

central Panama during 1949 and in north-western Panama and Costa Rica during 1951.

The habits of common species of canopy-feeding mosquitoes of this area, belonging to the genera *Haemagogus*, *Aedes* (*Finlaya*), *Sabethes* and *Trichoprosopon*, are described.

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MOSQUITO CONTROL IN THE SOUTH PACIFIC

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A trip to Tahiti to attend a conference on filariasis provided a good opportunity to observe the mosquito situation on some islands in the Pacific. Because mosquito-borne diseases are a major health problem and because of fast air transportation, the possibility of these diseases spreading from these islands to Hawaii necessitates constant vigilance in our control program.

Both filariasis and dengue are common in many islands of the South Pacific. It is because of the wide prevalence of filariasis and the importance of its control, that the South Pacific Commission held a conference on this disease to improve the health of this part of the world.

Tahiti was chosen for the site of the conference because an active program of filariasis control is being carried on there. Intensive research on filariasis is being conducted by the Institute of Medical Research of French Oceania located on the island of Tahiti with headquarters in Pa-

peete, the capital. The Institute is housed in a well-equipped building, with a staff of twenty-seven persons. French and American scientists cooperate in the work of the Institute in solving the problem of filariasis control.

The principal vector of filariasis in the South Pacific is *Aedes pseudoscutellaris*. Its control is complicated by the many empty coconut shells lying around the plantations which furnish suitable breeding places for this mosquito. As the production of copra is an important industry on these islands, coconut plantations are numerous.

Mosquito control inspectors are attempting to educate the planters not to leave empty coconut shells on the ground but to assemble them into piles and to destroy them by burning. Another mosquito control measure around the house and on the plantations consists of keeping down weeds and shrubbery, as the vector mosquito has

the habit of biting outdoors among such vegetation.

Along with the day biting *Aedes*, the night mosquito, *Culex quinquefasciatus* was also incriminated in Tahiti as a possible vector of filariasis. This confirms our findings in Hawaii that the same local night mosquito here may be a suitable vector of the non-periodic form of filaria parasite prevalent in this part of the world.

Spraying of houses and the surrounding shrubbery with DDT as well as minor drainage is being carried on by the mosquito control teams on Tahiti.

The mosquito control program in Fiji is well organized, with about 75 inspectors covering the islands. House-to-house inspection is carried on in the city of Suva as well as in other centers of population. The inspectors are well trained and the public is fully aware of the danger of mosquito-borne diseases.

Fiji is so mosquito-conscious that an anti-malaria program is underway even though no *Anopheles* has yet been established on the islands. The Sanitation Division of the Fijian Medical Department has built concrete storm drains in and around their cities and towns so that the *Anopheles* will have less available breeding places in case any of them should enter the islands. The control of pest mosquitoes is also an integral part of community sanitation.

The areas with malaria-carrying *Anopheles* closest to Fiji consist of New Hebrides and Australia. The airport of Nandi and the seaport of Suva on Fiji are closely guarded against the introduction of *Anopheles* from these regions.

It was of interest to know that *Megarhinus splendens*, a predacious mosquito introduced into Fiji from Java in 1931, has established itself and has spread from the places where it has been released. Studies are being carried on to determine its part in keeping down the spread of filariasis. An insectary will also be constructed in Suva to ascertain if this species will mate indoors, as does the South African species which we have been propagating in Hawaii.

The control of mosquito-borne diseases on neighboring islands of the Pacific, which are drawn closer and closer to Hawaii by the ever increasing speed of modern air transportation, is of vital interest to our Territory, as well as on the mainland of America. Our mosquito control program also concerns their welfare. Any progress made on different parts of the Pacific area will be of mutual benefit in this shrinking world of ours.

There are a few imported cases of filariasis in Hawaii. They are among new immigrants to the Territory from South Pacific islands. So far, we found 12 out of 186 of these to be carriers of microfilariae in their blood. These positive cases were only found among those who have been in Hawaii for less than six years. The microfilariae evidently disappeared after a longer period of residence in the absence of reinfection.

Infection experiments which we carried on with these South Pacific islanders as a source of infection showed that our night mosquito, *Culex quinquefasciatus*, could act as a suitable intermediate host for the non-periodic form of *Wuchereria bancrofti*. Transmission of filariasis in Hawaii appears not to have taken place as no infection has been found yet among those born and reared in the Territory. However, constant vigilance in checking the infection and in mosquito control measures need to be exercised to prevent the establishment of this disease so common in other Pacific islands from gaining a foothold in Hawaii.

The dengue epidemic which Hawaii suffered in 1943-44 was likely to have been imported from the South Pacific. This supposition is primarily based on the knowledge of the cases of two airline pilots who were hospitalized with dengue in Honolulu earlier in July, 1943, after arrival from Suva, Fiji Islands, where an epidemic of dengue had been reported. One of the pilots was already ill when he came to Honolulu, but the other had onset of symptoms several days later and was not isolated by hospitalization until he had passed through the infectious period. The

fliers occupied an apartment at a Waikiki rooming house. The maids at this house later came down with what was subsequently suspected of being dengue. By August 8, 1943, Waikiki had become such a focus of infection that it was restricted to military personnel.

As dengue is common in South Pacific islands, there is always the danger of its introduction again into Hawaii. There are two commercial airlines connecting Honolulu and Australia, stopping over on Canton Island and Fiji Island. The Philippines and the Orient are also endemic regions for dengue. The day mosquito control program in Honolulu is a preventive measure to keep the dengue vector population at such a low level that an epidemic may not occur again in case dengue should enter into this crossroad of the Pacific.

Airlines crisscrossing the Pacific have

reduced distances in term of flying hours. One can now reach Australia in less time by plane from Honolulu than it takes to make an inter-island trip on boat to the port of Hilo on one of the neighboring islands within our Territory. The South Pacific is not any more a remote spot far away from the rest of the world. It will be still closer as connecting airlines link some of the more remote islands to major airports.

The South Pacific Commission is actively attacking the program of filariasis and of mosquito control as part of its health activities. Along with the researches and field studies carried on by the Institute of Medical Research in Tahiti, the joint anti-filariasis campaign is already showing good progress in the control of this mosquito-borne disease in the South Pacific.

REPORT OF THE A.M.C.A. COMMITTEE ON RESEARCH AND DEVELOPMENT OF MOSQUITO CONTROL AND RELATED PROBLEMS

Assembled by
B. B. PEPPER

INTRODUCTION

At the direction of President Don Rees, there was appointed a special committee on research and development of mosquito control and related problems. The members of this committee were as follows:

Harold F. Gray, Alameda Co. Mosquito Abatement District, Oakland, California.

William E. Bickley, University of Maryland, College Park, Maryland.

J. A. Mulrennan, Florida State Board of Health, Department of Entomology, Jacksonville, Florida.

B. V. Travis, New York State College of Agriculture at Cornell University, Ithaca, N. Y.

B. B. Pepper, New Jersey Agricultural

Experiment Station, Rutgers University, New Brunswick, N. J., Chairman of Committee.

The purpose of this committee was threefold. First, to select some of the more important contributions from the current literature and to suggest the possible significance or application of this information. Second, to prepare a list of some of the more important problems confronting mosquito control workers at present, that should be solved to implement control work. And third, to include other pertinent information which the committee felt would assist mosquito control workers.

The committee was given a free hand on the development of its report. An outline