

BOOK REVIEWS

MOSQUITOES, MALARIA AND MAN: A HISTORY OF THE HOSTILITIES SINCE 1880. BY Gordon Harrison. 1978. E.P. Dutton, New York. 314 pp. \$15.00.

Detective stories are not the usual fare for medical entomologists, but Harrison has provided such in his fascinating book: *Malaria, Mosquitoes and Man*. A good detective book has short, fast-moving chapters, each leaving one in suspense and with the feeling that some solutions will be forthcoming in the next chapter, yet knowing that the final unraveling will not occur until the end. The best part of Harrison's book is that the intrigue, the challenges, the disappointments of wrong solutions, and the successes are all real. Harrison has gleaned through much published literature and especially personal notes and letters in order to provide his historical documentation. At the same time he has given his personal interpretations to many of the events which he describes.

Medical entomologists know that Ronald Ross was given credit for having proved that a mosquito is the vector of the malaria parasite—he received a Nobel prize for his efforts. Yet it may not be generally realized that Ross never did make this determination for human malaria. He tried, but had to be satisfied with bird malaria and *Culex* mosquitoes. Ross did make the correct interpretation for *Anopheles* as the vector for human malaria. Also, Ross, though a medical doctor and not an entomologist, was one of the first persons to attempt malaria control by means of mosquito control, with emphasis on *Anopheles*.

Hindsight is fine—Harrison describes many efforts in different parts of the world to control or to eradicate malaria, and he interprets philosophically what may have gone wrong when programs did not succeed, or what went right when success was achieved. His analysis is especially cogent relative to eradication efforts towards an insect imported into a foreign area, as for example *Anopheles gambiae* into South America.

Harrison's interpretations of the world malaria eradication program first by a Commission of the League of Nations and later by WHO, AID and others, provide some of the most lucid opinions of what should or should not have been done in this program, and

should therefore be a *must* reading for anyone seriously concerned with mosquito and malaria control. The failure of politicians and the general public to continue to support vector control programs once the problems have been appreciably diminished is clearly presented, especially in the chapter entitled "Relapse." The tremendous resurgence of malaria in recent years has been caused to a much greater extent by public apathy and misunderstanding than by mosquito resistance to insecticides, although that has been important. This same problem has occurred recently in California's mosquito control programs. When the public voted for Proposition 13 to cut taxes, it resulted in a great reduction or even virtual destruction of effective programs.

It obviously was not possible for Harrison to review or present all the literature on malaria. Several minor omissions included the work of W. B. Herms in California which represented some of the first efforts in malaria control in the United States. Also, the U.S. Armed Forces malaria control units in the South Pacific in at least certain cases achieved complete protection for troops and close to eradication from native populations within a period of 2 or 3 years of effort, this in some of the most highly malarious areas of the world. Had these programs been continued, it is probable that permanent eradication of the parasite would have been obtained on some of the islands. As Harrison states, however, re-introductions from uncontrolled areas could nullify the gains within a very short time.

Harrison has provided an interesting history of malaria and efforts to control and eradicate it, and at the same time has presented philosophies which should be reviewed by everyone engaged in mosquito and malaria control programs.—W. Donald Murray, Delta Vector Control District, 1737 West Houston Avenue, Visalia, CA 93291.

MICROBIAL CONTROL OF PESTS AND PLANT DISEASES 1970–1980, edited by H. D. Burges. 1981. Academic Press Inc., London and New York. 949 pp. \$99.50.

The publication of "Microbial Control of Pests and Plant Diseases 1970–1980" within a

decade after "Microbial Control of Insects and Mites" (1971) is indicative of the logarithmic growth of the subject. The 1971 work reviewed the field from the first mention by Agostino Bassi in 1835 that the fungus *Beauveria bassiana* caused the muscardine disease of silkworms to an analysis of *Bacillus thuringiensis* isolates in 1970. To avoid duplication, the more than 60 authors and coauthors of the present book omit the earlier cited publications except when absolutely necessary to maintain continuity. Thus, this is an entirely new volume, rather than a revision. Of the 43 chapters and 3 appendices, the following are especially relevant to mosquito workers: Chapter 2, Identification of Bacteria Found in Insects (G. E. Bucher); 3, Identification of H-serotypes of *Bacillus thuringiensis* (H. de Barjac); 5, Identification of Insect and Mite Viruses (C. C. Payne and D. C. Kelly); 6, Identification of Entomopathogenic Deuteromycetes (R. A. Samson); 7, Identification of the Entomophthorales (D. S. King and R. A. Humber); 8, Identification of Coelomomyces, Saprolegniales and Lagenidiales (C. E. Bland, J. N. Couch and S. Y. Newell); 9, Identification of Microsporidia (E. I. Hazard, E. A. Ellis and D. J. Joslyn); 11, Insecticidal Activity of Isolates of *Bacillus thuringiensis* and their Potential for Pest Control (H. T. Dulmage and Cooperators); 14, Potential of *Bacillus sphaericus* and Related Spore-forming Bacteria for Pest Control (S. Singer); 23, Toxins of Entomopathogenic Fungi (D. W. Roberts); 29, Mosquito Control by the Fungi *Culicinomyces*, *Lagenidium* and *Coelomomyces* (B. A. Federici); 33, Potentials of Nematodes for Pest Control (J. R. Finney); 40, Safety, Safety Testing and Quality Control of Microbial Pesticides (H. D. Burges); 43, Strategy for the Microbial Control of Pests in 1980 and Beyond (H. D. Burges); Appendix 1, Susceptibility of Arthropod Species to *Bacillus thuringiensis* (A. Krieg and G. A. Langenbruch) and Appendix 2, A Catalogue of Viral Diseases of Insects, Mites and Ticks (M. E. Martignoni). An additional 10 chapters and the third appendix (Repository for Data on the Safety of Insect Pathogens—M. Laird) contain information in related areas that can be applied to mosquito control.

The above chapters are organized into major units which include: Identification, Bacteria, Viruses, Fungi, Protozoa, Nematodes, Technology and Integration. This facilitates use of the book by specialists who have interests in certain groups of pathogens.

Although Burges' 1981 book contains about 25% more material than its predecessor, it is

the same size. Economies have been effected through the use of a thinner paper stock and the printing of 47 lines per page as contrasted with the previous 40 lines per page.

According to the jacket, "The work is aimed at a wide readership of pest control practitioners, research workers, students and lecturers seeking new information on advanced topics." This may be more optimistic than the circumstances warrant as many of the procedures documented are rather sophisticated and not applicable to current problems in many tropical areas. However, Burges concludes with an optimistic statement in which most will concur: "It is perhaps no accident that the most successful commercial pathogen, and the pathogen accredited top priority for vector control research is *B. t. i.*—the simplest to produce and use."—R. A. Ward.

INSECTS AND HYGIENE, Third Edition, by J. R. Busvine. 1980. Chapman and Hall, London; Methuen, Inc., New York. 568 pp. \$55.00.

This book is subtitled "The biology and control of insect pests of medical and domestic importance." The 1st edition appeared in 1951, and the 2nd in 1966. The author has completely rewritten the chapter on chemical control measures and has expanded the scope of the book by increased coverage of the pests of continental Europe and North America. In the interests of economy 3 chapters on structure, physiology, and ecology of insects have been deleted.

The first 4 chapters deal with how insects affect man's health, how pest infestations may be prevented and controlled, and how mechanical, physical, biological, and chemical control measures may be applied. The 5th chapter, "Bloodsucking flies," includes 28 pages on mosquitoes, 6 pages on biting midges (Ceratopogonidae), 6 pages on black flies, and 15 pages on sand flies, horse flies, the stable fly and its allies. Eight subsequent chapters have the following titles: "Parasites," "Pests of foodstuffs," "Insect pests in waste products," "Clothes moths and carpet beetles," "Wood-boring insects," "Stinging, biting, and urticating arthropods," and "Nuisances." There is a "Chemical Appendix" which lists insecticides with common and trade names and with physical data. A "Biological Appendix" consists of keys to selected groups of arthropods. There are 652 references.