Microbial Control of Insects

Insect Pathology. An advanced treatise. vol. 2. Edward A. Steinhaus, Ed. Academic Press, New York, 1963. xiv + 689 pp. Illus. Until 31 October, $20; $23.

This is the second volume of a two-volume treatise on insect pathology [vol. 1, reviewed in *Science* **140**, 167 (1963)]. The study of insect pathology and the use of diagnosis in entomology are only partially comparable to the corresponding field for vertebrates. Both are presumably interested in causes and primary reactions (about which little is known at the physiological or biochemical level), but, whereas vertebrate pathology is primarily concerned with diagnosis and cure, insect pathology is concerned mainly with the control of insects—that is, with killing the infected organism rather than curing it. Hence this volume, in contrast to volume 1 which dealt with more basic problems, emphasizes the culture of organisms, especially to obtain commercial quantities for application in nature, and the use, or the hoped for use, of these in the control of insects noxious to man. Numerous of the chapters end with summaries emphasizing the lack of adequate information and itemizing the kinds of data needed for further advances.

A number of things are omitted from these volumes. No mention is made of microorganisms for which insects are vectors (for example, malaria, tularaemia, and filiaria), not even of those that can be lethal to the insect. And, more surprisingly, no mention is made of the fungus group Laboulbeniales which infests only insects, perhaps because they do not ordinarily kill the insect (but, in volume 1, there is a chapter on the "normal" microbial fauna and flora of insects!).

Volume 2 includes chapters by O. Lysenko (on the taxonomy of entomogenous bacteria), A. M. Heimpel and T. A. Angus (on diseases caused by sporeforming bacteria), S. R. Dutky (on milky diseases), G. E. Bucher (on nonsporeforming bacteria), J. N. Couch and C. J. Umphlett (on infections caused by *Coelomomyces*), D. M. MacLeod (on Entomophthorales), M. F. Madelin (on hyphomycetous fungi), F. L. McEwen (on *Cordyceps*), J. Wiesner (on sporozoans), J. J. Lipa (on other protozoans), H. E. Welch (on nematodes), R. L. Doutt (on pathologies from insect parasites), T. Tamada (on epizootiology), I. M. Hall (on the use of microbes in insect control), J. D. Briggs (on the commercial production of pathogens), E. A. Steinhaus (on diagnostic procedures), and G. Wittig (on techniques in insect pathology).

I get the impression that this volume, unlike volume 1, is devoted to propagandizing for microbial control of insect pests. Desirable as such control measures might be, the fact remains that, at the present stage of our knowledge, it is seldom possible to control insect pests by using microbial methods. But, if these volumes help lead to the development of a significant amount of control in the future, such would surely be welcome.

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Marine Biology

Advances in Marine Biology. vol. 1. F. S. Russell, Ed. Academic Press, New York, 1963. xiv + 410 pp. Illus. $13.50.

This first volume of a proposed new series contains five contributions: "Rearing of bivalve mollusks," by Loosanoff and Davis (136 pp.); "The breeding of the North Atlantic freshwater eels," by the late Anton Bruun (32 pp.); "Some aspects of photoreception and vision in fishes," by Nicol (37 pp.); "The biology of coral reefs," by Yonge (51 pp.); and "The behaviour and physiology of herring and other clupeids," by Blaxter and Holliday (131 pp.). The first of these is not just a review paper, for it includes much original material not previously published, and it will be in great demand in marine laboratories as a *vade mecum*. Although its other major contribution, a review of the literature, is important, it is, nevertheless, primarily an itemization of the literature (mostly of the past 30 years). Bruun's essay was intended to be a refutation of D. W. Tucker's controversial notions; in my opinion the essay, even in its unfinished state, adequately disposes of that question. Nicol and Yonge have contributed good, standard performances, but it must be said that their papers would have been just as acceptable in the standard review journals. It is interesting to note that radiation is not mentioned in the admittedly skeletonized index and that it receives notice only in a footnote which is concerned with the effect of low concentrations of Sr^{90} and Y^{90} on the development of *Engraulis*. We need critical reviews in this aspect of marine biology.

This book will be a problem in libraries, because physiologists will want the handbook on raising bivalves on their desks at all times and fisheries biologists will doubtless feel the same way about the review of herrings. Both are large contributions that could stand alone as separate monographs, and if this first volume of *Advances in Marine Biology* has set a pattern to be followed in later numbers, the market for the books may be as diverse as its contents. One wonders if it might not have been more practical to publish these papers, which are obviously too long for review journals, as a series of short monographs. The material certainly would be more available to those who want to use it. As it is, those whose interests may not lean so heavily to fish and fisheries are asked to invest $12 if they need the information on rearing bivalves. This is the chief disadvantage of such serial volumes. Perhaps the publishers might consider reprinting the larger contributions in such volumes as paperbacks for those who really need the individual papers.

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A Virginia Botanist

John Clayton: Pioneer of American Botany. Edmund Berkeley and Dorothy Smith Berkeley. University of North Carolina Press, Chapel Hill, 1963. xii + 236 pp. $6.

Fifteen years before Linnaeus published his *Species Plantarum*, in which he named more than 400 Virginia plants, based on Clayton's collections, the first edition of the *Flora Virginica* appeared. Thereby is Clayton's niche in the history of North American botany sure and deep. Though he was preceded in Virginia by Banister, Clayton's work was not destined to be published as a unit. The botanical fraternity abroad included the draper Collinson,