

Book Review: *Behavioural Ecology: An Evolutionary Approach*. Edited by J. R. KREBS & N. B. DAVIES. 4th edn. Oxford: Blackwell (1997). Pp. viii+456. Price \$85.95 (CDN).

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Article:

For the past 20 years, J. R. Krebs and N. B. Davies have been synonymous with introductory books on behavioural ecology. In their fourth edition of *Behavioural Ecology: An Evolutionary Approach*, they incorporate similar topics from previous editions with new chapters on the exciting developing fields of cognitive ecology, phylogenetics, population genetics and conservation. Most noticeable, however, is the new hierarchical organization of the book. The book is divided into three major parts: 'Mechanisms and individual behaviour', 'From individual behaviour to social systems', and 'Life histories, phylogenies and populations'.

As the editors state, the book is best suited for a graduate seminar course such as ours. The broad subject matter provides a seminar course with ample material for discussion. As the intended audience, we considered the fundamental objectives outlined in the preface to *Behavioural Ecology*. Do the chapters provide a review of the main ideas associated with their subjects? Are empirical data provided? Are current controversies and unsolved questions outlined adequately, providing a framework for future research? We also evaluated the various chapters for readability and whether the authors were critical in their evaluation of the field.

Generally, the chapters are well organized and readable. Each chapter maps out relevant areas for future research and gives the reader a clear picture of where research is likely to be heading. As graduate students we found this particularly helpful. Many of the chapters provide a fresh perspective on familiar topics. For example, Giraldeau's chapter, 'The ecology of information use', finally gives us a summary of spatial memory as an adaptive cognitive specialization. Also, models of reproductive skew are revived as an important factor in the evolution of social behaviour in the chapters by Bourke ('Sociality and kin selection in eusocial insects'), Emlen ('Predicting family dynamics in social vertebrates') and Pusey & Packer ('The ecology of relationships'). A major highlight of the book is Emlen's Appendix-10.1, 'Evolutionary predictions of living within family kin groups'. These 15 predictions illustrate the maturity of behavioural ecology from natural history to its current status of testable science.

Many new chapter topics outline exciting new areas of research. As a whole, Birkhead & Parker's 'Sperm competition and mating systems' is the book's best chapter. We were especially impressed by the models presented because they were explicitly tied to the reproductive anatomy and fertilization mechanisms of the taxa considered. The most unique chapter is Haig's 'The social gene', which explores the application of trade-offs to lower levels of the biological hierarchy. However, the presentation of ideas is bogged down by distracting metaphor (e.g. plasmid protection rackets, the nuclear citadel, multi-cellular corporations) and ambiguous terms (e.g. strategic gene). We are still unsure how different these ideas are from Dawkins's 'extended phenotype'. If no difference is implied, we would have preferred Haig to adopt the older, familiar terminology. The book closes with a section containing three new chapters. Harvey & Nee's 'Phylogenetic foundations of behavioural ecology' makes a good case for the use of the comparative method, but lacks any discussion of how to

incorporate the comparative method into behavioural ecology. In fact, it offers no explicit examples of behaviour. The same criticism applies to Hewitt & Butlin's 'Causes and consequences of population structure'. This chapter is a good review of population genetics rather than a mandate for its integration with behavioural ecology. It is obvious that both phylogenetics and population structure are important for behavioural ecologists and the lack of behavioural examples may simply reflect the need to use these approaches more extensively. 'Individual behaviour, populations and conservation', by Goss-Custard & Sutherland, emphasizes the use of behavioural decisions in the construction of population models to predict the consequences of habitat loss. The chapter provides a template upon which behavioural ecology can make a meaningful contribution to conservation biology using individual-based models. The focus of the models, however, is restricted to the authors' own research organism, the oystercatcher, and few empirical data are presented.

We have several broad criticisms. First, many chapter titles are misleading, such as Ryan's 'Sexual selection and mate choice'. Since the chapter lacks any mention of male–male competition or other aspects of sexual selection, a more appropriate title may have been 'Female mate choice'. Second, we found little critical content in many chapters. For example, Daan & Tinbergen's 'Adaptations of life-histories' suggests that reproductive value decreases with increased parental effort, yet the authors did not inform their readers about the controversy surrounding the quantification of costs of reproduction (Bailey 1992; Reznick 1992). This lack of criticism seems pervasive among many chapters, perhaps because the chapter authors rely heavily on their own work as examples even though rigorous criticism is an integral part of creative research. Many of the examples of Daan & Tinbergen and all of the models discussed in Goss-Custard & Sutherland are from at least one of the authors. Third, we found it unfortunate that the editors ignored a few new, emerging topics such as behavioural ecology of disease and human evolutionary psychology. Also missing, but present in previous editions, are behavioural ecology of plants and predator–prey interactions.

Should you buy this book? For the intended audience of upper-level undergraduate and graduate students, Krebs & Davies have again fulfilled their goal of providing an advanced introduction to the field. The book gives a good overview of behavioural ecology, and the general lack of criticism allows plenty of opportunity for discussion by students. Having said this, as students, we found it unfortunate that we do not have a choice of a text with a less prohibitive price. Students deterred by the cost need not purchase this edition, since the same or better material can be gained from periodic review articles. We hope that established researchers will take this opportunity to produce a book at a reasonable cost and of comparable quality.