evolution / biology

The Major Transitions in Evolution Revisited

edited by
Brett Calcott and Kim Sterelny

In 1995, John Maynard Smith and Eörs Szathmáry published their influential book *The Major Transitions in Evolution*. The "transitions" that Maynard Smith and Szathmáry chose to describe all constituted major changes in the kinds of organisms that existed but, most important, these events also transformed the evolutionary process itself. The evolution of new levels of biological organization, such as chromosomes, cells, multicelled organisms, and complex social groups, radically changed the kinds of individuals natural selection could act upon. Many of these events also produced revolutionary changes in the process of inheritance, by expanding the range and fidelity of transmission, establishing new inheritance channels, and developing more open-ended sources of variation.

Maynard Smith and Szathmáry had planned a major revision of their work, but the death of Maynard Smith in 2004 prevented this. In this volume, prominent scholars (including Szathmáry himself) reconsider and extend the earlier book's themes in light of recent developments in evolutionary biology. The contributors discuss different frameworks for understanding macroevolution, prokaryote evolution (the study of which has been aided by developments in molecular biology), and the complex evolution of multicellularity.

Brett Calcott is a postdoctoral researcher in the Philosophy Program in the Research School of the Social Sciences at Australia National University and a founding member of ANU's Centre for Macroevolution and Macroecology. Kim Sterelny is Professor of Philosophy at both the ANU and Victoria University in Wellington, New Zealand. He is the author or editor of many books, including *Language and Reality* (second edition, MIT Press, 1999), and the editor of the MIT Press series Life and Mind.

Vienna Series in Theoretical Biology

"This book presents new and sophisticated ways of carving the history of life at its evolving joints. The clarity of the writing and the succinct introductions by the editors make the illuminating conceptual distinctions and imaginative expansions of major transitions' range and loci accessible and enjoyable by all theoretically-minded biologists and biologically-minded philosophers."
Eva Jablonka, Cohn Institute for the History and Philosophy of Science and Ideas, Tel Aviv University

"Over the last fifteen years there has been a sea change in evolutionary biology brought about in part by the recognition that major evolutionary transitions are not just microevolution writ large. In this excellent volume of essays, biologists and philosophers draw on this work to evaluate the extent to which the findings on these topics force significant revision of the biological and conceptual foundations of our understanding of development, evolution, and individuality. The volume is essential reading for biologists interested in major transitions in evolution, for philosophers of biology, and for all those with a serious interest in evolutionary history."
Richard Burian, Professor Emeritus of Philosophy and Science Studies, Virginia Tech

978-0-262-01524-0

THE MIT PRESS MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE, MASSACHUSETTS 02142 HTTP://MITPRESS.MIT.EDU