

Tropical World to Be Home of Empires of the Future

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HOTEL TIVOLI, ANCON, Panama.—I have just returned from a chat with Colonel William C. Gorgas, the army surgeon who has been in charge of health matters during our stay on the Isthmus of Panama. You all know of his wonderful work. He found the canal zone a pest hole, and he has made it one of the healthiest of all spots upon earth. The death rate last year among our fifty odd thousand employes was less than eight to the thousand, and among the white Americans who work on the canal it was less than three to that number. The death rate in New York of all causes was about sixteen per thousand, and in many other cities of the United States it is very much higher.

I have never seen anywhere a healthier looking crowd than those men who are working on the canal. They labor all day in the sun, and in the rainy season are out for eight hours when the heavens downpour. Nevertheless, their eyes are as bright as the blue of the Panama sky, and their faces as rosy as that of the sun when it rises out of the Pacific ocean to send its blazing fire upon them.

That sun and the Pacific I will not again attempt to explain. It seems here to rise in the west and set in the east, but it is just as hot as any sun of the tropics, and for all other things quite as deadly. Through the efforts of Colonel Gorgas and the others of our medical force it has been robbed of its terrors, and men labor away all day, all week and the whole year without fearing. Their experiments in sanitation have, indeed, robbed the tropics of its terrors and they have instituted a new scheme of treatment which promises to create a new world for the future. But I will tell you what Colonel Gorgas says about this farther on.

The Panama of the Past.

During my talk I asked Colonel Gorgas something as to the Panama of the past and whether it was really as bad as was painted. He replied:

"We found it so when we took charge here in 1894. The official pilot chart used at that time described the Isthmus as the hottest, wettest and most feverish region on earth. It was said that intermittent and malignant fevers were prevalent, and that there was an epidemic of yellow fever at times. This had been the condition for centuries. The Spaniards, who first crossed to the Pacific about 1520, found it so, and at the time of the discovery of gold California the forty-niners died by the hundreds. Along about 1838, when the Panama railroad across the Isthmus was half completed, we sent a regiment of the United States army to California by way of the Isthmus, with General Grant as quartermaster. That regiment had to march from Gorgona to Panama where they took ship for San Francisco. During the latter part of their journey they lost eighty men out of 810."

"An even greater mortality prevailed among some of the men who built the railroad. You have heard of the death cars which went over the road every morning and the story that there was a corpse for every tie on the track. I do not know about that, but the mortality was so great that the construction work had to be stopped for lack of men. The railroad company once imported 1,600 negroes from the west coast of Africa, and they all died within the space of six months. Later they brought in 1,000 Chinamen and the most of these died. The mortality was terrible."

Death and Disease Among French.
 "It was equally bad in the days of the French canal, was it not?"
 "If we may believe the stories it was beyond description, awful. Sir Claude Mallet, the present British minister at Panama, was then British consul here and as such had the administration of the estates of the British subjects who died on the work, tells me that he had from 300 to 600 such estates every month. Our death rate calculated on a force of 20,000 would amount to only twenty per month, and those British deaths were among the subjects of John Bull only."

"It is hard to get accurate statistics of just how many died under the French. We know that they had good hospitals and that the sick in them were well cared for, but the contractors had to pay \$1 a day for their men who were kept in the hospitals, and you can easily see that the ordinary contractor would send no more than he had to. From the best information I can get I believe that the French lost 40,000 laborers by death during the work of the first company on the canal, and that would make a death rate per annum of about 25 per cent, or more than 250 per thousand. I doubt if we could have done better if we had known no more of tropical diseases than they did."

What Sanitation Did.

"Under those conditions could we have built the canal, Colonel Gorgas?" I asked.
 "It would have been very difficult to have gotten our white employes to come here. We had trouble to hold them during the yellow fever time of 1865. You must also consider that the deaths among the French were very largely among the white French employes. According to the records of their hospitals here they had more than 1,900 yellow fever deaths during nine years and those were mostly Frenchmen. It is safe to say that there were 45 many more deaths from yellow fever among the same class outside the hospitals."

"Now, the French white employes averaged only a few over 1,000, and this means that they lost four-fifths of their whole force in nine years, or eleven-sixteenths in five years. During our first five years the number of our white force was, on the average, only a little more than 5,000, if we had lost at the same rate as the French we would have already buried more than 4,000 of those white men from yellow fever alone, and according to the same calculation we should have had about 24,000 white men here in Panama to have kept our forces at work. If we had had that many we should have already buried over 4,000 from that disease."

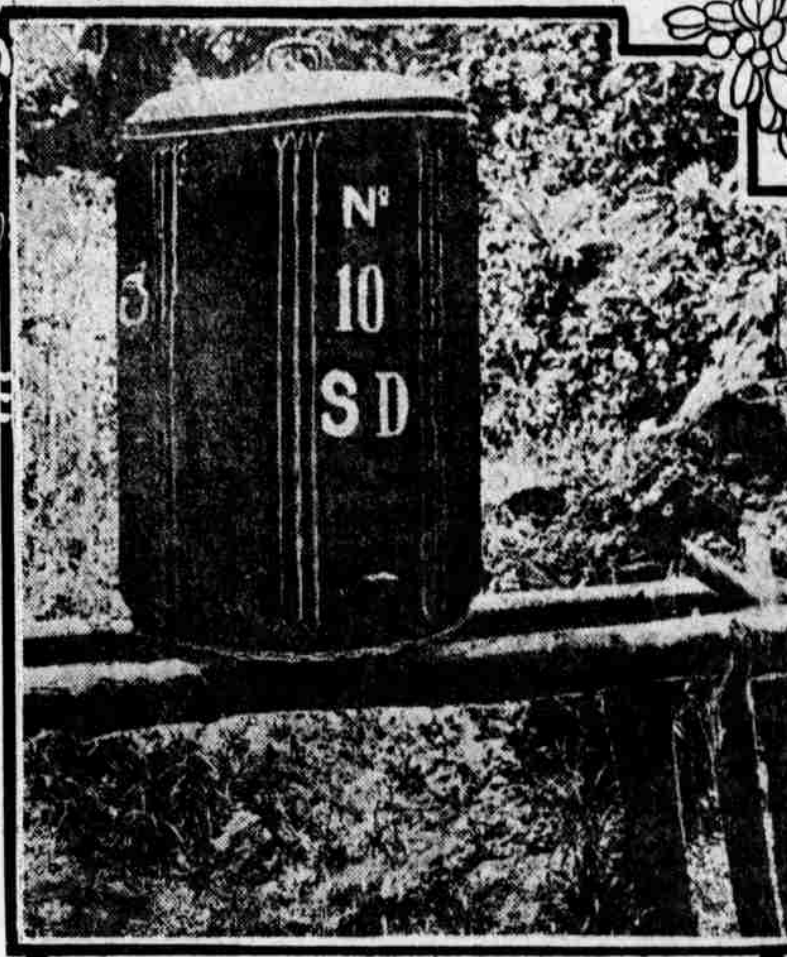
A Cost of One Cent Per Day
 "But, Dr. Gorgas, are not the methods of sanitation used on the canal so costly that no nation could afford to adopt them?"
 "No. They are cheap. The average cost of keeping the population of the Isthmus in its present sanitary condition is just about 1 cent per day per capita, and that sum is well within the means of any tropical country. A great deal of misstatement has been made concerning that matter. It has been said that we were spending something like \$2,000,000 per year on sanitation, and certain imaginative newspaper men have figured out



Spraying ditches to destroy malaria baby mosquitoes



BURNING THE GRASS WITH CRUDE OIL AS FUEL



Barrel containing mosquito oil which automatically drips, coating the brook beneath.

any working force all the world over is much better than ours."

Tropics as the World of the Future.
 "Have you not proved that the white man can live and work in the tropics quite as well as in the temperate zone?"

"Yes," replied Colonel Gorgas. "That has been absolutely demonstrated, and I believe it will have a great effect as to the world of the future. It would seem that the first man must have lived in the tropics, and that that was his natural habitat. He was born an animal without clothes and at the start he must have had a warm climate. It was only when the tropical diseases drove him away that he left that most beautiful part of old mother earth. Now that these diseases can be controlled, he will come back and within a few centuries in all probability the most civilized parts of the world will be the tropical zones. With a given amount of labor man can produce far more there than in the colder regions. He can live better and have more days to work. As it is now the greater part of the population of the cold lands is idle for six months of the year. Its inhabitants spend their time in fighting the cold."

"But will it not cost too much to make the fight against the disease. Can the ordinary man afford to live in mosquito-proof dwellings?"
 "I think it would be very much cheaper than to heat his home in the cold lands of the far north," replied Colonel Gorgas. "All that you need here is a screen of woven wire about the outside of your house. You do not need a heating plant or fur or wool clothing. Indeed the difference of the cost is altogether in favor of the tropics, and as the sanitation of the tropics is improved the diseases will be so eliminated that the cost of fighting them will grow less and less."

"You must also remember," continued Colonel Gorgas. "That the great undeveloped lands of the future are those near the equator. Take Brazil. That country is as large as the United States, and has a vast deal more cultivable land. The whole northern part of South America will eventually be the home of a great many people, and we yet have the Congo valley as the center of a race of white men. Moreover the habitable parts of the world must have room. I believe that the white man's emigration to what is the so-called torrid zone is only a question of time."

Sanitation in Brazil.
 "But how about the tropical peoples of today, Colonel Gorgas? Do they realize the possibilities that might come to them by improved sanitation? Have they learned any lessons from Panama?"
 "Most of the people of the tropics, and by this I mean the civilized nations, have been watching with great interest the government work here at Panama and many of them are taking advantage of the discoveries made in recent years as to malarial and yellow fever mosquitoes. They have adopted the methods of eliminating these pests which we introduced at Havana and have found to work so well here. As a result yellow fever has been almost eliminated from Rio Janeiro and Santos, which for generations have been the pest holes of the world. It has been practically wiped out of Mexico and it has been reduced greatly in other places."

"And just here I would say," continued Colonel Gorgas, "that a great misapprehension obtains as to the dangers of the tropics. If you can keep away from the mosquitoes the climate is no more deleterious than that of any other part of the world. Taking care of one's health here is not unlike taking care of an orchard. Apples and peaches are injured more by the insect pests which attack the trees than by lack of cultivation or inferior soil. If you can keep off the insects the luscious fruit matures in bountiful quantities. It is the same with man in the tropics. If you can keep the parasites out of him he seems to thrive quite as well as in the temperate zone."

Yellow Fever Not Contagious.
 "But how do you know that, Colonel Gorgas?" I asked.
 "It has been proved by many experiments. The fact that the malarial mosquito would transmit malaria was discovered by an English army surgeon, Ronald Ross, and, as you may remember, experiments were made in the campagna just outside Rome, which proved there was no danger of disease in that fever-stricken district to those who live in screened houses and were not bitten by mosquitoes. The fact that the yellow fever mosquito would transmit the yellow fever was discovered by a board of army doctors, namely, Drs. Reed, Carroll, Agramonte and Lazzar, at Havana. It was their discovery that enabled us to wipe the yellow fever out of the island of Cuba and later on to clean up the Isthmus. These doctors made experiments which showed that yellow fever could not be taken unless a man was bitten by a yellow fever mosquito. They had men sleep in beds in which yellow fever patients had died. They even had them covered with the black vomit of a yellow fever patient and to be exposed to the emanations from yellow fever, but none caught the disease until he was actually bitten by a yellow fever mosquito, which was in the right condition to transmit the disease."

"That story is too long to tell, now," continued Colonel Gorgas. "Those discoveries, however, will go down in history as among the great events of the world, and the American doctors at Havana who permitted themselves to be bitten by yellow fever mosquitoes and thereby took the fever that they might make these investigations deserve to be ranked among the greatest of our heroes. Of them, Dr. Lazzar died, Dr. Carroll took the disease,

and he same ratio it would cost a vast sum to keep the United States healthy. Those figures did not come from this bureau. Our actual cost of sanitation has not amounted to more than \$35,000 per year, and this is for a population of 150,000. It would amount to considerably less than 1 cent per day per man. If you take the ratio of cost, as compared with that of Chicago or others of the United States cities you will find that we are spending comparatively little. Indeed, I have figured that we are spending here only 10 per cent more per capita than is spent the United States over."

The Deadly Mosquitoes.

The conversation here turned to the two kinds of mosquitoes, which more than the lions and tigers of the jungle have driven the white men from the tropics, and I asked Colonel Gorgas to tell me something about these terrible insects. In the conversation which followed, he said:

"There are altogether about 400 different kinds of mosquitoes, each of which has its own habitat and peculiarities. Take the Jersey mosquito. That breeds in salt water and will sometimes fly thirty miles during the night. It is far more ferocious than the malarial or yellow fever mosquito, and its bite is more painful. The malarial mosquito is known as the anophele. It bites during the day-time, but its chief feeding time is at night. It is an out-of-door mosquito and usually lives in the country. It breeds in fresh water and seeks fresh streams with long grass at the sides or quiet pools. The stegomyia or yellow fever mosquito is more fond of the towns and cities. It breeds in cisterns, rain barrels, old cans filled with water and stagnant pools. It is not nearly so large as the Jersey mosquito, and is grayish white with zebra stripes about his body and legs."

Both the stegomyia and the anophele have about the same habits as to reproducing their young. They feed upon vegetable matter, but the females when they are about to breed must have blood and for that reason they attack man. They also have the properties which make them the fit habitat for the yellow fever and malarial parasites, and if they feed upon a man who has malaria or the yellow fever they take these parasites into their system. The parasites are so small you cannot see them with a microscope, but we know that they exist and that they multiply so rapidly that they finally come into the saliva of the mosquito. When the mosquito, having been infected with these parasites, bites man a second time she injects some of this saliva containing the parasites and this gives man the yellow fever or malaria."

"It is, however, the anophele only that transmits malaria, and the stegomyia only that gives yellow fever. There is no such thing as men having either of these diseases if he is not bitten by these mosquitoes."

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Barrel containing mosquito oil which automatically drips, coating the brook beneath.

but recovered. Dr. Reed was absent at the time the test was made. "Our first work here was to clean up Panama and Colon, and especially all

places on the zone within 200 yards of the settlements. We cleaned the cities to get rid of the yellow fever, and we have drained all places about the settlements and kept down the vegetation to fight the malaria. In some places our drains are made of concrete and in others they are open ditches which must be kept free from grass. We have also subsoil drainage. We have taken away the breeding places and are trying to keep them away. We have a mosquito brigade, which is devoted to this business. We have also housed our men in mosquito-proof quarters. Their homes are covered with woven wire in such a way that they practically sleep out of doors safe from all insects. In addition to our drainage system we sprinkle all such stagnant water as we cannot drain with crude petroleum to destroy the larvae or young of the mosquitoes. The larvae are the little wigglers you have seen in rain barrels. They are the tadpoles of the mosquito, if you will imagine the mosquito's frog. They are air breathers, and must come to the top of the water every few moments to get air. They bump their noses against the oil scum, and are suffocated by it. We use also larvacide, another preventive, and we have imported fish from Barbadoe to put in the pools. They are fond of the larvae and eat them."

"I suppose you use a great deal of oil?"
 "We are using about a thousand barrels a month, and also about 500 barrels of larvacide. But you must remember that the use of oil is to a certain extent a confession of failure as to the drainage. If we could keep down the breeding places of the mosquito, including the pools, drains and water holes hidden by vegetation, we should not need oil at all. We are using less and less as we extend our system of drainage."

"The methods I have given are those which relate to the towns and settlements and working places along the Canal Zone. We have also certain ways of taking care of the surveyors and others who work in the jungle on such jobs as that of relocating the Panama railroad, where the sleeping places are constantly changing. We give such men daily doses of quinine, and protect the cars and tents in which they sleep with mosquito netting or woven wire. By these means we have reduced the malaria here to a minimum, and the disease is now not as serious a feature as some others which are prevalent among the workmen of the temperate zones."

FRANK G. CARPENTER.

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