F. B. Christiansen & T. M. Fenchel. 1977. Theories of populations in biological communities. Ecological studies vol. 20. X + 144 pp., 68 figs, 5 tables. Springer Verlag, Berlin-Heidelberg-New York. ISBN 3–540–08010–4. Price DM 62,– ; US $ 27.30.

In this book the authors, a population geneticist and an experimental ecologist, wish to give a theoretical framework for ecology, and 'if not to integrate, then to demonstrate the connection between population genetics and population ecology'. Apart from discussing mathematically formulated models to connect these two fields, the book also brings in observational data from nature.

The authors see the importance of mathematical formulation in its more likely resistence to false conclusions and its ability to generate quantitative predictions which can be tested in nature.

These aims are quite high, too high perhaps. The authors of this book prove to be far more familiar with the mathematics involved than with the techniques of bridging the ever widening gap between theoretical and practical ecology. Their examples of factual data from nature are not only vague and without connection with the detailed mathematical analysis they follow, but are also incomplete. So, the lack of seriousness in their attempt to test their models in the field, even though this was one of their objectives in writing this book, is my main criticism.

An example is their discussion of the occurrence of character displacement. At first we are told that 'Hutchinson (1959) reviewed the cases of character displacement known at the time;...' which, without much further detail, is not really informative. More importantly, of what use to an ecologist are highly sophisticated models eventually leading to a remark about Hutchinson's review that 'Most cases of character displacement in coexisting congeners manifested themselves as a ratio in linear dimensions of about 1.3'? In the authors reference to their Section 3.6, I could not find any analytical argument which leads to this numerical expectation. How great in such a case is the 'order of magnitude' in the testing of predictions? Their own example of a prediction of a case of character displacement concerns size ratios of three species of mud snails. Here too, they arrive at a numerical value for the size ratio of 'about 1.3', but base this result on only 16 observations, that is, on 3, 6 and 7 observations of the three species. This is extremely limited and, as an example of an analysis connected with this theory, it contrasts sharply with that of Grant (1975, Evolutionary Biology 8 : 237–337), dealing with the classical case of character displacement in two *Sitta* species, to which the authors do not refer.

A chapter on models of spatially structured populations is of interest, although the same criticisms apply here. For instance, neither a stochastic population theory by Reddingius & Den Boer (1970, Oecologia 5 : 240–284), nor the difficulty in the equilibrium theory of the estimation of extinction rates of populations as the counterpart of immigration in island biogeography are mentioned. How the absence of several habitat types can actually be measured remains obscure, as does also the estimation of the K of environmental capacity mentioned earlier in the book. These are only a few among those mathematical concepts which urgently need to be made operational before the theory developed can make sense ecologically.

Mathematics, the authors state, 'makes it clear whether a problem is understood or not'. However, to me the means to estimate the parameters in a model about a process in nature forms an integral part in its understanding. The authors have already gone a good way by properly stating the problems and integrating models from fields which were previously apart but fail to put their theory into practice.

The text is written in a style which is not always clear, sometimes containing grammatical errors which could have been avoided by employing the services of a professional linguist. There is also a lack of clarity in the figures, non-consequent trends of curves including one which bears no relationship to the points through which it has been drawn (Fig. 57). The blowfly of Fig. 3, crawling between graphs and formulas, is surely puzzled by its landing place – and so am I.

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