TROPICAL MEDICINE IN THE ARMED FORCES

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In this presentation dealing with the Armed Forces' interest in tropical medicine, I must emphasize that the views presented are primarily those of the Army; however, the principles apply to the other services. The Armed Forces' interest in tropical medicine must always be primarily influenced by its actual or potential bearing on manpower, particularly during critical phases of military operations. The magnitude of such influence dictates the emphasis to be placed on the disease or other health factors concerned. For example, some of the Army's experience in World War II with some communicable diseases usually considered in the category of tropical disease is shown in table 1.

It can be seen that the dysenteries, particularly those bacterial in type, malaria, and virus hepatitis influenced manpower in a major way whereas diseases such as filariasis, schistosomiasis, and leishmaniasis were of very little significance.

What are the current military interests in tropical diseases? Before discussing these problems specifically, I would point out that the tropics are no longer remote, isolated areas, and many diseases that formerly were thought of as confined to tropical climes, are no longer limited to these areas but because of rapid transportation now in use, are apt to be encountered in any of the places inhabited by man.

The Armed Forces provide group environment for their members in contrast to the family environment to which most individuals are accustomed. Further, the Armed Forces are not limited to the protected, sanitated environment of the United States but their members may see duty in many foreign lands where sanitation is primitive and disease transmission favored. Frequently the Armed Forces are required to supervise the health of civil populations under their care as refugees or displaced persons. Under conditions of war the environment these populations must live under is extremely unfavorable for health, and resources are very limited for its improvement.

These wide fields of responsibility show the orientation of the Armed Forces' interest, and, bearing in mind that emphasis will always be placed on major causes of disability and manpower loss, the following list indicates in general the fields in which the Armed Forces are either conducting or sponsoring research:

1. Human
   a. Malaria
   b. Dysenteries
   c. Scrub typhus
   d. Schistosomiasis

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TABLE 1

Selected Categories Disease Cases, U. S. Army 1942–1945 Inclusive

	Total cases	Average cases per year
Encephalitis	508	127
Filariasis	4,036	1,009
Leishmaniasis	346	86
Poliomyelitis	1,326	331
Schistosomiasis	1,636	409
Coccidioidomycosis	2,894	723
Malaria	462,060	115,414
Acute respiratory diseases, including influenza	4,081,533	1,021,883
Diarrhea and dysentery	523,211	130,802
Infectious hepatitis	171,691	42,922
Venereal disease	1,071,429	267,857
	1944 *1945*	
Amebiasis	7,303 26,998	

TROPICAL MEDICINE RESEARCH

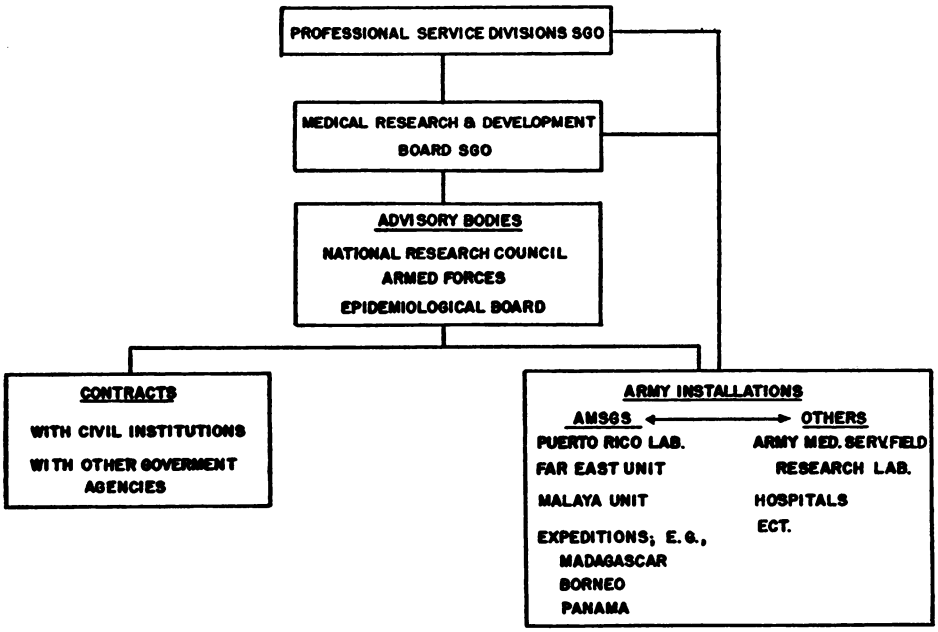

FIG. 1

e. Neurotropic viruses
f. Fungus and yeast infections
g. Bacterial infections of skin and chemical sensitization
h. Physiological and psychological requirements for homeostasis in tropical environments

i. Control of harassing agents—insects, heat rashes, land leeches, snakes, helminthic parasites, poisonous plants, poisonous foods
j. Dental materials and dental health
k. Other—leishmaniasis, leptospirosis, etc.

2. Animal

Prevention, control, and treatment of diseases in the tropics that affect Army animals

The approach to these problems is essentially basic in type with the utilization of applied research only where the problems of disease prevention, control, and therapy necessitate adaptation of existing knowledge to the military situations. For example, while testing of drugs and chemicals is done in clinical and sanitary work, we are much interested also in the mode of action of antibiotics and insecticides; the basic water and electrolyte requirements of troops under combat conditions, and the levels to be expected in wounded, with methods developed for their understanding and control. Basic studies on host-parasite relationships are under way or planned in the field of schistosomiasis both in regard to the life cycle in the mollusk and in man. Mere screening of chemicals just to find out if they have value as a molluscacide or as a therapeutic agent in man must be considered interim measures. Fundamental knowledge must be developed so that control and elimination of these parasites can be attained. The present advantage of effective residual acting insecticides has permitted a great step forward in the control of insect-borne diseases. As is evident, this advantage has not remained unchallenged. Most species of insects are now showing adaptive reactions to this unfavorable environment, and if we are to maintain and improve our advantage we must understand the mode of action of insecticides and meet each adaptation on the part of the insects by an effective countermeasure. Ways and means must be found to continue successfully to utilize interference reactions in some essential metabolic function of the insect vectors of disease.

Malaria is still being attacked by studies on prophylaxis, curative therapy, and destruction of infected vectors. Dysentery is responding well to sanitation and antibiotic therapy, but the method of transmission and the infective dose plus the influence of immunity on the clinical course of this disease are not understood.

The Army Medical Service's organization for the study of tropical disease is essentially as shown in figure 1.

It can be seen that this constitutes a careful fusing of military and civil talent not only at the advisory level but also at working levels. For example, there is currently a combined civil-military research group studying dysentery in Korea; antimalarial drugs are being studied in the United States and in Central America; and virus hepatitis investigations are under way in Japan, the United States, and Germany. These studies and the method of approach efficiently utilize civilian talent as well as military. The efforts exerted are for the common good as well as for the protection of the soldier. Great progress can be expected to continue if these efforts are understood, supported, and their results applied to health of the nation in peace as well as war.