A FOGGING OPERATION IN AUSTRALIA

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This is an account of measures taken at Bulwer Island, Brisbane, to prevent attacks by salt marsh mosquitoes on the occasion of the unveiling of the Memorial Cairn by Her Majesty Queen Elizabeth II on Wednesday 6th March, 1963, to record the discovery of Oil in Queensland.

Because *Aedes vigilax* is a migratory species with a flight range of some twenty miles or more, it was not considered practical to attempt larval control in this project.

Portions of Bulwer Island had been reclaimed by hydraulic dredging to form the site for the AMOCO Oil Refinery. The memorial cairn and royal pavilion had been erected on part of the reclaimed area within a distance of one chain from common mangroves, which are a prolific source of nectar providing carbohydrate meals for *Aedes vigilax,* as well as furnishing favoured harbourage areas from which to launch an attack.

Mr. P. J. Sparks, Officer in Charge of the Entomological Section of the Department of Health, was in charge of field control measures instituted. For several days before the royal visit investigations revealed the presence of *Aedes vigilax* in great numbers, biting freely and viciously both in the shaded sections of the mangrove growth and in the contiguous open sunlit areas. Blood-sucking flies known commonly as marsh flies (family Tabanidae) were constant in attack within the dais structure and the area surrounding it. Workmen had, in fact, complained of such attacks whilst preparing the royal pavilion and dais.

Aerosol fogging employing two TIFA machines mounted on Jeeps was carried out in and about the mangroves when conditions were favourable for fog dispersal, so as to reduce the adult population as much as possible before the royal visit on the 6th instant.

Heavy banks of mangroves interposed with salt marsh pans were extant on all borders with the exception of the cleared southern boundary contiguous to the Brisbane River.

It was decided that major adulticidal measures should be concentrated on the morning of the 6th instant for optimum results likely to persist over the actual ceremony scheduled with the Queen's visit at 3:15 p.m. and terminating with her departure at 3:45 p.m.

Prior meteorological information as to prevailing winds and other pertinent factors was obtained from the Department of Civil Aviation, which controlled the adjacent Brisbane International Airport near the mouth of the Brisbane River.

It was resolved to commence the work at 5:30 a.m. on the 6th instant, in an effort to avoid excessive wind speeds, but difficulty was presented at that time and onwards to 6 a.m. when the wind blew from the south to southwest at a speed between 4 to 5 knots per hour with a relative humidity rising to 94 at a temperature of 67.1° F. Thermal air currents tended to carry the fog upwards over the target zone and the use of the fog applicators was withdrawn and Fon-Tan equipped personnel penetrated the mangrove area, applying knockdown and residual formulations amidst the growth. This treatment was extended in the form of a determined sectional approach, and the operation was covered on the flanks by a population-containing thermal aerosol operation, through the use of a Swing-Fog applicator, portable equipment ideal for close application.

This action provided a complete mor-

* EDITOR'S NOTE: J. D. Mabbett is Chief Health Officer of the City of Brisbane, Australia. There are several points and expressions in his article that may not be entirely clear to readers in other parts of the world, but it is so seldom that we hear from Australia, and the operations described are so interesting, with many useful hints, that it seemed worthwhile to print the account more or less as received.—D. L. C.

tality result and was continued in other areas until the TIFA's were re-introduced at approximately 7 a.m. when the temperature rose to 69° F, with a fall in humidity to 88 and the wind blew at 3 knots per hour from the south veering to southwest. Good results were then being obtained with an adequate drift from the use of the fog applicators, although for periods the wind swung to a direct northerly influence.

At 8 a.m. the temperature rose to 72.9° with a relative humidity of 76 with the wind coming from the south to southwest at a speed of 3 knots and this permitted good penetration and coverage. There was a further rise in temperature to 76.8° with a drop in humidity to 65 at 9 a.m. with the wind blowing at 3 knots per hour from the southwest. All machines were then in use and results were satisfactory.

By 10 a.m. the temperature had risen to 78.9°, the humidity was 62 percent and the wind from the west had dropped to 2 knots per hour. These conditions enabled approach by the fog applicators on the western side of the first mangrove bank.

The temperature rose to 82.8° at 11 a.m. with a fall in humidity to 53 and a complete absence of wind. At 12 noon the wind rose from the west to northwest at a speed of 4 knots per hour, with the temperature continuing to rise to 84.5° but with humidity falling to 44. There was a further rise to 85° at 1 p.m. with the humidity going to 47, but conditions were calm with the wind at 0 knots per hour.

Temperature reading at 2 p.m. was 85.5° with a further rise in humidity to 54 and the wind rising to 3 knots per hour from the northeast. Final working reading was at 3 p.m. when the temperature was constant at 85.5°, the humidity at 51 and the wind blowing adversely from the northeast at 8 knots per hour.

The day was one of full sunshine without rainfall. It was evident, with a temperature range from 67.1° to 85.5° a difference in humidity readings of 50 and wind changes from practically all points of the compass at speeds from 0 to 8 knots per hour, that frequent changes in directional approach were necessitated.

It is recognised that difficulties arise when the wind speed exceeds 3 to 4 knots per hour and when the relative humidity is high, as thermal air currents tend to carry the fog upwards. However, the available area indicated for treatment was fogged and excellent control was gained.

The machines were drawn at approximately 5 to 8 miles per hour taking swaths of 60 to 80 feet with the distributor heads to the rear and slightly down. A constant air temperature of 900° F. was maintained at the distributor head with the particle size set at 10. The thermal aerosol emission rate was 15,000 cubic feet per minute, with an output of approximately 16 gallons per hour, and the fog was applied at the rate of approximately 6 to 8 gallons of fog liquid per acres.

Between 1 p.m. and 3 p.m. the repellant diethyl toluamide was incorporated in knockdown formulations to act as a deterrent to any mosquitoes wind borne or actively flying from untreated areas. Constant checks were made throughout the work period to observe the degree of adult incidence. Shortly before the arrival of the Queen the treated areas were clear and not a single adult attempted to feed.

All structures and the land in the immediate vicinity were treated at a late hour to curb the incidence of the infesting biting flies. This action produced highly favourable results and it can safely be said that the function was held without insect nuisance.

It is felt that the favourable control gained indicates the high value of such work and the potential of custom fogging in the control of adult salt marsh mosquitoes.

Tribute is paid to the diligence and enthusiasm of Inspector Sparks and his staff to whom every credit must be given for a job well done.