An Annotated Bibliography of the Mosquitoes and Mosquito-Borne Diseases of Guam (Diptera: Culicidae)[1/]

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ABSTRACT. The literature concerning the mosquitoes and mosquito-transmitted diseases on Guam, Mariana Islands, is presented in the form of an annotated bibliography. It reflects the emphasis on mosquito surveys during World War II, and the continuing mosquito surveillance with new species collection records which has resulted from the island's current importance as a U.S. military center and port for both aerial and surface trans-Pacific commerce.

The earliest scientific references to mosquitoes on the island of Guam are comments by J.F. Leys (1905) and F.E. McCullough (1908), Surgeons, U.S. Naval Station, Guam. The initial entomological survey of the island was accomplished in 1911 by Mr. D.T. Fullaway (1912), and the first definitive study of the mosquito fauna of Guam made during 1936 was reported on by Mr. O.H. Swezey (1942). U.S. Navy activities on Guam dating from August 1899, combined with U.S. military actions during World War II, stimulated entomological surveys and produced numerous reviews of the local mosquitoes and the diseases they can transmit to man. The severe outbreaks of dengue fever in 1944 and Japanese B encephalitis in 1947-1948 made continued mosquito surveys on Guam desirable.

The post World War II buildup of U.S. military facilities, and the role of Guam as both an aerial and surface port for trans-Pacific traffic during the Korean and Vietnamese conflicts, sustained interest in the mosquito surveillance. Incidence of autochthonous malaria in 1966 initiated a series of surveys that resulted in the reporting of 9 species of *Anopheles* on Guam. It also redirected attention to the probability of introduction of new mosquito species into Guam via airplanes and ships.

The steady increase in the number of species of mosquitoes collected on Guam between 1948 and 1972 was documented by Nowell (1975) with the number rising from 12 to 37. Subsequent discoveries have brought this total to 40 species, including the two *Toxorhynchites* species purposely introduced during 1954 in an attempt to control the day-biting mosquito, *Aedes albopictus*.

[1/] The views expressed herein are those of the author and do not necessarily reflect the views of the United States Air Force or the Department of Defense.

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The following bibliography is an annotated account of the studies and review of the collections and records that have been published on the mosquitoes and the diseases they can transmit to man on the Island of Guam. Those entries marked with an asterisk (*) were not seen by the author.

Bibliography

American Geographical Society. 1952. Distribution of dengue and yellow fever. Atlas of Distribution of Diseases - Pl. 5. Geogr. Rev., Vol. 42, No. 2. Marianas designated as an area where epidemics of dengue fever occur repeatedly.

Bagg, C.P. 1917. (Collection record for *Aedes calopus (Aedes aegypti)* from Guam). *In* L.O. Howard, H.G. Dyar and F. Knab. The Mosquitoes of North and Central America and the West Indies. Carnegie Inst. Wash. Publ. No. 159, Vol. 4(2):525-1064. Collection record for *Aedes calopus (Aedes aegypti)* from Guam, p. 840.

*Bailey, S.F. and R.M. Bohart. 1945. Unpublished survey for *Aedes aegypti* on Guam during February 1945. (mimeographed). Referenced by Bohart and Ingram (1946) and by Hull (1952). It was indicated that *Aedes aegypti* was the vector of the severe epidemic fever which occurred among the military personnel on Guam during 1944, and this survey was made to determine the abundance and distribution of mosquito vectors of dengue fever and other diseases.

Bailey, S.F. and R.M. Bohart. 1952. A mosquito survey and control program in Guam. J. Econ. Ent. 45(6):947-952. A mosquito survey was accomplished during February 1945 to gather epidemiological data concerning the severe epidemics of dengue fever on Guam, and establish preventive measures. Nine species of mosquitoes were collected. Control measures are described.

Basio, R.G. 1969-1973. Mosquito identification log, Guam. USAF 5th Epidemiological Flight, Pacific Air Forces. (unpublished records). Contains all of the identifications of mosquito specimens collected on Guam and sent to the 5th Epidemiological Flight in the Philippine Islands for identification. The identifications were made by Ruben G. Basio, mosquito identifier who was on contract to the 5th EF. The log covers the period 1 Oct 1969 to 30 Jun 1973, when Mr. Basio's contract was terminated. This period also spanned deactivation of the 5th EF (Aug 1970) in Manila and relocation of its Entomology Service to the USAF 1st Medical Service Wing at Clark Air Base.

Basio, R.G. 1971. The mosquito fauna of the Philippines (Diptera: Culicidae). Nat. Mus. Philipp., Manila. Monog. 4:1-198. Includes Guam or the Mariana Islands in the distribution records for those species which occur in both the Philippine Islands and the Mariana Islands.

Basio, R.G. and W.K. Reisen. 1971. On some mosquitoes of Guam, Marianas Islands (Diptera: Culicidae). Philipp. Ent. 2(1):57-61. ***Aedes (Stegomyia) burnsi*** n.sp., p. 58; ***Anopheles baezai, A. lesteri,*** and ***A. tessellatus*** are recorded from Guam for the first time.

Belkin, J.N. 1962. The mosquitoes of the South Pacific (Diptera, Culicidae). Univ. Calif. Press, Berkeley and Los Angeles, 2 Vols., 608 and 412 pp. Includes "Marianas" in the distribution records for those species occurring on Guam.

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Bohart, G.E. and J.L. Gressitt. 1951. Filth-inhabiting flies of Guam. B. P. Bishop Mus. Bull. 204:1-152. The family Culicidae is represented on Guam by only 9 species (none listed), p. 1.

Bohart, R.M. 1946. New species of mosquitoes from the Marianas and Okinawa (Diptera, Culicidae). Proc. Biol. Soc. Wash. 59:39-46. Describes ***Culex litoralis*** n.sp. from Guam, p. 43.

Bohart, R.M. 1955. The role of taxonomy in relation to ecology and control. Proc. & Papers Twenty-Third Ann. Conf. Calif. Mosq. Cont. Assoc. 23:97-98. Uses ***Aedes aegypti*** and ***A. guamensis*** on Guam as an example of the interdependency of taxonomy, ecology and control. Knowledge of the differences of ecology and larval habitats of these two species enabled control efforts to be concentrated on ***A. aegypti,*** p. 97.

Bohart, R.M. 1956 (1957). Diptera: Culicidae. B.P. Bishop Mus., Honolulu, Hawaii. Insects of Micronesia 12(1):1-85. Introduction of ***Toxorhynchites brevipalpis*** and ***T. splendens*** on Guam in 1954, p. 3; disease relationships and medical importance of mosquitoes, p. 3; 11 species from Guam in key, p. 8; species bionomics.

Bohart, R.M. and R.L. Ingram. 1946. Mosquitoes of the Mariana Islands, *in* Mosquitoes of Okinawa and islands in the Central Pacific, pp. 33-44. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. NAVMED 1055. Descriptions, distribution records, and notes on biology and systematics on 12 species from the Marianas, 9 from Guam; keys to the adult and larval forms, p. 33-35; *Culex annulirostris marianae* n. subsp. from Guam, p. 42.

Brody, J.A. and F.L. Dunn. 1959. Malaria surveillance in the United States, 1958. Am. J. Trop. Med. Hyg. 8(6):635-639. Guam is designated as the foreign source for a single case of malaria, Table, p. 637.

Brown, R.B. 1966. Malaria on Guam. Memorandum for the Secretary of the Navy, 18 Nov 1966. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. Memo, BUMED-72-CHM:vs, 2 pp. (typed). 5 cases of falciparum malaria apparently contracted on Guam, with comments on the vector and mosquito control plans.

Bruce-Chwatt, L.J. 1970. Global review of malaria control and eradication by attack on the vector, *in* Conference on Anopheline Biology and Malaria Eradication. A Symposium of the Walter Reed Army Institute of Research, Washington, D.C. 21-23 May 1969, pp. 7-27. Ent. Soc. Am., Misc. Publ. 7. Malaria in the South Pacific is limited to the northwestern islands, *viz* the Solomons and the Santa Cruz-New Hebrides. The remainder of this large area extending over 120^{0} long. by 80^{0} lat. is malaria-free. The northwestern limits are circumscribed by a line that starts from the Bonin Islands and then turns south and southwest to include the Marianas and Palau Islands, p. 21.

*Brumpt, E. 1936. Precis de Parasitologie. Masson et Cie, Paris. Guam is included in the map of the distribution of *Aedes aegypti* as known to date.

Bryan, E.H., Jr. 1948. Bibliography of Micronesian entomology. Pacific Sci. Board (Honolulu), Natl. Res. Council, Washington, D.C. 43 pp. (mimeographed). Annotated bibliography of the principal publications on the insects of Micronesia, including references to Guam.

*Bryan, E.H., Jr. 1949. Economic insects of Micronesia. Report of Insect Control Commission for Micronesia, 1947-1948. Pacific Sci. Board (Honolulu), Natl. Res. Council, Washington, D.C. 29 pp.

Chow, C.Y. 1967. *Aedes aegypti* in the Western Pacific Region. Bull. Wld. Hlth. Org. 36(4):544-546. Brief historical note on the presence of this mosquito on Guam, p. 544; control note, p. 546.

Clarke, D.H. and J. Casals. 1965. Arboviruses; Group B, *in* F.L. Horsfall, Jr., and I. Tamm (Eds.). Viral and Rickettsial Infections of Man, 4th Ed., pp. 606-658. J.B. Lippincott Co., Philadelphia. The outbreak of Japanese B encephalitis that occurred on Guam in 1947-1948 was the first recognized appearance of the disease there. It is believed that the disease was newly introduced to the island from an epidemic or endemic area, p. 626; the probable, but not proved, vector on Guam was ***Culex annulirostris***, p. 630.

Cook, D.R. and R.H. Foote. 1955. Pictorial keys to the mosquitoes of medical importance, IX. Australian Region. Mosq. News 15(1):35-38. An epidemic of Japanese B encephalitis occurred on Guam in 1947 and 1948, but its vector is not known, p. 38.

Cooke, C.M. Jr., et al. 1939. Pacific entomological survey. Science 89(2320):556. Comments on the Bernice P. Bishop Museum's entomological expeditions to Guam and Micronesia during 1936 and 1938, and the confusion arising from a separate study organized subsequently and registered with the same name in England.

Crow, G.B. 1910. Filariasis on the Island of Guam. J. Am. Med. Assoc. 55(7):595-596. Filariae were found in the blood of 13 persons out of 224 natives tested in 1910 from various parts of the island. The infection focus was apparently limited to the region of Inarajan, a village on the southeast shore of the island. A brief history of filariasis on Guam is included, but no vector data are given.

Cruz, A. 1937. (Collection record for ***Aedes scutellaris pseudoscutellaris*** (Theobald) from Guam). Cited by O.H. Swezey (1942) and S.F. Bailey and R.M. Bohart (1952). Swezey: "In 1937, A. Cruz reared quite a lot of them from larvae in coconut hulls at Mogfog, Nov. 10." This species was probably the same one reported by Swezey and which was eventually described as ***Aedes (Stegomyia) guamensis*** by Farner & Bohart in 1944.

Darsie, R.F., Jr. and A.C. Ramos. 1971. Additional species of ***Anopheles*** on Guam. Mosq. System. Newsl. 3(2):28-30. ***Anopheles (Cellia) vagus***, ***A. (Cellia) indefinitus***, and ***A. (Cellia) subpictus*** were collected during September 1970.

Darsie, R.F., Jr. and A.C. Ramos. 1972. Descriptions and keys for anophelines of Guam. Mosq. News 32(1):16-22. ***Anopheles indefinitus***, ***A. subpictus*** and ***A. vagus*** are described and illustrated. Keys are provided for adult, pupal and larval identification of these and four additional species of ***Anopheles*** found breeding on Guam.

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Edgren, D.C., V.S. Palladino and A. Arnold. 1958. Japanese B and mumps encephalitis. A clinicopathological report of simultaneous outbreaks on the island of Guam. Am. J. Trop. Med. Hyg. 7(5):471-480. Clinical and pathological aspects of patients hospitalized on Guam with encephalitis following the encephalitis epidemic which occurred on Guam in late 1947 and early 1948.

Eliason, D.A. 1975. An outbreak of dengue hemorrhagic fever among Vietnamese refugees on Guam. Wld. Hlth. Org., Pan Am. Hlth. Org., Dengue Newsl. for the Americas 4(2):4. An outbreak of DHF among Vietnamese refugees on Guam and its control through ground and aerial treatment is reported.

Esaki, T. 1940. A preliminary report on the entomological survey of the Micronesian Islands under the Japanese Mandate, with special reference to the insects of economic importance. Proc. Sixth Pacific Sci. Cong., Berkeley, 4:407-415. General comments on mosquitoes in the Mariana Islands, p. 414; *Culex quinquefasciatus* is common throughout the islands, and there are no anopheline mosquitoes in Micronesia, p. 414.

Esaki, T., et al. 1932. Nippon Konchu Zukan (Iconographia Insectorum Japanicorum), Tokyo. 2,241 pp. (in Japanese). (see S. Yamada, 1932).

Esaki, T., E.H. Bryan, Jr. and J.L. Gressitt. 1955. Insects of Micronesia - Bibliography. B.P. Bishop Mus., Honolulu, Hawaii. Insects of Micronesia 2:1-68. Comprehensive bibliography for the Insects of Micronesia publications series.

Farner, D.S. 1944a. Arthropod-borne diseases in Micronesia. U.S. Naval Med. Bull. 42(4):977-989. Presents an analysis of the available information on the arthropod-borne diseases of Guam and other islands in Micronesia. Records and vector data for filariasis, p. 980; dengue fever, p. 982; malaria, p. 984.

Farner, D.S. 1944b. Fauna of medical importance, *in* Compilation on the diseases of naval importance in Micronesia, including the identification and distribution of arthropods of medical importance, pp. 38-63. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. NAVMED 211. The entomological, parasitological and medical literature on Micronesia is reviewed. The section devoted to mosquitoes provides an excellent summary of the widely scattered German, American, and Japanese reports and surveys from 1905 to 1942. Keys to the females and 4th instar larvae reported from Micronesia are included.

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Farner, D.S. and R.M. Bohart. 1944. Three new species of Australian *Aedes* (Diptera, Culicidae). Proc. Biol. Soc. Wash. 57:117-122. *Aedes (Stegomyia) guamensis* n.sp. from Guam, p. 117.

Farner, D.S. and R.M. Bohart. 1945. A preliminary revision of the *scutellaris* group of the genus *Aedes*. U.S. Naval Med. Bull. 44(1):37-53. Includes *Aedes (Stegomyia) guamensis* from Guam. The records of *scutellaris* by Fullaway (1912) and Swezey (1942) are referable to *A. guamensis*, p. 50.

Farner, D.S., R.J. Dicke, G. Sweet, L. Isenhour and T.Y. Hsiao. 1946. The distribution of mosquitoes of medical importance in the Pacific area. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. NAVMED 983:1-64. Atlas of mosquito distribution charts; Guam species are *Aedes aegypti, A. albopictus* and *Culex quinquefasciatus*. Systematics, bionomics and relationship to diseases are presented for each species.

Foote, R.H. and D.R. Cook. 1959. Mosquitoes of medical importance. U.S. Dept. Agr., Agr. Res. Serv., Washington, D.C. Agr. Handb. 152:1-158. Notes on malaria, dengue fever, encephalitis and filariasis on Guam, p. 106. Vector species data: *Aedes aegypti*, p. 107.

Fullaway, D.T. 1912. Entomological notes, *in* Annual Report Guam Agricultural Experiment Station for 1911. pp. 26-35, U.S. Govt. Print. Off., Washington, D.C. Two species of mosquitoes are listed: a culicine *(Culex* sp. near *vishnui)* and *Stegomyia scutellaris*. Swezey (1942) states that the *Stegomyia scutellaris* reported by Fullaway was actually *Aedes pandani* and not *Aedes scutellaris pseudoscutellaris*. Also, the *Culex* sp. near *vishnui* is probably *Culex quinquefasciatus*.

*Fullaway, D.T. 1913. Entomological notes. Experiment Station Record, Guam 28:158-159. Reprint of Fullaway's 1912 paper.

Fullaway, D.T. and N.L.H. Krauss. 1945. Common insects of Hawaii. Tongg Publ. Co., Honolulu. 228 pp. *Aedes albopictus* is established in Guam, p. 144.

*Fujii, T. 1939. [Species of mosquitoes distributed in the South Sea Islands]. Nanyo Igaku Ronbunshu [Coll. of South Sea Med. Publ.] 5:135-140. (in Japanese).

Gressitt, J.L. 1954. Insects of Micronesia - Introduction. B.P. Bishop Mus., Honolulu, Hawaii. Insects of Micronesia 1:1-257. Entomology on Guam, p. 13; Guam, pp. 54-59; mosquitoes on Guam, p. 144; ecology data, pp. 157-159; mosquito vectors and diseases, p. 191; mosquito collection data, pp. 194, 195, 200-201.

Gressitt, J.L. 1957. The insect fauna of Micronesia. Proc. Eighth Pacific Sci. Cong., Pacific Sci. Assoc., 1953. Vol. IIIA: Oceanography and Zoology, pp. 1453-1456. Natl. Res. Council of the Philippines, Univ. Philippines, Quezon City, Philippines. Contributions from Guam will be incorporated in this study, the results of which will be published by the B.P. Bishop Museum, Hawaii, as a series under the title "Insects of Micronesia," p. 1453.

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Hammon, W.McD. 1949. Public health problems relating to the viral encephalitides in the Far East and the Pacific Islands. Proc. and Papers Seventeenth Ann. Conf. Calif. Mosq. Cont. Assoc. 17:13-15. An outbreak of JBE on Guam in January 1948 is noted.

Hammon, W.McD. 1969. Observations on dengue fever, benign protector and killer: a Dr. Jekyll and Mr. Hyde. Am. J. Trop. Med. Hyg. 18(2):159-165. Reviews the outbreaks of dengue fever and mumps on Guam during the period 1944-1947, pp. 160-162.

Hammon, W.McD. 1973. Dengue hemorrhagic fever - do we know its cause? Am. J. Trop. Med. Hyg. 22(1):82-91. Both Dengue types 1 and 2 were suspected to be present on Guam during World War II from the results of antibody studies which should have differentiated had only one type been present, p. 86.

Hammon, W.McD., W.D. Tigertt and G.E. Sather, with T.O. Berge and G. Meiklejohn. 1958. Epidemiologic studies of concurrent "virgin" epidemics of Japanese B encephalitis and of mumps on Guam, 1947-1948, with subsequent observations including dengue, through 1957. Am. J. Trop. Med. Hyg. 7(4):441-467. Epidemiologic review of the 1947 outbreak of JBE on Guam, with reference to the distribution, vectors, and serological findings of this disease.

Harrison, B.A. and J.E. Scanlon. 1975. Medical entomology studies - II. The subgenus *Anopheles* in Thailand (Diptera: Culicidae). Cont. Am. Ent. Inst. 12(1):1-307. Guam is included in the distribution notes for *Anopheles baezai* Gater, p. 114.

Hart, T.A. and W.H. Hardenbergh. 1963. The Southwest Pacific area, *in* Preventive Medicine in World War II. Vol. VI. Communicable Diseases: Malaria, pp. 513-578. Off. Surg. General, Dept. of the Army, Washington, D.C. *Anopheles subpictus indefinitus* was recovered on Guam subsequent to World War II, p. 529.

Hayes, G.R., Jr. and B.T. Whitworth. 1969. Trip to Guam, November 24 - December 13, 1969. Memorandum to the Chief, Insect & Rodent Control Branch, Dept. of Health, Education, and Welfare, Public Health Service, Atlanta, Georgia, with attachments. 10 pp. (mimeographed). Preliminary report of Vector Control Consultants Hayes and Whitworth's trip to Guam to survey present and potential vector problems, and recommend control measures. A comprehensive report followed (Hayes & Whitworth, 1970).

Hayes, G.R., Jr. and B.T. Whitworth. 1970. Survey of vector problems, Guam, U.S.A. Insect & Rodent Control Branch, EHS - Environmental Control Admin., Public Health Service, U.S. Dept. Health, Education, and Welfare, Atlanta, Georgia. 24 pp. (mimeographed). Comprehensive report of a vector survey accomplished on Guam during 24 Nov - 14 Dec 1969. Analyzes the 6 confirmed malaria cases in Guam during 1969, and provides an updated appraisal of vector control problems. Reviews the 15 species of mosquitoes known to occur on the island at the time, with consideration of their vector capabilities.

Hodes, H.L. 1946. Experimental transmission of Japanese B encephalitis by mosquitoes and mosquito larvae. Proc. Meetings Johns Hopkins Med. Soc. Johns Hopkins Hosp. Bull. 79:358-359. Reports that *Aedes vexans* from Guam (presumably *nocturnus*) served as a vector of JBE virus in laboratory experiments. Describes the experimental transmission of Japanese B virus by *Culex jepsoni* Theobald *(=Culex sitiens)* from Guam.

Holway, R.T. 1955. Mosquito survey for naval activities on Guam. U.S. Navy Preventive Medicine Unit No. 6. 22 pp. + 3 attach., 11 pp. (mimeographed). Report of an entomological survey of mosquito problems on Guam during July-August 1955, with emphasis on those species which are significant pests or potential disease vectors in the naval areas. 11 species are listed with bionomic data for the 6 major pest/vector species. Presents extensive collection data and control information.

Holway, R.T. 1964a. Disease vector and pest control technology; report of training and assistance in. U.S. Navy Preventive Medicine Unit No. 6. 15 pp. Lists the mosquito species collected on Guam since 1942, including results of a survey in 1964, with their importance as vectors. *Culex tritaeniorhynchus* as vector of JBE; *Culex pipiens quinquefasciatus* of Bancroft's filariasis; *Mansonia uniformis* as a known vector of Malayan filariasis; *Aedes aegypti* and *A. albopictus* previously important as vectors of dengue fever, all on Guam.

Holway, R.T. 1964b. Military responsibility for disease vector quarantine, *in* Proc. Fourth Triennial Conf. Mil. Ent., Walter Reed Army Med. Cent., Washington, D.C., 5-9 Oct 1964. 6 pp. Presents the history of the importation of mosquitoes into Guam.

Holway, R.T. 1964c. Mosquito abatement in Apra Harbor area, recommendations for. U.S. Navy Preventive Medicine Unit No. 6. 4 pp. (mimeographed). Mosquito collections of July 1964 are presented, and an alarming increase in population levels of *Culex tritaeniorhynchus* and *Mansonia uniformis* were noted. Control recommendations are offered.

Holway, R.T. 1964d. Mosquito survey for naval activities on Guam. U.S. Navy Preventive Medicine Unit No. 6. 4 pp. (mimeographed). Initial records for adult *Aedeomyia catasticta* collected from light traps in the Apra Heights and Camp Roxas areas.

Holway, R.T. ?1964-66. Key to mosquitoes of the Marianas. U.S. Navy Preventive Medicine Unit No. 6. 4 pp. (mimeographed). Adult and larval keys to 14 species.

Holway, R.T. 1965a. *Culex tritaeniorhynchus* Giles and *Mansonia (Mansonioides) uniformis* (Theobald) on Guam. Notes and Exhibitions for May 11, 1964. Proc. Hawaiian Ent. Soc. 19(1):16. Both species are apparently well established on Guam.

Holway, R.T. 1965b. Mosquitoes on Guam, Philippines, and Canton I. Notes and Exhibitions for September 14, 1964. Proc. Hawaiian Ent. Soc. 19(1):30. Contains mosquito collection data for Guam.

Holway, R.T. 1968a. *Culex annulirostris marinae* and *Aedomyia catastica*. Notes and Exhibitions for January 10, 1967. Proc. Hawaiian Ent. Soc. 20(1):2. Man-biting collections of the *Culex*, and first record of collection of the larvae of *Aedeomyia catasticta* from Guam.

Holway, R.T. 1968b. Malaria in Guam. Notes and Exhibitions for January 10, 1967. Proc. Hawaiian Ent. Soc. 20(1):2. Reviews cases of malaria on Guam during 1966, with evidence that introduced autochthonous malaria had occurred on the island.

Holway, R.T. 1969. *Culex (Lutzia) fuscanus* Wiedemann. Notes and Exhibitions for October 14, 1968. Proc. Hawaiian Ent. Soc. 20(2):280. First collection record for the adult of this mosquito from Guam. This is the sixth known mosquito introduction to Guam since World War II.

Holway, R.T. 1970. Disease vector surveillance and control, *in* Rept. 2nd Pacific Fleet Prev. Med. Workshop, U.S. Navy Guam, Marianas Islands, 21-23 April, pp. 22-24. The status of vector-borne diseases and the danger of establishment of malaria in Guam are presented.

Holway, R.T. and J.R. Bridges. 1970. Illustrated key to the adult mosquitoes of the Marianas. U.S. Navy Preventive Medicine Unit No. 6. 6 pp. + Change 1 (1971), 2 pp. (mimeographed). Key includes 18 species known to occur on Guam. Change 1 adds 2 species of *Anopheles*.

*Hornbostel, H.G. 1925. Mosquitoes and flies of Guam. The Guam Recorder 2:268 (Dec.).

Horsfall, W.R. 1955. Mosquitoes, their bionomics and relation to disease. Ronald Press Co., New York. 723 pp. Summarizes the large and varied literature on mosquitoes that pertains to their bionomics and relation to disease. Includes those species known to occur on Guam as of 1955.

Howard, L.O. 1930. A history of applied entomology. Smithson. Misc. Coll. 84(3065):1-564. Refers to the initial entomological survey of Guam accomplished by D.T. Fullaway (1912) in 1911, p. 416.

Howard, L.O., H.G. Dyar and F. Knab. 1912. The mosquitoes of North and Central America and the West Indies. Carnegie Inst. Wash. Publ. No. 159, Vol. 1, 520 pp. Refers to the distribution records of *Aedes calopus (=Aedes aegypti)* in Vol. 4, p. 293.

Howard, L.O., H.G. Dyar and F. Knab. 1917. The mosquitoes of North and Central America and the West Indies. Carnegie Inst. Wash. Publ. No. 159, Vol. 4, 1,064 pp. (see C.P. Bagg, 1917).

Hoyt, C.P. 1957. Parasites and predators introduced into the Pacific Islands for the biological control of insects and other pests. So. Pacific Comm. Tech. Paper 101, 38 pp. So. Pacific Command, Noumea, New Caledonia. Two species of the culicid genus *Toxorhynchites* were introduced into Guam to control *Aedes* mosquitoes there.

Hu, S.M.K. 1950. Encephalitis on Guam. Notes and Exhibitions for March 14, 1949. Proc. Hawaiian Ent. Soc. 14(1):4. Type B encephalitis, a form of sleeping sickness with high case fatality, has been reported by Dr. W.McD. Hammon. Also refers to *Anopheles subpictus* Grassi, recently found established on Guam.

Hu, S.M.K. 1953. Mosquito survey of Guam. Mosq. News 13(2):123-125. Seven of the 11 species which have been reported from Guam were collected; none was new to Guam. Previous epidemics of dengue fever and JBE on the island are reviewed.

Hu, S.M.K. 1955. Progress report on biological control of *Aedes albopictus* Skuse in Hawaii. Proc. and Papers Twenty-Third Ann. Conf. Calif. Mosq. Cont. Assoc. 23:23. Colonies of *Toxorhynchites brevipalpis* from South Africa and *T. splendens* from the Philippines, two carnivorous species used in biological control, have been established in Hawaii. Requests for stock material were received, and living larvae have been sent to Guam.

Hu, S.M.K. 1960. A review of new findings on the bionomics of insect vectors of filariasis. Proc. Eighth Pacific Sci. Cong. of the Pacific Sci. Assoc. in 1953. Vol. 6A:607-617. Presents filariasis incidence and the vector potential on Guam, p. 609.

Huang, Y-M. 1972. Contributions to the mosquito fauna of Southeast Asia. XIV. The subgenus *Stegomyia* of *Aedes* in southeast Asia. I - the *scutellaris* group of species. Cont. Am. Ent. Inst. 9(1):1-109. Keys, morphological and distribution data for the group, including *Aedes albopictus* from Guam, pp. 13-17.

Hughes, J.H. 1949. Aircraft and Public Health Service foreign quarantine entomology. Federal Security Agency, Public Hlth. Serv., Washington, D.C. Pub. Hlth. Rept. (Suppl.) 210:1-38. Discusses the recent report of establishment on Guam of *Anopheles subpictus indefinitus* Ludlow, and its interception on aircraft landing at Honolulu, p. 8.

Hughes, J.H. and J.E. Porter. 1956. Dispersal of mosquitoes through transportation, with particular reference to immature stages. Mosq. News 16(2):106-111. Remarks on the introduction of *Anopheles subpictus indefinitus* and *Aedes albopictus* into Guam.

Hull, W.B. 1952. Mosquito survey of Guam. U.S. Armed Forces Med. J. 3(9):1287-1295. Reviews early mosquito surveys on Guam. No *Aedes aegypti* adults or larvae were found during this 1951 survey. A total of 9 species was collected and their distribution is reported.

Hurlburt, H.S., J.D. Maple, C.S. Wilson, S.R. Fallander and C.N. Husman. 1947. Observations on the dispersal of DDT from aircraft for the control of mosquitoes. U.S. Naval Med. Bull. 47(2):368-379. Describes a field test using a natural population of *Aedes pandani* as the test mosquito on the island of Guam during August 1945 to evaluate the efficacy of air spray with equipment mounted in a C-47 aircraft, pp. 374-375.

Imms, A.D. 1943. The insects of Guam. Nature [London] 152(3845):55 (July 10). Reviews the recently published B.P. Bishop Mus. Bull. 172, Insects of Guam-I, and notes the inclusion of mosquito species.

Insects of Guam. 1942. Bernice P. Bishop Mus., Honolulu, Hawaii. Bull. 172:1-218. Contains the results of studies of insects collected during an entomological survey of Guam in 1936. Culicidae are included, pp. 199-200 (see Swezey, 1942).

*Iyengar, M.O.T. 1954. Distribution of filariasis in the South Pacific region. So. Pacific Comm. Tech. Paper 66:1-52. So. Pacific Command, Noumea, New Caledonia. Filariasis infections have been reported in Saipan and Tinian, but the disease is entirely absent from Guam.

*Iyengar, M.O.T. 1955. Distribution of mosquitoes in the South Pacific region. So. Pacific Comm. Tech. Paper 86:1-47. So. Pacific Command, Noumea, New Caledonia. Lists ***Aedes vexans*** as occurring in the Mariana Islands, p. 45.

Joyce, C.R. 1961. Potentialities for accidental establishment of exotic mosquitoes in Hawaii. Proc. Hawaiian Ent. Soc. 17(3):403-413. Inadvertent mosquito introductions on Guam, p. 404; 12 species of mosquitoes known to occur on Guam, p. 409; potential introductions to Hawaii from Guam, p. 410.

Joyce, C.R. 1963a. ***Culex tritaeniorhynchus*** Giles on Guam. Notes and Exhibitions for June 13, 1962. Proc. Hawaiian Ent. Soc. 18(2):207-208. This species was recovered during a survey made during 20-27 May 1962. It was abundant, probably unrecognized since adults are very similar to ***Culex annulirostris marianae*** Bohart & Ingram. ***C. tritaeniorhynchus*** is an important vector of JBE in Japan and other parts of the Orient.

Joyce, C.R. 1963b. ***Mansonia (Mansonioides) uniformis*** (Theobald). Notes and Exhibitions for July 9, 1962. Proc. Hawaiian Ent. Soc. 18(2):210. One female was discovered in a mosquito light trap collection from Guam dated 24 May 1962. This is the first apparent record from Micronesia. It is a vector of filariasis, ***Brugia malayi,*** in Borneo.

Joyce, C.R. and P.Y. Nakagawa. 1963. ***Aedes vexans nocturnus*** (Theobald) in Hawaii. Proc. Hawaiian Ent. Soc. 18(2):273-280. Distribution and medical importance of this species on Guam, p. 277; Guam is a suspected port of origin for introduction of this species into Hawaii, p. 278.

Kessel, J.F. 1966. Filariasis as a world problem. Mosq. News 26(4):490-497. Nocturnal-periodic bancroftian filariasis on Guam, map, p. 494.

Kindleberger, C.P. 1912. Sanitary conditions in Guam. U.S. Navy Med. Bull. 6(3):464-472. Disease data reported on Guam prior to 1912 include 11 cases of *Filaria bancrofti*, 1 case of elephantiasis, with 83 Americans and 28 natives admitted during the year with dengue fever. No cases of malaria were known to have originated on the island, p. 472. Refers to the D.T. Fullaway collection of mosquitoes during 1911, p. 468.

*Knight, K.L., R.M. Bohart and G.E. Bohart. 1944. Keys to the mosquitoes of the Australasian region. Natl. Res. Council, Washington, D.C. *Aedes scutellaris pseudoscutellaris* (Theobald) recorded from Guam is referable to *Aedes (Stegomyia) guamensis* Farner and R. Bohart, p. 55.

Knight, K.L. and H.S. Hurlburt. 1949. The mosquitoes of Ponape Island, eastern Carolines. J. Wash. Acad. Sci. 39(1):20-34. Comparison of *Aedes senyavinensis* with *A. oakleyi*, a species known only from Guam, p. 30; *Culex annulirostris marianae* Bohart & Ingram, from the Marianas, is subspecifically distinct from *C. annulirostris*, p. 31.

*Kumm, H.W. 1931. The geographical distribution of the yellow fever vectors. Am. J. Hyg. Monog. Ser. 12:1-110. A comprehensive summary of world distribution records for *Aedes aegypti;* Guam is included in the distribution data.

Lauret, T. 1975a. Personal communication. Adult *Culex fuscocephalus* were collected in a light trap at Apra Harbor, Guam, by U.S. Navy Public Works Center personnel during Aug-Sep 1969. Larvae of this species were found at the same time breeding in a sewer break, 50 to 60 feet from where the light trap was set up. The larvae were feeding on *Culex quinquefasciatus* immatures. This was the initial collection record for this species on Guam. It was recorded on a local mosquito identification form, and the species was included by Holway and Bridges (1970) in their key to the mosquitoes of the Mariana Islands.

Lauret, T. 1975b. Personal communication. One adult *Armigeres subalbatus* was reared in Sep-Oct 1969 from larvae found in a potato chip can which had been discarded behind the Orchid Restaurant and Bar in Apra Harbor, Guam. This is the first collection record for this genus on Guam. The specimen was not retained, and the collection record was neither published nor the species included in Holway and Bridges (1970) key to the mosquitoes of the Marianas.

Leach, P. 1900. Sanitary report on Guam, L.I. (Aug. 7, 1899 to Dec. 31, 1899), *in* (Annual) Report of the Surgeon General, U.S. Navy (for 1900), pp. 208-212. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. Includes malarial fever in the list of more important individual diseases, p. 211, and refers to it as follows: "Manifestations presumed to be malarial are very rare, and it is not certain that malaria exists at all in the island."

Leys, J.F. 1905. Report on the United States Naval Station, Island of Guam, (1904), *in* (Annual) Report of the Surgeon General, U.S. Navy (for 1905), pp. 91-96. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. States that there is no malaria on Guam and that anopheline mosquitoes are not found there, p. 93. *Aedes aegypti* is abundant but yellow fever has never been introduced, p. 93.

Lvov, D.K. 1973. Arbovirus infections in Australia and Oceania. Med. Parazitol. Parazit. Bolezn., Moscow 42(3):342-348. (in Russian with English summary). The prevalence and epidemiological importance of 38 arboviruses known to occur in Australia and Oceania are reviewed, together with records of the insects from which the viruses have been isolated.

Mackie, T.T., G.W. Hunter and C.B. Worth. 1954. A manual of tropical medicine, Ed. 2. W.B. Saunders Co., Philadelphia. 907 pp. Japanese B encephalitis occurred in an epidemic outbreak in 1947-48 on Guam. No vector has yet been implicated.

*Marks, E.N. 1954. A review of the *Aedes scutellaris* subgroup with a study of variation in *Aedes pseudoscutellaris* (Theobald) (Diptera: Culicidae). Bull. Brit. Mus. (Nat. Hist.) (B) 3(10):349-414. *Aedes guamensis* from Guam is included, p. 352.

Mattingly, P.F. 1969. The biology of mosquito-borne disease. American Elsevier Publ. Co., New York. 184 pp. Malaria is absent from Polynesia and Micronesia, where there are no anopheline mosquitoes, apart from a wartime introduction into Guam, p. 59.

*May, J.M. 1954. Map of the world distribution of some viral encephalitides. Geogr. Rev. 44:408-410. JBE occurs on Guam.

May, J.M. 1961a. Studies in disease ecology. Hafner Publ. Co., New York. 613 pp. Chapt. 2: The Ecology of Dengue, and Chapt. 8: The Ecology of Malaria, include data on Guam. See Wisseman and Sweet (1961), and May (1961b).

May, J.M. 1961b. The ecology of malaria, *in* J.M. May (Ed.), Studies in Disease Ecology, pp. 161-229. Hafner Publ. Co., New York. *Anopheles superpictus* was introduced into Guam during World War II, p. 187.

McCullough, F.E. 1908. History of epidemics in Guam. U.S. Navy Med. Bull. 2(3):22-25. The vector of dengue fever exists in large numbers, p. 25.

McCullough, F.E. and G.L. Angeny. 1909. Guam: Reports on health and sanitation for the years 1907 and 1908. U.S. Navy Med. Bull. 3(3):321-333. According to McCullough, the island is free from malaria because the host mosquito does not occur there, p. 326.

McDonald, J.L. 1968. Malaria in the Western Pacific. U.S. Navy Disease Vector Cont. Cent., Naval Air Station, Jacksonville, Florida, Tech. Monog. 1(2):1-12. (mimeographed). *Anopheles subpictus indefinitus* is on Guam with notes on its bionomics and vector capability, p. 11.

*McKinley, E.B. 1935. A geography of disease. Am. J. Trop. Med. (Suppl.) 15(5):i-xxv, 1-495. Includes references to dengue fever and malaria on Guam.

deMorais, A.T., C.R. Schneider and W.H. Wright. 1962a. Filariasis. *In* Tropical Health, a report on a study of needs and resources. Natl. Acad. Sci. - Natl. Res. Council, Washington, D.C., Publ. 996:63-69. Nocturnal periodic *Wuchereria bancrofti* is transmitted on Guam by *Culex quinquefasciatus*, p. 64.

deMorais, A.T., C.R. Schneider and W.H. Wright. 1962b. New diseases, the present knowledge of which is limited: Arthropod-borne virus diseases. *In* Tropical Health, a report on a study of needs and resources (Chapt. 6). Natl. Acad. Sci. - Natl. Res. Council, Washington, D.C., Publ. 996:127-129. JBE is recorded from Guam, p. 127.

Morrill, A.W., Jr., A.N. Dandoy, M.S. Johnson, J.F. Poole and R.H. Vincent. 1952. Mosquito control on Army posts in the Far East. Mosq. News 12(2):110-115. Vector data on *Aedes aegypti, A. albopictus, A. pandani, Anopheles subpictus* and *Culex quinquefasciatus* on Guam, p. 111; with control data.

Mulder, D.W., L.T. Kurland and L.L.G. Iriarte. 1954. Neurological diseases on the Island of Guam. U.S. Armed Forces Med. J. 5:1724-1739. Assumes that individuals having a history of an acute febrile illness during the winter 1947-48 epidemic period on Guam suffered from JBE. According to Pieper, et al (1958) none of these patients was included in the verified encephalitis cases upon which they reported.

Mumford, E.P. 1942a. Mosquitoes, malaria and the war in the Pacific. J. Trop. Med. Hyg. 45(10):74-76. Projects the possibility of inadvertent introductions of anophelines on the islands of the Central Pacific before World War II is terminated, p. 75.

Mumford, E.P. 1942b. Mosquitoes, malaria and the war in the Pacific. Science 96(2487):191-194. This is not a reprint of Mumford 1942a. Projects the possibility that the islands of the Central Pacific will lose their immunity from malaria and *Anopheles* before the end of World War II, p. 193.

Mumford, E.P. and J.L. Mohr. 1943a. Background to postwar reconstruction. Part 1. Preliminary report on parasitic and other infectious diseases of the Japanese Mandated Islands and Guam. Am. J. Trop. Med. 23:381-400. Lists 66 diseases with their native names in Micronesia, and discusses their causative agencies. Discusses the historic controversy of malaria on Guam, p. 387-8; includes Kindleberger (1912) reference to dengue fever on Guam, p. 391; filariasis is also reported, p. 396.

Mumford, E.P. and J.L. Mohr. 1943b. Preliminary report on the infectious diseases of enemy occupied territories. Part I: the Japanese Mandated Islands and Guam. J. Trop. Med. Hyg. 46(2):15-23. Discusses the historic controversy of malaria on Guam, p. 16; includes Kindleberger's (1912) reference to dengue fever on Guam, p. 18; states that filariasis has been reported on Guam, p. 20.

*Mumford, E.P. and J.L. Mohr. 1944. Manual on the distribution of communicable disease and their vectors in the tropics - Pacific Islands section. Part 1. Am. J. Trop. Med. (Suppl.) 24(3):1-26.

Nakata, S. (for W.W. Cantelo). 1960. *Aedeomyia catastica* Knab on Guam. Notes and Exhibitions for January 12, 1959. Proc. Hawaiian Ent. Soc. 17(2):161-162. This species was first collected in a light trap near Apra Harbor in January, 1958, and has been taken frequently in the Apra Harbor area since that date. It may have been introduced into Guam from the Philippine Islands or the western Carolines.

National Academy of Sciences. 1962. Tropical Health, a report on a study of needs and resources. Natl. Acad. Sci. - Natl. Res. Council, Washington, D.C., Publ. 996:1-540. Filariasis and Japanese B encephalitis recorded from Guam (see deMorais, et al, 1962).

Nowell, W.R. 1955. Recent developments in mosquito control in the Air Force. Proc. & Papers Twenty-Third Ann. Conf. Calif. Mosq. Cont. Assoc. 23:33-36. Aerial dissemination of liquid sprays for mosquito control was accomplished on Guam by means of T-6 aircraft modified with tanks suspended beneath either wing, p. 34.

Nowell, W.R. 1975. International quarantine for control of mosquito-borne diseases on Guam. NATO-AGARD Conf. on Aeromed. Implications of Recent Experience with Communicable Disease, Proc. 169(A7):1-8. Reviews outbreaks of mosquito-transmitted diseases occurring on Guam and shows by comparison of the major mosquito surveys the progressive buildup in the number of mosquito species on the island.

*Oakley, R.G. 1940. Classification and identification of Guam insects. Guam Recorder 16(12):508. Six species of mosquitoes are listed.

*Oakley, R.G. 1946. Entomological observations in the Marshall, Caroline and Mariana Islands. U.S. Commercial Co. (Honolulu) rept. 14(2):1-82. (mimeographed).

Olitsky, P.K. and J. Casals. 1952. Viral encephalitides, *in* T.M. Rivers (Ed.), Viral and Rickettsial Infections of Man, 2nd Ed, pp. 214-266. J.B. Lippincott Co., Philadelphia. JBE occurs on Guam, p. 231.

*Pacific Islands Pilot. 1928. Pacific Islands Pilot, 3rd Ed. U.S. Hydrographic Office, Navy Dept., Washington, D.C., Publ. No. 165, Vol. 1, 714 pp. Reports the presence of *Anopheles* in Micronesia (Guam), possibly based on the results of Satterlee's Sanitary survey in 1928. According to D.S. Farner (1944b, p. 38), "it (the report) seemed to be unfounded."

Pieper, S.J.L., Jr. and L.T. Kurland. 1958. Sequelae of Japanese B and mumps encephalitis. Am. J. Trop. Med. Hyg. 7(5):481-490. Follow up study during Mar-Sep 1957 of residual manifestations in patients hospitalized on Guam during the Dec 1947 - Jan 1948 outbreak of JBE.

Porter, F.E. 1932. Health condition in Guam. Report of the Department of Health for the Fiscal Year 1931. U.S. Navy Med. Bull. 30(3):446-453. Lists 22 laboratory examinations for malaria, p. 452; incidence of malaria is not reported. While quarantine measures are enforced, no ships were quarantined during the year, p. 450.

Pratt, H.D. and N. Siren. 1971. *Anopheles indefinitus* and *Culex fuscanus* (Diptera: Culicidae) in Saipan. Mosq. News 31(1):114-115. Presents collection history of *Anopheles indefinitus* on Guam, and ascribes the introduction of both species to Saipan from Guam.

Prowazek, S.J. von 1913. Die deutschen Marianen, ihre Natur und Geschichte. J.A. Barth, Leipzig. 125 pp. Diseases of the Mariana Islands. Filariasis is common among the immigrants from Samoa.

Ramos, A.C., S.M. Valder and R.L. Hoskins. 1975. Guam, *in* 1974 PACAF Mosquito Identification Summary, p. 3. U.S. Air Force 1st Medical Service Wing (PACAF) 75-203:1-38. (mimeographed). Lists the species and numbers of mosquitoes trapped on Andersen AFB during July and August 1974.

Ramos, A.C., S.M. Valder and D.R. Sutton. 1976. Guam, *in* 1975 PACAF Mosquito Identification Summary, pp. 4-5. U.S. Air Force 1st Medical Service Wing (PACAF) Tech. Rept. 76-1:1-60. Lists light trap collection data for 6 species of mosquitoes trapped on Andersen AFB during May-Nov 1975.

Reeves, W.C. 1948. Mosquito survey activities relevant to epidemiological investigations on virus encephalitis on Guam, preliminary report. U.S. Army and G.W. Hooper Foundation Med. Res., Univ. Calif. Consult. Ltr., 9 Mar 1948, 3 pp. A species list of known mosquitoes on Guam during 1948 is given. Disease vectors of dengue fever, filariasis and encephalitis are discussed.

*Reeves, W.C. 1953. Possible recent introduction of mosquito vectors of human disease in the Central Pacific. Proc. Seventh Pacific Sci. Cong. 7:371-373. Discusses the introduction of ***Anopheles subpictus indefinitus*** Ludlow and ***Aedes albopictus*** onto Guam in 1948, with the indication that they may have entered by means of surface craft during military operations.

Reeves, W.C. and A. Rudnick. 1949. Unpublished survey of mosquitoes of Guam during November and December 1948 and January 1949. Referred to by Hull (1952): "out of 2,189 larval collections and 250 adult collections, no ***Aedes aegypti*** were found. ***A. albopictus*** was found in 119 collections and was rather widespread from Talofofo north. ***Anopheles*** mosquitoes were found throughout the southern end of Guam. These workers also collected all other species known from Guam except ***Culex sitiens***."

Reeves, W.C. and A. Rudnick. 1951. A survey of the mosquitoes of Guam in two periods in 1948 and 1949 and its epidemiological implications. Am. J. Trop. Med. 31(5):633-658. Surveys were made in Feb-Mar 1948, and Nov 1948-Jan 1949, following the epidemic of JBE in Guam in December 1947. This report is based on the findings of an intensive survey of the mosquito fauna of Guam, in an attempt to determine if mosquitoes were the vectors of JBE. Includes the first record of adult ***Aedes albopictus*** (Skuse) from Guam, p. 648.

Reid, J.A. 1966. A note on ***Anopheles subpictus*** Grassi and ***A. indefinitus*** Ludlow (Diptera: Culicidae). J. Med. Ent. 3(3-4):327-331. Considers the ***Anopheles subpictus indefinitus*** (Ludlow) of early collectors on Guam as a full species, ***Anopheles indefinitus*** (Ludlow) in the ***Pyretophorus*** series.

Reid, J.A. 1968. Anopheline mosquitoes of Malaya and Borneo. Studies Inst. Med. Res., Malaysia 31:1-520. ***Anopheles indefinitus,*** a valid species, became established on Guam sometime between 1945 and 1948, p. 337.

Reinert, J.F. 1973. Contributions to the mosquito fauna of Southeast Asia. XVI. Genus ***Aedes*** Meigen, subgenus ***Aedimorphus*** Theobald in Southeast Asia. Cont. Am. Ent. Inst. 9(5):1-218. Reviews the taxonomy and collection records, including those on Guam, for ***Aedes vexans nocturnus*** (Theobald), p. 74, and states: "In the absence of sufficient biological, behavioral and genetical data on the Pacific Island populations of ***vexans,*** and since specimens from these populations fall within the variable range of morphological characters of other populations within the distribution of the species, I am hereby synonymizing ***nocturnus*** with ***vexans vexans,***" p. 77.

Reisen, W.K. and R.G. Basio. 1971. Oviposition trap surveys conducted on four USAF installations in the Western Pacific. Philipp. Ent. 2(1):62-66. *Aedes albopictus, A. burnsi* and *A. pandani* were recovered from NCDC "black jar" oviposition traps on Guam. This was the first record for recovery of the latter species from an oviposition trap, p. 64.

Reisen, W.K. and R.G. Basio. 1972. Oviposition trap surveys conducted on four USAF installations in the Western Pacific. Mosq. News 32(1):107-108. *Aedes albopictus, A. pandani* and *A. vexans nocturnus* were recovered from NCDC "black jar" oviposition traps on Guam.

Reisen, W.K., J.P. Burns and R.G. Basio. 1971a. The distribution and abundance of mosquitoes on USAF installations in Asia for 1970. U.S. Air Force 1st Medical Service Wing (PACAF) Tech. Rept. 71-2:1-40. (mimeographed). Light trap collection data for Guam during 1970, p. 30. A total of 18 different species with 9 new collection records, Tables 30, 31. Medically important species list, Table 32.

Reisen, W.K., J.P. Burns and R.G. Basio. 1971b. A mosquito survey of Guam, Marianas Islands. U.S. Air Force 1st Medical Service Wing (PACAF). 30 pp. (mimeographed). Guam was surveyed for adult and immature mosquitoes during Feb 1971; adult mosquito light trap collection data compiled by the Preventive Medicine Section, USAF Hospital, Andersen AFB, during 1970 are included. A list of the species captured at various points around the island using ovitraps, light traps, man-biting surveys, and larval sampling is given. 18 different species, including 8 new distribution records are listed.

Reisen, W.K., J.P. Burns and R.G. Basio. 1972. A mosquito survey of Guam, Marianas Islands with notes on the vector borne disease potential. J. Med. Ent. 9(4):319-324. Data in this report were extracted from Reisen, Burns & Basio (1971b). 32 species, including new collection records for *Aedes aegypti, A. scutellaris, A. vexans nipponii, Anopheles lesteri, A. sinensis, A. tessellatus, A. vagus* and *Culex sinensis* are listed.

Robson, R.W. (Ed.). 1956. Pacific Islands Year Book, 7th Ed. Pacific Publ. Pty., Sydney, New South Wales. 479 pp. Mariana Islands (including Guam) are malaria-free, p. 173; Guam, pp. 189-190; malaria and yellow fever are unknown on the island, p. 190.

Rosen, L. 1971. Infectious disease research activities of the National Institutes of Health in the Pacific, *in* Proc. Commander in Chief Pacific First Conference on Preventive Medicine, Oahu, Hawaii, 18-22 January 1971, pp. 14-17. Notes that after *Aedes albopictus* was introduced accidentally on the island of Guam during World War II, it eventually displaced the endemic *scutellaris* species from the peridomestic habitat, p. 16.

Rozeboom, L.E. 1975. Our society - an entomologist's perspective. Am. J. Trop. Med. Hyg. 24(3):375-382. Cites the eradication of *Aedes aegypti* from Guam as an outstanding achievement in species sanitation, p. 377.

Rozeboom, L.E. and J.R. Bridges. 1972. Relative population densities of *Aedes albopictus* and *A. guamensis* on Guam. Bull. Wld. Hlth. Org. 46(4):477-483. A 1970 survey showed that since a similar survey in 1948-49, the population density of *A. albopictus* increased while that of *A. guamensis* decreased in both artificial and natural breeding sites. *A. guamensis* is indigenous to Guam, and *A. albopictus* was not discovered there until 1944. Competition between the two populations is suggested.

Russell, P.F. 1952. Malaria, basic principles briefly stated. Blackwell Scientific Publications, Oxford. 210 pp. *Anopheles subpictus indefinitus* has appeared on Guam since the beginning of World War II, but to date (1952) indigenous malaria has not resulted, p. 92.

Russell, P.F. 1955. Malaria: A world problem. Nature and extent of the problem. WHO Chron. 9(2-3):33-39. *Anopheles subpictus indefinitus* appeared after the beginning of World War II, but up to the present time malaria transmission has not taken place, p. 34.

Russell, P.F. 1959. Insects and epidemiology of malaria. Ann. Rev. Ent., Annual Reviews, Inc., Palo Alto, Calif. 4:415-434. Reviews introduction of *Anopheles subpictus indefinitus* on Guam in 1948, p. 420. Malaria is not endemic on Guam, p. 427.

Sabin, A.B. 1964. Dengue: research activities, *in* Preventive Medicine in World War II. Vol. VII. Communicable Diseases: Arthropodborne diseases other than malaria, pp. 40-62. Off. Surg. General, Dept. of the Army, Washington, D.C. Neutralization tests on sera from people with a diagnosis of dengue fever during the Hawaii epidemic of 1943-44, or the Japanese epidemics of 1944-45, revealed that the Hawaii type of virus was probably predominant in those outbreaks, while similar tests on the sera of Americans who had had the disease on Guam in 1944-45 indicated that another type or types of dengue fever were probably more prevalent there, p. 59.

Sabin, A.B. and W.D. Tigertt. 1956. Evaluation of Japanese B encephalitis vaccine. I. General background and methods. Am. J. Hyg. 63(3):217-249. Refers to the virus isolation by W.McD. Hammon (1948) from human cases from Guam, p. 218.

Sabin, A.B. and I. Young. 1948. A complement fixation test for dengue. Proc. Soc. Exp. Biol. Med. 69:478-480. Sera collected from American marines, 11 months after a single, primary attack of dengue fever on Guam, gave positive C-F tests with the Hawaii antigen, p. 480.

Sailer, R.I. 1960. Insect parasites and predators of medically important arthropods. Conference on Biological Control of Insects of Medical Importance, Washington, D.C., February 3-4, 1960. Tech. Rept. 144 pp. 2 species of predaceous culicids in the genus *Toxorhynchites* have been introduced into Guam, p. 81.

Satterlee, R.C. 1928a. Sanitary survey of the Island of Guam, 1928. Forwarded by the Governor Commandant of Guam, 28 August 1928, to the U.S. Navy Dept., Washington, D.C. Reports the presence of *Anopheles* in Micronesia (Guam), but according to D.S. Farner (1944b, p. 38), "it seemed to be unfounded."

*Satterlee, R.C. 1928b. Sanitary survey of the Island of Guam. The Guam Recorder 5:121. Reprint of Satterlee's survey report dated 28 August 1928.

Savage, E.P. 1966. Mosquitoes, *in* Report of Vector and Related Sanitation Problems on Guam, Part III, 10 pp. U.S. Public Health Service, National Communicable Disease Center, Atlanta, Georgia. An in-depth review of the 14 species of mosquitoes recorded from the Island of Guam to date: 6 species of *Aedes*, 5 species of *Culex*, and 1 species each of *Aedeomyia*, *Anopheles* and *Mansonia*. A summary of mosquito biting collections and a key to identify Guam mosquitoes are included, in addition to bionomics and public health data.

Schliessmann, D.J. 1968. *Aedes aegypti* eradication in a developed country. WHO Chron. 22(4):146-149. The measures taken by the United States of America are discussed. Guam is included as an American yellow fever receptive area as of 1960, p. 147.

Shriro, D.S. 1956. A report on mosquito control program at Contractor, Contract NOy-13931, Camps Nos. 1 and 3 Guam, M.I. U.S. Navy Area Public Works Office, Marianas. 5 pp. (mimeographed). Report of the comprehensive mosquito control program in the area of the two contractor camps on the east side of Guam, which followed Commander Holway's recommendations (R.T. Holway, 1955).

Simmons, J.F., T.F. Whayne, G.W. Anderson and H.M. Horack. 1944. Guam, *in* Global Epidemiology, A Geography of Disease and Sanitation, pp. 271-282. J.B. Lippincott Co., Philadelphia, Vol. 1. *Aedes aegypti*, *A. pseudoscutellaris*, *A. pandani*, *A. oakleyi*, and *Culex fatigans* are listed with their disease associations, p. 273. Mosquito-borne diseases on the island, p. 278-9.

Simmons, J.S. 1943. Dengue fever. Med. Clin. N. Am. 27:808-821. Guam is included in the map showing the geographic distribution of dengue fever, p. 809.

Smart, J. 1956. Insects of medical importance, 3rd Ed. Brit. Mus. (Nat. Hist), 303 pp., 13 pl. *Aedes guamensis* is listed (under Marianas) with the other species of the *scutellaris*-group, p. 109.

*South Pacific Commission. 1951. Conference of experts on filariasis and elephantiasis. So. Pacific Comm. Tech. Paper, 30 pp. So. Pacific Command, Noumea, New Caledonia.

*South Pacific Commission. 1959. Study group on filariasis. So. Pacific Comm. Tech. Paper, 80 pp. So. Pacific Command, Noumea, New Caledonia.

Steffan, W.A. 1975. Systematics and biological control potential of *Toxorhynchites* (Diptera: Culicidae). Mosq. System. 7(1):59-67. The species introduced from Hawaii into Pacific areas as *Toxorhynchites splendens* Wiedemann is *T. amboinensis*, p. 60.

*Stitt, E.R. 1906. Notes from a report on sanitary and medical conditions, U.S. Naval Stations, Guam, L.I., *in* (Annual) Report of the Surgeon General, U.S. Navy (for 1906), pp. 175-176. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C.

Stitt, E.R. 1926. Contributions of the Medical Corps, United States Navy, to American medicine. U.S. Naval Med. Bull. 24(1):1-12. Dengue fever, filariasis and malaria have been studied on Guam, p. 8.

Stone, A. 1939. Two new *Aedes* from Guam (Diptera, Culicidae). Proc. Ent. Soc. Wash. 41(5):162-165. *Aedes (Stegomyia) pandani* n.sp., p. 162, and *A. (Aedimorphus) oakleyi* n.sp. from Guam, p. 163.

Stone, A. 1945. A new species of *Aedes* from Saipan and the larva of *Aedes pandani* (Diptera: Culicidae). Proc. Ent. Soc. Wash. 47(3):65-69. Describes larva of *Aedes pandani* from Guam, p. 68.

Stone, A. and M.D. Delfinado. 1973. Family Culicidae, *in* Delfinado, M.D. and D.E. Hardy (Eds.), A Catalog of the Diptera of the Oriental Region, Vol. 1: Nematocera, pp. 266-343. University Press of Hawaii, Honolulu. Includes Mariana Islands (Guam) for the distribution of *Aedes vexans nocturnus*, *A. albopictus*, *Aedeomyia catasticta*, *Anopheles indefinitus*, and *Culex litoralis*.

Stone, A. and D.S. Farner. 1945. Further notes on the *Aedes scutellaris* group (Diptera, Culicidae). Proc. Biol. Soc. Wash. 58:155-162. The known range of *Aedes guamensis*, known heretofore from the Island of Guam, has been extended to Saipan on the basis of a male collected at Marpi Point, p. 158. *A. guamensis* is included in a key to the adults of the *scutellaris* group, p. 159.

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Surtees, G. 1967. Discussion on *Aedes aegypti* and the transmission of diseases of man. Bull. Wld. Hlth. Org. 36(4):675-676. Cites the replacement of *Aedes aegypti* by *A. albopictus* on Guam, p. 675.

*Swezey, O.H. 1936. A preliminary report on an entomological survey of Guam. Hawaiian Planters' Record 40(4):307-314.

Swezey, O.H. 1942. Culicidae of Guam, *in* Insects of Guam - I. Bernice P. Bishop Mus. Bull. 172, pp. 199-200. Collection data and ecological notes on *Aedes aegypti, A. oakleyi, A. pandani, A. pseudoscutellaris,* and *Culex quinquefasciatus*.

*Thomson, C.G. 1868. Diptera, *in* Kongliga Svenska Frogatten Eugenies Resa omkring Jordan, pp. 443-614. (Stockholm). Includes Diptera collected from Guam.

Travis, B.V. 1947a. Relative efficiency of six species of mosquitoes from Guam, M.I., as developmental hosts for *Dirofilaria immitis*. J. Parasit. 33(2):142-145. Data are presented to show which species of mosquitoes are most likely to be transmitters of dog heartworm on Guam.

Travis, B.V. 1947b. Three species of flies predaceous on mosquito larvae. Proc. Ent. Soc. Wash. 49(1):20-21. The ephydrid, *Ochthera canescens* Cress. and the dolichopodid, *Paraclia germanus* Parent were observed catching and feeding on larvae of *Culex annulirostris* Skuse and *C. fatigans* Wiedemann on Guam.

Travis, B.V., R.M. Labadan and H.H. Lee. 1968. Mosquitoes, *in* Arthropods of Medical Importance in Australia and the Pacific Islands. U.S. Army Natick Laboratories, Massachusetts, Tech. Rept. 68-61-ES-36:1-119. Disease and other data associated with mosquitoes found in Guam are referenced.

Tyson, W.H. 1970. Contributions to the mosquito fauna of Southeast Asia. VII. Genus *Aedeomyia* Theobald in Southeast Asia. Am. Ent. Inst. Cont. 6(2):1-27. Collection record for *Aedeomyia (Aedeomyia) catasticta* Knab at Sumay, Guam, p. 11.

U.S. Air Force. 1944. Notes on tropical diseases for Air Forces medical officers (127 pp.); Regional medical studies (118 pp.); and General medical bulletins (35 pp.). Army Air Forces School of Aviation Medicine Manual 25-200-5, Randolph Field, Texas. Designates the Pacific a malaria-free zone, p. 01-1; No reports of filarial disease cases in the Mariana Islands, p. 06-2; Regional medical studies 6: Health and disease in the Japanese Mandated Islands and Guam, 8 pp. - Dengue fever is endemic, p. 5; Filariasis has been reported, p. 5.

U.S. Air Force. 1975. Aerial spray report, Guam, Marianas Islands, 13 May - 30 June 75. U.S. Air Force 355th Tactical Airlift Squadron, Aerial Spray Branch. 11 pp. Report of the aerial spray mission for the suppression of dengue fever on Guam during May and June 1975. The results of the treatment, including effects on non-target fish, bees and other beneficial insects are included. Malathion 95% was applied at 3.0 fl. oz./acre over 40,000 acres.

U.S. Air Force. Consultative and technical reports published by the Fifth Epidemiological Flight and the First Medical Service Wing. See individual authors.

U.S. Army. Preventive Medicine in World War II. Off. of the Surg. General, Dept. of the Army, Washington, D.C. 7 vols. (See T.A. Hart and W.H. Hardenbergh, Vol. VI, 1963, and A.B. Sabin, Vol VII, 1964).

U.S. Dept. Health, Education, and Welfare. Morbidity and Mortality Weekly Report. Public Health Service, Center for Disease Control, Atlanta, Georgia. Current and cumulative cases of specified notifiable diseases, including arthropod-borne encephalitis and malaria, from the United States of America and its territories, including Guam.

U.S. Dept. Health, Education, and Welfare. 1975. Health status of Vietnamese refugees. Morbidity and Mortality Wkly Rept. 24(18):157-158, 163. Public Health Service, Center for Disease Control, Atlanta, Georgia. Hospitalization rates for refugees arriving on Guam are listed. Only 2 cases of malaria (1 *Plasmodium vivax*, 1 *P. falciparum*) have been reported. 5 cases of a syndrome clinically compatible with dengue fever have been diagnosed in arriving refugees. Comprehensive malaria assessment, including transmission potential and case occurrence, is given, p. 158.

U.S. Dept. Health, Education, and Welfare. 1975. Update on Vietnamese refugee health status. Morbidity and Mortality Wkly Rept. 24(19): 172. Public Health Service, Center for Disease Control, Atlanta, Georgia. 20 cases of malaria have been reported for a total of 22; no additional cases of dengue fever, leaving the total at 5.

U.S. Dept. Health, Education, and Welfare. 1975. Update on Vietnamese refugee health status. Morbidity and Mortality Wkly Rept. 24(20): 180. Public Health Service, Center for Disease Control, Atlanta, Georgia. 7 additional cases of malaria reported from Guam and Wake islands for a total of 25. One additional case of dengue fever from Guam for a total of 6.

U.S. Dept. Health, Education, and Welfare. 1975. Update on Vietnamese refugee health status. Morbidity and Mortality Wkly Rept. 24(21):188. Public Health Service, Center for Disease Control, Atlanta, Georgia. 5 additional cases of malaria reported from Guam and Wake islands for a total of 30. 2 additional cases of dengue fever reported from Guam.

U.S. Dept. Health, Education, and Welfare. 1975. Update on Vietnamese refugee health status. Morbidity and Mortality Wkly Rept. 24(22):189-190. Public Health Service, Center for Disease Control, Atlanta, Georgia. No new cases of dengue fever. Vector control activities included aerial ultra-low volume spraying with malathion. No transmission of the infection on Guam has been verified. A total of 90 cases of malaria has been reported to date from all refugees. 50 of these cases were reported from Guam and Wake islands. No transmission of malaria has been reported on Guam since the arrival of the refugees.

U.S. Dept. Health, Education, and Welfare. 1975. Update on Vietnamese refugee health status. Morbidity and Mortality Wkly Rept. 24(31):267-268. Public Health Service, Center for Disease Control, Atlanta, Georgia. An update is given on the incidence of dengue fever, malaria, and other diseases among the Vietnamese refugees on Guam, Wake Island, and in the United States of America. No new cases of dengue fever; 69 cases of malaria have been diagnosed on Guam and Wake.

U.S. Dept. Health, Education, and Welfare. Annual Supplements: Reported incidence of notifiable diseases in the United States, 1953-1973, to the Morbidity and Mortality Weekly Rept., U.S. Dept. Health, Education, and Welfare, Public Health Service, Center for Disease Control. Cases of mosquito-borne diseases reported for Guam are:

Ann. Suppl. 1953 (1954)	Malaria	7 Cases	Table 5, p. 9
Ann. Suppl. 1954 (1955)	Malaria	5 Cases	Table 5, p. 9
Ann. Suppl. 1955 (1956)	Malaria	3 Cases	Table 6, p. 12
Ann. Suppl. 1956 (1957)	Malaria	6 Cases	Table 7, p. 14
Ann. Suppl. 1957 (1958)	Malaria	3 Cases	Table 7, p. 14
Ann. Suppl. 1961 (1962)	Dengue	1 Case	Table 7, p. 12
	Malaria	5 Cases	Table 7, p. 12
Ann. Suppl. 1970 (1971)	Malaria	54 Cases	Table 6, p. 9
Ann. Suppl. 1972 (1973)	Malaria	2 Cases	Table 6, p. 9

These cases may have been acquired outside or on the island. There is no distinction in the reported cases. The disease data from Guam were not published each year. Since the years and numbers of cases of malaria reported do not include the 1966 and 1969 outbreaks on Guam, it is likely that they represent those cases diagnosed, treated or hospitalized in military personnel returning from assignments in the Far East or in Southeast Asia.

U.S. Navy. 1944. Fauna of medical importance, *in* Compilation on the diseases of naval importance in Micronesia, including the identification and distribution of arthropods of medical importance, pp. 38-63. Bur. Med. & Surg., U.S. Navy Dept., Washington, D.C. NAVMED 211. Reviews the literature records of mosquito fauna in Micronesia, with keys to the larval and adult species, pp. 38-42. (see D.S. Farner, 1944b).

U.S. Navy. 1945. Tropical and exotic diseases of naval importance. U.S. Naval Medical School, Bethesda, Maryland. 107 pp. Guam is included in a malaria-free zone (map and island list), p. 2; dengue fever distribution map, p. 42; filariasis distribution map, p. 66.

U.S. Navy. 1967a. Entomology, *in* Preventive Medicine Activities (RCS MED 6200-1). Semiannual report for period ending 31 Dec 1966, pp. 13-14, Enclosure 1. U.S. Navy Preventive Medicine Unit No. 6. (mimeographed). Reviews 6 cases of malaria occurring on Guam during 1966. There is evidence that introduced autochthonous malaria occurred, with 2 cases of *falciparum* malaria diagnosed at the U.S. Navy Hospital.

U.S. Navy. 1967b. Marianas, *in* Proc. Commander in Chief Pacific Conference on Quarantine and Control Measures to Prevent Dissemination of Vectors of Disease, Oahu, Hawaii, p. 13. Points out that vector mosquito control is conducted by limited aerial spraying on Guam.

U.S. Navy. 1967c. Mosquitoes of Guam. Enclosure to Letter: Conference of Military Entomologists, from U.S. Navy Public Works Center, Guam, to Pacific Division, Naval Facilities Engineering Command, 24 Jul 67. 5 pp. (mimeographed). Comprehensive review of the mosquitoes on Guam with collection sequence of the species, bionomic data, and control information.

U.S. Navy. 1971. Guam, *in* PACOM Intelligence, Proc. Commander in Chief Pacific First Conference on Preventive Medicine, Oahu, Hawaii, 18-22 January 1971, p. 28. States the intelligence for this area of study (Marianas) is minimal. The possibility of a major vector-borne disease outbreak such as dengue fever, encephalitis, malaria or plague exists and constitutes an area of major concern to preventive medicine officials.

U.S. Navy. Consultant and other reports published by the Preventive Medicine Unit No. 6. See individual authors.

U.S. War Dept. 1944a. Medical and sanitary data on Guam. War Dept. Tech. Bull. (TB MED) 57:1-16. No *Anopheles* mosquitoes or malaria in Guam. *Aedes aegypti, A. oakleyi, A. pandani, A. scutellaris pseudoscutellaris,* and *Culex fatigans* are reported, with notes on vector abilities. Dengue fever and endemic filariasis are reported as occurring.

U.S. War Dept. 1944b. Medical and sanitary data on the Mariana Islands. War Dept. Tech. Bull. (TB MED) 20:1-18. No anopheline mosquitoes in the Marianas, and malaria does not occur. *Aedes oakleyi, A. pandani* and *A. pseudoscutellaris* are recorded from Guam, p. 3; dengue fever occurs on Guam, p. 9.

U.S. War Dept. 1945. Dengue on Guam. Epidemic Disease Control and Sanitation 1(3):1-5. Publ. by Medical Section, Island Command, Guam. (mimeographed). Reviews the incidence, treatment, vectors and their control on Guam.

Usinger, R.L. 1944. Entomological phases of the recent dengue epidemic in Honolulu. U.S. Pub. Hlth. Rept. 59(13):423-430. Notes the presence of *Aedes (Stegomyia) scutellaris* (Walker) dengue virus vector, on Guam, p. 427. (This species was subsequently redesignated *Aedes (Stegomyia) guamensis* by D.S. Farner and R.M. Bohart in 1944).

Valder, S.M. 1975. Insect and rodent surveillance and control measures survey, Andersen AB, Guam. U.S. Air Force 1st Medical Service Wing (PACAF) 75-229:1-4. (mimeographed). No vector-borne disease was contracted by U.S. Air Force personnel from the Vietnamese nationals who moved through Andersen AFB during Operation New Life during April-July 1975. Presents notes on mosquito collection, surveillance and control.

Ward, R.A. 1975. Two new anopheline vectors reported on Guam. September 1975 Minutes of the Global Epidemiology Working Group, U.S. Army Medical Intelligence and Information Agency, Washington, D.C. 1 p. (mimeographed). Reports the presence of 2 previously unrecorded anopheline species on Guam: *Anopheles barbirostris* and *A. litoralis*. The mosquitoes were collected in light traps which indicates that the species were established and breeding. Guam was sprayed in June 1975; these mosquitoes were collected in July. It is felt that *Anopheles litoralis* was introduced into Guam via the Philippines, probably with cargo.

Ward, R.A., B. Jordan, A.R. Gillogly and F.J. Harrison. 1976. *Anopheles litoralis* King and *A. baribostris* group on the island of Guam. Mosq. News 36(1):99-100. Reviews the collection records for anopheline mosquitoes on Guam and reports the finding of two new species, *Anopheles litoralis* and a member of the *A. (A.) barbirostris* species group.

*Wester, W.H., Jr. 1918. Control of the disease situation, *in* Guam Agric. Exper. Sta. Rept. for 1917, pp. 58-62.

Wheeler, N.H. 1948. Contribution of the United States Naval Medical School to zoological science in World War II. Ann. Ent. Soc. Am. 41(1):41-47. *Aedes aegypti* and *Culex quinquefasciatus* were collected on Guam, pp. 43-44.

Williams, F.X. 1944. Biological studies in Hawaiian waterloving insects. Part III. Diptera or flies. D. Culicidae, Chironomidae and Ceratopogonidae. Proc. Hawaiian Ent. Soc. 12(1):149-197. Guam has 6 species of mosquitoes, p. 149.

Wisseman, C.L. and B.H. Sweet. 1961. The ecology of dengue, *in* J.M. May (Ed.), Studies in Disease Ecology, Chapt. 2, pp. 15-44. Hafner Publ. Co., New York. Dengue neutralizing antibodies in dengue fever patients from Guam, p. 21. *Aedes albopictus* is replacing *A. aegypti* on Guam, p. 34; distribution of the vector (includes Guam), pp. 42-43.

World Health Organization. 1955. Control of insect vectors in international air traffic. WHO Int. Dig. Hlth. Leg. 6(3):379-435. Cites three species of mosquitoes brought into Guam since World War II which have acclimatized themselves there, p. 388. Refers to the introduction of *Anopheles subpictus* into Guam, probably by insufficiently disinsected aircraft coming from the Celebes, p. 391, and *Aedes albopictus*, by aircraft from the Philippines, p. 392.

World Health Organization. 1969. Japanese encephalitis, *in* Report on the Second Regional Seminar on Virus Diseases: Mosquito-Borne Virus Diseases (Arboviruses). WHO Regional Off. for the Western Pacific, Manila, Philippines, 6-11 October 1969. WPR/416/69, 58 pp. A single epidemic of Japanese encephalitis occurred in Guam in 1947. The virus was apparently introduced, was not reported previously, and has not reappeared since, p. 2. *Culex annulirostris marianae* was considered to be the vector, p. 6.

World Health Organization. 1970. Status of malaria eradication during the year 1969. WHO Wkly. Epidem. Rec. 45(40):429-452. Guam is included in the list of malaria-free areas.

World Health Organization. 1971. Status of malaria eradication during the first semester of the year 1970. WHO Wkly. Epidem. Rec. 46(11):97, 100-109. Guam is included in the list of malaria-free areas with November 1963 as the date of notification.

World Health Organization. 1972. Vector control in international health. Wld. Hlth. Org., Geneva. 144 pp. *Anopheles subpictus indefinitus* was first reported on Guam in 1948; until that time the island was believed to be free from anophelines. In 1969, 6 cases of malaria were reported from Guam, and at least one of these cases was transmitted locally on this previously malaria-free island, p. 32.

World Health Organization. 1973. Status of malaria eradication during the year 1972. WHO Wkly. Epidem. Rec. 48(34):329-340. Guam is included in the Supplementary List of Malaria-free Areas, Table 4, with notification date of 14 November 1963.

World Health Organization. 1975. Dengue fever surveillance in some countries of Asia and the South-west Pacific. WHO Wkly. Epidem. Rec. 50(30):269-272. *Aedes aegypti* was detected during a survey carried out on Guam in 1971. *A. scutellaris* and *A. albopictus* were also identified, p. 271.

*Yamada, S. 1932. Family Culicidae, *in* Esaki, et al, Nippon Konchu Zukan (Iconographia Insectorum Japanicorum), pp. 210-235, Tokyo. (in Japanese). Reports *Aedes aegypti* from Guam.

Yamaguti, S. and W.J. LaCasse. 1950. Mosquito fauna of Guam. Off. of the Surgeon, Hdqtrs. U.S. Eighth Army, APO 343. 101 pp. Report of a comprehensive mosquito survey made on Guam during Feb-Mar 1948. A total of 10 species was collected. *Aedes albopictus* and *Anopheles subpictus indefinitus* are recorded for the first time from Guam. Keys to the larvae and adults of the 11 species of mosquitoes known to occur on Guam are provided.

*Yoshioka, K., C. Tsuji and H. Sawa. 1941. [Report on insects collected on the South Sea islands.] Hakubutsu-zasshi [J. Nat. Hist.] 38(72): 15-24. (in Japanese).

ADDENDUM

Esaki, T. 1939. Injurious Arthropoda to man in Mandated South Sea Islands of Japan (First Report), *in* Osaka Hakubutsu Gakkai, Volumen Tubilare pro Professore Sadao Yoshida, Vol. 1, pp. 230-252. Osaka Natural History Society, Institute for Research in Microbic Diseases, Osaka Imperial University, Japan (title in English, text in Japanese). Cites the mosquitoes collected by Fullaway (1912) on Guam, p. 252.

Guam, Government of. 1975. Environment impact assessment for aerial ULV application of malathion at three ounces per acre in Guam. Pp. 42 + Tabs A-E. (mimeographed). Examines the impact, on man and his environment, of the administration of 95% Malathion at the rate of 3 ounces per acre by aerial application to prevent an outbreak of dengue fever among the civilian community following the influx of Vietnamese refugees during "Operation New Life."

Haddock, R.L. 1973. A history of health on Guam, 2nd Ed. Cruz Publ., Guam. 50 pp. Cites the dengue fever (1944) and Japanese B encephalitis (1948) epidemics on Guam, and the outbreaks of malaria which occurred in 1966 and again in 1969, pp. 29, 32. Two dengue fever (1921, 1944) and 1 Japanese B encephalitis (1947) outbreaks are listed in the chronology of Epidemics Reported on Guam, pp. 38-39.

Velimirovic, B. 1969. Japanese Encephalitis history and geographical distribution, *in* Report on the Second Regional Seminar on Virus Diseases: Mosquito-Borne Virus Diseases (Arboviruses), p. 2. WHO Regional Office for the Western Pacific, Manila, Philippines, 6-11 October 1969, WPR/416/69, 58 pp. A single epidemic of JE occurred in Guam in 1947. The virus was apparently introduced, was not reported previously, and has not reappeared since, p. 2. *Culex annulirostris marianae* was considered to be the vector, p. 6. Dengue fever virus on Guam, p. 49/50; JE virus on Guam, p. 51/52; Arbovirus disease map, showing Guam, p. 57/58. (see W.H.O., 1969)

World Health Organization. 1976. Information on malaria risk for international travellers, Second Edition (updated). WHO Weekly Epid. Rec. 51(24):181-200. There is no risk of contracting malaria in Guam, and no preventive measures against malaria are required, Table 1, p. 195.