

inal ganglia of locusts reared without water, similar to the results obtained in the flight experiments, whereas no discharge occurred in locusts with access to water. Neurosecretory discharge under these conditions has no parallel in the literature, and it is tentatively suggested that the A2 neurosecretory cells of the abdominal ganglia secrete an antidiuretic hormone¹² which is released under conditions in which water conservation might be necessary.

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Transmission by Filariasis in the Philippine Islands by *Anopheles minimus flavirostris* Ludlow

THE highest endemicity of filariasis in the Philippine Islands occurs in the extensive abaca-growing areas of the Bicol Peninsula, Samar, Leyte and Mindanao¹. Here the principal vector is the plant-cavity breeding *Aedes (Finlaya) poicilius* (Theobald), which is able to exist in dense populations because the abundant rainfall keeps the leaf axils of the abaca trees filled with water¹. In our survey of 1954-55 (ref. 2), we showed a general correlation between the presence of abaca and filarial endemicity, but there were two notable exceptions. One of these was in the northern mountain province of Luzon. Through the co-operation of the Malaria Eradication Unit stationed at Tabuk, we received a sample of night blood films which showed a 29 per cent microfilaræmia-rate.

At that time we were unable to inspect the area from which the smears were reported to have been taken. The purpose of the work recorded here was to confirm the presence of filariasis among the indigenous, non-immigrant population, and to ascertain the environmental factors which would permit the disease to exist in this improbable area.

Our study area includes the barrio of Calaccad, some 15 miles south of Tabuk; from which it is accessible only by foot trails. The Kalinga tribespeople live in isolated, single family units, or in groups of 2 to about 6 families. These single houses, or groups of houses, are half a mile or more apart. Most of the dwellings are situated near small streams, which are heavily wooded with bamboo and deciduous trees. In Calaccad the forests are being depleted rapidly by dry season burning for rice cultivation. A few large trees remain in the relic forest patches.

Our night blood film survey during the past dry season showed an overall microfilaræmia-rate of 10.7 per cent in this diffuse population at Calaccad. There was a tendency for positive cases to be grouped, so that in several of the tiny settlements or 'sitios', of from 8 or 9 to 25 people examined, we obtained infection-rates up to 32 per cent.

The houses are built several feet above the ground on posts; the walls are made of split bamboo or sawali, and the roofs are thatched with cogon-grass. Almost all have been sprayed with DDT for the past 10 years. We have been unable to capture more than an occasional mosquito inside the houses. In order to obtain large numbers for dissection, we have made use of a large screened trap baited with a carabao. This trap was set up in the vicinity of a house in which 4 of the 7 inhabitants are infected with periodic *Wuchereria bancrofti*. Although most mosquitoes attracted to a carabao-baited trap are zoophilic, it seemed to us reasonable to assume that some of the insects which had previously fed on one of the human cases would be seeking their later meals from a carabao. It must also be understood that a large proportion of the mosquitoes caught in such a trap would be taking blood for the first time. Therefore, one could not anticipate a high infection-rate. The collections were made early in the morning, and the dissections were completed during the following day or two.

Apart from *Aedes vexans*, the only persistent man-biting species which also occurred regularly in the trap was *Anopheles minimus flavirostris*. Of 207 *flavirostris* examined so far, 4 have been found infected with filarial worms. In one there was a single second-stage larva in the thoracic muscles. Two of the specimens each contained 3 mature third-stage infective larvæ. In one the larvæ were in the thorax, and in the other they were in the head. In the fourth specimen, there were 2 sausage-stage larvæ in the thorax and a highly active motile infective larva in the proboscis. All the mature larvæ agreed in morphology with published descriptions of *Wuchereria bancrofti*. Also they were identical with *W. bancrofti* larvæ we have observed in mosquitoes in our previous investigations. We are offering these findings as evidence that in this area, where small foothill streams furnish an ideal environment for *A. minimus flavirostris*, this species is a natural vector of *Wuchereria bancrofti*.

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CYTOLOGY

A Cytochemical Method for Electron Microscopy

METHODS for specifically staining tissue constituents for electron microscopy are at present inadequate for the identification of important molecular species in the cell. The range of application of the electron microscope in biology is thereby severely limited.

It occurred to us that more specific stains might be prepared by complexing heavy metal atoms with enzymes of high substrate specificity. It was hypothesized that, even though the activity of the enzyme might be impaired by the presence of the metal atoms, substrate-bonding specificity might be retained sufficiently to bring about localization of heavy atoms at the substrate locus in the cell.

This communication describes preliminary experiments which tend to bear out this hypothesis.