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THE TROPICS FROM THE PUBLIC-HEALTH STANDPOINT

LEGENDS AND FACTS *

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Let us consider the tropics from the standpoint of those who live in the northern countries and temperate zone and from the standpoint of those who actually reside in the tropics and have their permanent homes there, enjoying the comforts of civilization.

To begin with, the wrong ideas that have settled in the minds of non-residents need to be corrected. An inferior stock, poor, ignorant and degenerated, of a physical and peculiar mental structure, under a red-hot sun, a blue sky, and in the midst of a deep blue sea. Wild and fierce animals and beasts, poisonous and annoying insects of all denominations, storms, earthquakes, volcanoes and huge snakes, and in this immense wilderness, people mixed and blended, of all races and creeds, without a definite personality, full of vice, degraded, and incapable of rising above this level. On the other hand, the tourist who makes a short cruise on a big liner is attracted mainly by the gifts that nature bestows—fresh air, luxuriant vegetation, bright colors, stately trees and royal palms, smooth rivers and balmy breezes, but in the midst of all this beauty, a queer and inferior people, lazy and indolent and powerless to organize a civilized community.

Two sides of the question must be considered, and leaving aside our presumed disgrace for living in the tropics, let us select the subject from the point of view of adaptability and in relation to the two prevailing schools. Climatological and environmental factors have no ill influence on the white man who comes from the temperate and cold countries. If sanitary and public-health measures convert this region of the world into a safe place to live, the people cannot only live and work, but can also bring up sturdy descendants who are healthy and virile. Those who see the wrong side of the question have the idea that the white man who tries to work out of doors under tropical conditions will be unable to withstand the strong influence of climate. The stress on the nervous system is so dete-

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riorating that sooner or later the physical and mental structure undergoes degeneration. The question is raised whether the stronger races through a natural instinct of selection occupied and inhabited the regions north and south of the tropics and that the powerless inferior races with no ambition and no initiative have remained in the tropics.

To my point of view, I believe there has been and there is no difference in the choice, but that it is due to the way the people react to the influence of environmental conditions, particularly to those of climate. The northerner thinks, acts, and lives in harmony with adverse climatic conditions. The curve goes up and down four times a year in accordance with the change of seasons. His mind is set for the extremes of temperature. He builds his home taking into consideration maximums and minimums, and never settles down to average figures. The minutest details of the construction of his home are in accord with the worst days of a severe winter. Spring, summer, and autumn are disregarded. Even the house furniture has the same relationship. A thick feather mattress for a cold season is left on the bed throughout the year when summer is suffocating, and this season, with improper readjustments, is a source of desperation to the people who have their minds set for a cold temperature. The influence of an adverse climate on the people is reflected on the whole social and economic structure of a country. They are compelled to live in better homes, to wear a more elaborate mechanism of body protection and to eat better food, and in order to meet all these necessities and indispensable outfit they have to work harder, earn higher salaries and better wages.

This superiority apparently is the reaction towards a better way of living and seems to have its rooting in adverse climatological conditions, for the people are bound to fight and overcome obstacles by artificial means. In those countries where too much consideration is given to climate and where the people know too much about it, no doubt the climate is very variable. The common expressions, fine day! nice day! and cool evening! have no meaning for us in the tropics.

It is a fact that our big problems, those which are intimately related to the health of the people, have their origin mainly in natural conditions. Climate in one way is our best ally to fight disease and in another way it is our worst enemy, giving rise to community problems which could not happen in the temperate and cold regions, because the people have to live better protected for their own personal health and comfort. In the tropics, comfort means nothing; it is

nature itself; in the north, comfort is secured through a complex structure of commodities and at a large expense. Why can the people live at ease in a cabin, in a hut, under any shelter so long as they receive protection from the rain and the direct rays of the sun? Why do we have so much malaria and hookworm? Why do we have so many people suffering from malnutrition and why is infant mortality so high? Why does tuberculosis demand every year a heavy death toll, particularly from the poor people who live in the urban zone? Just because of our even and nice temperature which favors disease. Were it not for this our death rate would come down to exceedingly low and stable figures.

Adverse conditions are of no concern to the people, particularly to the poor people who can put up a shack anywhere during the course of a few hours and at a minimum cost, for sheltering a large family. The living expenses are low in this way, and naturally labor is cheap, shoes are not necessary, and clothing has no relationship to protection from the extremes of cold weather. Thus, the earning capacity is satisfied just with the necessary economic return, sufficient to answer nature's demand for food which is unbalanced and barely enough to satisfy hunger. This accounts for malnutrition and infant mortality, which are due to economic factors.

In Porto Rico in the areas that have been covered by our public-health units and where sanitation has not been enforced, hookworm is universal, reaching as high as 90 per cent. Why? Because the people do not feel the necessity of constructing sanitary installations and they deposit their excreta in the open field. It is not only the habit of centuries, but the lack of pressure on the part of nature. Hence the government has to resort to drastic measures in order to compel the people to act as they should to protect their own lives and the health of the community and it is thus seen that the curve of a high morbidity is falsely considered normal in those countries where strong sanitary measures have not been adopted.

The people are so accustomed to see a sick community that they accept this condition as a normal state not only of a physical inferiority, but also mental as each disease has a mental modality which alters the behavior of the victim. We can see cases of acute maniacal insanity of the most severe type classed in our insane hospital as hookworm psychosis, and from this acute extreme we can determine the presence of all shades of mental derangement down to a normal equilibrium.

After four centuries of uselessness and invalidism we are carrying out at the present time sanitary measures in regard to uncina-

riasis on a large scale, based on the fact that sanitation is of paramount importance and the foundation on which all the work stands. The hatching of the egg and the development of the larva to its mature stage when it is ready to penetrate the skin takes about a week and it is accepted that it lives under favorable conditions for a period of six weeks; that is, treatment is of no avail without preliminary sanitation. The rural community forms the bulk of the population, hence the magnitude of the problem. This deficiency has become rooted in the minds of the people so as to become a habit and nowadays it is necessary to use strong measures at times in order to compel the people to obey the law. The second phase of the question will come up when the country dwellers are convinced of the benefit they receive in health and money. The importance of sanitation in the fight against hookworm is such that the latrine comes to be the protection of the community. The soil being clean, all the other factors can be disregarded, as even without treatment a patient will be in many instances restored to normal health, as the parasite lives about six years in the intestinal canal and there is no internal reproduction, so that a parasitical infection, without a new supply of worms, tends to diminish for purely biological reasons. But we have to administer treatment as a secondary adjunct, as we cannot let the patient live sick and invalid for such a long time. The modern campaign against uncinariasis tends to raise the standard of the living conditions in the tropics.

MALARIA

Malaria, our worst problem today, like filariasis and yellow fever is due to purely favorable climatic conditions, on account of the fact that mosquitoes of all sorts and species breed and thrive throughout all the seasons of the year, some causing annoyance for the discomfort they bring to the inhabitants and others causing disease. Yellow fever is gradually disappearing from the tropics, for the reason that there are no chronic carriers. By taking care of the sources of infection during the acute attacks and by discovering mild cases which might otherwise pass unnoticed, the species that transmits the germ remain sterile. Filariasis and its sequelae, so common, remain unconquered as the disease does not cause so much physical disability and the mortality from direct causes is low. The people and the sanitary authorities do not seem to give much consideration to this disease as there is no specific treatment and although the pathology has been so well studied, nevertheless the parasite in the blood and in the lymphatic system remains unconquered. However, the sanitary

measures that are instituted against malaria may serve the same purpose against yellow fever and filiarasis.

Malaria, to-day, is the scourge of the tropics. It causes a high morbidity and a high mortality. It gives rise to chronic carriers who keep the incidence of the disease alive in the community as long as the anopheles mosquito is present and this vector is found in the tropics throughout all the seasons of the year. Since the disease is mostly found in rural districts where the people live unprotected against the mosquito, it is here that it remains endemic, causing a great deal of disability and very often its symptoms are classified as some other current affection, preparing the victim for the inroad of other virulent diseases that find a fertile field for their development. But with the improvement in agricultural methods in the first place and taking into consideration the commercial side of the question, the incidence of malaria will diminish year by year.

In the fight against this disease and if we accept that the anopheles mosquito is not migratory and if we agree that its presence in a community is due only to local favorable conditions, then it is not possible to try or even dream of cleaning up a country of these insects, but in the first place the relationship of the human habitations to the breeding places must be determined, ignoring the rest. Usually, the worst problems arise in communities of poor people which have sprung up against the law, just because tropical conditions in regard to climatic factors are of no concern. Here, mechanical protection and the disappearance of the breeding places is impossible, so it is cheaper and easier to move the entire population from such districts. The general principles established in regard to the fight against malaria are that it is a local condition and that the more concentrated the population is, the more easy the work of prevention.

Tuberculosis in these tropical countries of America is mostly due to economic factors and to the facility with which the people, in light of an even climate, congregate to establish a community which gradually grows until it reaches immense proportions. The one-room shack without any sanitary installations and commodities is the rule. Consequently, improper feeding, overcrowding and the association of other primary diseases like malaria and hookworm exert their influence on the health of the people. Public-health measures in the phase of problems of this magnitude are difficult to enforce as this social obstacle hinders advice and education. The rural population which lives scattered is practically free from tuberculosis as also the higher classes who live in better homes and who possess sufficient

resources. The nice tropical environment stimulates and allows the poor people to live under such adverse conditions that they do not have to protect themselves from the inclemencies of the weather. The measures that have been adopted at the present time tend to stop the extension of these slums, even if we are obliged to use our police power in declaring such districts a public nuisance. In this way modern settlements are being formed by our advice and under our control.

It has been said that the white man is, as he is practically everywhere else in the tropical world, a more or less exotic bloom. It may be so to some extent in some countries, where the white man makes a temporary or a permanent home and acts as the manager and advisor in some form of industry or agricultural enterprise, but it is not everywhere. These civilized American tropics generally have a large white native population, as fit, physically and mentally, as in the most progressive countries of the world, living with all the comforts and luxuries of other enlightened communities and powerfully organized to handle their own affairs in all the activities of life, from the routinary unskilled labor to the highest attainments of intellectual activities.

Much has been said about adjustments and readjustments and the reaction that the white man undergoes in the tropics, but for those who have had the opportunity to live closely with people coming from north or south of the tropical belt, no apparent change is observed either from the physical standpoint or from the mental attitude of the person. The stories about tropical neurasthenia are more or less due, in my opinion, to an equivalent or manifestation of homesickness that we from the tropics also suffer when we leave behind our affections and associations. It is also said that those who come to the tropics are apt to become alcoholic addicts. This is more likely to be a compensation to keep the mind away from mental worry.

The absence of change of seasons is responsible for the failure of vital reaction in the individual. No doubt this lack of variation makes life monotonous. Nature appears always clad in the same bright colors with an endless variety of shades. No traditionary stories are elaborated around the chimney and the fireplace. No change in clothing. The land is always ready for the seed. No heating systems to worry one, since the thought of the coldest day of the year, on which the North American mind bases all calculations, is not given any consideration. A refreshing constant breeze soothes the influence of the heat. The lack of need of struggle against an

adverse nature is responsible for a routinary life which is the cause of the "*dolce farniente*" of which so much has been said and written and which has given origin to the belief that the people who reside in the tropics are indolent and indifferent and that they leave all their activities and worries for the following day.

For those who live in the tropics, disregarding race and social conditions, I believe that the first subject to be taken into consideration is the preparation of a suitable environment. Newcomers cannot live in a tropical country if they are constantly exposed to infection. If no public-health measures have been duly established, the native population will live a life of distress, as our parasite diseases, if they do not kill in the course of a short and spectacular period, undermine and diminish physical fitness and create a state of mental inferiority. Even if proper care is taken and successful treatment administered, many victims do not recover from the action of the disease when this has already caused a great deal of permanent injury that cannot be restored completely.

The degree of civilization of a community is influenced by several causes, but the most important and the one on which progress and development depend is the action of a chronic, specific, and universal disease upon the population. A civilized and prosperous country will fall and decay like Rome and Greece and a nation will be powerless to attain a high degree of development and will fall into stagnation. This influence will be felt in all the different enterprises and achievements, from a routinary life to the highest accomplishments.

Although climate has a preponderating influence in the progress of a country it is its favorable action on germs and mode of living of the people which accounts for this influence. Climate cannot be modified, but the problems which are derived from it can be successfully handled by the combined action of the government and the response which it may receive from the people. What is needed is a fit place to live in and this can only be established by public-health measures and not by any other means. The history of the building of the Panama Canal is a good example. Enterprise and genius would be powerless to act, even in the light of immense economic resources.

Endemic diseases constitute the scourge of the tropics, as these affect a large part of the population, and although the mortality from direct causes is low nevertheless the morbidity is universal. Epidemic diseases that occur once in a while in the form of acute outbreaks do not need to be taken very seriously as to the disability

which they may cause, and these diseases respond more promptly to direct measures of control. In regard to the former, the general accepted idea is that the individual can live in the tropics if he is adapted to the local diseases, and this is a misconception as above everything he should live free from disease if he wants to be a straight and useful citizen.

PUBLIC-HEALTH MEASURES IN THE TROPICS

Public-health measures and methods do not follow any standard and do not fall into specific rules, as each country has different problems that demand peculiar consideration. The peculiar-health expert that leaves the school where he obtained a thorough preparation is obliged to adapt his knowledge to the country where he is going to work, taking into consideration all the different factors that form the social structure of the community and it is better to select this material from those elements who know and understand the needs and sentiments of the people. In any public-health organization there are standard services that are essential and of universal necessity, like a division of sanitary engineering and a division of vital statistics, which are common to all the departments of health of the world. Upon this fundamental structure is built the machinery which is completed with the local problems, particularly so in the tropics. Malaria and hookworm, for instance, are of no concern in Canada. On the other hand, this country may have problems that do not need to be considered in the tropics.

The ability to handle public-health controversies and problems is acquired only through a long school of experience and even with abundant legislation at hand at times the public-health officer is compelled to arrive at definite conclusions with the general principle: "The aim of a health organization is to protect the health of the community primarily and when matters do not fall into the scope of written statutes then list them under the supreme dictum '*Salus Populis, Suprema Lex*'."

When legislation in force does not permit a readjustment of factors that have their origin in the inherited neglect and tolerance of a misunderstood charity, so that law does not permit a modification, it is better to allow those improvements which tend to raise the standard of living.

The poor people have to be handled in harmony with their economic possibilities and at times some of the difficulties which they create do not fall into any category of specific legislation. At this point it is necessary to use good judgement and a great deal of common

sense, otherwise unrest is created and hatred is elaborated in their minds. It is more so in these tropical countries where industrial development is so limited, where families are large, where morbidity is universal, unemployment the most serious obstacle, and where bad habits inherited from centuries and generations still persist. Moreover the mental attitude of the people is influenced by parasitic diseases that act on the cerebral structure, modifying the character which is dominated by a state of apathy, indolence and indifference. The disease that is most responsible for this peculiar behavior is uncinariasis. The natural struggle for life compels the people to violate law under the pressing need of unforeseen circumstances. The father of a large family who earns a very small wage is fined ten dollars for his refusal to construct a pit latrine, while the amount of this fine would cover the cost. Then if he cannot pay he is confined in jail for a period of ten days and during this time the family is left without protection and no practical benefit is derived from this measure. To this end, even the judges should have a knowledge of public-health methods and their ability to co-operate can be shown by their disposition to advise and educate rather than to punish.

In spite of favorable climatic factors and sufficient land facilities, nevertheless the housing problem is one of the most serious difficulties that the public-health officer has to contend with in the tropics, more so on the outskirts of the large centers where the cheapest material and the most unsanitary places are selected for the construction of the usual one-room shack that follows no orientation and no preconceived plans. As I pointed out before, the struggle for life, where poverty is so universal, trains the people to do things against law if proper vigilance is not continuously exercised. When the present campaign of readjustment was started four years ago, mounted inspectors were kept in the suspicious districts during the day. Then the people began to construct during the late hours of the night and in one instance the inspector who stopped at the nearby *cafeteria* to take a cup of coffee, on returning to his post of duty found a newly constructed shack made of Ford packing boxes, with a family inside, apparently sleeping, and with domestic animals underneath the house. At the same time they had borrowed a patient in the neighborhood in order to elaborate some argument of discussion with the sanitary authorities and this patient was housed as a safeguard in order to remain unmolested. In the belief that the home is unassailable, at times a whole family is placed on a vacant lot and in a rush some form of structure is speedily constructed about them and this within the term of one or two hours. A shelter is made out of palm or

sugar cane leaves to protect a goat or an old horse from sun and rain and the attention of the inspector is attracted when he sees smoke going up from the camouflage shelter. A large family is living there and the animal was used as a pretext to occupy and convert the shelter into a home. Court action, according to the routinary way of conducting these violations of law, would simply punish the guilty who includes the expected fine in the estimate of the shack, but for a Department of Health this is not sufficient, as the condition is not corrected with a fine or with imprisonment. Here the principle "*Salus Populi, Suprema Lex*" comes into play. A public nuisance is declared and this is done away with quickly in a very drastic, but at the same time efficient manner. Otherwise, tolerance which is legalized with a small fine gives ground to the formation of slums which spoil the beauty and comfort of towns and cities. Let private initiative or any branch of the government attend to the charitable part of the work, as otherwise it would be impossible to control the situation, since at any time in the case of epidemics or unforeseen circumstances, the government would be obliged to spend large sums of money in trying to check the spread of disease.

The experience in my work, where I have to deal with problems of a large magnitude that have to be handled on a large scale, has convinced me that public health is a very complicated and enormously extensive subject that needs full time, attention and a thorough knowledge of local conditions. It should be based on plain fundamental principles in such a way that exceptions must not be taken into consideration as they tend to mislead the people from the main issue of the question, in contrast with the general practice of medicine. The internist is more given to find exceptions to the rule, that natural tendency to find something rare. We, however, have to follow nature's own way. General principles: "Uncinariasis is acquired through the feet when mature larvae penetrate the skin and this is possible only when the soil is contaminated." "Oral infection or through any other channel must be disregarded." "If the soil is clean the patient can go barefooted without danger of acquiring a new infection." "Bubonic plague is transmitted from rat to man through the agency of the flea and in no other way, except the pneumonic form which is directly transmitted by droplet infection." "Malaria is transmitted from person to person through the mosquito of the species *anopheles* and in no other way. This mosquito is not migratory and in this way malaria can be considered as a local condition, in such a way that the breeding place can be found close to the spot where human cases occur." By putting into practice measures

based on principles and not on exceptions, the people no doubt will be more easily educated and their minds not diverted from the real source of danger, as the more details added the more complicated will be the subject laid before the public. It is easy to understand that if the migratory habits of the anopheles mosquito come into play, the primary focus of infection may be disregarded and efforts made to locate it miles away, that in fact may have no connection with the original breeding place.

The first duty of the government is to protect the health of the people, and this statement has a broader meaning in the tropics, as diseases that are preventable find the best conditions for their development, exerting their influence on commercial and industrial enterprise and on all the different activities of life. For suggestive, theoretical, and sentimental reasons public education to stamp out illiteracy is awarded the first place, then comes public works for the intimate relation they have to commerce and agriculture. When we are accustomed to deal with a sick population, as I said before, we accept this situation as normal. The intellectual classes who have in their hands the leadership and control of all the government activities hardly consider public-health matters as the main duty of the state, and this is wrong. In our work it is exceedingly more difficult to educate the higher intellectual classes, because at times they are controlled by the most systematized sense of prejudice. The necessities of the poor working classes are ignored and many a time we are bound to use drastic law measures and our police power in order to secure their well-being and their comfort.

If a public-health officer succeeds in convincing a community that the prevention of disease and the promotion and conservation of health is the first and most important duty, he will have accomplished a miracle, and this is a very difficult task only because disease plays havoc, naturally, among the poorer classes and in the lower strata of society. Here the human mind is completely absorbed and controlled by the dominant thought of a bitter struggle for life and this is measured only in terms of economic possibilities.

