REVIEWS AND ABSTRACTS

THE EFFECTS OF ATMOSPHERIC PRESSURE ON THE FLIGHT RESPONSES OF *Aedes aegypti* (L.). W. O. Haufe. Bull. Entom. Res. 45(3):507–526. 19 refs. 1954. Little is known of the effects of variations in pressure on animals, especially invertebrates. The author has studied such effects on the behavior of adult female mosquitoes. The factors included were the "level" of pressure, the direction of a change in pressure (increase or decrease), and the magnitude and rate of such a change.

The equipment and methods used are thoroughly explained. The experiments appear to be well controlled and carefully executed and various statistical methods have been used in the handling of the data. Acclimatization of mosquitoes to different pressures was studied and found to be important from the standpoint of repeatability of results. The mosquitoes appeared to be equally active at the different pressures used, after becoming acclimatized to those pressures.

A "critical" pressure was found for *Aedes aegypti* above which a decreasing pressure was more stimulatory than an increasing one, and below which an increasing pressure was more stimulatory than a decreasing one. There was a suggestion that this pressure may be close to that prevailing at the time of emergence of the adult.

The experiments involving increase and decrease of pressure are rather complex and cannot be briefly summarized; details should be sought in the original. A change in pressure was usually more stimulatory than a constant one, at least above 500 mm. Hg. The author states that "Although the effects of atmospheric pressure on the flight activity of *A. aegypti* are probably of less importance than those of temperature and saturation deficiency, they were found to be sufficiently significant in this investigation to be considered as an important factor." One should, however, be careful in extrapolating from these results to field conditions since the rates and magnitudes of changes in pressure used in this study are, for the most part, much larger than are normally found in nature.—Ralph Barr, University of Kansas, Lawrence, Kansas.

BIOLOGICAL STUDIES ON *Culex tarsalis* (DIPTERA CULICIDAE) IN KANSAS. Lungstrom, L. Trans. Kansas Acad. Sci. 57:86–96. 8 refs. 1954. Studies on the abundance of *Culex tarsalis* Coq. were carried out in Kansas from 1945 to 1949 based on female count. This species was surpassed only by *Aedes vexans* in density and constituted above 21 percent of all mosquitoes caught, as indicated by 31 individual seasonal light trap collections. It was more abundant in the central and western sections of Kansas with the highest population density occurring near the salt marsh area in Stafford and Rice counties. The largest average catches were made during July and August but the peak population in the eastern section of the state occurred later in the season. The amount of precipitation had a great effect upon the abundance of this species. During dry periods the larvae were collected from springs and the adults were scarce.

The eggs measured an average of 0.165 x 0.629 mm. in size. Only 2.6 percent failed to hatch. An average of 155 larvae hatched from each raft in a period of 18–24 hours. They were fed dog chow, chopped grass, cereal food, yeast, algae, and food in creek water. The rate of survival among the larvae reared in a laboratory with artificial food appeared to be low but was highest among those reared on dog chow. The pH (7.80–8.45) of prepared media was higher than the pH of water from ideal field habitats (7.3–7.9). . . . The larvae were collected principally in temporary to semi-permanent pasture depressions, springs, ditches, and creeks. Nearly all collections were made in rural areas with very few from artificial containers. The adults rested during the day in or on farm buildings, under bridges and culverts.

The females began biting with the approach of darkness. Laboratory reared specimens were not so aggressive as field collected ones. Precipitin tests indicate that *C. tarsalis* feeds on the blood of domestic animals and man with the most frequent attacks on chickens and cattle. This mosquito was collected from horses, cattle, and man. Although the precipitin tests indicated little feeding on man, field experience demonstrated that this species attacked one readily. Several specimens collected were engorged with fruit juice resembling mulberry.

The laboratory-reared adults lived up to 9 days during summer but some of the field collected ones lived more than 2 weeks. During the cooler part of the season the females lived at least 40 days. Field collected females oviposited at nearly all hours of day or night in the basement laboratory for 2 weeks at a declining rate. Attempts with several modifications in procedure to rear *C. tarsalis* through the complete life cycle were unsuccessful.—Excerpts from summary by author. Bethany College, Lindberg, Kansas.

THE INVESTIGATION OF A SYLVAN YELLOW FEVER EPIZOOTIC ON THE NORTH COAST OF HONDURAS, 1954. Trapido, H., and Galindo, P. Amer. J. trop. Med. Hyg. 4(4):665–674. 1955. 15 refs. 1. Howling monkeys (*Alouatta*) died of histopathologically proven yellow fever in July and early August, 1954, on the coastal plain near La Masica, Honduras, in an ecological situation unlike that of epizootics experienced during the preceding

five years in Panama and lower Central America. No naturally proven vector mosquitoes could be found on the coastal plain where the monkeys died.

2. Small numbers of *Haemagogus spegazzinii falco,* a proven natural vector in South America, were taken on mountain slopes in the tropical rain forest some 10 to 20 kilometers or more from the place where the monkeys died, but no evidence could be obtained of monkey mortality there. The authors believe the north coast of Honduras to be at or near the northern limit of the range of *H. spegazzinii falco.*

3. *Haemagogus equinus,* which has been shown to be capable of transmitting yellow fever in the laboratory, but from which virus has never been certainly recovered in the field, was the only *Haemagogus* species recovered at the place where the monkeys died near La Masica. This species which is widespread in Middle America has been taken by us in the Atlantic drainage as far north as the southwestern corner of the Mexican state of Tamaulipas which borders Texas on the Gulf Coast.

4. Aside from the predominantly ground-level biting *Psorophora* and *Mansonia,* which are not considered to be involved in the yellow fever transmission, the commonest arboreal mosquito was *Trichoprosopon magnus.* The ability of this mosquito to transmit virus is unknown. Another sabethine mosquito whose status as a vector is also not known, *Sabethes chloropterus,* was present in moderate numbers. This species has been present at other recent yellow fever episodes in Panama and lower Central America.

5. No human cases of yellow fever were recognized in the immediate area of the epizootic during, or in the months following the monkey fatalities.—Summary and conclusions by the authors, Gorgas Memorial Laboratory, Panama, R. de P.

THE NATIONAL CAMPAIGN AGAINST MALARIA IN IRAQ: PROGRESS REPORT, 1946–1952. I. Pringle, G. Bull. Endemic Dis. 1(2):87–117. 2 maps, 18 tables. Jan. 1955. Pub. by The Institute of Endemic Diseases, Ministry of Health, Baghdad, Iraq. The organization of the Institute of Endemic Diseases is described, and the development of the malaria control project in Iraq, 1947–1953, outlined. Information gathered during the surveys is grouped according to regions (subdivided into districts) each of which has special geographical and epidemiological features. These features are related to the flooding characteristics of the Tigris, Dyala, and Euphrates, and are used rather than administrative boundaries.

Region I. Shatt Al-Arab and Hammar Lake Littorale. *Anopheles stephensi* is the most important malaria vector, followed by *A. sacharovi.*

Region II. Alluvial Plain. District 2 A. Euphrates-alluvial. Vector, *A. stephensi.* District 2 B. Tigris-alluvial. Chief malaria vectors apparently are *A. stephensi* and *A. superpictus. A. pulcherrimus* was abundant in certain areas, but obviously low in transmission rate, while *A. sacharovi* was found but not connected with infections present. District 2 C. Dyala-alluvial. Predominant malaria vector, *A. stephensi.* Sometimes there are invasions of *A. sacharovi* and *A. superpictus.*

Region III. Syrian Desert. District 3 A. Euphrates-Syrian Desert. No malaria apparent, no anophelines collected. District 3 B. Tigris-Syrian Desert. Comparatively healthy area, and no anophelines were studied. 3 C. Spring-fed Oases-Syrian Desert. Vectors are *A. stephensi* and *A. fluviatilis.*

Region IV. Steppe-Desert. District 4 A. Tigris-Steppe. District 4 B. Dyala-Steppe. District 4 C. Zab-Steppe. District 4 D. Jezira-Steppe. No data given in this report.

Region V. Submontane. District 5 A. Tigris-Submontane. District 5 B. Zab-Submontane. District 5 C. Dyala-Submontane. No data given in present report.

Region VI. Zagros-Montane. No data given in present report.

The first three Regions are discussed in some detail. In addition to the supporting tables appended, there are six subjects considered under each District: (1) General notes which outline boundaries, ecology, status of malaria and vectors; (2) Administrative notes; (3) Control work undertaken, may be either, or a combination of, drain, fill, ditch, oil, clear, residual spray, or *Gambusia* introduction; (4) Results of control operations which include discussions of spleen indices supported by a short table in the text; (5) Course of malaria in uncontrolled communities is a report of some random observations; and (6) Scale of operations, heads paragraph giving numbers of laborers employed, density of population, etc.

The insecticides used were Gammexane and/or DDT. According to the author: "The dosage aimed at, with each spray, is 1 gm. of technical DDT/sq. meter, when oil formulations are used, and twice this dosage with wettable formulations of DDT. On the few occasions when spraying was carried out with Gammexane, the dosage aimed at was the equivalent of just over 0.1 gm. of gamma isomer BHC/sq. meter."—H. L. T. D.

EFFECT OF CLOTHING COLOR ON MOSQUITO ATTACK ON EXPOSED SKIN. Brown, A. W. A. Journ. Econ. Ent. 48(2):130. 1955. This is a one-page report on a project at Goose Bay, Labrador, during the period June 25 to July 6, 1953. The principal species of mosquitoes were *Aedes communis* (Deg.), *A. punctor* (Kby.), *A. pionips* Dyar, and *A. fitchii* (F. & Y.) These tests were undertaken to determine whether an "unattractive" (a white drill coverall and a green nylon "insect suit") garment would decrease the attacks on hands and face of wearer, or increase it by discouraging mosquitoes from landing on the garment itself. "Attractive" clothing included a black drill coverall

and a serge "air force blue" battledress. The landing rates of these species on backs and faces of the wearers are listed in tabular form. There were 4 tests or counts for each pair of clothing, and each pair was tried on 4 different pairs of wearers. The results suggest "that the expected diminution in the swarm around an unattractively clothed person is partially negated by a greater portion of the swarm proceeding to the face." It was concluded "that lighter-colored clothing does not increase the attack of mosquitoes on the face, although a significant decrease was obtained only with white versus black."—H.L.T.D.

A STUDY OF PREDATORS OF MOSQUITO LARVAE AND PUPAE WITH A RADIO-ACTIVE TRACER. W. F. Baldwin, H. G. James, and H. F. Welch. Can. Ent. 87(8):350–356. 1955.—Larvae and pupae of *Aedes stimulans* (Wlk), and *A. trichurus* (Dyar) were made radio-active with P^{32} and released in natural ponds near Chatterton, Ontario in 1953. The following day animals were collected from the ponds and tested for radio-activity. Predacious diving beetles (Dytiscidae), caddis-worms (*Limnephilus*), and larvae of water scavenger beetles (*Hydrophilus*) were the most important predators. The population density of mosquitoes decreased by approximately 40 percent from April 14 to May 11. During the same period there was a great increase in the number of predators and the percentage of radio-active animals.—W. E. Bickley, University of Maryland, College Park, Md.

CONSIDERAÇÕES GERAIS SOBRE A EPIDEMIOLOGIA DA MALÁRIA NO SUL DO BRASIL. Rachou, R. G., Ferreira, M. O., Lôbo, A. G. S., and Pires, W. M. Rev. Bras. Malariol. e Doenças Trop. 6(2): 177–188.1954. 3 tables, 3 graphs, 2 maps. In the south of Brazil, malaria is transmitted by *A.* (*K.*) *cruzii, A.* (*K.*) *bellator, A.* (*N.*) *darlingi,* and probably *A.* (*N.*) *albitarsis.* On the coast, the two species of the sub-genus *Kerteszia* are responsible for endemic malaria. *A.* (*N.*) *darlingi* is found in the north of Paraná State, part of which has endemic malaria and part epidemic malaria with long periodicity (4, 5 or 6 years). In the Valley of Uruguai River are little foci of epidemic malaria, probably transmitted by *A.* (*N.*) *albitarsis.* The control of malaria in the region, no matter the different vectors, has been made quite satisfactory by the DDT house spraying.—Authors' summary.

RESULTADOS PRELIMINARES DE UMA PROVA DE CAMPO PARA COMPARAÇÃO DA EFICÁCIA DE 3 INSETICIDAS DE ACÃO RESIDUAL APLICADOS NO INTERIOR DAS CASAS PARA COMBATE AO *Culex fatigans.* Rachou, R. G., Ferreira, M. O., and Lima, M. M. Rev. Bras. Malariol. e Doenças Trop. 6(2):159–172. 1954. 3 tables, 6 graphs. The authors present the results of the first 6 months of the experiment they are conducting in Florianópolis (mean temperature: 22°–16° C.) to evaluate the efficacy and the residual effect of three insecticides, applied indoors—BHC, DDT, and dieldrin—to control *Culex fatigans,* the vector of bancroftiasis in Brazil. (Applied doses: per sq. meter: mgr. of gamma isomer with BHC—emulsion, 410 mgr. of gamma isomer with BHC-suspension, 2.6 gr. of DDT and 0.95 gr. of dieldrin.) The preliminary results indicate: (1) a very good residual effect of BHC-emulsion and of dieldrin for six months; (2) lower effectivity of BHC-suspension as compared with BHC-emulsion; (3) DDT as the least efficient of the three tested insecticides. The long residual effect of BHC-emulsion is probably due to the low temperature of the region.—Author's summary.

FILARIOSES HUMANAS NO BRASIL. CONHECIMENTO ATUAL DE SUA DISTRIBUIÇÃO GEOGRÁFICA E TRANSMISSÃO. Rachou, R. G. and Deane, L. M. Rev. Bras. Malariol. e Doencas Trop. 6(3) 377–387. 1954. 22 refs. 4 tables. In Brazil, from the data available at present, autochthonous infections by *Wuchereria bancrofti* are known to occur in Manáus (State of Amazonas), Vigía, Bragança and Cametá (State of Pará), Recife (State of Pernambuco), Macció (State of Alagoas), Salvador (State of Bahia), Florianópolis and Ponta Grossa (State of Santa Catarina) and Pórto Alegre (State of Rio Grande do Sul); *Mansonella ozzardi* is endemic in Manáus, Tefé, Fonte Boa, São Paulo de Olivença, Benjamin Constant, Remate de Males, Maria Açu and Ataláia (State of Amazonas).

W. bancrofti occurs principally along the coast with a spotty distribution; in few localities its incidence is so high as to make it an important public health problem. *M. ozzardi* is found in the interior and so far, has been encountered only in the forested plains of the Amazon Region, sparsely inhabited by a population with a preponderance of the Indian element.

All cases of Bancroftian filariasis studied, both in the North and South of the country, harbored embryos with a definite nocturnal periodicity. The usual vector of *W. bancrofti* in the country is *Culex fatigans,* although other species of mosquitoes can transmit the parasite as secondary vectors.—Authors' summary.

OBSERVAÇÕES PRELIMINARES SÔBRE AS VARIAÇÕES ESTACIONAIS DE ALGUNS FATORES FÍSICOS E QUÍMICOS NAS ÁGUAS DE CRIADOUROS DE *A. darlingi* NO SUL DO BRASIL. De Andrade, R. M., Rachou, R. G., and De Souza, M. A. Rev. Bras. Malariol. e Doenças Trop. 6(3): 415–418. 1954. 1 table. The authors present the temperatures (water and air), pH, total acidity, chlorine content, total calcium and magnesium hardness, calcium and magnesium of breeding places of *Anopheles darlingi* Root, 1926, in Marques dos Reis Village, Jacarèzinho County, State of Paraná, Brazil, during two months, February (Summer) and July (Winter) 1952.—Authors' summary.

INQUÉRITO DE FILARIOSE BANCROFTIANA EM FLORIANÓPOLIS, CAPITAL DO ESTADO DE SANTA CATARINA. Rachou, R. G., Ferreira, M. O., and Lima, M. M. Rev. Bras. Malariol. e Doenças Trop. 6(2):189–204. 1954. 4 tables, 4 graphs and 2 maps. The authors carried out an epidemiological survey to ascertain the incidence and transmission of bancroftiasis in Florianópolis, capital of Santa Catarina State. They examined the blood taken at night from 3,663 inhabitants (7.2 percent of the population), obtaining a microfilaria rate of 1.4 percent and an average count of microfilariae of 8.3 (20 cmm. of blood per sample). *Culex fatigans* was found naturally infected (2.5 percent among 1,302 dissected specimens); 0.5 percent from the dissected specimens harbored infective larvae. The authors conclude that the incidence of bancroftiasis is low in Florianópolis, although the so-called zone 1 ought to be considered as a focus of relative importance. —Author's summary.

RELAÇÃO ENTRE A MICROFILAREMIA HORÁRIA DA *"Wuchereria bancrofti"* E A FREQÜÊNCIA. DOMICILIÁRIA HORÁRIA DO *"Culex fatigans"* NO NORTE E NO SUL DO BRASIL. Rachou, R. G., Deane, L. M., Damasceno, R. G., and Lima, M. M. Rev. Bras. Malariol. e Doenças Trop. 6(2):205–218. 1954. 3 refs., 5 tables, and 6 graphs. Based on observations made in two cities, Belém and Florianópolis, respectively, in northern and southern Brazil, the authors were able to confirm the exsitence of a correlation between the periodicity of *Wuchereria bancrofti* and the hematophagic activity of *Culex fatigans* inside houses in both cities. The microfilariae have a definite nocturnal periodicity, the peak of which is at 1 a. m. in Belém and at 4 a. m. in Florianópolis.—Authors' summary.

AN ACCOUNT OF THE TAXONOMY AND BIOLOGY OF THE LARVAE OF CULICINE MOSQUITOES IN IRAQ. I. CENTRAL IRAQ. By Fadhil H. Khattat. Bull. Endemic Dis. 1(2):156–183. 1955. (In English) 6 tables, 4 figs., 8 plates, 17 refs. In 1954, a survey was made of the culicine breeding places during the period from August through November; and the information included in this paper is based for the most part on material obtained at this time and considered fairly representative for the autumn and early winter seasons.

The species collected were identified and important taxonomic features sketched by the author, who also compares chaetotaxy in 2 tables. He lists *Aedes caspius* Pallas, *Culex pipiens* Linn., *C. pusillus* Macq., *C. theileri* Theo., *C. tritaeniorhynchus* Giles, *Theobaldia longiareolata* Macq., *T. subochrea* Edw., and *Uranotaenia unguiculata* Edw. The *Uranotaenia*, although rare, was recorded for the first time from this area.

It is of interest, although the author does not mention it, that *Theobaldia subochrea* is a species described as autogenous by Marshall and Staley, 1936.—H. L. T. D.