REVIEWS AND ABSTRACTS

Anopheles-BEOBACHTUNGEN IN SÜDRUSSLAND (*Anopheles* OBSERVATIONS IN SOUTH RUSSIA). W. Eichler. Riv. di Malariol. 30(1):29–38. 1951. The author reports his observations on the anopheline population of South Russia (Kuban district) made during 1943. The extensive swamps offer breeding places with high anopheline density, in spite of the well-organized malaria control work carried out before the 2nd world war by the Soviet Government. Characteristic of those areas are the lowlands flooded by the waters of the big rivers and covered by a rich growth of vertical and horizontal vegetation.

The most common *Anopheles* mosquitoes are: *messeae, typicus* and *atroparvus*, particularly *messeae*. The eggs of the Kuban *A. messeae* are slightly different from those of Central Europe. In the suitable areas oviposition occurs during the whole summer, but there are places, as the Tamen peninsula, where during the hot season every breeding place is dried up. Mosquitoes then cease to lay eggs and have only occasional blood meals. The author calls this period "the summer phase" and points out its importance for the epidemiology of hot areas. A count of anophelines in dwelling places showed that the outside limits of the villages are the most haunted.

In the breeding of larvae it was observed that the first to develop were always males, followed by mixed males and females; at the end of the breeding period there were only females.—From author's English summary.

NTAYA VIRUS. A HITHERTO UNKNOWN AGENT ISOLATED FROM MOSQUITOES COLLECTED IN UGANDA. Smithburn, K. C., and A. J. Haddow. Proc. Soc. Exptl. Biol. and Med. 77:130–133. 1951. A filterable neurotropic virus was isolated from mice inoculated intracerebrally with a mixed lot of mosquitoes captured in western Uganda. The agent is believed to be hitherto unknown and has been named Ntaya virus in respect of the locality in which the mosquitoes were caught. Certain of its pathogenic and immunological properties are discussed.—Authors' summary.

TRES ESPECIES NUEVAS DE *Aedes* (DIPTERA, CULICIDAE). Vargas, Luis, and Wilbur G. Downs. Rev. Soc. Mex. Historia Natural 11(1–4):161–172. 1950. The authors describe the larvae, pupae and adults, including male genitalia, of *Aedes* (*Ochlerotatus*) *shannoni* n. sp., *Aedes* (*Gualteria*) *ramirezi* n. sp. and *Aedes* (*Gualteria*) *kompi* n. sp. All of the above material was collected in the State of Morelos, Mexico, in a neotropical region close to the nearctic (montane) zone.

With the above described species, the Mexican species of *Aedes* (*Ochlerotatus*) now number 24 and of *Aedes* (*Gualteria*) 7.—Authors' summary.

PROBABLE INSECT VECTORS OF YELLOW FEVER VIRUS, FROM MONKEY TO MAN, IN BWAMBA COUNTY, UGANDA. Lumsden, W. H. R. Bull. Ent. Res. 42(2):317–330. 1951. The habits and habitations of the natives in the Bwamba lowlands, Uganda, are briefly described. A series of catches designed to assess the relative importance of the various species of biting insect and various routes of transference in the transmission of yellow fever virus from the monkey population of the forest to the nearby human population is reported. The microclimate in a native hut is discussed. The species of biting insects encountered are listed, the results of the catches given, and the relative importance of the different species and routes assessed by means of indices.

It is concluded that yellow fever virus is most likely to be transferred to the native population by *Aedes* (*S*) *simpsoni* in plantations, the infection in this insect being derived from forest monkeys which raid the plantations for food.—Author's summary.

STATUS OF MALARIA ON GREECE, CYPRUS AND SARDINIA. Prepared by Wm. J. Perry, LCDR (MSC) USN; Approved by M. E. Bell, Sci. Director. Tech. Rept. ONRL-63–51, Office of Naval Research, London. 6 pp. July 1951. The application of insecticidal sprays to villages under 2500 population to take advantage of the residual action of DDT and the utilization of larvicidal measures in those areas surrounding cities over 2500 people have greatly reduced the incidence of malaria in Greece.

The danger of a recurrent epidemic in hyperendemic areas such as exists on Sardinia, Cyprus and Greece is emphasized when natural immunity in indigenous populations is reduced by anopheline eradication campaigns. Adequate preventive measures should be continued.—Author's summary.

DISTRIBUTION AND CONTROL OF MOSQUITOES IN RICE FIELDS IN STANISLAUS COUNTY, CALIFORNIA. By Markos, B. G. Jour. Nat. Malaria Soc. 10(3): 233–247. 1951. Observations in rice fields in Stanislaus County, California, and adjoining areas, during the summer of 1947, revealed that

1. Rice fields are productive of large numbers of mosquitoes, which appear in three well-defined peaks. The *Aedes* mosquitoes, represented by *Aedes dorsalis* (Meigen), *Aedes nigromaculis* (Ludlow), and *Aedes vexans* (Meigen), appeared immediately after flooding, and then disappeared. In the early summer, *Culex tarsalis* Coquillett appeared, followed in the late summer by *Anopheles freeborni* Aitken.

2. *C. tarsalis* reached its peak during the last week of June and first week of July, *A. freeborni* reached its peak during August and September.

3. The centers of "checks" were found to be as productive of mosquito larvae as were the areas adjacent to the levees. Larvae of the

above-mentioned species were found to be well-distributed throughout the "check."

4. In view of the general distribution of mosquito larvae throughout the "checks," and because of the extensive areas involved, present control methods are virtually confined to the use of aerial sprays.

5. Aqueous emulsions of DDT and DDD, applied from an airplane at the rate of 0.3 pound per acre, gave excellent control for periods of one to two weeks.

6. The control of disease-bearing mosquitoes, such as those found in our studies, which breed in rice fields, is of prime public health importance, as they are known carriers of malaria and the encephalitides.—Author's summary.

THE HOUSEFLY, by Luther S. West. Comstock Publishing Company, Inc., Ithaca, New York, 1951, 584 pp., 176 figures. Price $7.50. Entomologists, engineers, sanitarians, and medical men who are concerned with mosquito abatement projects are being drawn more and more into housefly control. Dr. West's book will make available to these workers much of the information, on all aspects of the housefly problem, that has been built up since the publication of the books by L. O. Howard (1911) and C. Gordon Hewitt (1914).

The author has done well in reviewing the voluminous literature on this world-wide pest and his own experience, especially in the Army, and has been drawn upon in several chapters. Control men will be particularly interested in the chapters on emergency and planned control, public health relations, and insecticides.

The morphology, physiology, life history, habits, ecological factors, natural enemies, and world distribution of flies of the genus *Musca* are discussed in considerable detail. Field, museum, and laboratory techniques are also given considerable attention.

The tabulation of species and subspecies and their distribution over-emphasizes the number of forms with which the entomologist and sanitarian have to deal. Although eight forms are listed as occurring in the New World, for all practical purposes, there is only one—*Musca domestica*. In a number of instances species are referred to the genus *Musca* which definitely belong in families other than Muscidae. Despite points of this kind and certain errors in the spelling of scientific names, we anticipate that this valuable book will be widely used as a reference work.—F. C. Bishopp.

MOSQUITO ABATEMENT IN CALIFORNIA. Bureau of Vector Control Bull. No. VC-1. 47 pp. 19 illus. State of Calif. Dept. of Pub. Hlth. 1951. This bulletin briefly discusses the biology of the more important California mosquitoes and mentions some mosquito transmitted diseases. Summaries are given of the various principles and practices of mosquito control as drainage, filling, natural, and chemical control. Problems incidental to irrigation of forage and rice fields are also presented. Organization of the mosquito abatement districts is discussed as well as the part played in the mosquito problems of California by the State Department of Health, California Mosquito Control Association, and the Universities and Colleges. This bulletin would be extremely useful for providing background information to public officials concerned with the problem of financing mosquito control programs. —E. L. Seabrook, Palm Beach County Mosquito District, West Palm Beach, Florida.

(Ed. note: BVC address is 2180 Milvia St., Berkeley 4, Calif.)

ILLUSTRATED MAP OF THE ANOPHELINE IMAGINES OF INDONESIA. (English translation). Published by the Ministry of Health of Indonesia. 1949. 69 pp. Numerous Illustrations. This is a corrected and supplemented English edition of the excellent guide to the adult *Anopheles* of Indonesia published in 1938. The word "Map" in the title is misleading as the work contains no maps in the usual sense, but consists of brief statements by species of the principal characters in relation to malaria, and breeding places. Opposite these statements are excellent drawings of the more important taxonomic features, especially the mouthparts, wings, legs and male hypopygia. Sixty-two species and varieties of *Anopheles* and six of *Bironella* including four not found in Indonesia are included.

The large size of the book approximately 11x15 inches makes it difficult to file but has the advantage of permitting it to be opened flat and the characters to be seen at a glance on the large drawings and directly associated with descriptive material.

Apparently W. J. Stoker and R. Waktoedi Koesoemawinangoen are largely responsible for this publication which should be of much value to all those concerned with malaria control in Indonesia and especially to American workers who are assigned to projects in that region.—F. C. Bishopp.

A SERIES OF FOUR PAPERS dealing with studies of the responses of the female *Aedes* mosquito appeared in the Bulletin of Entomological Research 42, Nos. 1 and 3. Data on this fundamental study was reported by A. W. A. Brown, D. S. Sarkaria, R. P. Thompson, and D. G. Peterson. Part I, entitled, "The Search for Attractant Vapours" described the authors' research with the attractiveness of water vapor, carbon dioxide, and candidate attractants. Moist air (85% R. H.) was found to attract 3 to 5 times as many female *Aedes aegypti* mosquitoes as dry air (15% R. H.). Pure CO_2 vapor proved to be no more attractive than dry air, and several times less attractive than moist air. However, the addition of 10% CO_2 to a dry air stream approximately doubles the number of mosquitoes attracted to an olfactometer. A number of chemical compounds found in body exudations were also tested in the olfactometer, but none were consistently attractive, and many were significantly

repellent. Sweat proved significantly attractive at a low vapor concentration but significantly repellent at a high concentration.

Part II was concerned with the action of liquid repellent compounds. The experiments reported in this section of the study assessed the repellent power of the vapors of a number of mosquito repellents by using olfactometer technique. It was concluded that vapor repellency was not simply a function of vapor pressure, but that it may also depend on the biological activity of the molecules in the vapor. Three compounds were found which afford not only a long protection period due to their nonvolatility, but also with a high vapor repellency due to the potency of the comparatively few molecules that are volatilised. Vapors of most of the repellents were found to induce knockdown of mosquitoes, but there was no correlation between the speed of this process and the vapor repellency.

The response of *Aedes aegypti* to a warm body and its radiation was discussed in Part III. The authors readily established the fact that warm bodies, 100° F., were more attractive than cool ones, 80° F., irrespective of their humidity. They then set out to distinguish the attractiveness between convective and radiant warmth. By using an air-tight window of thallium bromoiodide which allowed almost all of the radiation to filter through, the authors concluded that heat convection, which was not eliminated by the air-tight window, was the factor which makes a warm object attractive to the mosquito. In addition, surfaces which differed widely in their emission of radiant heat, but which had the same surface temperature, were found not to differ significantly from each other in attractiveness.

Part IV reported the results of data obtained by similar studies under field conditions. Several species of *Aedes* peculiar to the Canadian forest were involved. The investigations were made by means of a pair of robots so constructed, heated, and clothed as to constitute dummy men. Again the authors observed that moisture increased the attractiveness of a warm body 2 to 4 times when the air temperature exceeded 60° F., but that surface moisture decreased the attractiveness at cooler temperatures. Warmth increased the attractiveness, so that a robot at 98° F. attracted 3 times as many mosquitoes as one at 50 to 65° F. The authors, therefore, concluded that moisture was the major attractant factor when the air temperature exceeds 60° F., and warmth when the temperature was less than 60° F. Carbon dioxide vapor emitted from a robot's head almost doubled the attractiveness of a warm body. Vapors of ether and gasoline were significantly attractive. Robots clothed in sweat-soaked clothing were slightly but significantly more attractive than a water-soaked one. Light colors were less attractive than dark ones and luminescent dyes decreased the attractiveness of cloths. Green was less attractive than red or blue. Greenish-khaki nylon cloth was much less attractive than khaki drill or cotton. No interspecific differences in responses were observed. Part V dealing with the importance of visual responses in attractiveness, has been submitted for publication in the Bulletin of Entomological Research.—H. H. Stage.

A REPORT FROM THE GOOD NEIGHBOR CLUB was received from its chairman, Harry H. Stage, too late for inclusion in this issue of *Mosquito News*. There is space here to record only one or two items of special interest in that report.

Mrs. Ernestine Thurman, a member of this Committee now in Thailand, writes: "Thailand needs all available assistance from AMCA. Any effort on your part will not be wasted. The workers in malaria control are eager for information, literature, equipment, and encouragement. It was quite a blow to find a total void of natural history collections in the magnificent, spectacular national museum in Bangkok." Tommy Mulhern writes: "I have entered into the spirit of your Good Neighbor Club by paying up back dues of C. Y. Chow, our good friend who is in Formosa. You may not know it, but because of inflation, it costs Dr. Chow almost a week's salary for a stamp to write us. If someone else wants to participate in like fashion, they might take care of back dues of Teh-Nevg Chen, who is also in Formosa and whose account remains unpaid from 1948."