Ecology booklets

P. D. Moore

Island Ecology. By M. Gorman. Pp.79. (Chapman and Hall: Andover, UK, 1979.) £1.95. *Vegetation Dynamics.* By J. Miles. Pp.79. (Chapman and Hall: Andover, UK, 1979.) £1.95.

THE days are gone when undergraduate texts adequately embraced broad subjects. The development of a whole range of specialist studies even within a field like ecology has rendered it difficult for any one author to deal effectively with the rapidly growing body of information and ideas. Publishers are facing this problem in one of two main ways; either they are turning to edited textbooks in which each chapter has a different author (for example, *Thoretical Ecology* edited by R.M. May (Blackwell: Oxford, 1978)) or they resort to part-works in which various specialists are responsible for brief booklets which are intended to fit together into a uniform whole. This approach has been most effectively pioneered by Edward Arnold in their Institute of Biology series, which now runs to over a hundred items.

Chapman and Hall are now entering this market by producing an ecological series designed on similar lines and edited by George Dunnet and Charles Gimmingham at Aberdeen. The first two issues in this series are reviewed here.

Vegetation Dynamics by John Miles, of ITE (Institute of Terrestial Ecology), Banchory, is essentially a study in plant succession and it represents a very thorough and up to date review of this area of ecology. It begins by considering the ways in which ecologists view vegetation, with emphasis upon the divergence in viewpoints since Gleason and Clements. Mechanisms of vegetation change are dealt with fairly briefly, which is an unenviable task since such wide subjects as seed dormancy, competition and allelopathy need to be covered in a single chapter. This is not entirely satisfactory, since the subject warrants a book on its own and much has to be conveyed by examples, and no example can ever fully typify an ecological generalisation. In particular, more space could have been given to a consideration of stability, its definition and conceptual value. As it is, one is left with an uncritical statement of Horn's logical, but somewhat unhelpful, definition relating stability to speed of return to the equilibrium state.

A consideration of cyclic changes concentrates upon the well known A.S. Watt examples, plus regeneration of *Abies* forest. It would have been sensible to develop this idea more fully in its application to the persistence of the climax state. The regeneration mosaic of the climax, as demonstrated by such workers as Loucks, Forcier and Hope-Jones, provides an interesting comparison with the cyclic phenomena described in such detail by Watt.

There is finally a consideration of the role of grazing animals, another subject in which generalisation is difficult. Perhaps its influence on population dynamics of plant species could have received more emphasis.

One area which is rather neglected in the booklet is the total ecosystem view of succession, but perhaps the title was chosen specifically to avoid this issue. Nevertheless, a more complete work would have resulted if the Odum analysis of succession (which is mentioned) had been critically discussed. Such subjects as energy flow and nutrient cycling are central to an understanding of succession.

Overall, I wish the booklet could have been a little longer to include these additional items. Within the spatial confines of 80 pages, Miles has produced an extraordinarily extensive review of over 300 papers and has collated them in an interesting and thought-provoking manner. I shall certainly direct students towards it.

Island Ecology by Martyn Gorman is concerned with a very much more confined topic than vegetation dynamics and thus is more easily dealt with inside the restricted space available. The subject is again one which is of interest to many ecologists because of the manner in which the biogeographical principles propounded by McArthur and Wilson have been applied generally to fragmented habitats at a variety of scales.

The bulk of this booklet is concerned with true islands and their biology, but the idea of 'habitat islands' is always held in mind. For example, when considering dispersal, reference is made to B.N.K. Davis' experiments with nettle clumps and their invasion by invertebrates.

The mathematics of island biogeography is dealt with in a clear and simple manner and will provide a useful starting point for introducing students to this concept. The evolutionary significance of islands is also considered. The final two chapters are devoted to habitat fragmentation, both on the scale of mountain ranges and at the nature reserve level.

The bibliography for this topic is, not surprisingly, considerably smaller than that for vegetation dynamics. The editors should have insisted upon a uniformity of arrangement of references which, in this book, are placed at the end of chapters.

This new series has commenced with two useful and readable booklets and subsequent titles must be awaited in hopeful anticipation. Some of the future authors, we gather, will derive from areas other than eastern Scotland; the home team has set them a high standard to maintain. □

P.D. Moore is Senior Lecturer in the Department of Plant Sciences at King's College, University of London, UK.

Microbial ecology

P. S. Meadows

Microbial Ecology: A Conceptual Approach. Edited by J.M. Lynch and N.J. Poole. (Blackwell Scientific: Oxford, 1979.) Hardback £19.50; paperback £9.80.

THIS book is a mixture of styles and subjects, and standards — some of them excellent, a few mediocre and one or two very poor. The book is divided into three major sections on (1) the principles of microbial behaviour in ecosystems, (2) microorganisms in their natural environments, and (3) economic microbial ecology.

Much of the first of these is interesting reading, although I am not convinced of the need for a detailed description of the range of microorganisms (chapter 2.1). The mathematical treatment of population and community dynamics in chapter 2.3 is not easy to follow unless one has a good grasp of mathematics. It could have been presented in a simpler way without loss of much detail.

The second section contains the main part of the book with six chapters. Chapters on the terrestrial and aquatic environment are followed by the animal as an environment, extreme environments, aerial dispersal and biological interactions. Parts of these are well presented and interesting; but there are some omissions and a few inadequacies. Much of the chapter on the aquatic environment is to my mind too general, and is not strictly related to microbial ecology except in a very broad sense. For example, the large diagram on the major oceanic gyres is not really necessary. Biological interactions (chapter 3.6) contains two pages on the rumen and caecum (a field that would not be regarded as ecological by some ecological purists), whereas the relationships between microorganisms and invertebrates in sediments and on solid surfaces in aquatic environments receives hardly any comment.

The last major section — on economic microbial ecology — has one first-rate chapter on nitrogen fixation, two chapters of variable standard on microbial spoilage of food and on water pollution, and one quite extraordinary one on recalcitrant molecules.

The book has excellent parts to it.