

chapters are rich in interesting details, the evolutionary toolbox used to construct logical arguments connecting these details to the grander picture is sometimes rather limited. As a result the reader is left with just-so-stories, and in most cases (but there are exceptions) alternative hypotheses are not considered. The arguments given in support of the presented hypotheses are mostly qualitative and not quantitative. For obvious reasons, there are only a few chapters reporting results of experimental studies. Evidence is often based on comparisons between western and primitive societies and in a few cases between humans and animals. Thus, if you expect to find solid evolutionary arguments in the book, you will be rather disappointed.

The above-mentioned shortcomings clearly indicate that the field of evolutionary medicine remains largely unexplored. This will hopefully change in the near future, as this field certainly deserves more attention. If your graduate student is looking for a research topic with some interesting perspectives, evolutionary medicine might be a good choice. However, the field of evolutionary medicine is not well represented in the book by Trevathan *et al.* but rather highlights certain aspects of it. In particular, we felt a lack of theory and clear conceptual thinking is a weakness. Therefore we would recommend this book only together with another recent book on the same topic, edited by Stephen Stearns (1999). Together, these books give a good overview of the field and its problems and highlight the numerous unexplored areas that are ripe for further investigation and for the development of rigorous research programmes.

The most powerful tool evolutionary biology can provide to medicine is a concept-orientated thinking that allows formulating hypotheses and testing their predictions. This method may be particularly helpful in those cases where traditional approaches have failed. However, care should be taken not to 'throw the baby out with the bath water'. Evolutionary method is very powerful, but its usefulness for medicine has to be thoroughly tested. The accumulation of examples where evolutionary approaches have made positive contributions to human health and well being is very slow. Traditional medicine has been enormously successful in the last 100 years and it will certainly continue to be so. Evolutionary medicine cannot compete with this success, but it may add to it, by pointing out alternatives and suggesting unconventional solutions that might have been overlooked otherwise. The contributors of the book deserve credit for their attempt to use the conceptual power of evolutionary biology to work out medical problems and to suggest further directions of research.

References

- Stearns, S.C. 1999. *Evolution in Health and Disease*. Oxford University Press, Oxford.
- Williams, G.C. & Nesse, R.M. 1991. The dawn of evolutionary medicine. *Q. Rev. Biology* **66**: 1–22.
- Dieter Ebert and Natalia V. Sokolova
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- Adaptive evolutionary change in natural populations**
A review by Derek A. Roff
- Adaptive Genetic Variation in the Wild. By Timothy A. Mousseau, B. Sinervo and John Endler, eds. Oxford University Press, Oxford. 2000. 265 pp. Price £40.00. ISBN 0-19-512183-X.
- The meaning of the title of this book is not immediately obvious and it is only in the last chapter, an overview by John Endler that its meaning is defined (p. 251), 'I use the term "adaptive genetic variation" in the sense of genetic variation that is correlated with variation in lifetime or total fitness of individuals'. In other words, genetic variation that permits adaptation. This is slightly at odds with the description given in the preface, which is (pv), 'The central thesis of this collective work is that the expression of genetic variation is modulated and shaped by the action of natural selection in the natural environment'. I do not disagree with either of these statements and both can be applied to the chapters in this book, to the extent that genetic variation is presumed to exist. However, none of the chapters, with the possible exception of chapter 1 (see below), addresses the questions 'how is genetic variation maintained?' or 'is genetic variation *per se* adaptive or does it merely permit adaptation?' At the present time we do not have satisfactory answers to either question.
- Within the above limitation of the scope of research this book provides a valuable glimpse into the continuing research on adaptive evolutionary change in natural populations (which is probably a better title). The collection of chapters is not organized in any particular manner (at least to this reviewer) and the chapter I would suggest starting with is the last chapter, the overview by John Endler.
- The 10 chapters forming the main body of the book are each organized about a particular taxon, from the level of the species to variation among families, with most focusing upon variation within species. After reading Endler's overview I recommend the following sequence of chapters (there are a number of possibilities but I definitely found the order as given not satisfactory):
- (1) Chapters emphasizing genetic variation and its consequences: Chapter 9 by Hoffman addresses the question of whether genetic variation measured in the

lab is indicative of variation measured in the field. Chapter 8 in which Ritland provides some alternative methods based on molecular markers. Chapter 10 by Mousseau provides instructive examples of both the regression and the marker-based methods of estimating heritability (also analysis of adaptation using geographical variation). Chapter 1 by the Grants examines genetic variation in Darwin's finches and the possible role of hybridization in introducing genetic variation into a population. Chapter 4 by Nager, Keller and van Noordwijk argue for the importance of genotype by environment interaction and the role of adaptive phenotypic plasticity.

(2) Chapters emphasizing adaptive evolution within species: Chapter 6, written by Smith and Girman, discusses the evolution of bill size in an African finch. Chapter 3, by Robinson and Schluter, also discusses the evolution of trophic structures, in this case the evolution of gill rakers in a variety of northern fishes. Chapter 2, by Sinervo, describes his work on the evolution of egg and clutch size in the lizard *Uta stansburiana*. Sinervo dem-

onstrates the utility of path analysis for investigating causal relationships. Another example of the use of path analysis is given by Mazer and Meade in chapter 7, where they describe their research on the evolution of flower size in wild radish. This chapter demonstrates that evolution frequently involves interaction among species, in this case wild radish and its pollinators. Chapter 5 by Moper, Landau and van Zandt, describes a fascinating study of leafminer interpopulation variation, showing that although gene flow is occurring there is continual selection reducing variation at a site over time.

In summary, this book would be excellent as a focus for a graduate course and provides a general overview of the field. I came away with a sense that there is a lot remaining to be done but also some real excitement in the field.

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