I have been teaching an advanced undergraduate course in host–parasite coevolution; Payne's chapter was the only one that proved useful. Paradoxically, it illuminates what is missing from the rest of the book: data directed at well constructed, testable hypotheses. In the final chapter, Moore and Clayton provide a stimulating summary of what is not included in their book, and it makes good reading for graduate students casting around for a project. They end by welcoming the reader to 'the lively bustle of a work in progress'. I agree there is a bustle, but the avian slant of this book means that much of it is missing. Phage–bacteria studies, insect–pathogen interactions and within-host evolution of mammalian parasites, such as HIV and trypanosomes, have generated major insights into the general principles of host–parasite evolution, and are surely going to keep doing so. Perhaps someone in those fields ought to pause to write a review.

Andrew F. Read

Institute of Cell, Animal and Population Biology, University of Edinburgh, Edinburgh, UK EH9 3JT
(aread@holyrood.ed.ac.uk)

References

1 Loye, J.E. and Zuk, M. (1991) *Bird–Parasite Interactions: Ecology, Evolution and Behaviour*, Oxford University Press

A model fish

Sex, Color and Mate Choice in Guppies

by Anne E. Houde

Princeton University Press, Monographs in Behavior and Ecology, 1997.
£35.00/$49.50 hbk, £14.95/$19.95 pbk
(xii + 210 pages)
ISBN 0 691 02790 0 / 0 691 02789 7

As a particular field of research matures, studies of a few key taxa often contribute disproportionately to its data base. In sexual selection, the peacock might exemplify the primary quandary of the evolution of extremely sexually dimorphic traits[1] but, despite some excellent studies[2], the peacock is more of a mascot than a model. Of the few model systems in sexual selection, the guppy stands supreme.

In her new book, Houde reviews much of the relevant literature and combines it with some of her unpublished research to address the question of why males have evolved their spectacular color polymorphism. Houde builds on a wealth of information dating from the earlier studies by Baerends, the Haskinses, Liley and Endler and culminating in the mate choice studies by herself, John Endler, and others.

The main focus of Houde's analysis is the role of female mating preference in the evolution of male color, especially orange. This concern is complex because it not only involves documenting the female's preference, but also addresses how the color pigments are acquired, how color is perceived by females and predators, the influence of the environment on color transmission, and some speculation as to what information about the male is conveyed by these colors. Houde's analysis is characteristic of a new trend in studies of behavioral and evolutionary ecology towards an integration of frequently isolated levels of analysis. Many other guppy studies have also relied on the extensive population variation that has endowed guppies with the raw material required by researchers to document the correlates of color variation in nature (such as predation pressure and possibly geographic variation in female visual sensitivity); to conduct artificial selection experiments on the response of color to predation (there is a clear evolutionary response to selection); and to uncover genetic correlations between male trait and female preference (these results are less clear). This superb presentation by Houde will bring many readers up to speed on the current status of guppy studies.

Another refreshing aspect of Houde's synthesis is how she addresses hypotheses about the evolution of female mating preferences. Gone is the overworked emphasis of 'good genes' versus runaway sexual selection. Instead, Houde acknowledges that these effects can act in concert, that the neural mechanisms underlying preference can be influenced by selection in a variety of other contexts and that preference can be influenced by the past evolutionary history of the species. However, it is interesting how difficult it is to abandon the intuitively seductive notion of good genes despite any evidence for its support in this system. Orange, and other carotenoid-based pigments, cannot be synthesized in guppies but must be acquired through the diet. The color of an individual, therefore, provides a window on its foraging behavior – the suggestion is not that carotenoids themselves are advantageous (apart from attracting females) but that only a healthy foraging male can acquire them. Several studies have investigated whether female guppies (and other animals, such as finches[3]) that mate with brighter males produce offspring of greater vigor. There are no compelling data to suggest this is true. This is clearly stated but it seems difficult for the author to let go of this notion.

My only serious complaint about this book might be more aptly directed to the publisher rather than the author. This is a book about color, but on the cover (of the paperback version) there is not a single color illustration; if ever color was needed to make a point, the stunning variation in the color of male guppies is it.

In many biological disciplines, new researchers tend to gravitate towards model systems when embarking on their research careers. In various areas of ecology, evolution and behavior, however, the opposite often appears to be true. These are fields that attempt to explain diversity and, to understand diversity, a diversity of systems must be understood. Thus, there can be no single 'lab rat'. However, students are often drawn to the bizarre rather than the manageable. But, if this new trend towards a more integrative biology is worthwhile, there must be some premium put on studying systems for which there is a wealth of information. Houde has clearly shown the advantage of the model-system approach. This book can serve both as an introduction in how to study sexual selection to the novice and as a welcome synthesis and update on guppy sexual selection.

Michael J. Ryan

Dept of Zoology,
University of Texas,
Austin, TX 78712, USA
(mryan@mail.utexas.edu)

References

1 Cronin, H. (1991) *The Ant and the Peacock*, Cambridge University Press
2 Petrie, M. (1994) *Nature* 371, 598–599
3 Ryan, M.J., Autumn, K. and Wake, D.B. *Integr. Biol.* (in press)

Space, time and statistics

Spatiotemporal Models of Population and Community Dynamics

by T. Czárán

Chapman & Hall, Population and Community Biology Series, 1997.
£59.00 hbk (xvii + 284 pages)
ISBN 0 412 57550 7

Recently, the effects of spatial configuration in population and evolutionary processes have been the subject of intensive research efforts. Most ecological interactions (e.g. competition over resources, disease transmission, cooperative interaction by attracting common pollinators and reproduction) occur within a spatial scale that is much smaller than the size of the whole

