

## THE DEVELOPMENT OF INTERNATIONAL TRANSPORTATION AND ITS EFFECT ON THE PRACTICE OF TROPICAL MEDICINE<sup>1</sup>

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Very few diseases are limited to the tropics, but many diseases have a high incidence in the warm countries as compared to the rate for the same diseases in other regions. It is impossible sharply to define *Tropical Medicine*, but one can say that the term applies to those diseases of high incidence in the tropics caused by pathogenic parasites and by diet deficiency. The practice of tropical medicine, therefore, consists of the pathological study and treatment of these diseases, and the demand is for high grade training in protozoology, helminthology, medical entomology, and the chemistry and physiology of nutrition. The future no doubt will add some detailed study in relation to the white race's reaction to light, heat, and humidity.

Our modern transportation certainly will expand the duties of the various quarantine services in regard to defenses against the regional intermingling of the diseases of man, domestic animals, and plants. The Panama and the Suez Canals have greatly shortened international lines of communication. All modern steamship lines are building ships of greater speed. The railroad networks are increasing their speed for freight as well as passengers, and the air lines have tremendously reduced the "time size" of the world. Some years ago passengers were at sea long enough to pass most if not all of the incubation period of certain feared diseases, thus making it comparatively easy for the quarantine personnel quickly and safely to release passengers at the end of their voyages. At present, passengers by sea routes and

<sup>1</sup>Presidential address of American Society of Tropical Medicine.

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by air lines can arrive at their destination before the incubation period of certain diseases has been completed, and the responsibility of the quarantine official is thereby greatly increased. The possible transportation of mosquito and other insect vectors confront them with an additional problem. However, all of these problems of air, sea and rail travel are more easily managed than will be true of travel over the new international systems of highways now under construction. Generally speaking, only the well-to-do and the middle classes travel in large numbers by air, sea, and rail. Massive migration by the really poor with their domestic animals and produce will occur over the highway and trail systems. The greatest danger of plant, animal, and human disease introductions will be associated with the movements of this group. The control over this class of migration becomes an international rather than a national problem. Many of these poor people will leave the highway at the national boundaries and make the crossing where no inspection service can be made. People with contraband material and police records can more easily succeed in evading inspection by use of the highway and its boundary trails than by any other means of travel. It was my opportunity to camp for a few weeks on three different national boundary lines where no railroad or highway communications existed and where no one believed that regular use of poor trails by outsiders was in effect. It was found that an average of 20 people a month without proper papers came over just one of these trails. These people proceeded down the river to tidewater and then by small coast sailing craft to points outside the harbors covered by a quarantine service. They could from these points enter any town or city of interest to them. Travel of this character will be greatly increased at all boundary lines by the new highway systems.

#### HISTORY OF DISEASE INTRODUCTION

It is well known what the early explorers and buccaneers succeeded in introducing, but perhaps the best example of disease introduction into the western hemisphere was our inheritance

from slavery as recorded in splendid detail by Admiral Stitt.<sup>2</sup> In his summing up of the probable disease importation into our Southern States by African slaves he feels justified in assuming that malignant tertian malaria with its associated blackwater fever came from West Africa. Bacillary dysentery was one of the scourges of the slave ships. Filariasis was introduced and became endemic in a restricted area near Charleston, S. C. The Guinea worm was undoubtedly introduced but later disappeared. He expresses little doubt that hookworm disease, leprosy, yaws, and yellow fever were slave ship introductions to the New World. Of course, in those days a modern quarantine service was not in effect. On the other hand, our present population is so massive as compared to that of the colonies that exposures now to an introduced disease would be very much greater, provided the disease escaped our present methods of defense against its spread.

#### FUTURE BUSINESS NEED FOR THE TROPICS

Judging from appearances in the north temperate zone of the eastern hemisphere, the increase in population associated with "land hunger" is more directly the cause of national expansion efforts, and sometimes the cause of war, than all other factors. Many of the students of the population problem are already giving notice, in the world considered as a whole, that populations are increasing faster than the means of subsistence, and that in those regions under long periods of cultivation soil erosion and deterioration are subtracting greatly from production. In our own country the tendency of expansion is toward the equator. The steamship lines for many years have been bringing out of the tropics oil, fruit, rubber, coffee, hides, lumber, etc. In general, most of these supplies come from the low coastal plains and river valleys. The future certainly will demand the use of the tropical highlands as well as the lowlands. Most of the large cities of the United States are on the sea coast or the shores of large lakes, while in Central America and many South American countries the large cities are nearly all located in the mountains. Lowland locations in the tropics are very difficult to defend against disease

<sup>2</sup>U. S. Naval Med. Bull., 26, No. 4, 801-817, October, 1928.

as well as against enemies. Agriculture in the temperate zones usually produces one crop a year on a given piece of land. In the tropics, many think that three or four crops a year could be produced in the coastal plains and river valleys, provided disease control of plants, animals, and man could be assured. The raising of other crops and the breeding of domestic animals will certainly be a future necessity in the tropic highlands. The discussion of plans for the complete development of the tropics always includes the age-old question of the ability of the white race to live permanently in the tropics. One or two places in the South Pacific that involved a handful of people indicate the possibility of a successful occupation by this race. Permanent occupation of the tropics by the white race is far less apt to occur and is far less apt to be needed than is the protection of the health and efficiency of the native populations. In the advancement of this work the white race will be expected to assist with its temporary personnel in directing the plans for preventive medicine and business enterprises. Colonization of the tropics by our race, even in this manner, will make protection against disease and the prevention of its spread a fundamental necessity.

Three kinds of pioneer medical organizations of wide scope are already at work in our tropics and they differ widely in their application. I do not refer to the teaching centers and research institutions.

The greatest demonstration in tropic health control, associated with a business enterprise, is the health department connected with the construction, operation and maintenance of The Panama Canal. It will always continue to be a fine example of what can be done. Too many of us forget that the complete operating plans of this organization cannot be generally applied. The problem for industry is not comparable and the nations of tropical America cannot yet consider the large expenditures that would be required to maintain their countries in such a high state of sanitation. They must be content with less until the improvements now in progress raise their economic status.

The second great organization in the course of time to enter the tropics was the International Health Division of the Rockefeller

Foundation. The participation and demonstrations of this great staff in the various nations is of very great importance to future development even though present financial conditions in many countries do not permit as rapid progress as could be desired.

The third health organization to enter the field is one that is seldom given as much credit as I think it deserves. I refer to the large medical departments of the great industries, such as those of the United Fruit Company, The Standard Oil Company, the rubber companies, etc. They practice medicine for business as well as humanitarian reasons. They are the people who can give the most correct idea of what diseases in the tropics most vitally affect business progress. It is in such hospital centers as these that the native sons can learn to apply their medical education to the best advantage. It is in such self contained industrial communities that the average citizen of the country and the laboring class learn by actual experience the general facts connected with business from the administration viewpoint to the shop and plantation jobs as well as the health requirements. Such industries were the first to demonstrate that the coastal plains of the tropics can be safely developed. I consider such organizations our very best type of the pioneer medical missionary.

The United Fruit Company in commemorating its twenty-fifth year of business activity sponsored and financed the International Conference on Health Problems in Tropical America. This meeting lasted ten days and was attended by 88 delegates as well as other visitors from all parts of the world. It was arranged to promote a discussion of tropical diseases, standardize practice, and promote preventive medicine and hygiene. I believe a real benefit could be derived if all the industrial medical units of the tropics could arrange every five years to unite on a scientific program concerning health problems most closely affecting their business. It would add to the attractiveness of their medical services and lead to the recruiting of men for positions in preventive medicine, a field at present not as attractive to young men as surgery. These industries conduct not only hospitals and dispensaries but also a campaign in field preventive medicine in so far as they can get a fair return in labor efficiency

for the money expended. It is my firm belief that the most important problem in tropical industrial medicine is the control of malaria and an efficient diet for the labor camps. Next to this is the world wide problem of venereal diseases. Since we are still young in the application of tropical preventive medicine it seems only fair to me that we at first attack the industrial problems of the tropics rather than the studies of diseases that are more or less of academic interest.

The stimulus to study tropical medicine in our country has never been as great as in those nations that possess colonies in the tropics. It seems that we have always more or less considered our needs for a knowledge of tropical medicine limited to men in the military services, the public health service, certain teaching positions, a few research institutes and a few men for tropical business organizations. We are, apparently, not entirely awake to the fact that ease and speed of travel and cheap international highway opportunities are making the world rapidly smaller and more attractive to the expansion of business and to the traveler. The press and the moving pictures have added to the education of the masses yet, in general, our people are not all well informed on tropical health conditions. Almost none of the members of our profession give *serious thought* to the possibilities of disease introductions in returning soldiers, sailors, tropical employees, tourists, etc. except the Medical Corps of the military services, a few port physicians, and doctors teaching this subject. Vast numbers of our race who are on leave or terminating their services are returning all the time from tropical stations. They scatter all over the United States and are too likely to be found in small towns. How many of these towns ever think of the possibility of a tropical disease being in their midst? How many such towns have members of our profession qualified sufficiently well in clinical and laboratory practice to be depended on to recognize and manage any of these three ordinary diseases; malaria, amoebic dysentery, and hookworm anemia? Not enough I can assure you, for I have lost two valued friends on their return to the United States under such circumstances. Returning employees, discharged soldiers and sailors, and trav-

elers deserve our best thought and attention. The rapid development of all forms of transportation encourages expansion of business and travel, and our modern times demand a wider medical knowledge by every graduate in medicine. The man who specializes in tropical medicine will of course want detailed courses of study, but there is no longer a place in the world where the doctor can afford to forget the possibility of disease introductions that are not common to his location whether he be in the temperate zone or the tropics.

A network of informed physicians is bound to develop, and growth in the membership of this society should very naturally follow. Enough has been accomplished in the past generations to show what the prospects are for the future. The tropics have long been said to represent the hot-houses of the temperate zones, but one should be reminded that these hot-houses will demand all of the care and protection that we give our old "glass greenhouses." Past achievements indicate wonderful future opportunity in tropical research and practice. The unsolved problems of the effect of the year around tropical climate exposure in regard to the white race still confront us as well as the continuation of studies on most of the general diseases. The melting pots are full of problems for medical experience. Tropical medicine has a clear field for the future but every medical course should be large enough to prepare its graduates for world wide practice. If one's destiny happens to be in tropic fields he will find a challenge and adventure not to be compared with practice in the temperate zones.