of its most engaged, and engaging, thinkers.

Presents an introduction to evolutionary developmental biology which studies genes and their role in biological diversity and evolution.

Evolution, biology, and society is a catch-all phrase encompassing any scholarly work that utilizes evolutionary theory and/or biological or behavioral genetic methods in the study of the human social group, and *The Oxford Handbook of*

Evolution, Biology, and Society contains an much needed overview of research in the area by sociologists and other social scientists. The examined topics cover a wide variety of issues, including the origins of social solidarity; religious beliefs; sex differences; gender inequality; determinants of human happiness; the nature of social stratification and inequality and its effects; identity, status, and other group processes; race, ethnicity, and race discrimination; fertility and family processes; crime and deviance; and cultural and social change. The scholars whose work is presented in this volume come from a variety of disciplines in addition to sociology, including psychology, political science, and criminology. Yet, as the essays in this volume demonstrate, the potential of theory and methods from biology for illuminating social phenomena is clear, and sociologists stand to gain from learning more about them and using them in their own work. The theory focuses on evolution by natural selection, the primary paradigm of the biological sciences, while the methods include the statistical analyses sociologists are familiar with, as well as other methods that they may not be familiar with, such as behavioral genetic methods, methods for including genetic factors in statistical analyses, gene-wide association studies, candidate gene studies, and methods for testing levels of hormones and other biochemicals in blood and saliva and including these factors in analyses. This work will be of interest to any sociologist with an interest in exploring the interaction of biological and sociological processes. As an introduction to the field it is useful for teaching upper-level or graduate students in sociology or a related social science.

Named A Best Book of the Year by World Magazine Throughout his distinguished and unconventional career, engineer-turned-molecular-biologist Douglas Axe has been asking the questions that much of the scientific community would rather silence. Now, he presents his conclusions in this brave and pioneering book. Axe argues that the key to understanding our origin is the “design intuition”—the innate belief held by all humans that tasks we would need knowledge to accomplish can only be accomplished by someone who has that knowledge. For the ingenious task of inventing life, this knower can only be God. Starting with the hallowed halls of academic science, Axe dismantles the widespread belief that Darwin’s theory of evolution is indisputably true, showing instead that a gaping hole has been at its center from the beginning. He then explains in plain English the science that proves our design intuition scientifically valid. Lastly, he uses everyday experience to empower ordinary people to defend their design intuition, giving them the confidence and courage to explain why it has to be true and the vision to imagine what biology will become when people stand up for this truth. Armed with that confidence, readers will affirm what once seemed obvious to all of us—that living creatures, from single-celled cyanobacteria to orca whales and human beings, are brilliantly conceived, utterly beyond the reach of accident. Our intuition was right all along.

The Princeton Guide to Evolution is a comprehensive, concise, and authoritative reference to the major subjects and key concepts in evolutionary biology, from

genes to mass extinctions. Edited by a distinguished team of evolutionary biologists, with contributions from leading researchers, the guide contains some 100 clear, accurate, and up-to-date articles on the most important topics in seven major areas: phylogenetics and the history of life; selection and adaptation; evolutionary processes; genes, genomes, and phenotypes; speciation and macroevolution; evolution of behavior, society, and humans; and evolution and modern society. Complete with more than 100 illustrations (including eight pages in color), glossaries of key terms, suggestions for further reading on each topic, and an index, this is an essential volume for undergraduate and graduate students, scientists in related fields, and anyone else with a serious interest in evolution. Explains key topics in some 100 concise and authoritative articles written by a team of leading evolutionary biologists Contains more than 100 illustrations, including eight pages in color Each article includes an outline, glossary, bibliography, and cross-references Covers phylogenetics and the history of life; selection and adaptation; evolutionary processes; genes, genomes, and phenotypes; speciation and macroevolution; evolution of behavior, society, and humans; and evolution and modern society

Douglas Futuyma presents an overview of current thinking on theories of evolution, aimed at an undergraduate audience.

The third edition of this comprehensive book has increased its scope while emphasizing the intellectual order and molecular perspectives which have added to evolutionary studies in the 1990s.

Part of a continuing series on evolutionary biology, this volume contains essays on morphology, symbiosis, co-evolution among competitors and the implications of DNA variations on human evolution, among other topics.

Have humans always waged war? Is warring an ancient evolutionary adaptation or a relatively recent behavior--and what does that tell us about human nature? In *War, Peace, and Human Nature*, editor Douglas P. Fry brings together leading experts in such fields as evolutionary biology, archaeology, anthropology, and primatology to answer fundamental questions about peace, conflict, and human nature in an evolutionary context. The chapters in this book demonstrate that humans clearly have the capacity to make war, but since war is absent in some cultures, it cannot be viewed as a human universal. And counter to frequent presumption the actual archaeological record reveals the recent emergence of war. It does not typify the ancestral type of human society, the nomadic forager band, and contrary to widespread assumptions, there is little support for the idea that war is ancient or an evolved adaptation. Views of human nature as inherently warlike stem not from the facts but from cultural views embedded in Western thinking. Drawing upon evolutionary and ecological models; the archaeological record of the origins of war; nomadic forager societies past and present; the value and limitations of primate analogies; and the evolution of agonism, including restraint; the chapters in this interdisciplinary volume refute many popular generalizations and effectively bring scientific objectivity to the culturally and historically controversial subjects of war, peace, and human nature.

A FINALIST FOR THE PULITZER PRIZE NAMED A BEST BOOK OF THE YEAR BY THE NEW YORK TIMES BOOK REVIEW, SMITHSONIAN, AND WALL STREET

JOURNAL A major reimagining of how evolutionary forces work, revealing how mating preferences—what Darwin termed "the taste for the beautiful"—create the extraordinary range of ornament in the animal world. In the great halls of science, dogma holds that Darwin's theory of natural selection explains every branch on the tree of life: which species thrive, which wither away to extinction, and what features each evolves. But can adaptation by natural selection really account for everything we see in nature? Yale University ornithologist Richard Prum—reviving Darwin's own views—thinks not. Deep in tropical jungles around the world are birds with a dizzying array of appearances and mating displays: Club-winged Manakins who sing with their wings, Great Argus Pheasants who dazzle prospective mates with a four-foot-wide cone of feathers covered in golden 3D spheres, Red-capped Manakins who moonwalk. In thirty years of fieldwork, Prum has seen numerous display traits that seem disconnected from, if not outright contrary to, selection for individual survival. To explain this, he dusts off Darwin's long-neglected theory of sexual selection in which the act of choosing a mate for purely aesthetic reasons—for the mere pleasure of it—is an independent engine of evolutionary change. Mate choice can drive ornamental traits from the constraints of adaptive evolution, allowing them to grow ever more elaborate. It also sets the stakes for sexual conflict, in which the sexual autonomy of the female evolves in response to male sexual control. Most crucially, this framework provides important insights into the evolution of human sexuality, particularly the ways in which female preferences have changed male bodies, and even maleness itself, through evolutionary time. *The Evolution of Beauty* presents a unique scientific vision for how nature's splendor contributes to a more complete understanding of evolution and of ourselves.

Evolutionary Biology Sinauer Associates, Incorporated

This new edition of *Evolution* features a new coauthor: Mark Kirkpatrick (The University of Texas at Austin) offers additional expertise in evolutionary genetics and genomics, the fastest-developing area of evolutionary biology. Directed toward an undergraduate audience, the text emphasizes the interplay between theory and empirical tests of hypotheses, thus acquainting students with the process of science.

Proceedings of a workshop held Nov. 4-7, 2009 at Stony Brook University to mark the bicentennial anniversary of Darwin's birth and the sesquicentennial of the publication of *On the Origin of Species*

Of what use is evolutionary science to society? Can evolutionary thinking provide us with the tools to better understand and even make positive changes to the world? Addressing key questions about the development of evolutionary thinking, this book explores the interaction between evolutionary theory and its practical applications. Featuring contributions from leading specialists, *Pragmatic Evolution* highlights the diverse and interdisciplinary applications of evolutionary thinking: their potential and limitations. The fields covered range from palaeontology, genetics, ecology, agriculture, fisheries, medicine, neurobiology, psychology and animal behaviour; to information technology, education, anthropology and philosophy. Detailed examples of useful and current evolutionary applications are provided throughout. An ideal source of information to promote a better understanding of contemporary evolutionary science and its applications, this book also encourages the continued development of new opportunities for constructive evolutionary applications across a range of fields. This volume captures the state-of-the-art in the study of insect-plant interactions, and marks

the transformation of the field into evolutionary biology. The contributors present integrative reviews of uniformly high quality that will inform and inspire generations of academic and applied biologists. Their presentation together provides an invaluable synthesis of perspectives that is rare in any discipline.--Brian D. Farrell, Professor of Organismic and Evolutionary Biology, Harvard University
Timon has assembled a truly wonderful and rich volume, with contributions from the lion's share of fine minds in evolution and ecology of herbivorous insects. The topics comprise a fascinating and deep coverage of what has been discovered in the prolific recent decades of research with insects on plants. Fascinating chapters provide deep analyses of some of the most interesting research on these interactions. From insect plant chemistry, behavior, and host shifting to phylogenetics, co-evolution, life-history evolution, and invasive plant-insect interaction, one is hard pressed to name a substantial topic not included. This volume will launch a hundred graduate seminars and find itself on the shelf of everyone who is anyone working in this rich landscape of disciplines.--Donald R. Strong, Professor of Evolution and Ecology, University of California, Davis
Seldom have so many excellent authors been brought together to write so many good chapters on so many important topics in organismic evolutionary biology. Tom Wood, always unassuming and inspired by living nature, would have been amazed and pleased by this tribute.--Mary Jane West-Eberhard, Smithsonian Tropical Research Institute

Evolutionary biology has witnessed breathtaking advances in recent years. Some of its most exciting insights have come from the crossover of disciplines as varied as paleontology, molecular biology, ecology, and genetics. This book brings together many of today's pioneers in evolutionary biology to describe the latest advances and explain why a cross-disciplinary and integrated approach to research questions is so essential. Contributors discuss the origins of biological diversity, mechanisms of evolutionary change at the molecular and developmental levels, morphology and behavior, and the ecology of adaptive radiations and speciation. They highlight the mutual dependence of organisms and their environments, and reveal the different strategies today's researchers are using in the field and laboratory to explore this interdependence. Peter and Rosemary Grant--renowned for their influential work on Darwin's finches in the Galápagos--provide concise introductions to each section and identify the key questions future research needs to address. In addition to the editors, the contributors are Myra Awoodey, Christopher N. Balakrishnan, Rowan D. H. Barrett, May R. Berenbaum, Paul M. Brakefield, Philip J. Currie, Scott V. Edwards, Douglas J. Emlen, Joshua B. Gross, Hopi E. Hoekstra, Richard Hudson, David Jablonski, David T. Johnston, Mathieu Joron, David Kingsley, Andrew H. Knoll, Mimi A. R. Koehl, June Y. Lee, Jonathan B. Losos, Isabel Santos Magalhaes, Albert B. Phillimore, Trevor Price, Dolph Schluter, Ole Seehausen, Clifford J. Tabin, John N. Thompson, and David B. Wake.

Wide-ranging and inclusive, this text provides an invaluable review of an expansive selection of topics in human evolution, variation and adaptability for professionals and students in biological anthropology, evolutionary biology, medical sciences and psychology. The chapters are organized around four broad themes, with sections devoted to phenotypic and genetic variation within and between human populations, reproductive physiology and behavior, growth and development, and human health from evolutionary and ecological perspectives. An introductory section provides readers with the historical, theoretical and methodological foundations needed to understand the more complex ideas presented later. Two hundred discussion questions provide starting points for class debate and assignments to test student understanding.

A marvelous journey into the world of bird evolution *How Birds Evolve* explores how evolution has shaped the distinctive characteristics and behaviors we observe in birds today. Douglas Futuyma describes how evolutionary science illuminates the wonders of birds, ranging over topics such as the meaning and origin of species, the evolutionary history of bird diversity, and

the evolution of avian reproductive behaviors, plumage ornaments, and social behaviors. In this multifaceted book, Futuyma examines how birds evolved from nonavian dinosaurs and reveals what we can learn from the "family tree" of birds. He looks at the ways natural selection enables different forms of the same species to persist, and discusses how adaptation by natural selection accounts for the diverse life histories of birds and the rich variety of avian parenting styles, mating displays, and cooperative behaviors. He explains why some parts of the planet have so many more species than others, and asks what an evolutionary perspective brings to urgent questions about bird extinction and habitat destruction. Along the way, Futuyma provides an insider's perspective on how biologists practice evolutionary science, from studying the fossil record to comparing DNA sequences among and within species. A must-read for bird enthusiasts and curious naturalists, *How Birds Evolve* shows how evolutionary biology helps us better understand birds and their natural history, and how the study of birds has informed all aspects of evolutionary science since the time of Darwin.

Evolutionary Biologist, Douglas Emlen and Science Writer, Carl Zimmer continue to improve their widely-praised evolution textbook. Emlen, an award-winning evolutionary biologist at the University of Montana, has infused *Evolution: Making Sense of Life* with the technical rigor and conceptual depth that today's biology majors require. Zimmer, an award-winning New York Times columnist, brings compelling storytelling to the book, bringing evolutionary research to life through a narrative sure to capture the attention of evolution students. With riveting stories about evolutionary biologists at work everywhere from the Arctic to tropical rainforests to hospital wards, the book is a reading adventure designed to grab the imagination of students, showing them exactly why it is that evolution makes such brilliant sense of life. The new edition of *Evolution: Making Sense of Life* is now supported in SaplingPlus. Created and supported by the author and other educators, SaplingPlus's instructional online homework drives student success and saves educators' time. Automatically graded homework problem contains hints, answer-specific feedback, and solutions to ensure that students find the help they need.

Join scientist Doug Emlen on his quest to find out why an elusive type of beetle grows weapons that are enormous for its body size. What does it take to be a scientist in the field? Doug Emlen is a scientist. He studies beetles. Specifically, he studies the evolution of beetle weapons—how their horns and armor change to better suit them in different environments. This book starts with a mystery: Doug wanted to know why a particular type of beetle developed a massive evolutionary weapon. He wanted to know how these changes happened and what advantages these enormous weapons gave the tiny dung beetles. So, he went to visit. Part travel diary and part scientific exploration, *Beetle Battles* takes you deep into the South American rainforest to monitor beetles in their own habitat. Packed with color photographs, extensive back matter, and entertaining anecdotes, this book will make beetle fans out of all its young readers.

A noted evolutionary biologist examines the creation controversy, explaining the fallacies behind the claims of creationists and providing a straightforward interpretation of the theory of evolution

Evolutionary Ecology simultaneously unifies conceptual and empirical advances in evolutionary ecology and provides a volume that can be used as either a primary textbook or a supplemental reading in an advanced undergraduate or graduate course. The focus of the book is on current concepts in evolutionary ecology, and the empirical study of these concepts. The editors have assembled a group of prominent biologists who have made significant contributions to this field. They both synthesize the current state of knowledge and identify areas for future investigation. *Evolutionary Ecology* will be of general interest to researchers and students in both ecology and evolutionary biology. Researchers in evolutionary ecology that want an overview of the current state of the field, and graduate students that want an introduction the field, will find this book very valuable. This volume can also be used as a

primary textbook or supplemental reading in both upper division and graduate courses/seminars in Evolutionary Ecology.

Part 1. Analysis and Inheritance of Resistance Variation Chapters by George G. Kennedy and James D. Barbour; John A. Barrett; Ellen L. Simms and Mark A. Rausher; and Mary R. Berenbaum and Arthur R. Zangerl
Part 2. Evolutionary Responses to Plant Resistance by Herbivores and Pathogens Chapters by Lawrence Wilhoit; Diana Pilson; Arthur E. Weis; and James Groth and Barbara Christ
Part 3. Population and Community Responses to Plant Resistance Variation Chapters by Richard Karban; A. Joseph Pollard; Robert S. Fritz; and J. Daniel Hare
Part 4. Evolution of Plant Resistance Robert J. Marquis; Helen M. Alexander; Matthew A. Parker; Arthur R. Zangerl and Fahkri A. Bazzaz; Ellen L. Simms; and Janis Antonovics
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"Why are male birds often so brightly colored? Why do some birds lay more eggs than others? Will bird species adapt to climate change? In *How Birds Evolve*, Douglas Futuyma invites readers into the amazing world of bird evolution to answer these and other questions.

Futuyma's goal in this book is not to offer a comprehensive evolutionary history of birds, but to explore how the processes of evolution produced the distinctive features and behaviors we observe in birds today as well as their impressive diversity. Using one or two birds per chapters as a lens into broader questions, Futuyma explores how a bird's evolutionary history helps us understand the diversity of species and the bird tree of life and how natural selection explains most of the characteristics of birds from how populations adapt to sexual selection and birds' amazing social behavior. Futuyma concludes by discussing the future of birds, particularly patterns of extinction and whether they can adapt to a changing climate. Ultimately, Futuyma wants readers to see that evolutionary biology helps us to better understand birds, and that the reverse is also true: studies of birds have informed almost every aspect of evolutionary biology, from Darwin to today"--

Used widely in non-majors biology classes, *The Tangled Bank* is the first textbook about evolution intended for the general reader. Zimmer, an award-winning science writer, takes readers on a fascinating journey into the latest discoveries about evolution. In the Canadian Arctic, paleontologists unearth fossils documenting the move of our ancestors from sea to land. In the outback of Australia, a zoologist tracks some of the world's deadliest snakes to decipher the 100-million-year evolution of venom molecules. In Africa, geneticists are gathering DNA to probe the origin of our species. In clear, non-technical language, Zimmer explains the central concepts essential for understanding new advances in evolution, including natural selection, genetic drift, and sexual selection. He demonstrates how vital evolution is to all branches of modern biology—from the fight against deadly antibiotic-resistant bacteria to the analysis of the human genome.

Basics in Human Evolution offers a broad view of evolutionary biology and medicine. The book is written for a non-expert audience, providing accessible and convenient content that will appeal to numerous readers across the interdisciplinary field. From evolutionary theory, to cultural evolution, this book fills gaps in the readers' knowledge from various backgrounds and introduces them to thought leaders in human evolution research. Offers comprehensive coverage of the wide ranging field of human evolution
Written for a non-expert audience, providing accessible and convenient content that will appeal to numerous readers across the interdisciplinary field
Provides expertise from leading minds in the field
Allows the reader the ability to gain exposure to various topics in one publication

Covers the genetic, developmental, and ecological mechanisms of evolutionary change, the major features of evolutionary history as revealed by phylogenetic and paleontological studies, and material on adaptation, molecular evolution, co-evolution, and human evolution.

World-renowned in the fields of population genetics, bacterial genomics, paleontology, human genetics, and developmental biology, the authors have elegantly synthesized molecular

biology and evolutionary biology to produce a thoroughly integrated and current text. This new (textbook) is among the best.--"Nature." Full color.

Representing the state of the art in evolutionary paleobiology, this book provides a much-needed overview of this rapidly changing field. An influx of ideas and techniques both from other areas of biology and from within paleobiology itself have resulted in numerous recent advances, including increased recognition of the relationships between ecological and evolutionary theory, renewed vigor in the study of ecological communities over geologic timescales, increased understanding of biogeographical patterns, and new mathematical approaches to studying the form and structure of plants and animals. Contributors to this volume—a veritable who's who of eminent researchers—present the results of original research and new theoretical developments, and provide directions for future studies. Individually wide ranging, these papers all share a debt to the work of James W. Valentine, one of the founders of modern evolutionary paleobiology. This volume's unified approach to the study of life on earth will be a major contribution to paleobiology, evolution, and ecology.

A major synthesis of homology, written by a top researcher in the field Homology—a similar trait shared by different species and derived from common ancestry, such as a seal's fin and a bird's wing—is one of the most fundamental yet challenging concepts in evolutionary biology. This groundbreaking book provides the first mechanistically based theory of what homology is and how it arises in evolution. Günter Wagner, one of the preeminent researchers in the field, argues that homology, or character identity, can be explained through the historical continuity of character identity networks—that is, the gene regulatory networks that enable differential gene expression. He shows how character identity is independent of the form and function of the character itself because the same network can activate different effector genes and thus control the development of different shapes, sizes, and qualities of the character.

Demonstrating how this theoretical model can provide a foundation for understanding the evolutionary origin of novel characters, Wagner applies it to the origin and evolution of specific systems, such as cell types; skin, hair, and feathers; limbs and digits; and flowers. The first major synthesis of homology to be published in decades, *Homology, Genes, and Evolutionary Innovation* reveals how a mechanistically based theory can serve as a unifying concept for any branch of science concerned with the structure and development of organisms, and how it can help explain major transitions in evolution and broad patterns of biological diversity.

Traces scholarly thought from the nineteenth-century birth of evolutionary biology to the mapping of the human genome through forty-eight essays, arranged in chronological order, each preceded by a one-page essay that explains the significance of the chosen work.

Evolutionary Biologist, Douglas Emlen and Science Writer, Carl Zimmer continue to improve their widely-praised evolution textbook. Emlen, an award-winning evolutionary biologist at the University of Montana, has infused *Evolution: Making Sense of Life* with the technical rigor and conceptual depth that today's biology majors require. Zimmer, an award-winning New York Times columnist, brings compelling storytelling to the book, bringing evolutionary research to life through a narrative sure to capture the attention of evolution students. With riveting stories about evolutionary biologists at work everywhere from the Arctic to tropical rainforests to hospital wards, the book is a reading adventure designed to grab the imagination of students, showing them exactly why it is that evolution makes such brilliant sense of life. The new edition of *Evolution: Making Sense of Life* is now supported in SaplingPlus. Created and supported by the author and other educators, SaplingPlus's instructional online homework drives student success and saves educators' time. Automatically graded homework problem contains

hints, answer-specific feedback, and solutions to ensure that students find the help they need.

An exploration of the extreme weapons we see in the animal world—teeth, horns and claws—draws parallels to the way humans develop and employ our own weapons. This book is divided in two parts, the first of which shows how, beyond paleontology and systematics, macroevolutionary theories apply key insights from ecology and biogeography, developmental biology, biophysics, molecular phylogenetics and even the sociocultural sciences to explain evolution in deep time. In the second part, the phenomenon of macroevolution is examined with the help of real life-history case studies on the evolution of eukaryotic sex, the formation of anatomical form and body-plans, extinction and speciation events of marine invertebrates, hominin evolution and species conservation ethics. The book brings together leading experts, who explain pivotal concepts such as Punctuated Equilibria, Stasis, Developmental Constraints, Adaptive Radiations, Habitat Tracking, Turnovers, (Mass) Extinctions, Species Sorting, Major Transitions, Trends and Hierarchies – key premises that allow macroevolutionary epistemic frameworks to transcend microevolutionary theories that focus on genetic variation, selection, migration and fitness. Along the way, the contributing authors review ongoing debates and current scientific challenges; detail new and fascinating scientific tools and techniques that allow us to cross the classic borders between disciplines; demonstrate how their theories make it possible to extend the Modern Synthesis; present guidelines on how the macroevolutionary field could be further developed; and provide a rich view of just how it was that life evolved across time and space. In short, this book is a must-read for active scholars and because the technical aspects are fully explained, it is also accessible for non-specialists. Understanding evolution requires a solid grasp of above-population phenomena. Species are real biological individuals and abiotic factors impact the future course of evolution. Beyond observation, when the explanation of macroevolution is the goal, we need both evidence and theory that enable us to explain and interpret how life evolves at the grand scale.

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