

REVIEWS AND ABSTRACTS

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ANNUAL REVIEW OF ENTOMOLOGY. Vol. 9. Editor, R. F. Smith; Assoc. Editor, T. E. Mittler. Annual Reviews, Inc., 231 Grant Avenue, Palo Alto, Calif. \$8.50 (U.S.A.), \$9.00 (elsewhere) postpaid. 390 pp. 1964. As always, this review is published in cooperation with the Entomological Society of America; the 1964 Editorial Committee consists of: V. G. Dethier, G. F. Edmunds, Jr., A. C. Hodson, B. N. Smallman, R. F. Smith, and B. V. Travis.

In addition to a prefatory chapter by R. L. Usinger on, "The Role of Linnaeus in the Advancement of Entomology," there are 14 other chapters and four indices. Dr. Usinger presents a fascinating and fresh approach to the career of Linnaeus, who, in addition to being a zoologist, was a mineralogist, bibliographer, philosopher, and practicing physician.

"The Epidemiology of Filariasis Due to *Wuchereria bancrofti* and *Brugia malayi*," pp. 245-268, by J. F. B. Edeson and T. Wilson, of the Liverpool School of Tropical Medicine, summarizes current ideas on the filarial infections, sets forth the more important unsolved problems, and lists 102 literature citations, concluded in March 1963. Under "Parasites," the authors review changes in nomenclature and terminology, and geographical distribution. "Vertebrate Hosts" is followed by "Insect Hosts," with sub-headings, "criteria of vector status," and "ecology of the vectors." Table I in this section lists animals examined in Malaya and found infected with *Brugia* spp.; and Table II lists vectors of *W. bancrofti* and *B. malayi*. Six and one-half pages are devoted to a review of the "Host-Parasite Relationship." Points on which information is deficient and the possibilities of controlling filariasis by means of chemotherapy and vectors by insecticides are topics discussed in "Present State of Knowledge."

"Insect Chemosterilants," pp. 269-284, by C. N. Smith, G. C. LaBrecque, and A. B. Borkovec, of the United States Department of Agriculture, Orlando, Fla., lists 65 references to literature, the survey of which was concluded in March 1963. A brief history of events leading to the current investigations into the use of chemosterilants for insect control, is followed by sections dealing with the following phases of chemosterilants: their actions and potential advantages, biochemical characteristics and relationships, types and examples of effective chemosterilants, biological evaluation, and problems in the practical use of chemosterilants. A two-page list of compounds used as chemosterilants includes the insects affected by each with appropriate literature citations.

In addition to the two chapters above, which are recommended especially to AMCA members,

there are other chapters which contain information of general interest and certain points of specific interest and value to anyone connected in any way with the broad problem of mosquitoes and their control.—H. L. T. D.

A CONTRIBUTION TOWARD AN ENCYCLOPEDIA OF INSECT ANATOMY. By Snodgrass, R. E. Smithsonian Misc. Coll. 146(2):1-48. Smithsonian Institution, Washington, D. C., July 1963. Dr. Robert E. Snodgrass, whose sudden death ended a long and distinguished career, left an unfinished manuscript, which Dr. A. Glenn Richards says might have been called, "An Encyclopedia of Insect Anatomy." The subjects completed in the manuscript were prepared not in alphabetical order but rather in the order of subject matter; and the essays on each of these 37 anatomical terms are published, with a minimum of editing, under the present title.

Subjects treated are:

1. Insect, entomology, Hexapoda
2. Anatomical names
3. Body segmentation
4. Segments
5. Segment areas and sclerotization
6. Segmental plates
7. Body regions and plates
8. Tergum and notum
9. Pleuron
10. Sternum
11. External grooves of skeleton
12. —Ite
13. Larva
14. Pupa
15. Metamorphosis
16. Recapitulation
17. Moulting
18. Ecdysis
19. Alimentary canal
20. Gastrula
21. Gastrulation
22. Mesenteron
23. Stomodaeum and proctodaeum
24. Head
25. Epicranial suture
26. Ecdysial cleavage line of head
27. Antenna
28. Neck
29. Gula
30. Thorax
31. Spiracle
32. Leg
33. Wings
34. Abdomen
35. Male genitalia
36. Aedeagus
37. Ovipositor

As always, any contribution by Dr. Snodgrass, even an encyclopedia of terms, is the ultimate in scientific literature; it affords a fascinating and revealing experience for specialist and non-specialist alike. We are fortunate indeed to have these 37 precious essays.—H. L. T. D.

TRINITY VIRUS, A NEW AGENT ISOLATED FROM TRINIDADIAN MOSQUITOES. By Spence, L., Anderson, E. R., Aitken, T. H. G., and Downs, W. G. *Amer. Journ. trop. Med. Hyg.* 13(1):114-117. 10 refs. 1964. Of two viruses isolated from a pool of mosquitoes taken from the Arena Forest in north-central Trinidad during 1955, one, fatal to mice and hamsters in the laboratory, was a new virus, for which the authors propose the name Trinity.

The virus was isolated from a pool of 37 mosquitoes: 24 *Trichoprosopon digitatum* (Rondani), 11 *T. theobaldi* Lane and Cerqueira, and 2 *T. longipes* (Fabricius). The mosquitoes were processed on June 1, 1955, and a suspension inoculated into mice; the same day, a portion of the mosquito suspension was stored in a sealed glass ampule placed in a CO₂ ice cabinet. In December 1958, approximately 3½ years later, the virus was reisolated from this same mosquito suspension.—H. L. T. D.

REPORT ON THE FOURTH ASIAN MALARIA CONFERENCE. Manila, September 27-October 3, 1962. World Health Organization, Geneva, Switzerland. (WHO/MAL/374) 102 pp. Jan. 1963. Dr. I. C. Fang, Regional Director, WHO Regional Office for the Western Pacific, officiated at the opening ceremony of the Fourth Asian Malaria conference, held in Manila; and his speech and the message from Dr. M. G. Candau, Director-General, WHO, are printed in full in this Report. Included also are an opening statement by Mr. Roy Fritz, United States Agency for International Development; a statement by Dr. Mangay-Angara, the UNICEF Representative to the Conference; a message from Dr. A. H. Taba, Regional Director, Eastern Mediterranean Region; a message from Dr. C. Mani, Regional Director, South-East Asia Region; and a speech by Dr. Hi Sup Chung, Minister of Health and Social Affairs, Korea.

Countries attending the Conference were six from the South-East Asia Region, one from the Eastern Mediterranean Region, and 15 countries or territories from the Western Pacific Region. In addition to the 38 participants, there was one UNICEF observer, 19 from U. S. AID, one from South Pacific Commission, 13 from the national malaria staff in the Philippines, and 39 WHO staff members.

PART I AND PART II of the Conference were each of three days duration. The first session, covering Administration and Policy, considered the following topics:

1. Review of malaria projects—present status and future prospects.

2. Present administrative difficulties encountered in malaria eradication programmes.
3. Classification of malaria eradication projects.
4. Basic health services in relation to malaria eradication in developing countries.
5. Country co-ordination in malaria eradication.

Part II concerned itself with Technical Matters such as:

1. Epidemiological assessment.
2. Technical problems related to insecticides, entomology, drug resistance and research.
3. Requirements for certification and registration of malaria eradication.

Five pages are devoted to recommendations regarding problems considered in both sessions.

Seven annexes listed are: (1) Agenda, (2) List of participants, (3) Working groups, (4) Messages and speeches, (5) Information on the status of malaria eradication in the Eastern Mediterranean, (6) Information on the status of malaria eradication in South-East Asia, (7) Information on the status of malaria eradication in the Western Pacific.

This is a well-written, well-organized report of significant proceedings; and, as usual, it contains some challenging facts and figures.—H. L. T. D.

PROCEEDINGS AND PAPERS OF THE THIRTY-FIRST ANNUAL CONFERENCE OF THE CALIFORNIA MOSQUITO CONTROL ASSOCIATION, INC., Santa Barbara, Calif., Jan 28-30, 1963. Editor, J. R. Walker. Proceedings Committee, W. D. Murray and J. St. Germaine. Pub. by Calif. Mosq. Cont. Assoc. 1737 West Houston Ave., Visalia, Calif. 108 pp. Dec. 1963. Exclusive of welcoming addresses and reports from the CMCA business meeting, papers printed in these "Proceedings" number forty-two. All are of much interest, but only a few can be discussed in a brief review.

Of seven stimulatingly worthwhile papers concerning public relations, project advancement, and communication methods, four were presented at the opening session, three, at the closing. Titles are: "The Private Life of Public Relations," "Communications as an Aspect of Education," "The Press and its Responsibilities," "Participation is the Keynote," "The Spoken Word," "The Written Word," and "How to Communicate Effectively with Pictures."

A panel on "New Concepts Applicable to Mosquito Control," was moderated by Richard F. Peters. In his prefatory remarks, Mr. Peters refers to his attendance at the World Health Organization's world-wide conference on Vector Control in Geneva, Switzerland, where primary emphasis was placed on mosquitoes and the diseases transmitted by them. Mr. Peters calls attention to the problems facing members of CMCA, such as increasing insecticide resistance and the need to concentrate on means of control other than that by insecticides. "Highlights of Research on Chemosterilization of Mosquitoes,"

by Donald E. Weidhaas, U. S. Dept. of Agriculture. Dr. Weidhaas reviews the general and specific meanings of the term "chemosterilant"; the two ways in which chemosterilants could be used for control or eradication; theoretical advantages of sterilization of insect populations; research with compounds which have caused sterilization of house flies, and with new compounds, and the results when used on mosquitoes; and the ways in which these methods might be used in practical control or eradication under field conditions.

The second paper on the panel, "Research on Biological Control of Mosquitoes," is by William R. Kellen, State Dept. of Pub. Health, who outlines that phase of biological control under investigation at the Bureau of Vector Control's Fresno laboratories. Control by microorganisms pathogenic to mosquitoes is called microbial control. "Coelomomyces," a pathogenic fungus, is one of the more promising organisms and is being studied for mode of transmission and host specificity. In California, Microsporidia (Protozoa) attack all stages of the mosquito. Two species of *Thelohania* attack the following mosquitoes: *Culex tarsalis*, *C. apicalis*, *C. peus*, *Culiseta inornata*, and *Aedes cinereus*. One species of *Thelohani* has been found in *Culex thriambus*, *C. erythrothorax*, *Culiseta incidens*, *C. particeps*, *Anopheles pseudopunctipennis franciscanus*, *Aedes melanimon*, *A. increpitus*, *A. cataphylla*, and *A. ventrovittis*. Two species of *Nosema* have been found in *Culex tarsalis* and *Anopheles pseudopunctipennis franciscanus*. Dr. Kellen develops more fully this section on Microsporidia and concludes his presentation with a paragraph on a possible polyhedrosis virus infection of many *Culex tarsalis* larvae in the laboratory.

A third and final paper in the group was by Eldridge G. Hunt, Calif. State Dept. of Fish and Game, who concluded his paper with the observation that we should strive to maintain an environment amenable to both man and wildlife. There are seven references.

"Related Problems of Interest to Mosquito Control Agencies," moderated by Norman F. Haurer, includes five papers indicative of problems other than mosquito control which might be faced by local agencies. Are these types of problems adequately taken care of by other agencies, or do mosquito abatement districts have the obligation to take a broader view of vector control? A paper by Leo Kartman, San Francisco Field Station, U. S. Pub. Health Service, "Mice that Mar the Land"—A Unitary View of Public Health and Vector Abatement," is a 9½-page review work done by vari-

ous agencies throughout affected areas in the State. There are 19 references to literature, 3 figures, and 3 tables. Included are a map showing the distribution of animal plague infections in California; a graph, the prevalence of commensal rats in San Francisco over a ten year period; and tabulations on human plague cases in California, 1927-1962, and their probable source of exposure, and on human cases of selected zoonoses reported in California, 1951-1961.

"The Educational Approach to Fly Control in Santa Clara County," by James St. Germaine; "Gnat Control in Mosquito Abatement Agencies," by William E. Hazeltine; "Needs and Potentials for Yellow Jacket Control," C. Donald Grant; and "Review of the *Triatoma protracta* Problem in the Sierra Nevada Foothills of California," by Earl W. Mortenson and John D. Walsh, deal with problems familiar to Californians. All are worthwhile reading.

"Techniques for locating a Mosquito Source," and "The Value of Premises Surveys in a Mosquito Abatement Program," by James Mallars, provide excellent information, as do the eight papers appearing under the "Trustee Program." Three timely topics are: "Should a Mosquito Abatement District be Involved in Insect Control Other than Mosquitoes?" by Edward E. Enos; "Functions and Procedures of a Mosquito Abatement District Board of Trustees," by A. Sandy Steiner; and "Casualty Insurance," by Robert Tyler.

"Source Reduction," Fred A. Compiano, moderator, contains four papers; and the panel moderated by David E. Reed on "Papers on Significant New Technical Developments," lists eight contributions. Subjects discussed include effects of organic pollution on mosquito larval populations, air-carrier experiments with high-efficiency fans, entomophobia in arthropod control work, biological control of *Hippelates collusor* (Townsend), taste organs and their role in the feeding of mosquitoes, and some physico-chemical factors influencing performance of new granular mosquito larvicides. "Effects of Carbamate Insecticide Selection Pressure on *Anopheles albimanus* Wied.," by G. R. Georghiou is a timely consideration of resistance and candidate substitutes for dieldrin and DDT. A comprehensive treatment by R. H. Whitsel, C. A. Vickery, Jr., C. J. Rogers, and C. D. Grant, "Studies on the Biology and Control of Chironomid Midges in the San Francisco Bay Region," covers twelve pages and includes 10 references, 1 plate of 4 photographs, 6 tables, and 2 graphs.—H. L. T. D.