

Biotas in space and time

Carolyn M. Harrison

Biogeography: An Ecological and Evolutionary Approach, 4th Edn.

By C.B. Cox and P.D. Moore.

Blackwell Scientific: 1985. Pp.236. Hbk \$19; pbk £9.80.

Themes in Biogeography.

Edited by J.A. Taylor.

Croom Helm: 1984. Pp.404. Hbk £25; pbk £12.95.

WHEN the first edition of Cox, Healey and Moore appeared in 1973, it quickly established itself as a popular text and successive editions have served to reinforce its appeal. In this new edition, the authors have retained the essential structure of the immediate predecessor, and have expanded two chapters to discuss more fully how the major patterns of biota emerged in the distant and recent past. They do this with the distinctive blend of description and analysis adopted in earlier editions and the student is left in no doubt about the difficulties of reconstructing palaeoenvironments and their associated biotas.

The evident emphasis on analysis of the spatial response of biota to plate-tectonic movement and climatic change will be welcomed by many, but it has been achieved at the expense of any real discussion of how plants and animals adapt to their changing environments. In earlier editions, a chapter on natural selection, inbreeding and adaptation formed an important functional link between the evolutionary and ecological perspectives that the book seeks to forge. The omission of these topics in the new edition is not unexpected, given the complexity of evolutionary and ecological genetics; nevertheless their absence merely serves to reinforce a retreat from the stress on ecology that can be detected in the earlier editions. The task of preserving a balance among differing views of biogeography is a challenging one and it is easy to be dismissive of the value of ecological studies for students who are interested in the history of distinctive floras and faunas. But, for those large numbers of biogeographers who are intrigued by the impact of human activities on the distribution and survival of biota when seen as resources and cultural symbols, an ecological perspective is just as fundamental as an evolutionary one. As a result students in biology and geology departments will be better served by this new edition than will their fellows in departments of geography and environmental studies.

The tensions provoked by the position of biogeography at the meeting point of several disciplines is nicely revealed

through the 11 essays edited by J.A. Taylor. This volume is addressed to the advanced student and aims to provide a representative selection of traditional and emergent themes in biogeography, as seen by British researchers. The result is something of a potpourri. In these essays biogeography emerges as a multifaceted subject and as one to be approached in a variety of ways and with a range of analytical tools. Each essay stands on its own; most are scholarly, informative and up to date; some are idiosyncratic and a few are dull. Of more concern than the disparate nature of the assembled topics, however, is that here an opportunity has been missed. Many researchers will be disappointed to find that the chance to raise the level of debate about research priorities was not grasped more fully. Moreover, aspiring researchers will find little to help them decide which of the

several methodologies or techniques available are the most appropriate for tackling particular problems. This is not to belittle any one of the individual contributions to the volume, but rather to point to the benefits that a more obvious and focused discussion of research developments would have brought.

Biogeography has experienced something of a renaissance in recent years and some of its popularity can be attributed to the well-deserved success of books such as Cox and Moore. I cannot help feeling however, that students who are inspired early on in their careers by these authors, will not find their enthusiasm fanned equally by a reading of Taylor's volume. And that is a pity. □

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Change in population

Michael B. Usher

Population Biology: The Coevolution of Population Dynamics and Behavior.

By John Merritt Emlen.

Macmillan, New York/Collier Macmillan, London: 1984. Pp.547. £31.50.*

HOW would most population biologists answer the question "how much mathematics should a student know?". Dr Emlen leaves the reader in no doubt since his book commences with a mathematical introduction, the "tools of the trade". The tools largely consist of matrix algebra, with, in addition, complex roots, variance and covariance, partial derivatives and the Taylor expansion. After this explanatory introduction it is odd that these mathematical concepts, especially matrices, are not made more of in the subsequent text.

Most of the topics that one would associate with a population dynamics textbook are covered — populations with and with-

out age structure, predator-prey interactions, competition and multi-species interactions — though it is, perhaps, surprising that parasitoids and mutualism are hardly mentioned. The book starts to diverge from the usual text when a strong genetic flavour is introduced in chapters that look at the genetic structure of populations and analyse models developed to deal with population parameters, either at a single locus or at multiple loci. Fitness is considered, largely by posing questions that raise a multitude of other questions: the same may be said about clines in colour, and their possible relation to environmental gradients.

The basic material having been covered, the evolution of various traits of population dynamics is then analysed in the final seven chapters. These traits include population parameters, age structure, mating systems and competitive interactions. The account of the latter is particularly concerned with niche separation, and emphasizes the coefficients proposed for measuring the effect of one species on another. The chapter dealing with predator-prey relations reviews the evidence for adaptations of both prey and predator, and for their coevolution.

The subtitle is somewhat misleading, since "behavior" is so underplayed in the text and the emphasis is firmly upon genetics; a subtitle such as *The Integration of Population Dynamics and Population Genetics* would have been much more appropriate. The book itself is almost dauntingly large, with large pages of small type, but it does encompass most of the subject, including reviews (to 1982), and incorporates discussion of many recent concepts. Although the style of writing seldom makes the text particularly lucid, I suspect that I shall make good use of this book for reference. □

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*Where appropriate, the price of a book in both Britain and the United States is printed at the head of a review in *Nature*. Prices are confirmed shortly before publication of a review.

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Attempts to persuade Macmillan Inc. to make public the dollar prices of *Population Biology* and *Microbiology*, 4th Edn (see p. 49) have failed, and these prices therefore do not appear here. The company might consider whether this policy is in its own best interest or that of potential purchasers of its books.