Ultrastructuralism

Michael Ashburner

Insect Ultrastructure. Vol.1 The Ultrastructure of Gametes. Vol. 2 The Ultrastructure of Developing Cells.
Edited by Robert C. King and Hiromu Akai.
Plenum: 1982/1984. Vol. 1 pp.624, $55, £52.25. Vol. 2 pp.650, $85, £80.75. Two-volume set $127.50, £121.13.

IN September 1969 the Royal Entomological Society of London held a symposium called "Insect Ultrastructure". Of the eleven people who contributed to it five were, or had been, members of the Department of Zoology in Cambridge. Surprising, considering that the meeting was organized by an Oxford man. The present two volumes have 49 contributors, only one of them from Cambridge Zoology. But then only one, David Spencer Smith (to distinguish him from all the other eminent biologists, let alone Oxford professors, called David Smith), has contributed to both of these volumes and to the 1969 symposium. David Spencer Smith is, now, in Oxford.

Who will read such volumes as these, 31 chapters on the ultrastructure of insects? I suppose there are those who will read anything on structure if it is ultra, whether from bees or bats. There are, I know, those who will read (almost) anything on insects, from ultrastructure to sociobiology. For these readers the two books suffer from a serious lack of balance. Some of the chapters are very narrow, others paint on a broader canvas. For example at one extreme we have Sorsa's review of the ultrastructure of the polytene chromosomes of *Drosophila melanogaster*. I have no quarrel with Sorsa's chapter as a contribution to science (at least no quarrel worth airing in these pages) but the ultrastructuralist or entomologist reading these volumes should be warned that it is very much a review of Sorsa's own work and makes no attempt to review the field comprehensively. Moreover there can be few who require 10 pages of a detailed map of the banding pattern of chromosome arm 2L. An $85 book is not a suitable medium for its publication.

Another example of a review whose field is narrow is that by Rasmussen and Holm on the ultrastructure of meiotic prophase in the silkmoth, *Bombyx mori*. I am sure that this is a subject worthy of review. That is not my complaint. My complaint is that in a large and expensive work called *Insect Ultrastructure* the purchaser might expect a more comprehensive review of, for example, meiotic prophase in insects or, perhaps, of meiosis in *B. mori*. I must not give the impression that all of the chapters are as narrow in their compass as these. Many, indeed, will be of interest to biologists with a wide range of interests, David Spencer Smith's review of the ultrastructure of insect muscle being one such.

In addition to the two classes of omnivorous reader there are those (and here I include myself) who approach volumes like these with the attitude of a selective browser. We will read chapters in this book for one (or more) of four reasons: (i) because we need to know what is going on in a particular field of research (which may be our own); (ii) because we always wanted to know about, for example, neuromuscular junctions in the Orthoptera but never, before, knew who to ask; (iii) because we are intrigued by the title of a particular chapter; or (iv) because we once met Professor Kafatos at a conference banquet in East Idaho and always wondered what he did for a living. For the selective browser balance is irrelevant; these volumes are a lucky dip to which he can return over and over again.

It is interesting, for an outsider whose practical experience of insect ultrastructure is limited to peering over Nancy Lane's shoulder at a glowing screen, to compare Neville's 1969 volume and David (Spencer) Smith's 1968 book *Insect Cells: Their Structure and Function* with these volumes. Two overall impressions. The first is the importance of technical advances: not only that the slow but steady improvement in preparative techniques has led to far better electron micrographs, but of methods such as scanning electron microscopy (in its infancy in 1968), freeze fracture, chromosome spreading and reconstruction from serial electron micrographs that are now routine tools. The greatest contrast, though, is that the two earlier books, Smith's especially, left one with a very static view of structure, making the necessary relationship between structure and function difficult to draw. Now, however, I get a real feeling for dynamic processes, of the importance of the change in structure, and hence function, with time. It is impressive to see how much the study of insect ultrastructure is now the adjunct of the experimental biologist, rather than the preserve of the morphologist. □

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• Next week's issue of *Nature* includes the Spring Books Supplement, 25 pages of reviews from, among others, W.F. Bynum, Richard C. Lewontin, Nevill Mott, David Park, Owen Gingerich, David Bohm and Anthony Clare.

Sea slugs: beauty in biology

Elizabeth B. Andrews

Biology of Opisthobranch Molluscs, Vol. II.
By T.E. Thompson and G.H. Brown.
The Ray Society, British Museum (Natural History), London: 1984. Pp.229. £39.

THE delicacy of shape and the beauty of colouring of sea slugs, the animals with which this volume deals, have captured the attention and admiration of many zoologists, amateur and professional. Their agility and grace of movement contrast markedly with the drabness and ponderous crawling of their terrestrial relatives and with their own dreadful deadness when pickled. They have remained a rather neglected group by comparison with both prosobranch and pulmonate gastropods, however, due partly to their unreliable occurrence and partly to the fact that many species are particularly abundant in those marine habitats that are most difficult to explore — too low for shore collecting, too shallow for adequate boat-work. The first difficulty still remains, and some species are genuinely rare. Scuba diving has largely abolished the second, however, and one reason for the success of this book is that both authors are accomplished divers and have thus found not only more specimens for study but also more species new to the area covered by their work.

The authors offer a taxonomic survey of the nudibranch gastropods found in British waters, with keys and illustrations to help identification. They give brief definitions of subordinal and familial characters, and for each species provide details of appearance, anatomy, feeding, breeding and a brief synonymy. Local distribution is recorded in a series of maps, and foreign distribution is mentioned, and there are short discussions of taxonomic problems, a very complete list of references and a helpful index. The book also benefits from the provision of an "Epilogue": a summary of ideas and information relating to opisthobranchs published since 1976 when Vol. 1 appeared.

Illustrations are important in any book dealing with such photogenic subjects as nudibranchs, and comparison with The Ray Society's previous publication on the group, Alder and Hancock's *A Monograph of the British Nudibranchiate Mollusca* (1845–1855), with its beautiful figures, is inevitable. Thompson and Brown's work stands up to the comparison with distinction: all but two species are illustrated in a series of plates on which paintings of the animals stand against a black background, lifelike and attractive. In addition, each species is shown in black and white, a helpful guide for the student.

For all interested in this group of animals the book will be an essential acquisition. It is an excellent addition to the series which The Ray Society has produced for so long, and a worthy successor to Alder and Hancock's *Monograph*. □

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