toxicants used on a variety of plants and animals. Except in these chapters and two untidy chapters on pesticides with a nonspecific mode of action and on those whose mode of action is unknown, herbicides and insecticides are treated in different chapters. Most herbicides are found in chapters on photosynthetic inhibitors and on plant growth inhibitors, most insecticides in chapters on anticholinesterases and on neuroactive nonanticholinesterases. The book finishes with a seven-page chapter entitled "Conclusions; pesticide design."

This is a compact, readable source book that covers its diverse fields in considerable depth, yet provides enough relevant introductory biology (accounts of, for example, respiration, photosynthesis, neurobiology) to enable anyone familiar with elementary organic chemistry to understand the essential points. Furthermore, the author provides a critical review rather than a simple report of "what-the-authors-claim." Most of the important findings published in 1972 or before are well covered, and the 14-page chapter on pesticides of unknown mode of action may indeed, as the author hopes, stimulate research by spotlighting areas of ignorance.

On the negative side, the author relies rather heavily on secondary sources, and some of his choices of original references are odd; for example, he documents the action of DDT with unpublished work by Pichon (p. 176), but omits the classic 1968 studies of Narahashi and of Hille. Nor has he mentioned the numerous objections to the proposal that DDT acts by blocking an adenosine triphosphatase. Too little attention is given to the actions of rotenone, cyanide, and fluoracetate and to the effect of DDT on eggshell thickness. Acetylcholinesterase is nearly always postsynaptic, not presynaptic and postsynaptic as stated in the book. In the seven lines devoted to insect neurobiology, the author fails to note the extensively documented fact that neuromuscular transmission in insects does not involve acetylcholine and almost certainly does involve glutamate. This striking physiological fact is a particularly exciting invitation to those who would design pesticides on biologically rational grounds.

Corbett has not published extensively on the subject of pesticide action, and the book is perhaps deficient in offering really new insights. The chapter on pesticide design provided an opportunity for original contributions, for the subject has not often been explicitly addressed and this is the author's own field of interest; but design is dismissed in a page and a half of truisms. The book does not in itself, therefore, advance the science of pesticide action. But it is a valuable record of how things stand. It gives a more synoptic view of the whole range of pesticide action than the treatments to which workers in this field are accustomed.

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Neuron Properties in Insects

Insect Neurobiology. J. E. TREHERNE, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1974. xvi, 450 pp., illus. $44.25. Frontiers of Biology, vol. 35.

We are waiting for a second volume of this work because this beautifully produced volume lays all the groundwork but covers almost none of the exciting areas of recent discovery in insect neurobiology. There is an incomparable account of the cellular structure of the nervous system, especially of glia and ultrastructure, by Nancy Lane, followed by careful and most useful accounts of axonal conduction and central synaptic transmission in insects by Yves Pichon and Jean-Jacques Callec. The chapter by Treherne on the environment and function of nerve cells shows exemplary moderation in both conclusions and volume. These, and the section on neuromuscular transmission by Peter Usherwood, are very solid, bread-and-butter productions by up-and-coming experts. That is refreshing: they are not reiterations of battle cries by old campaigners, but useful summaries by middle-of-the-road researchers who are with it. That is the kind of summary that is handy to have on the shelf.

I found the chapter by Simon Maddrell on neurosecretion the most exciting, perhaps because Maddrell sticks his neck out occasionally, possibly because this is a most rapidly growing and difficult area. As we are brought up to date our attention is drawn to many exciting possibilities just around the corner, whereas the earlier chapters treat mostly topics that are becoming rounded off. Even in the account of neurosecretion, however, I noted the feeling of bowdlerization the whole volume conveys. The daring passages have been removed or were never there.

The implication in the hopes for a volume 2 is that the rest of the subject of insect neurobiology contains the fascinating front line research, notably on sense organs, noise generation, specific odors, and defensive behavior. The action and function of sense organs have now become such a large topic that they warrant a whole volume.

Peter Miller makes a gallant attempt to summarize the neurobiology of insect behavior in 50 pages, but he offers no explanations of mechanisms. Most of his chapter is a careful survey of capabilities of the system, with reference to the kinds of other data that will ultimately be useful in framing explanations. At present, however, the components of the central nervous system are not even listed, nor are their activity and interactions recorded. The topic for the third volume, the neurobiology of insect behavior, is as yet a glimmer reflected occasionally from the eyes of the proposal readers. There are only a handful of papers that say anything useful on the topic, and probably we must wait till next century for a volume on that topic as thorough as this one. Here is a book for lecturers and researchers on insect nervous systems; let us hope for more, and more exciting ones, from the same stable.

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Marine Protozoans

Foraminifera. Vol. 1. R. H. HEDLEY and C. G. ADAMS, Eds. Academic Press, New York, 1974. x, 276 pp., illus. $15.

This is the first volume in an open-ended series intended to provide a current review and evaluation of foraminiferal research for student and specialist. Foraminiferal research is international in scope and has become highly diverse in approach. The editors' belief that there is a need for synthesis is well founded. The volume contains four articles: "Recent advances in the classification of the Foraminiferida" by Loeblich and Tappan, "Biometry of the foraminiferal shell" by Scott, "Field and laboratory techniques for the study of living foraminifera" by Arnold, and "Towards understanding the niche of the foraminifera" by Lee. There is also a four-