

recommended for use as course texts although Carlberg's might be suitable for particular types of courses. Its price, however, would prevent its purchase as a standard text. For students studying genetics as well as microbial genetics, a more sensible purchase would be the second edition of M. W. Strickberger's *Genetics* (Collier-Macmillan: London, £6.30+0.95 pence for answer manual).

Bacterial, Phage and Molecular Genetics. (Springer: Berlin and New York, DM23; \$9.50). a practical manual by U. Winkler, W. Ruger and W. Wackernagel, translated from the German, is a very useful collection of experiments which complement well the manuals already available. There are a range of experiments on the purification of bacteriophages as well as detailed schedules on density gradient centrifugation techniques. Molecular aspects include the isolation and analysis of DNA from bacteriophages as well as experiments on mRNA. The use of ultraviolet light, one of the safer mutagens, is fully exploited to show lethal effects, mutagenesis and the induction of lysogenic and colicinogenic bacteria. Standard

bacterial and bacteriophage genetics experiments are included as well as transfection of *Escherichia coli* sphaeroplasts with λ DNA. The final section deals with gene action and phenotypic expression with systems ranging from morphogenesis in T4 bacteriophage to regulation of β -galactosidase. In addition to schedules for 25 experimental areas there are also brief introductions to background theory, useful references, five sets of problems and answers and (particularly valuable) 48 pages of the results expected from the experiments described.

This manual should prove very useful to lecturers attempting to broaden the range of experiments in microbial genetics courses. The book is clearly produced and usefully illustrated with graphs and specimen data sheets. The experiments described are not as ambitious as some of the recent manuals on molecular genetics but this has the advantage that most of the experiments should be feasible in a department with average equipment.

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... and ecology

Interfaces in Microbial Ecology. By K. C. Marshall. Pp. x+156. (Harvard University: Cambridge, Massachusetts, and London, 1976.) £9.40.

PROFESSOR MARSHALL has written a book that is attractive to read, and which is concise, selective, and clearly written. Microorganisms living at interfaces do so in a peculiar habitat; they are faced by unusual physicochemical stresses and must live a very different life from that of the bulk phase organism. What then do we hope to learn from a book that introduces us to the microbial ecology of this habitat?

The history of physical chemistry abounds with studies on the properties of interfaces: there are also clear ecological distinctions between gas-liquid, gas-solid, and liquid-solid boundaries: living bacteria exist in all environments and so must encounter such interfaces regularly. Topics of this sort are fundamental enough to need careful definition and discussion in an introductory text. Professor Marshall does precisely this, guiding us adeptly through some fairly advanced physical chemistry in the first few chapters, being careful to define his symbols as he does so.

Later chapters are concerned with "non-specific interfacial interactions in aquatic and terrestrial environments" and "specific interfacial interactions in

microbial ecology". Although some workers may not be convinced of the need for this distinction, Professor Marshall's treatment of aquatic and terrestrial environments is stimulating and provokes one to further research. He discusses the nature of bacterial adhesion, the problem of nutrients at surfaces, and the habitat of sedimentary microorganisms, and considers such terrestrial topics as moisture content, the rhizosphere and mineral dissolution. In his final chapter Marshall comments on the characteristics of oral and intestinal microorganisms, and lists some other microbial curiosities all of which prove entertaining.

Technically, the book is well produced, and the typographical layout is clear. Almost all of the figures and tables serve to amplify the text, except perhaps Fig 1.1 and 5.6, both of which suffer from being reproduced on matt paper. The bibliography is representative and the only fault I could find in the text was unfortunately a reference to my own work with Professor Crisp, which I thought was slightly irrelevant in a paragraph on primary microbial films (p61).

In general, I found Professor Marshall's book easy to read systematically, as well as being enjoyable to dip into, and can recommend it to advanced undergraduates and postgraduate research workers.

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