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THE ROLE OF THE INSECT IN CIVIL DEFENSE

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Dr. Taliaferro asked me to address you in his place since as many of you know, he has been concerning himself more and more with problems of immunity and has practically ceased any investigations on parasites. I personally am more interested in the parasites and certain of their effects on the host than I am in the control of arthropod vectors. However, I hope that some of the ideas I shall try to present will be germane to the interests of the present conference.

The question of the possible role of insects in Civil Defense can be resolved into four major points.

First, we must consider the insect vectors and the diseases already present in the area under study.

Secondly, we must examine the possibility that rare or sporadic disease transmission may evolve into epidemic spread under the conditions following an attack either high explosive or atomic in nature.

A third factor to be considered is the possible introduction of new or more virulent agents of disease by biological warfare methods.

Finally, we have the possible alteration of known epidemic patterns by atomic warfare.

After a bombing attack, whether atomic or high explosive, we can expect and prepare for a series of events of importance in disease transmission.

There will be movement of groups of people and massing of refugees from the afflicted areas. Thus we will have large numbers of people in close personal contact.

We can expect immediate partial or total destruction of sanitary facilities associated with water supply and waste disposal.

There will be an overloading of these same sanitary facilities in areas of refuge.

As a fairly immediate result we can also expect increased breeding of flies and mosquitoes in areas bombed as well as an increase in rats, which may act as important reservoirs of human disease.

Almost at once one might expect increases in food- and water-borne typhoid, the bacillary dysenteries and amoebic dysentery. The primary controls necessary to prevent these enteric infections from becoming epidemic center about the re-establishment of general sanitary conditions.

Insect control, although important, is secondary to these primary control measures. The control of the so-called "filth flies" will be necessary to eliminate the possibility of epidemic insect borne enteric infections.

A potential danger of probably less importance will be the increase of culicine mosquitoes. The virus encephalitides, specifically St. Louis encephalitis, might be transmitted in epidemic proportions. Thus, general mosquito control measures must be sustained.

Increase in anopheline mosquitoes would probably be of no immediate consequence. In most areas of the United States no extensive endemic reservoirs of malaria are to be found. Thus a high infection rate is extremely unlikely over any short period of time.

With redistribution of a refugee population and overcrowding that may result, another danger—louse-borne or epidemic typhus—may present itself. It is difficult

to assess the danger from this source. As shown by sporadic cases of Brill's disease in our larger cities we may assume that there may be a constant low level of infection in the population at large. In any case, experience during the last war has shown that epidemic typhus can be controlled even when in full stride. Extensive louse control measures can be postponed until there is evidence of marked increase in human louse infestation or increase in typhus itself.

Another important epidemic disease might follow an increase in the rat population—that is, bubonic plague. Where reservoirs of infection are known to exist as in some of our west-coast areas, transmission of the disease to man by rat fleas could occur on an epidemic scale. This would, in all probability, necessitate first an epidemic in the rat population. Rat control rather than insect control would be the most effective measure.

The question of the use of infectious agents in biological warfare and their possible relationships to insect-borne disease is obscured by the restriction of information by the armed forces. However, of the dozen or more disease agents that might be most effectively used, few would be primarily related to insect transmission. The enteric group such as cholera or typhoid would be primarily water-borne—and only secondarily transmitted by "filth flies." Such forms as bubonic plague or even the rickettsial group might be used. Although these are primarily arthropod-transmitted under natural conditions, they can also infect via the respiratory tract and most probably would be disseminated as aerosols. Once established in the population, insect transmission might later be of importance and necessitate control.

One can go to the realm of fantasy in imagining what insects might possibly be used for nuisance value in a protracted attack. Less fanciful perhaps, might be the introduction of strains resistant to insecticides or new forms injurious to plants and livestock. If we consider the difficulty in handling large numbers of insects in this way I think we can assume they are low on the list of practical biological weapons.

Finally there is the additional point that epidemic patterns of some diseases may be changed by atomic warfare. Not only may there be greater destruction but if large groups are exposed to radiation an epidemic may run an extremely rapid course in a susceptible population with its general immunity lowered by radiation damage.

MOSQUITO CONTROL ACTIVITIES OF THE COMMUNICABLE DISEASE CENTER, U. S. PUBLIC HEALTH SERVICE

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The program for eradication of malaria from the continental United States continues to be the principal mosquito control activity of the Communicable Disease Center. This program was begun on July 1, 1947, and is carried on cooperatively with state health departments throughout the southeastern United States.

At the present time, the goal of the program—eradication of malaria as a disease of public health significance in this country—appears to be rapidly approaching.

Widespread use of DDT residual house spraying for malaria control was begun in this country in 1945, and approximately 700,000 house spray applications were