

ist manages crop pests. Hence, the author has chosen to use the term pest-control instead of pest management. This move is contrary to the efforts of many scientists to integrate these disciplines.

Chapters 6-10 present the different pest disciplines: plant pathology, nematology, entomology, weeds and vertebrates. These chapters were written by the author and several of his colleagues, and are extremely informative and well written; but brevity prevents these chapters from providing the details and examples necessary to make this part a useful reference.

Chapter 11 deals with the systems approach to plant-pest control. The author does a good job of explaining the systems approach to pest control in a manner readily comprehensible to the average student. The last chapter is used by the author to reiterate the importance of taking a holistic approach to crop production and crop protection.

The author for his writing and the publisher for design and typography are to be commended, but the brevity of most chapters and the lack of more examples and references make this book of little use as a reference source to students seriously pursuing a comprehensive introduction to integrated pest management. On the other hand, this book would serve as an excellent outline of material for an introductory integrated pest management course.

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HONEY BEE PESTS, PREDATORS, AND DISEASES, by R. A. Morse, ed. Cornell University Press, Ithaca and London, 430 pp. \$27.50.

Sixteen authors have collaborated to produce an encyclopedia of both common and little-known facts about problems encountered by honey bees, *Apis* sp. Written in a technical style, this book is not a handbook on bee husbandry but is a veterinary manual for serious students of bee biology and insect pathology. The book's 16 chapters and 4 appendices are supplemented by 1167 references, an index of scientific names, and a general index. The book is a quality publication.

The introduction by Editor Morse is concise, easily understood, and helpful in that it prepares the lay person for the extensive use of scientific nomenclature used in subsequent chapters.

T. A. Gochnauer discusses viruses and rickettsiae and provides the reader with the latest information about this relatively new field and its relationship to honey bees. (Most of this references are from the 1960's and 1970's.) Dr. Gochnauer stresses the need for better diagnoses and treatments for viral diseases of the honey bees.

H. Shimanuki discusses 4 bacterial diseases of honey bees: American foulbrood, European foulbrood, septemia, and powdery scale. Gaps in our knowledge about European foulbrood and powdery scale diseases are revealed.

Protozoa are covered by B. Furgala and E. C. Mussen. *Nosema* disease receives the most attention (11 pages and 5 figures). Amoeba disease, gregarines, and flagellates are also included.

M. Gilliam discusses chalkbrood, stonebrood, and other related subjects in a chapter entitled "Fungi." The number of references available on chalkbrood is quite surprising, since *Ascosphaera apis* was not reported from honey bees in the U. S. until 1972. These references necessarily include much subjective information and speculation since our knowledge about this disease is so incomplete. There is no chemotherapeutic agent for chalkbrood disease.

The 2 pages on nematodes by T. Lehnert provide the shortest chapter, yet this seems adequate for the subject.

Insect pests of honey bees are allotted 4 chapters by 4 separate authors. J. Williams has done a superb job of covering the most serious insect pest, the greater wax moth. Mr. Williams also discusses the Indianmeal moth, the Mediterranean flour moth, the dried-fruit moth, the lesser wax moth, the bumble bee wax moth, and the death's head moth. L. Knutson reports 7 families of Diptera as honey bee pests, and gives detailed information about the distribution and taxonomy of each species. Predatory Hymenoptera, including ants, hornets, yellow jackets, bee wolves, velvet ants, and other wasps, are described in an interesting chapter by D. DeJong. In the final chapter on insect pests, D. M. Caron discusses 10 additional orders of insect pests of honey bees, their combs, and the hive products.

Also, D. M. Caron and R. A. Morse discuss arachnid pests of honey bees in separate chapters. The spiders and pseudoscorpions are considerably less important than the mites; however, the U. S. is apparently free of the 3 mites of economic consequence—*Acarapis woodi*, *Tropilaelaps clareae*, and *Varroa jacobsoni*. However, *V. jacobsoni* has recently moved from Asia to Europe, Africa, and South America where it has become a serious pest of *Apis mellifera*.

Other minor pests of honey bees in the U. S. include amphibians, discussed by R. A. Morse, and birds discussed by J. T. Ambrose. In other parts of the world these pests are of considerable economic consequence and the beekeeper's ingenuity in controlling them may be a matter of life or death to a colony, or indeed, to an industry. D. M. Caron surveys the literature on marsupials and mammals predatory on honey bees and provides suggestions for reducing bee losses from several of these pests, including skunks and bears. Perhaps the most serious mammalian pest described is a primate—*Homo sapiens*.

Additional interesting reading in this book includes a chapter by K. W. Tucker entitled "Abnormalities and Noninfectious Disease," and a chapter by R. J. Barker entitled "Poisoning by Plants." These authors present a surprising array of non-disease problems that individually or collectively might also spell disaster for bee colonies.

The book continues with still another stimulating chapter, "Antibiotic Systems in Honey, Nectar and Pollen" by D. M. Burgett and a summary of control methods by R. A. Morse and H. Shimanuki. Possibly some of the specific recommendations for handling various problems might have been better incorporated into their respective chapters. Also, Appendix 1, "Species of *Apis*", by Morse, and appendix 2, "Synonymy in Bee Diseases", by Shimanuki, could easily have been abbreviated and incorporated into the introductory chapter. Appendices 3 and 4 summarize U. S. and Canadian bee disease laws, respectively, and are appropriate, thorough, and extremely useful. These 2 appendices were written by A. S.

Michael (now deceased) and Gochnauer, respectively.

Honey Bee Pests, Predators and Diseases is a unique compilation of bee literature. It is written from the points of view of North American bee scientists; however, observations and opinions are reported somewhat uncritically, and thus the book gives a certain credibility to "facts" that aren't necessarily true. Unfortunately, the book does not touch on the most serious problem that confronts many beekeepers throughout the world—protecting bees from pesticides. Perhaps this problem has been discussed adequately elsewhere or warrants an entire volume.

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How INSECTS LIVE, by Walter M. Blaney. Elsevier-Phadon, Oxford. 160 pp. 1976.

Despite a few irritating spelling errors (e.g., "malpighian" tubules and "fernur"), and a few anatomical errors (e.g., the midgut is labeled the gizzard), this is really a most beautifully illustrated and interestingly written book that will appeal to a very wide audience. The volume is divided into the following chapters (1) an introduction, (2) variations on a theme, (3) basic problems of life, (4) locomotion on land and water, (5) wings and flight, (6) food and feeding, (7) vision, (8) mechanical and chemical senses, (9) reproduction, (10) growth and development, (11) social insects, (12) communication and navigation, (13) the struggle for survival, and (14) insects and man. Although the book has a good index, it does not have any references. The 168 color photographs are often stunningly beautiful and the drawings are clear and useful.

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PERSPECTIVES IN URBAN ENTOMOLOGY, ed. by G. W. Frankie and C. S. Koehler. 1978. Academic Press, New York. 417 pp. \$21.50.

This multi-authored volume resulted largely as an outgrowth of a symposium, "Ecology and Management of Insect Populations in Urban Environments" held during the 15th International Congress of Entomology, 1976, in Washington, D. C. It comprises 17 chapters contributed by renowned authorities in their specialties. Chapter topics include widely diverse subjects such as: butterflies, garden insects, survey techniques and reports, educational value of insect-plant relationships, medically important arthropods, yellow jackets, urban apiculture,

structural pests and management, pest management of plant-infesting arthropods, urbanite insecticide usage, and sources of urban pest management information.

As one might guess, such diversity leads to generality, and many topics are either covered superficially or limited aspects are examined in such great detail that it is difficult to grasp the full magnitude of the particular area being discussed. Most of the contributors, however, included extremely extensive bibliographies at the end of each chapter; and in most cases the reader should be able to grasp the essential components within a chapter's scope and refer to these references for additional information. Unfortunately, the book does not contain a general index, which makes it difficult to find highly specific information without careful reading of appropriate chapter(s).

The intended audience of this book evidently was not clearly identified. Some chapters are written in descriptive, narrative, "layman's" style, while others are extremely technical, verbose, and of value only to those working in or familiar with the particular area. Some chapters are practically oriented, while others are highly theoretical.

The publication is reproduced from photographed typewritten copy, which detracts somewhat from its appearance but readability is good on quality nonglare paper. Typographical errors are few (a "form" for "from"), scientific nomenclature is italicized, trademarks noted, and pesticides are identified by approved common names.

Several authors point out that people, not pests, are our greatest problem. Urban facilities are constructed with little regard for biological consequences. The general public usually is not biologically oriented, and when pest problems arise, they demand immediate, complete relief. One of the urban entomologist's most pressing tasks is the education of the urbanite to accept reasonable pest infestations and to choose control methods least disruptive to the environment. Since one report indicates that most people rely on exterminators and nurserymen for pest control advice, it is very important that these segments be knowledgeable in all aspects of urban pest control.

The book is not suitable as a college text, although certain chapters might be utilized. The absence of an index and lack of specific control recommendations limit its usefulness for the extension entomologist, while established researchers would find little new information in their respective fields. The book's greatest value is to a person unfamiliar with urban entomology who wishes a good overview of this complex area. The book solves few problems but brings several into sharper focus.

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