

book are entertaining and convey the take-home messages in ways that can be related to nonspecialists over lunch in the laboratory or dinner at home.

In summary, this volume succeeds in offering both a general overview and deeper coverage for many of the most fascinating topics. It will be interesting reading for graduate students as well as instructors. Even educated general readers with an interest in the evolutionary aspects of cooperation and conflict that play out in wombs will not be disappointed.

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FROM GROUPS TO INDIVIDUALS: EVOLUTION AND EMERGING INDIVIDUALITY. *Vienna Series in Theoretical Biology.*

Edited by Frédéric Bouchard and Philippe Huneman. Cambridge (Massachusetts): MIT Press. \$55.00. ix + 278 p.; ill.; index. ISBN: 978-0-262-01872-2. 2013.

The founders of modern evolutionary theory, Charles Darwin and Alfred Russel Wallace, set the stage for what has become to be known as the “level of selection” debate. Darwin, from a family that took as paradigmatic the self-interest at the heart of 18th-century political economy, wanted always to explain the workings of natural selection at the lowest level. He knew nothing of genetics, so he could not truly anticipate Richard Dawkins and selfish genes, but he did his best. When confronted with hymenopteran sociality, he declared that families are individuals. Wallace, a socialist from a very young age, always saw selection in terms of groups. If a feature or an action favors the group—young women forsaking the handsome but unworthy for the ugly but responsible—then so be it.

For the past 30 years, philosophers have made a cottage industry out of this controversy. This comprehensive and rather engaging collection will get you right up to date. It starts by looking at the meaning of “individual” in evolutionary biology, showing it is often unclear and that too often biologists are arguing at cross purposes. The discussion then moves on to adaptation and its ubiquity (or not). I confess that I get irritated at my fellow philosophers who think that Darwin went soft on group selection in the *Descent of Man*. A man from a family that was making its fortune from the sweat of the uneducated in the pottery factories just did not think that way. The third and final section takes up groups as individuals. Included here are some useful reflections on the notion of the “superorganism,” something that in recent years has had a life in biology (with its championing by Edward O. Wilson) and out of biology (with the championing of the Gaia hypothesis by James Lovelock).

The volume concludes with a sprightly essay on symbiosis by one of the editors, the French-Canadian philosopher of biology Frédéric Bouchard. I was glad to see how he linked his discussion to human digestion, with interesting implications for a subject that this journal has long championed, evolutionary medicine. Perhaps what seems at first to be a rather ethereal collection does in the end have real implications for life. It would be nice to think so.

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PILLARS OF EVOLUTION: FUNDAMENTAL PRINCIPLES OF THE ECO-EVOLUTIONARY PROCESS.

By Douglas W. Morris and Per Lundberg. Oxford and New York: Oxford University Press. \$117.00 (hardcover); \$52.95 (paper). viii + 272 p.; ill.; index. ISBN: 978-0-19-856879-7 (hc); 978-0-19-856880-3 (pb). 2011.

This volume begins with an analogy that likens traditional approaches to teaching evolution to planning a road trip with many detailed local maps of each destination (specific topics within evolutionary biology), but no large-scale map enabling navigation between destinations. This analogy will resonate with many who have learned or taught evolution using traditional textbooks. Morris and Lundberg’s goal is to focus not on the details of the subdisciplines but rather on fundamental evolutionary concepts (the pillars) to gain an overview of the process of adaptation. The authors’ five pillars include mechanics, function, structure, scale, and dynamics, and the role of the five pillars is to support the “capstone” of adaptation. Adaptation is the central theme, and the book will appeal most to readers who share the authors’ adaptationist worldview. It will be most useful for graduate students who are already familiar with the traditional subdisciplines or “local maps of evolution” and are interested in exploring possible frameworks for integration.

One of the most unique and compelling aspects of *Pillars* is its emphasis not on genes or even traits, but rather on function. The authors explore links between environments, genes, traits, function, and fitness and ultimately conclude that the critical (and often least explored) link in this chain is function. Indeed, it is organismal function that underlies differences in individual fitness, and thus drives the process of adaptation. Genes and traits are involved in fitness only insofar as they influence, either directly or indirectly, organismal function. In this volume, the environment plays the dual role of shaping trait expression (e.g., due to phenotypic plasticity) and setting fitness landscapes. But it is this largely “extrinsic” view of the environment that may surprise those attracted to the book by its subtitle, which

promises an eco-evolutionary perspective. Many readers will expect a discussion of eco-evolutionary dynamics or bidirectional interactions between environments and the trajectory of evolution. Because organismal functions shape environments in ways that can feed back to impact future adaptation, the authors' scant treatment of such bidirectional interactions is a missed opportunity for an otherwise compelling synthesis.

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TAXONOMY, SYSTEMATICS, AND PHYLOGENETICS

PHYLOGENETICS: THE THEORY OF PHYLOGENETIC SYSTEMATICS. *Second Edition.*

By E. O. Wiley and Bruce S. Lieberman. Hoboken (New Jersey): Wiley-Blackwell. \$99.95. xvi + 406 p. + 8 pl.; ill.; index. ISBN: 978-0-470-90596-8. 2011.

It was after reading the first edition of this book, which appeared in 1981 with Wiley as single author, that I and many other biology students decided to pursue a research career in phylogenetics. Why did the volume make such a strong impression on us? Most of our teachers thought systematics a dead discipline, barely science at all. With his emphasis on the philosophical and scientific principles underpinning systematics, and on the conceptual advances in the 1960s and 1970s, Wiley convinced us that there were many exciting years ahead for aspiring young phylogeneticists.

Thirty years later, the field has changed radically. There is hardly a single discipline in the life sciences that does not use phylogenetic analysis, and the number of papers on phylogenetic methods has exploded. Morphological data and simple parsimony methods have largely been replaced by molecular data and statistical rigor, even in classical systematics. Alpha taxonomy is undergoing transformative changes with the rise of e-science and next-generation sequencing.

Wiley, originally a fish systematist, has taken the help of Lieberman, an invertebrate paleontologist, in a valiant attempt to revise the original text and bring it up to date, but the result is far from the "industry standard" on phylogenetics it purports to be. The description of quantitative methods of phylogenetic analysis, already weak in the first edition, simply does not cut it today, even though these sections have been completely reworked. Some readers may be pleased by the lack of equations and techni-

cal detail, but too often the salient points are lost in the attempt to simplify. Many topics of fundamental importance are missing completely, including the reasons why modern phylogeneticists prefer statistical approaches, the phenomenon of long-branch attraction and its causes, and methods of divergence time estimation. In historical biogeography, the authors express doubt that parsimony will ever be substituted by statistical approaches, even though the recent literature on the topic would suggest otherwise.

The book definitely has its strong points. The discussion of basic phylogenetic concepts (species, taxon, homology) in the light of the philosophy of science is excellent. The analysis of the pros and cons of the PhyloCode, a proposal to overhaul the principles of nomenclature based on phylogenetic ideas, is the best I have seen. There are other highlights, but often Wiley's ability to cut through difficult debates, so prominent in the first edition, is replaced by simple summaries of the arguments of current controversies.

The volume is impressively broad in its coverage of modern systematics, including topics such as nomenclature, curatorial practices, and publication, in addition to the basic principles and methods of phylogenetic inference. However, readers will have to look elsewhere for insights into the most exciting recent developments in phylogenetics.

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BEHAVIOR

THE WAR OF THE SEXES: HOW CONFLICT AND COOPERATION HAVE SHAPED MEN AND WOMEN FROM PREHISTORY TO THE PRESENT.

By Paul Seabright. Princeton (New Jersey): Princeton University Press. \$24.95. xi + 241 p.; ill.; index. ISBN: 978-0-691-13301-0. 2012.

Eventually, even a biodiversity-loving evolutionary ecologist can succumb to the temptation to cross the tracks and study the strategic behavior of his own species. Nowadays, many economists have taken the reverse journey, seeking evolutionary explanations for seemingly irrational decisions by their dismal study species. Paul Seabright is one such economist. His latest book (I have not read the first) is an urbane, literary infusion of studies from evolutionary biology, behavioral economics, gender politics, and social psychology. It centers around the economic question of why men are usually better paid than women; and why the sexes often have different career paths (part-time/full-time; representation in dif-