Fresh selection

T.R. Birkhead

Behavioural Ecology: An Evolutionary Approach, 2nd Edn.

Edited by J.R. Krebs and N.B. Davies.
Blackwell Scientific/Sinauer: 1984.
Pp.493. Hbk £25, \$42; pbk £13.80, \$25.

BEHAVIOURAL ecology has come a long way since the first edition of this book appeared six years ago, and is still moving fast. Some second editions are gentle updates, or even so subtly improved versions of the first, but this is virtually a new book. There are very few chapters unchanged from the 1978 edition, the only exception being Maynard Smith's sex. Several of the chapter titles are the same as previously but often with new authors and certainly with a great deal of new information. As before the emphasis is on theory and the book is aimed at researchers and dedicated final-year students.

Behavioural ecology was born out of the cross-fertilization of ideas from several disciplines and it is exciting to find that the scope of *Behavioural Ecology* has expanded to include two additional topics, learning (Chapter 7 by Shettleworth) and plants (Chapter 14 by Charnov). While plants clearly don't behave as animals do, behavioural ecology theory has much to

offer botanists. Considering the rich rewards that so many zoologists have gained from the use of selection thinking, it is somewhat surprising that botanists have lagged behind. Charnov's chapter deals with sex choice, breeding systems and the conflicting interests of males and females. These are not the only areas of common ground for zoologists and botanists; others (at Sheffield and the University of East Anglia) are already looking at the foraging behaviour of plants!

In Chapter 12 Emlen updates his review of cooperative breeding — clearly a necessity if the number of birds known to breed in this way is any measure of this subject's interest. In the first edition Emlen noted that there were 150 known cooperatively breeding birds: the figure is now 300! The diversity of such breeding systems has also increased but at a much faster rate than our understanding of how they evolved. Cases in which close kin act as helpers are relatively easily explained, but why unrelated individuals should help is more problematical. Emlen discusses reciprocity, but another possibility, not yet fully explored, is that helpers mate with breeding females and actually help to rear their own young.

All in all this is an excellent text. It is well produced, clearly written and provides plenty to think about. □

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Wholesome ecology

Robert H. Smith

Ecology: Principles and Practice.

By W.H. Dowdeswell.
Heinemann Educational: 1984. Pp.312.
Pbk £7.50.

Concepts of Ecology, 3rd Edn.

By Edward J. Kormondy.
Prentice-Hall: 1984. Pp.298. Hbk
\$29.65, £27; pbk \$22.90, £20.85.

Principles of Ecology.

By R.J. Putman and S.D. Wratten.
University of California Press/Croom Helm: 1984. Pp.388. Hbk \$22.50,
£22.50; pbk \$9.95, £9.95.

FEW textbooks that attempt to encompass the whole of ecology have received widespread acclaim. Odum's *Fundamentals of Ecology* (Saunders, 1953), Krebs' *Ecology* (Harper & Row, 1972) and Ricklefs' *Ecology* (Nelson, 1973) are the three which have been most often adopted as set texts, and all have run to second and third editions. Recently, the trend among publishers has been to launch series of smaller books, each dealing with a specialized aspect of ecology. However, many lecturers like to recommend a single book for purchase by first-year students which will also provide an introduction to later, more specialized courses.

Of the three books reviewed here, two are aimed firmly at the undergraduate market while Dowdeswell's *Ecology* is intended mainly for sixth formers and first-year university students. Dowdeswell's book is quite different from the other two and I shall consider it first. Dowdeswell provides a very basic introduction to ecological principles, going from physical factors through population dynamics to communities and ecosystems in less than 60 pages. No topic is considered in depth, nor is it intended to be. The book is written as extended notes with keywords highlighted in bold type and is clearly aimed at British, pre-university examination syllabuses. The second quarter of the book is about collecting and analysing data, and those involved in setting up simple field exercises for students may appreciate some of the practical tips. I do, however, have severe worries about the oversimplified treatment of statistics; for example, the statement "in order to avoid sampling error, the whole population should be collected but this is obviously impossible" does nothing to help the student struggling with the concept of the infinite population from which a sample is taken. The rest of the book runs through six groups of ecological communities and concludes with the obligatory chapter on ecology and man. I do not imagine that the level of description will be adequate for any biology degree courses, but the book is nicely produced

and will probably do well in the pre-university market at which it is aimed.

Kormondy's *Concepts of Ecology* is a middle-aged standard, first published in 1969 and possibly running to fat in an expanded third edition. My personal view is that his treatment of ecology is unexciting in both content and presentation. Most of the references are to books or general articles in *Science* and *Scientific American*; though adequate for first- and second-year undergraduate courses, final-year students need something more demanding. Just as Dowdeswell's book is parochially British, Kormondy's is parochially American and I could not find a single reference to European ecological journals: have *Oikos*, *Oecologia*, the journals of the British Ecological Society or *Nature* never published anything worth mentioning? Kormondy's approach is the standard one, dealing first with energy flow in ecosystems and biogeochemical cycles, then with population ecology and community organization, finishing off with human ecology.

Principles of Ecology by Putman and Wratten is the largest and most comprehensive of the three, with over 500 references, mostly to original papers. The order in which material is presented is the first feature that strikes the reader; after the usual introductory chapter on tolerance to abiotic factors and physiological and behavioural homeostasis, the authors launch straight into the ecological community as the unit of study. In some ways this unusual approach is a good one, since energetics and nutrient cycling are dealt with in an integrated way with species-abundance relations, community dynamics and succession. However, I did find that the links between different topics in the first four chapters are not made all that clear, and I reckon that students will have some difficulty in following the chapter on the niche without first thinking about intra- and interspecific competition (which come later). It is in the chapter on interspecific competition that the deficiencies of treating species interactions before single-species populations become most apparent. In order to develop a Lotka-Volterra model, exponential and logistic population growth models are skimmed through in a few lines, and the presentation of the conditions for coexistence is terrible.

Putman and Wratten place their chapter on population structure and analysis centrally — which of course means that the central concepts presented there are rather lost. The expanded repetition of exponential and logistic population models is again badly presented and likely to confirm the average biology undergraduate's prejudices about mathematical representation. A brief consideration of life tables leads into key factor analysis and the use of *k*-values but, like many authors, Putman and Wratten do not emphasize the direct link between the methods of analysis and implicitly assumed population models. Perhaps I am