Ecology of rivers . . .

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River Ecology. (Studies in Ecology, Vol. 2.) Edited by B. A. Whitton. Pp. x+725. (Blackwell Scientific: Oxford and London, 1975. Distributed in US by University of California Press.) £18.

River Ecology is the second volume in this internationally-based series concerned with ecology which aims at the production of scholarly integrations of established topics and critical assessments of newly-opened fields. This volume offers a comprehensive treatment of river ecology, and its prime aim is to provide a fundamental framework for the subject. Such an approach will be of value both to the more advanced student and to the research worker and river management officer who needs some guidance to the mass of literature which is now appearing about rivers. The 28 contributions to this book go a long way to fulfilling these aims and have certainly guaranteed that it is one of the few, although not the cheapest, books in English which covers so many aspects of river ecology.

Unavoidably the contributions vary in their quality and length, and their uneven size does not necessarily correspond to the importance of their subject. Some are disappointingly short, whereas others are surprisingly drawn-out. For example, only 31 pages are devoted to fish, whereas a similar number of pages deal with lotic periphyton. No-one would question the great importance of zonation in river ecology but the 63 pages devoted to this subject are more than twice the number of pages given to any of the other contributions except two.

In a book of this sort, where the size of the author's contribution is necessarily limited, it is not difficult to find omissions. The most glaring omissions occur in the chapter on Ecological Aspects of River Impoundment. This chapter tends to dwell almost entirely on the effects within the impoundment, and the downstream effects of impoundment on rivers are described in two pages. Only ten lines are devoted to the effects of hydroelectric installations on river flows and fish movement, and no mention is made of the effects of water transfer, either directly from river to river or indirectly through a regulating reservoir. This is a subject of paramount importance in the water resources field in this country at the moment, and its omission is to be deplored.

In the chapter on River Zonation and Classification a number of photographs are included which depict the various zones, named after the dominant fish species present, in a number of river systems. A number of these do not correspond with the physical appearance of these same zones in other river systems. For instance, the example given of the minnow reach or grayling zone (Fig. 14.2a) is nothing like the grayling zone on the River Tweed or the River Clyde; and the minnow reach in some Welsh mountain streams would correspond almost to the head stream depicted in Fig. 14. 1a. The author refers to the River Wye, at Newbridge-on-Wye, (Fig. 14.2b, and the front cover of dust jacket) as being an upper salmonid zone although grayling, dace and chub are abundant in this stretch of the river. I would not refer to the Wye being an upper salmonid zone until one reached a point upstream of Llangurig.

The book ends with an Appendix which gives a guide to Further Literature on Particular Rivers. There are a number of glaring omissions, however, which include the Teifi and Towy in Wales, the Bran, Conon, Don, Forss, Meig and Tay in Scotland and the Fraser, Margaree, Miramichi and Pollet in Canada.

This is, however, a most valuable work on river ecology and I recommend it being purchased by all appropriate university departments and research institutions, and by more affluent research workers. □

. . . and animal populations

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Animal Population Ecology. By J. P. Dempster. Pp. x+155. (Academic: London and New York, August 1975.) £3.80; $10.00.

THIS thin, hard-backed volume provides good, if mostly brief, coverage of its subject, dealing with 'basic concepts', competition, social behaviour, qualitative changes, natural enemies, weather, and examples of field studies, and concluding with population theories and applied population ecology. The comparative account of selected field studies is a major and valuable feature. For each of them, life tables are presented and analysed by the Varley and Gradwell method for key factors, to diagnose where, if at all, in the life cycle there occurs a mortality that is the chief component of the fluctuations in numbers over successive generations. The book also attempts to diagnose which process is responsible for the limitation of numbers. In four of the six examples, this density dependent process seems to be intraspecific competition, for food in the cinnabar moth, wood pigeon, and pine looper in its outbreak areas, for settlement sites in the edible cockle, or for territories in the tawny owl. Three other field studies, on larch tortrix, red grouse and rock ptarmigan, are considered in connection with the problem of how periodic cycles of these species are engendered.

The author's grasp of the theory of population dynamics seems to falter in places. The intrinsic rate of increase (r) equals births minus deaths (p. 4) only in the infinitesimal interval of the calculus equation describing increase; over a finite period the relationship is not so simple. It is not true that k-factor analysis necessarily enables us to recognise "any density dependent relationships which exist" (p. 15). The statement (p. 140) that "the maximum sustainable yield.....in the logistic model.....is $K/2$", can hardly be correct, since in this context yield is a rate, whereas $K/2$ is a quantity.

The exposition is occasionally faulty. On page 17 the explanation of k-values is confused by the introduction of an index of mortality that is insufficiently explained by the footnote. In Table XVII the values are divided by 10^6 and so on, not multiplied as indicated above the columns. The phrase "sufficiently density-dependent to prevent extinction" (p. 105) may lead students to suppose that a density-dependent influence at low density can avert population extinction in some positive way (whereas the most it can do is to cease its adverse action). On the verbal level, it is disconcerting to find Pimentel, one of the theorists whose views are examined, misspelled in both text and reference list. 'Epidemic' should not be treated as a synonym of 'epizootic' (p. 43). Hassell's term is 'aggregative', not 'aggregate' response (p. 49).

In spite of these blemishes, however, this is a valuable book that should appeal to university students and research workers. It has an index and an up-to-date reference list of some 200 items. Its scope overlaps that of the earlier book by Varley, Gradwell and Hassell (*Insect Population Ecology*, Blackwell, Oxford, 1973), which goes more deeply into population dynamics and the relevant methods of analysis, but is confined to insects. □