

6-1-1917

[Book review of] Adaptation in Metapopulations:
How Interaction Changes Evolution, by Michael J.
Wade.

David C. Queller

Washington University in St Louis, queller@WUSTL.EDU

Follow this and additional works at: https://openscholarship.wustl.edu/bio_facpubs



Part of the [Biology Commons](#), and the [Evolution Commons](#)

Recommended Citation

Queller, David C., "[Book review of] Adaptation in Metapopulations: How Interaction Changes Evolution, by Michael J. Wade." (1917). *Biology Faculty Publications & Presentations*. 161.
https://openscholarship.wustl.edu/bio_facpubs/161

This Review is brought to you for free and open access by the Biology at Washington University Open Scholarship. It has been accepted for inclusion in Biology Faculty Publications & Presentations by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

nal-propelled peer review process. This makes this volume an all too rare glimpse into valuable results obtained from cumbersome fieldwork, focusing on a valuable land use type.

Naturally, edited books vary in terms of quality of the different chapters, yet I consider the overall coherence across all contributions as good. The individual chapters are widely tapping into the current literature, and the boxes with explanations, examples, and illustrations found throughout the volume will be a delight to readers. Some plots tend to be trivial at rare occasions, or might even contain hardly any benefit. Although many may call the lack of richer statistical analyses at times a missed opportunity, I think it does justice to the flow and style of this book. The authors did a very good job in compiling this coherent array of approaches and topics. I especially like the vividness of much of the text, with rich citations and a deep insight into the relevant regional dynamics.

Taken together, this volume fills an important gap, since it links vital aspects for policy, conservation, and management with a nuanced overview building on local to regional examples. In times of ever shorter publications, this book is a valuable contribution. It provides diverse and layered information, just as the topic of wildlife conservation in farmland that it focuses on.

HENRIK VON WEHRDEN, *Institute of Ecology, Faculty of Sustainability, Leuphana University, Lüneburg, Germany*

STITCHING THE WEST BACK TOGETHER: CONSERVATION OF WORKING LANDSCAPES. *Summits: Environmental Science, Law, and Policy.*

Edited by Susan Charnley, Thomas E. Sheridan, and Gary P. Nabhan. Chicago (Illinois): University of Chicago Press. \$100.00 (hardcover); \$35.00 (paper). xxi + 343 p.; ill.; index. ISBN: 978-0-226-16568-4 (hc); 978-0-226-16571-4 (pb); 978-0-226-16585-1 (eb). 2014.

This is an ambitious book trying to stitch together conservation of biodiversity and traditional ranching in concert with community values to preserve both from excess development. There are five parts: The Importance of Conserving Western Working Landscapes; Collaborative Conservation; Case Studies of Working Forests; Case Studies of Working Ranches; and Emerging Approaches to Conserving Working Landscapes.



EVOLUTION

ADAPTATION IN METAPOPULATIONS: HOW INTERACTION CHANGES EVOLUTION.

By Michael J. Wade. Chicago (Illinois): University of Chicago Press. \$120.00 (hardcover); \$40.00 (paper). vii + 260 p.; ill.; index. ISBN: 978-0-226-12956-3 (hc); 978-0-226-12973-0 (pb); 978-0-226-12987-7 (eb). 2016.

This volume gives a coherent summary of much of Michael Wade's research career, leavened with some brief personal vignettes. I was struck by the description of the tenure process at Chicago as being put into a dark room for six years and told there is a hurdle in there somewhere to jump over. This book describes clearing that and many subsequent hurdles.

The title of this volume avoids the term "group selection" but this is in fact a serious treatment of the view that partitioning selection into within-group and between-group components can lead to insights. My review is from the standpoint of a kin selectionist. On one level this may be unfair, but we do need to build bridges between the various ways of viewing social evolution and kin selection has been the dominant paradigm. I think Wade is occasionally unfair to kin selection but this does not affect most of the book. My own view has evolved to viewing kin selection and group selection (correctly formulated) as essentially equivalent (but is it often, usually, or always?). I still find kin selection more intuitive and useful but if others get added insight through group selection, I want to share in that.

At the core of the volume is a series of artificial group selection experiments on flour beetles bolstered by some more natural studies of willow leaf beetles, as well as further experiments on the related issue of Wright's shifting balance theory. Wade's experiments that imposed selection on group productivity generally got strong responses, with cannibalism turning out to be the key underlying trait. A kin selectionist might interpret these results as simple family selection rather than group selection, but they still have interesting implications. Where kin selection has tended to focus on high-relatedness families such as social insects, these studies show selection for cooperation (less cannibalism) under low relatedness, perhaps 1/10. Kin selectionists ought to be happy with this result.

But the size of the between-group variance and the strength of the group response are greater than most would have expected. If the "standard theory" is failing here, I would like to see more of Wade's

theoretical work on why that is. Nonadditive gene combinations seem to be a big part of his answer. These are not heritable in unstructured populations but they can be in structured populations, because the gene combinations are coinherited to some degree.

Should this cause us to revise our view of social adaptations in the natural world? I am not sure. It would be foolish to see group adaptations everywhere, as in the years preceding George Williams' 1966 critique, *Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought* (Princeton (NJ): Princeton University Press). If they were everywhere, would not most species have female-biased sex ratios? And might the unexpectedly strong responses to group selection in the laboratory actually be evidence that group selection has been *weak* in nature, such that variation for group productivity has not been purged the way variation for individual fitness has? Still, kin selectionists have not paid much attention to the role of gene combinations in groups and this is an insight worth taking on board.

DAVID C. QUELLER, *Biology, Washington University, St. Louis, Missouri*

EVOLUTIONARY ETHNOBIOLOGY.

Edited by Ulysses Paulino Albuquerque, Patrícia Muniz de Medeiros, and Alejandro Casas. Cham (Switzerland) and New York: Springer. \$159.00. viii + 204 p.; ill.; index. ISBN: 978-3-319-19916-0 (hc); 978-3-319-19917-7 (eb). 2015.

I confess that before I set out to review this book, I had never heard of "ethnobiology," which I suppose tells you something about me or about ethnobiology or, more likely, a bit of both. It turns out, for those who share my state of ignorance, it is really quite a sensible idea—I do not mean to sound condescending—where one picks up on culture, let us say some prohibition against various foodstuffs, and relates it to biology, in the case of the volume under review—*Evolutionary Ethnobiology*—to the relevant evolutionary biology. I guess Marvin Harris' work on cattle taboos in India would be a good example, where a religious or cultural norm actually has evolutionary payoffs in the use that can be made of the live cattle, not to mention their role as foodstuffs for untouchables at the end.

One thing both interesting and exciting about this book is the extent to which the contributors come from a wide range of non-Anglophone countries, which gives the collection a distinctively broad vision of culture, and how it can play into biology. Equally interesting is that through the collection the unifying theme is not only Darwinian evolution but Darwinian evolution of a very traditional kind,

with a strong emphasis on individual selection. Delving deeply into culture is not thought antithetical to a firm theoretical framework—no post-modernistic dislike of the West here.

There is a broad range of topics covered. For instance, to what extent does human manipulation of evolution in other animals and plants—domestication—feed back into the evolution of humans? A classic case here would be lactose tolerance. Humans domesticated cattle, giving a ready supply of milk. There was strong selective pressure to be able to utilize this valuable food resource, and so those of us who live in areas where cattle are reared changed. Except Charles Darwin, apparently, for the latest hypothesis about his ill health is that he was lactose intolerant. He would go off to spas and live on gruel and then, feeling better, would come back home where his wife Emma would feed him deserts with lashings of whipped cream.

Expectedly, a lot of attention is paid in the volume to medical payoffs from cultural knowledge and how this interacts with evolution, of us humans and of other organisms. There are some interesting discussions about how native populations have huge amounts of useful information about the medicinal virtues of different plants and how this information might be used in the most effective way possible. As so often is the case with discussions such as these, one would sometimes like a more skeptical approach. Not every practice is of value and sometimes they seem positively harmful. How does one distinguish the dross from the gold?

The discussions are stimulating but, overall, rather brief. This is hardly a definitive introduction to the topic, but it is a good (albeit very expensive) teaser.

MICHAEL RUSE, *Program in the History & Philosophy of Science, Florida State University, Tallahassee, Florida*

RETICULATE EVOLUTION: SYMBIOGENESIS, LATERAL GENE TRANSFER, HYBRIDIZATION AND INFECTIOUS HEREDITY. *Interdisciplinary Evolution Research, Volume 3.*

Edited by Nathalie Gontier. Cham (Switzerland) and New York: Springer. \$179.00. xii + 337 p.; ill.; no index. ISBN: 978-3-319-16344-4 (hc); 978-3-319-16345-1 (eb). 2015.