Striking the autecological balance in plant ecology

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Introduction to Plant Population Ecology.
By Jonathan W. Silvertown.
Longman: 1982. Pp.209. £7.95, $17.95.
Environment and Plant Ecology, 2nd Edn.
By J. R. Etherington.
Wiley: 1982. Pp.487. Hbk £25, $59.95; pbk £12, $28.
Ecology of Woodland Processes.
By John R. Packham and David J. L. Harding.
Edward Arnold: 1982. Pp.260. £8.95, $19.95

IF THERE is one area of plant ecology which can truly be said to be blooming, it is the study of population ecology. After decades of emphasis on the synthetic, or community approach to ecology, the analytic, autecological balance is now being struck. Undoubtedly the publication of John Harper's *Population Biology of Plants* (Academic, 1977) has been a strong, stimulating factor in this development at the research level and its recent issue as a paperback has brought it (financially speaking) within the reach of undergraduates. But Jonathan Silvertown has now made a brave attempt to produce an introductory text on this subject, aimed directly at the undergraduate.

The book is briefer than Harper's, more visual in its approach (undoubtedly a product of the author's teaching experience at the Open University), uses a simpler style and, in general, assumes less background knowledge in the reader. But it is certainly not an oversimplified book. The need for a numerical approach and the value of mathematical modelling (including matrix-based models for populations with an age structure) is emphasized even in the first chapter. Beginning with life tables, seed dormancy and the seed bank, the author works his way through recruitment, demography, reproductive strategies, self-thinning and vegetative propagation. In all of these topics he draws liberally upon recently published experimental data which serves to underline the rapid advance of the subject.

In his final two chapters Silvertown tackles species interaction, competition and the concept of the niche. Again, as each concept or topic is introduced it is clearly illustrated by reference to an appropriate example from the literature. This leads to a lively development of the text and is a credit to its author's familiarity with the literature. It will make this book an excellent tool for the introduction of plant population biology to undergraduates and will also serve to open a wealth of valuable literature to postgraduates entering this field.

Etherington's *Environment and Plant Ecology* has already earned a respected position among undergraduate texts alongside Bannister's *Introduction to Physiological Plant Ecology* (Blackwell Scientific, 1976) and Larcher's *Physiological Plant Ecology* (Springer-Verlag, 2nd Edn 1980). Etherington has now considerably revised and expanded the book in a number of areas. Radiation balance and microclimate are dealt with in far greater detail, while the soils' section has been subjected to a rather less extensive revision but has been brought up to date in its literature coverage. A good balance is still maintained between topics such as soil profile description and geographical variation within soils, and the physico-chemical soil environment within which plant roots develop. The coverage of soil is generally stronger here than in competing books.

The response of the plant to radiant energy is a portion of the book which has changed beyond recognition. The lack of emphasis in the first edition on the light climate and photosynthetic pathways has now been thoroughly rectified, though the consideration of the ecological implications of the C_4 photosynthetic pathway could well have been developed further still, even though it is touched upon again in the chapter on water stress. A new chapter on climate and plant response has been inserted, which also refers back to the C_4 theme, as well as covering such topics as frost hardiness, seed germination and day-length responses.

The revisions, overall, are thorough and worthwhile, and the book has improved considerably since the first edition. It is assured of retaining an important position in this competitive field.

Books concerned with specific habitats must, by their very nature, have a more limited sales potential as undergraduate texts. Few courses are run on a habitat basis, but many concentrate upon particular habitats, particularly from the point of view of field work. The habitat-based book may, therefore, have its undergraduate appeal. Packham and Harding's *Ecology of Woodland Processes* is an ambitious attempt to introduce a spatially and biologically complex habitat at this level and to use the opportunity to expose the student to a variety of modern ecological concepts. Unfortunately, it is the first chapter, the "Introduction", which is the least successful. The authors try to pack far too many ideas into the first few pages, with the result that the reader is swept through population structure, allelopathy, hydrological cycles, production and *r-K* selection in the space of 20 pages. Many of these subjects are returned to later but this is enough to leave the beginner with mental indigestion, from which he is unlikely to recover. This tendency to skate over subjects superficially persists throughout the book. New terms (in heavy print) are introduced at a prodigious density, often as high as seven or more to the page. This could be tolerated if the terms were adequately defined, but sadly this is not always the case.

There are some features in this book which deserve considerable praise, such as the varied and interesting assortment of examples quoted to illustrate ecological points, many derived from non-British data, which is refreshing. It is also pleasing to find a cooperative venture between a botanist and a zoologist, though integration could have been more extensive. The book is weakened simply by trying to cover too much ground in too little space. □

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On the safe side of pesticides

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Herbicides and Plant Growth Regulators.
By W.W. Fletcher and R.C. Kirkwood.
Granada, St Albans, Herts/Renouf, Brookfield, Vermont: 1982. Pp.408. £25, $61.25.
The Chemistry of Pesticides: Their Metabolism, Mode of Action and Uses in Crop Protection.
By Kenneth A. Hassall.
Macmillan, London: 1982. Pp.372. Hbk £30, $46.20; pbk £15, $23.10.

PESTICIDES are an emotive subject and very big business economically. They are also a real problem when trying to write a comprehensive textbook, not least because of the fascinatingly interdisciplinary nature of the subject.

In *Herbicides: Physiology, Biochemistry, Ecology* (Academic, 1976), Professor Audus solved the difficulty by inviting many authors to contribute articles on their specialisms; the risk with this approach is that integration of the various topics is reduced. In their attempt to provide all-embracing coverage of herbicides, W.W. Fletcher and R.C. Kirkwood run into a different problem — there are so many