



MALARIA COULD HAPPEN HERE

We Have Everything But The Right Kind Of Mosquito

THERE has been so much speculation — much of it among returned servicemen — about the possibility of malaria in one form or another becoming established in New Zealand that a representative of *The Listener* went to the Medical Officer of Health at Auckland, to ask for the facts.

"No one can say confidently," he told us, "that New Zealand lies outside the range of malaria, except in the case of that form we call malignant tertian—a tropical form. So far as we know, the climate and the physical environment of a large part of the Dominion is suited both to the mosquitoes and the malarial parasites they carry."

What restricted the disease and the insects to certain areas, he explained, were the influences of environment on them and of these influences temperature, in conjunction with humidity, was vital. The possible limits of malaria, therefore, were fixed more by these two factors than by considerations of latitude.

"In theory," he said, "malaria could range anywhere between the North and South isotherm of 60 degrees Fahrenheit, and much of New Zealand lies inside that. Of course, malaria used to be universal throughout Europe. It has been (and still is) a serious problem for the Soviets and it is still important even in such a highly organised, and thickly populated, country as Holland."

Did Falstaff Die of Malaria?

During the first World War, we were told, over 600 cases of endemic malaria occurred in Southern England. That is to say, cases in which the disease was contracted in England, and not cases of soldiers returning from malarial countries abroad and having recurrent attacks. There had been a similar outbreak during the recent war, though statistics of this resurgence have not reached Auckland yet. The explanation of these sporadic outbreaks, of course, was that a native English carrier mosquito had transmitted the parasite of malaria from servicemen who had had the disease to other people. The disease, we learned, had occurred even in Scotland in the 18th Century.

"Do you remember," we said—the phrase "malignant tertian" had been knocking at the back of our mind for

some minutes—"Do you remember in Shakespeare's *Henry V* how Falstaff was described as being, before his death, 'shaked with a burning quotidian tertian?' Might that have been a reference to malaria?"

"Quite possible," the M.O.H. agreed, "though the terms sound a bit mixed."

There were four species of malarial mosquito still to be found in England, he went on, but of these only one habitually lived in close association with man. This type bred in brackish marshes, in freshwater lakes or even in slow-flowing rivers, and that explained why, of the 600-odd cases which occurred between 1914-18, 96 per cent. were from the neighbourhood of the Thames and the Kentish coast.

Anopheles Is Adaptable

Returning to the possibility of malaria reaching New Zealand, a complicating factor, we were told, was the knack anopheline mosquitoes had of producing strains or races peculiarly adapted for survival in new and unexpected environments. For example, the nearest malarial area to New Zealand was Aneiteum Island, not far from New Caledonia, and the carrier there was a happy-go-lucky type which could breed in fresh or salt, stagnant or running, clean or foul water. And, of course, the Dominion was now within a few hours, by plane, of the general South-West Pacific malarial area.

The head of the Entomological Division of the Department of Scientific and Industrial Research (Dr. D. Miller) had also pointed out that the anopheles mosquitoes had not yet reached the possible limits of their distribution. New territory had been invaded by them quite recently—the island groups of Reunion and Mauritius in the Indian Ocean and Barbadoes in the West Indies were instances of this. Rennel Island in the Solomons, which had been free of the disease in 1933, had become invaded by 1942.

Danger from Air Transport

The danger of mosquitoes extending their range had been greatly increased by the development of air transport. This had already had very serious consequences when the Gambiae mosquito (a purely tropical type carrying a very virulent form of malaria) had been introduced to Brazil from equatorial Africa in 1930. In all probability, this pest was introduced to the New World by one of the French air-liners operating then between Dakar and Natal, or by one of the fast destroyers which the French Government had stationed in these waters in connection with the air-service.

At any rate, the mosquito was first discovered in Natal itself in 1930 and in that and the following year occurred an outbreak of malaria of unprecedented severity. Within a few years severe epidemics of Gambiae-carried malaria had occurred over 200 miles west and north of Natal. So disabling and widespread were these epidemics that in some parts crops were not planted and in some badly affected areas it was estimated that nearly every person would be on

Government Relief in 1939—not because there was no work, but because they were unfit for work.

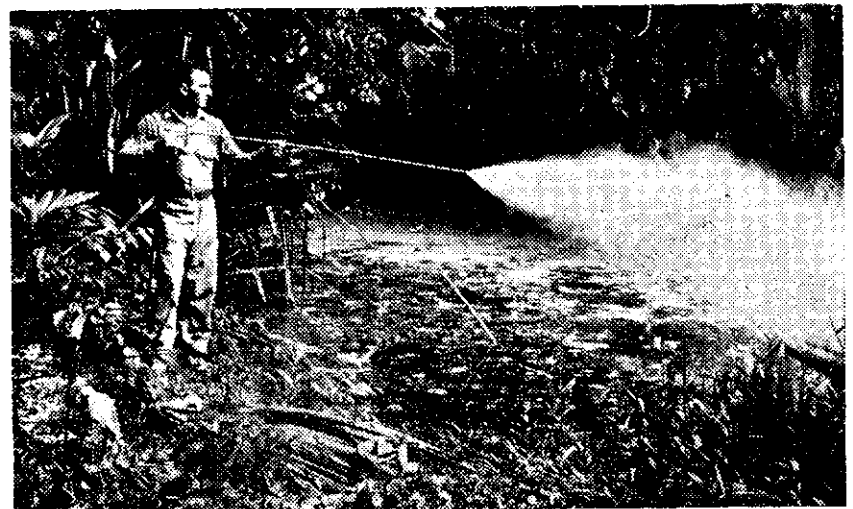
More than two million dollars were spent to fight the pest before the mosquitoes were apparently under control in 1940 and in spite of constant vigilance Gambiae-carried malaria has made its appearance again.

"Benign" Tertian Malaria

There is small danger of such a tropical form as the Gambiae-carried malaria reaching New Zealand, since the parasite needs a minimum temperature of 70 deg. Fah. But the variety known as "benign" tertian, which attacked troops of the 3rd Division in the Pacific, is the form which is endemic in temperate climates and if it managed to get into this country it could make itself very

mounting specimens of both adult and larval forms for despatch to the Cawthron Institute at Nelson.

As instances of the sporadic appearance of prohibited immigrants, we were told of the discovery, in a barrel on the Auckland waterfront in 1929, of larvae of a common Fijian and New Hebridean species not previously known in New Zealand. Since that time, however, no others of that species have been found. Again, in the same year, an anopheles mosquito of a species common in the tropics was found in a cobweb in the hold of an overseas ship. On examination it was found to be alive, but quiescent, and no blood was found in its stomach. Another, a live female, was found in a ship which had just arrived from Samaranga in Java, and since the war with Japan started several tropical mosquitoes have been found during the disinfection



WAR AGAINST THE MOSQUITO: A sergeant sprays oil on swamp water near a U.S. base on a South Pacific island. The oil will kill any mosquito larvae. Above left is a model of the "enemy"—the spotted wing anopheles, the malaria mosquito.

comfortable here. The temperature is right, there are abundant breeding-grounds, we have people in the country who suffer from malaria and who are malaria carriers, and the degree of humidity is congenial. It is true that, before malaria can spread in a country, it appears necessary to have a certain proportion of malaria mosquitoes and malaria patients or carriers present and this is the one all-important condition which so far is not fulfilled.

As far as can be known, there are still no malaria-carrying mosquitoes in New Zealand and every effort is made to ensure that none which may inadvertently make the journey here by ship or plane sets any of its feet on New Zealand soil.

Constant Check

But though all possible precautions are taken to prevent anopheles landing here, no control can be 100 per cent. effective, and one member of the Health Department staff at Auckland has a full-time job taking samples of mosquito larvae from breeding-places in the district, rearing them to the adult stage and

of planes arriving in Auckland from malarial areas.

Sound and Fury

Anything which local bodies and private individuals do to abate the nuisance caused by native New Zealand mosquitoes helps to reduce the chances of more dangerous varieties becoming established here, at least where preventive methods mean the elimination of breeding-grounds. With a life-cycle of days only, mosquitoes have been found breeding in such unsuspected places as flower-vases, wash-tubs and coppers; in discarded tobacco tins and old boots lying in the long grass of back-gardens where shade prevented the evaporation of rain-water, and in sagging lengths of roof guttering, where small quantities of rain and sediment collected.

On mosquitoes themselves, Auckland's Medical Officer of Health has a fund of amusing observations. The part that sound plays in the mosquito's life, he told us, has not been fully recognised. "People who are talking," he said, "are

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