

p. 95 and 'differentiation' for 'dédifferentiation' on p. 77. Aristotle's view of eel life-history was probably less naive than it is here painted. The name *Leptocephalus* was not, as the book states, first given to the larva of *Anguilla*. It was invented in 1763 by Gronovius for a larva of a conger eel sent to him by Pennant (although both, of course, were unaware of the relationship between larva and adult), long before Kaup put *L. brevirostris*, now known to be the larva of *Anguilla*, in the same 'genus'. It is worth mentioning that it was in the conger eel that the metamorphosis was first observed, by Delage in 1886, thus providing the analogy for the demonstration ten years later of the identity of *L. brevirostris* and *Anguilla* by Grassi and Calandruccio.

This book should appeal to a wide range of readers, and it is to be hoped that new editions will be called for in which not only some improvements can be made, but also the results of work still in progress may be incorporated to keep it up to date.

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## ECOLOGISTS IN THE LABORATORY

### Microbial Ecology

Seventh Symposium of the Society for General Microbiology, held at the Royal Institution, London, April 1957. Edited by R. E. O. Williams and C. C. Spicer. Pp. ix+388+6 plates. (Cambridge: At the University Press, 1957. Published for the Society for General Microbiology.) 32s. 6d. net.

THE complex interlocking social structure of most natural communities of organisms is determined first by the selective action of the habitat, and secondly by the interactions of its inhabitants. It is the business of ecology to understand these relationships; all biological information can be used, and eventually must be used, by the ecologist as raw material for his study, yet the amassing of this raw material is only a first step in the elucidation of ecological relationships. Ecology has been an over-worked word, and some microbial ecologists may have entertained private doubts as to whether the symposium volume here under review would represent a genuine and substantial contribution to ecology, rather than a mere rag-bag of assorted microbiological data in search of a collective title. Happily these hypothetical fears have been proved groundless by the actual event.

It is much to be hoped that ecologists in general will read this symposium volume, if only to realize that microbial ecology is now a branch of the subject in its own right, and not merely a provider of microbiological information useful, for example, to plant ecologists interested in the behaviour of roots, or in the availability of soil nutrients. Microbial ecology, owing to its greatly compressed space and time relationships, lends itself peculiarly well to laboratory study; as physiologists, biochemists and geneticists have also demonstrated, micro-organisms offer many advantages over higher animals and plants as experimental subjects.

To this volume, eighteen authors have contributed seventeen papers, distributed fairly evenly over the field of contemporary research. I should like to comment on every paper, but I must restrict myself to a short list of those contributions which I think

most nearly represent the whole subject, or which consider particular aspects of general interest. Other reviewers, with other special interests, might have made a different but equally good selection; nevertheless, I am certain that any reviewer would find an excuse to mention the outstanding paper by R. Y. Stanier and Germaine Cohen-Bazire on the role of light in the microbial world. It seems impossible for Prof. Stanier to write a paper that is dull even in part, and this one fully repays the attention that its closely-reasoned arguments demand.

Although Dr. Jane Gibson's paper is concerned with nutritional aspects of microbial ecology, yet I think it succeeds better than any of the other contributions in explaining very clearly the whole subject, and this is perhaps the best paper to read by way of introduction to the others. Incidentally, it includes one of the best short histories of soil microbiology that I have read. Whereas Dr. Gibson has confined herself to the microflora of soil and other habitats, a similar broad survey serving as an introduction to microfaunal ecology has been made by Dr. J. A. Kitching in his article on the free-living Protozoa; both he and Dr. Gibson epitomize the 'oscillating process' whereby research on microbial ecology must proceed, by the alternation of field surveys and laboratory experimentation, giving progressively closer approximations to the truth.

A paper by Dr. H. T. Tribe is noteworthy not only for its description of an elegant new technique for studying the development of a succession of micro-organisms on buried cellulose film, but also for the fact that equal attention is devoted to microflora and microfauna. This is one of the most comprehensive and convincing studies of a microbial succession on a selected substrate yet to have been published. Dr. P. W. Brian's paper, on the ecological significance of antibiotic production, is certain to be widely read; here we can see how the ecologist's approach has clarified a problem of absorbing interest to many microbiologists. Only Dr. Brian, with his unique experience of the whole subject, could have discoursed with so much insight on this problem. The amount of nonsense that has been written on this subject in the past, though admittedly not by ecologists, makes the recent progress reported by Dr. Brian all the more gratifying.

Mr. F. C. Bawden's article on the role of plant hosts in microbial ecology has been as well placed in this symposium as an astringent draught in an over-long banquet—towards the end, where it is needed. I do not agree with all that Mr. Bawden has said, but I imagine that he would be dismayed if I did; he seeks not to impose agreement, but rather to provoke a more sceptical spirit of inquiry, and he has certainly succeeded in making me re-examine my own convictions. He rightly criticizes the tendency to premature generalization, and remarks that every ecological situation is best considered as though it were unique.

In the course of his paper, Dr. Kitching has incidentally deplored the "academic estrangement of bacteriology from zoology"; the publication of this symposium will at least help those to help themselves who wish to reduce the worst consequences of a cleavage that starts in the classroom. The editors, Drs. R. E. O. Williams and C. C. Spicer, are to be congratulated on the results of their unobtrusive but not inconsiderable labours.

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