INSECTS AND DISEASES IN THE VIRGIN ISLANDS

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Since I have made my home in the tropics, the relation of insects to disease has been brought to my notice much more forcibly than when I lived in the States where people and conditions were very clean when compared to native inhabitants and conditions of our newly acquired possessions, the Virgin Islands, which were once the Danish West Indies. Since coming to Christianstedt, I have spent a good deal of my time chasing flies, killing mosquitoes, dodging ants, cockroaches and fleas (they seem to be here in abundance); and I have come to realize what very important things are hygiene and sanitation; I feel more thankful each day for the splendid lectures we had in our training school.

The United States has already begun a system of naval government and an efficient corps of medical men and nurses have begun operations to "clean up" the islands, and teach the people how to live in a hygienic and sanitary manner.

Most of the diseases common to the islands are transmitted by insects, some of them are: malaria, yellow fever, leprosy, dengue, papatacci fever, forms of filaria and typhoid fever.

Elephantiasis (a form of filaria) seems to be the most prevalent among the black inhabitants of the island and it is no uncommon sight to see a black woman (men seem to be afflicted less frequently) perched on a pile of cane tops driving a donkey cart, her legs twice the size of her body. Even along the streets, during a shopping expedition into the town, I have seen as many as six cases of "big feet." Elephantiasis is, of course, not confined to the feet, but may affect other parts of the body.

Leprosy is common also, and even though the cases are supposed to be isolated, I discovered with much interest and disgust that the "asylum" as the natives call it, is within a quarter of a mile of a sugar factory and within one mile of the town. The lepers work in the gardens around the hospital and those who are able bathe in the sea not far from the fishing grounds of many of the native fishermen. This condition is one of the things that will be changed shortly by the government.

Yellow-fever at present is scarce but, like typhoid, comes in epidemics.

I have found it extremely interesting to learn to distinguish insects as specific carriers and since they have been such a pest to me,

perhaps there are others who may be interested in differentiating some of them; I will begin with those I consider the greatest torment of the tropics.

Mosquitoes.—Some insects transmit diseases through a biological process in which pathogenic germs must go through development in the body of the carrier before transmission of infection or, in other words, the insect must itself become infected with a disease before it can transmit the infection to a person or animal. The insect in this case may be called the "host." Mosquitoes come under this class of insects. There are a great many kinds of mosquitoes, but I will not attempt to write of any except those that have to do with the diseases I have mentioned before. The tropical mosquito of Santa Cruz is much like the Crucian inhabitant, one never knows just when it is going to bite or when it bites, but does know when it has bitten. It is the female which is the "biter." She bites and sails serenely away with a body full of blood providing she has not been "scared off" and mosquitoes are persistent cowards. They stick around but not on, and it is very hard to catch them, for one does not feel the bite until after some minutes. I remember while in training how the big, old Jersey mosquitoes used to come over to Blackwell's Island to visit us. They used to let us know they were around!

Anopheline or Malarial Mosquito.—There are several varieties of this family which are malaria transmitters but the principal one is the *Anopheles Meculipennis.* It is the female mosquito which feeds upon blood, the male living upon fruits and flowers. The male is easily distinguished by his feather-like antennae. The female is of a grayish brown color, her palpi are as long as her proboscis and when she is at rest her body and proboscis form a straight line which is nearly perpendicular to the surface upon which she rests. The female anopheles bites at night and usually hides herself away in dark places such as shrubbery, closets and dark colored clothing during the daytime; in fact, she seems to prefer darkness to daylight (probably because her deeds are evil). The mosquito breeds in large pools, swamps or ditches and is found far from human habitation. The eggs are deposited in raft-like masses about one-fifth of an inch long and there are about one hundred eggs in each raft. The larvae hatch in from two to four days and are full-fledged mosquitoes in ten days.

After a mosquito bites a person infected with malaria, it takes about ten days for the parasite to develop in the body of the mosquito and thus render her capable of transmitting the disease to a human being by injecting some of the incubated parasites of her own body into the blood of man where it goes through another process of development before symptoms of malaria make their appearance.

The malarial district of the world seems to be approximately confined to the area between 60° north, and 40° south.

It is an interesting fact to note that the three species of malarial parasites, i.e., tertian, quartan and aestivo-autumnal, are found in the mosquito the same as in man.

Culicine or Yellow Fever Mosquito, Stegomyia Calopus.—This mosquito, unlike the malaria transmitter, seems to prefer the town rather than rural districts for breeding and chooses the water of gutters, cisterns, cesspools, etc., instead of brooks and streams on which to lay her eggs. This would suggest stagnant water, but culicine eggs can develop quite as readily in fresh running water. She lays her eggs in small groups of about seventy in number. The eggs will live under all sorts of unfavorable conditions such as drying and change of temperature. The larvae hatch out in about two days and in from ten to fourteen days generation is complete.

The insect is very black and has a silvery-white lyre-shaped marking on her back and silvery-white bands around her legs and abdomen. The palpi are shorter than the proboscis and when the mosquito is at rest her body is about parallel to the resting surface. The stegomyia makes no buzzing noise and she bites in the daytime, although her bite is supposed not to be as effective between the hours of midnight and 5 p. m. After she has bitten a person with yellow fever, within a certain number of days from its onset (some authorities say three days), a number of days must elapse before the parasite is sufficiently developed to infect another person. The yellow fever district seems to be confined to tropical zones of the western hemisphere and the west coast of Africa. It may be carried from port to port in ships harboring yellow-fever mosquitoes.

There are some other diseases which may be transmitted by the bite of mosquitoes, one of which is very common here, especially among newcomers. It is called dengue or breakbone fever. This disease was formerly supposed to be transmitted by the *Culex Fatigans,* but some later authorities say the stegomyia. The period of incubation in man is from two to nine days. There is a temperature of 102° to 105° and a rash similar to that of measles, general severe pains over the body and great depression. There is a marked leucopenia. The disease is short-lived however and death rarely occurs. The patient is usually as well as ever in three or four weeks. A great many of our U. S. Marines have suffered with this disease in the tropics.

Another common disease, similar to dengue, is papatacci fever transmitted by a midget moth, a small, very hairy fly with long legs and narrow wings.

Still another disease which can be transmitted by mosquitoes is the dreaded elephantiasis. It has been found that the embryo of fileria has been taken into the body of the mosquito and there developed into a larva which is later injected into man. These larvae reach the lymph channels and circulatory system where they grow and multiply and finally cause an obstruction, thus bringing about dilatations and solid oedemas of certain parts. This resembles lymhangitis and as a result the tissues become hard and tough resembling an elephant's skin.

Leprosy.—As yet little has been accomplished in culturing the bacillus of leprosy. It is supposed to originate by contact with some infected case but there are many views as to the methods of transmission. There have been theories of its transmission by itch-mites, flies, fleas, ants and other insects, but nothing definite has been demonstrated. There are several varieties of the disease. Its progress is so slow that methods of treatment are of very little value, although it is being studied carefully and some results have been obtained by the use of the x-ray and radium. There is quite a number of cases on the island, most of them black people, although there is some mixture of white blood. The moral and race conditions on the island are appalling, as there seems to have been no distinction between black and white blood in the years gone by. It is deplorable to see perfectly white children with negro features and light kinky hair.

Typhoid Fever is about the same as in the States, transmitted through water and food by common carriers.

Flies.—Next to mosquitoes the worst pest on the island is the house fly or *musca domestica.* A single female may lay as many as 129 eggs. The period of hatching is about ten days in our tropical temperature, the eggs hatch into "maggots" which can become fu fledged flies in a period of two weeks, so one can imagine the damage one female fly may do! The eggs are deposited in all kinds of decaying matter, vegetable or animal, and disease is transmitted mechanically, either directly or indirectly, by means of food or by contact with abraded surfaces.

With these dreadful diseases and thousands of horrid insects (and I haven't mentioned ants, fleas, cockroches and spiders), one really doesn't have much time to waste in the tropics where people are supposed to be lazy; in fact, one can be very busy looking after one's self and teaching cleanliness to the natives and then they don't understand!