Aphids

Aphids. (Invertebrate Series.) By Roger Blackman. Pp. 175. (Ginn: London and Aylesbury, 1975.) £3.00.

THE main reason why aphids have not attracted the attention they merit is the lack of simple accounts of their biology and taxonomy. Roger Blackman in 175 pages presents such a comprehensive, highly readable and extremely well illustrated account of aphids. The book's main asset is Chapter 10, 'Aphids in Britain'. This chapter makes available to amateur entomologists, for the first time, a workable key in English to the more common genera of aphids in Britain. The excellent colour plates by Hilary Burn, which illustrate this chapter, serve to bring some of the aphids to life. Unfortunately the colour photographs in plate 1 are so badly reproduced that they are useless; an additional colour plate would have been preferable.

The other 10 chapters deal with the structure and physiology of aphids, natural enemies, relationship with ants, population dynamics and techniques of study. This last chapter is a useful source of ideas for student projects.

In future editions Fig. 3 could be omitted, or revised, as it confuses rather than clarifies the discussion of an aphid's powers of multiplication; and Fig. 33 modified, as not all host-alternating aphids can produce and mature sexual morphs on their secondary hosts. The complex terminology of the various morphs of aphids has deterred many biologists from studying aphids, and it is therefore surprising that Dr Blackman did not use the simpler terminology proposed by Hille Ris Lambers (*A. Rev. Ent.*, **11**, 47–78, 1966). Unqualified statements such as aphids produce large numbers of offspring to counteract the losses they incur (p34), and that crowding is self induced (p78) unfortunately support Janzen's (*Science*, **182**, 1125–1126, 1973) contention that aphid biology is in need of a solid dose of evolutionary biology. Apart from these criticisms this book can be warmly recommended as an excellent introduction to a fascinating group of insects.

A. F. G. Dixon

Controversial texts

Techniques of Applied Quantum Mechanics. By J. P. Killingbeck. Pp. 224. (Butterworth: London and Boston, Massachusetts, November 1975.) £9.

OF the five chapters in this book two are directly relevant to the title—chapter four on "Perturbation and Variational Methods" and chapter five on "Group Theory", both topics in which the author has had practical experience. It is a pity that chapter four did not begin at the beginning—clearly a reader is supposed to have already read a standard book on quantum mechanics including the section on perturbation theory. The book would have been better if these chapters had been preceded by a conventional description of the principles of quantum mechanics. Instead we have a chapter called "Review of Basic Principles", which makes derogatory remarks on other textbooks, gives instructions to teachers of quantum mechanics and tells us about dyadics, but fails to review the basic principles. It is too nebulous in intent to be useful and is inconsistent in what is required of the reader—for example, if he needs to be told the meaning of operators commuting he should not be expected to be familiar with Dirac bra/ket notation. We then have two chapters on "Modern Mathematics" and "Operator Theory". In fact the mathematics of the second chapter is not in any sense modern. As a summary of some, mainly algebraic, topics these two chapters are adequate and probably useful. They are, however, essentially a list of definitions and theorems. Little is actually done with the concepts discussed and there are no proofs. It is hard to see how any student can really learn a subject from this type of treatment.

When the author is writing about "Applied Quantum Mechanics" he writes well and it should be said that the relevant two chapters constitute more than half of the book. In other places he is less convincing and one detects a certain 'propaganda' aspect to to the book, inappropriate in a textbook. On p10: "One of the basic problems is that of communication between the different types of scientist working on the subject; many a physicist has tried to follow up some interesting point which he suspects may have a practical application, only to give up in frustration at the large number of unfamiliar theorems and erudite subtleties which are taken for granted by the average mathematician's writings on quantum mechanics". Presumably it is "lack of communication" not "communication" that is alleged to be a problem. But is it a problem? What is the evidence?

On p38 we are told "The embedding of the real numbers in the complex numbers which is involved in this calculation is usually not commented on at all in texts concerned with quantum mechanics". Presumably these textbooks, contrary to the one under review, also omit to tell us that $\pm i$ is "more exactly $0 \pm 1i$". Maybe their authors know something! **E. J. Squires**

More to coral reefs . . .

Biology and Geology of Coral Reefs. Vol. 3 (Biology 2). Edited by O. A. Jones and R. Endean. Pp. xxi+435. (Academic: New York, San Francisco and London, 1976.) $49.00; £25.00.

FOR the second biological volume of this composite work on coral reefs, the editors have assembled a highly competent team of collaborators. There are chapters dealing with the more important groups of associated organisms and others covering aspects of the ecology of both reefs and coral cays. (For a review of volumes 1 and 2, see *Nature*, **248**, 809, 1974.)

From the unique wealth of his long experience, F. R. Fosberg discusses coral island vegetation which, in its limited but widely distributed species, gives, as he concludes, an insight into the nature and complexity of vegetation generally, while itself forming the basis of the rightly famed beauty of coral islands.

A. J. Bruce reviews our present knowledge (to which he has contributed so extensively) of the numerous shrimps and prawns around coral reefs. Aspects of the ecology of coral reef fishes are similarly discussed by B. Goldman and Frank Talbot, again on the basis of much personal experience on One Tree Island in the Capricorn Group. A further chapter deals with the natural toxicity of certain coral reef fishes.

The highly vexed problem of ciguatera is the province here of its major investigator, A. H. Banner. This disease, which may unpredictably follow human consumption of coral reef fishes in the Indo-Pacific and the Caribbean, forms a major hazard in the developments of fisheries. We know the nature of the toxin but not the conditions controlling its appearance.

The factors responsible for the destruction and recovery of reefs are very suitably reviewed by R. Endean; there are further chapters on echinoderms, on intimate associates of reef corals and on birds and on turtles, the last from Robert Bustard who has contributed so much to our knowledge of those around the Great Barrier Reef.

Altogether this is an exceptionally valuable book to be studied and, if possible, possessed by the growing numbers of those fascinated by the innumerable problems presented by a living coral reef.

C. M. Yonge