

MASTERING THE DREADED TYPHOID

Vaccination of 12,000 Men in the United States Army has Reduced the Death Rate 90%.



MAJOR F. F. RUSSELL WHO IS LEADING THE ARMY CORPS IN FIGHTING TYPHOID



CULTURE IN THE HUMAN BODY

TYPHOID GERMS

BY WILLIAM ABERNETHY DU PUY.
IN THE last 18 months 12,000 men of Uncle Sam's army have been vaccinated for typhoid fever. Of these 2,000, but three men have since been attacked, and these but slightly. There has not been a fatality from the disease in the whole number.

In every other block of the Army containing 12,000 men there have been 72 cases of typhoid in the same time and seven deaths. In the 50,000 unvaccinated there have been 300 cases and 26 deaths.

So has the medical corps of the Army filled up statistics which prove beyond a doubt that the disease that is always with us, that scourge of volunteers in time of war, may be met, muzzled and all but subjugated. So is the method of preventing typhoid being demonstrated on a magnificent scale. So is promise given that the whole country may be some day vaccinated, and as a result not one-tenth of the present mortality will be annually reported.

The month of September is the worst in the year for typhoid. Just now there are twice as many cases of it in all the cities as at any other season. This is because the Summer vacationists have returned from the country, have brought the rural disease with them and have spread it to others. It is never so in the Fall and every health department knows whence the disease comes. It is therefore timely that announcement of the great steps toward its eradication should be made now.

The statement is for the first time issued on the authority of the Medical Corps of the Army that if every individual in the Nation would capture, kill, count and inject into his arm \$300,000 typhoid bacilli, there would next year be but one case of the disease where there are now ten. It is further stated that all those who do not regard themselves as good capturers, killers, counters and injectors of bacilli may get the doses ready prepared from the Government, if they go about it in the right way.

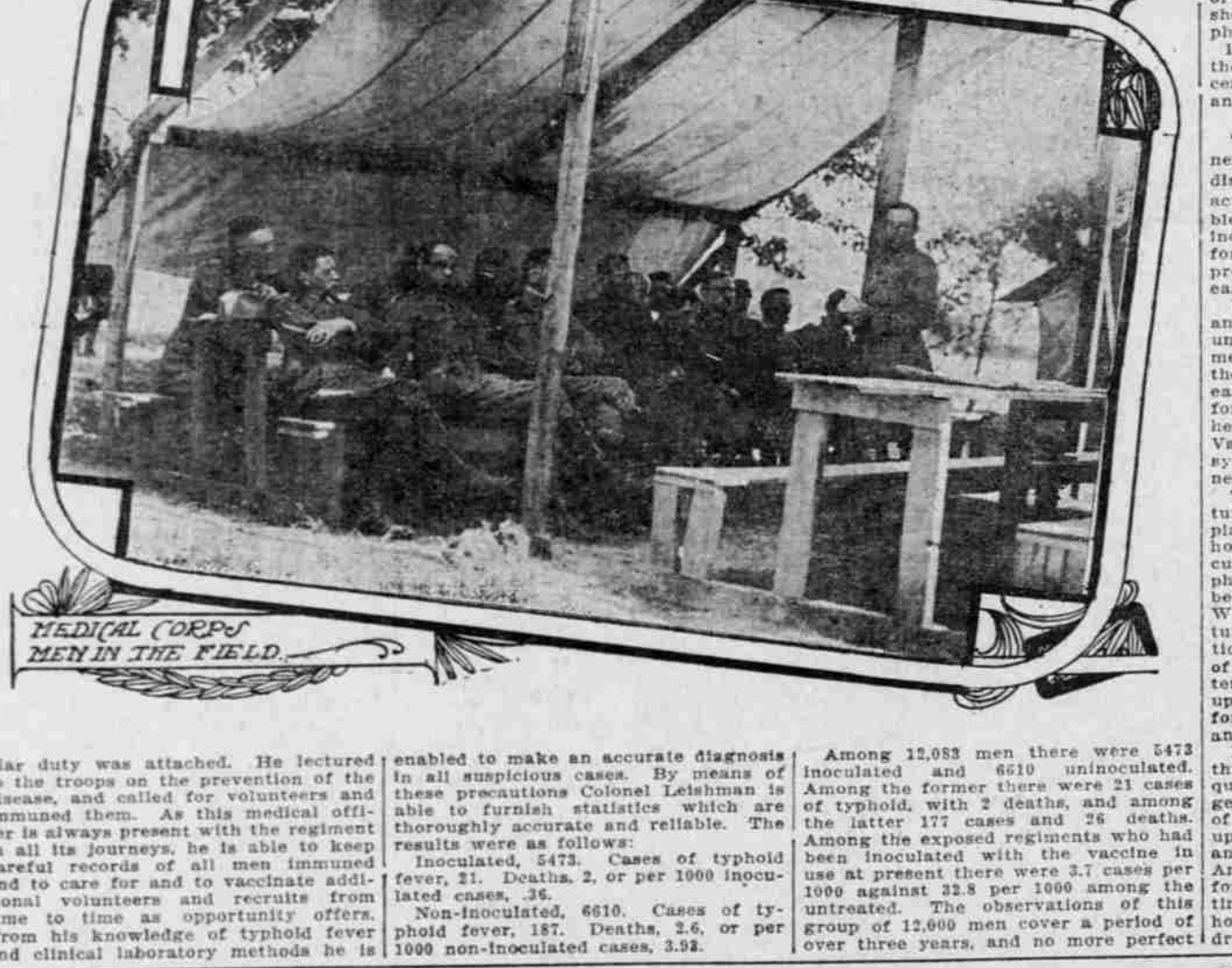
Uncle Sam's Army Medical Corps has been demonstrating. Major F. F. Russell is the chief instrument in its working out. It is but proper that the men of the Army should work out the solution of this problem, for when a fever takes greater toll than all the bullets. In the Spanish-American war 86 per cent of all deaths were due to typhoid.

In the Federal Army during the Civil War there were 50,000 cases. In the Franco-Prussian war the German forces lost 375 men from typhoid or 40 per cent of their total loss. In the Boer War the toll was 6000 men.

These frightful mortalities have aroused that portion of the medical world which has to do with its armies, and a great campaign for the prevention of these losses has been made. The latest phase of that campaign has been the vaccination of one-sixth of our boys in blue within that short period embracing the last 18 months. In an additional similar span the remainder of the Army will have been immunized and the greatest of the stumbling blocks removed.

The battle that the British were waging against disease in India in the '90s led from inoculations for the prevention of cholera to the application of the same principles to typhoid. Sir Al-moorth E. Wright, of the British forces, made a vaccine and tried it on two men. He was carried away with the results. The men became immune.

The English and the Germans began the long march toward developing the right serum and its right application to the individual. The most satisfactory check on results was gotten by Colonel Leishman, of the British army. Leishman vaccinated 5472 men of the British army. These men all belonged to 15 regiments which had been selected for a carefully controlled investigation on a large scale. As each of these regiments was in turn ordered to service in India, a medical officer who had been especially trained for this partic-



MEDICAL CORPS MEN IN THE FIELD

or convincing statistics are needed to show the value of this method of prophylaxis.

It seems to show that beyond a doubt the death rate has been reduced 90 per cent. Yet the process was yet young and the Yankees had not begun work.

The secret of the vaccination business lies in capturing the germs of the disease, killing them to prevent over-activity, and then placing them in the blood. This arouses the system of the individual and it produces an antitoxin for the disease in question—that is, it produces something to fight that disease.

When one has smallpox or typhoid or any such disease, it ravages the system until that system develops the elements that will counteract it. When these elements are developed the disease is met by an equal or conquering force and is able to make no further headway. The patient is then immune. Vaccination is but a fire alarm to the system and starts it to developing the needed antitoxin in advance.

The Government experts have cultures of typhoid germs which they can plant any day and raise a crop in 20 hours. The secret of this particular culture came from the spleen of a typhoid fever victim years ago, and have been kept virile and on top ever since. Whenever the vaccine is taken up and placed under the proper condition in tubes and allowed 20 hours of growth. In this time hordes of bacteria have been produced. These are cultured in test tubes and placed in hot water for 75 minutes. This kills the bacteria and it is ready to enter the vaccine.

But these germs must be counted and this process is ingenious. A given quantity of the mixture containing the germs is placed with a similar quantity of human blood. The mixture is shaken up. Then it is spread thin on a glass and put under a powerful microscope. Any given area of the glass is counted. So Ross II, who succeeded in 1872, followed his example and married the dusky inn, another high-bred Malay woman, who made a brave and devoted wife. But the present successor to the throne, though this three-quarters native, speaks from under a long Malay mustache with a broad touch of Scotch burr. It will take many generations for the palm to choke out the thistle.

George Clunies-Ross was getting a Glasgow University education when the urgent call came from his father to come back to Cocos in 1862, when a terrific cyclone and typhoon almost blew the settlement off the island. He took hold with a ready hand, and from his accession to his recent death he ruled the island like a true chip of his grandfather. He used his scientific training to good advantage on the island, and in a year or two every lighthouse in the Malay Archipelago was being lit by oil from the Cocos palms. Like his grandfather also, he was a pace in the arts of strength and seamanship no native could follow, and his court never heard the murmur of a mutiny.

For the biologist, as well as the ethnologist, the place should be ideal for research. To consider how the crowds of animals ever gained a foothold on a bit of coral so completely isolated from civilization, is a problem indeed. It seems as though all the enemies of man have done the incredible white none of our friends have survived the test. Rats from the ships, insects from the air and the water, unbelievable voyagers like cockroaches, centipedes,

thick as the corpuscles then there would be a similar number in a drop. If they are half as thick there would be half as many, and so on. So the number of bacteria may be compared with blood.

When the number of bacteria in a drop is known, that drop may be diluted and divided indefinitely. For a vaccination dose 5,000,000 dead germs are needed. The men of science have counted so accurately that the doses they fix up will not miss this exact number very far.

This vaccination is not to be compared in severity with that for smallpox. The patient has entirely recovered from the disease before he is vaccinated and this is fully developed within 12 hours. For a day the patient feels like he was going to have the grip or a cold, or some of those milder attacks, or suffer slight nausea. This usually lasts but two or three hours and all symptoms disappear. There are never any serious effects of the vaccination. The medical profession of the world has observed in all some 30,000 vaccinations. In no one of these has there been any injury or fatality. There is nothing whatever to fear in the process.

There is not a healthier place in the world than the army post. The sanitation of these is excellent and typhoid is infrequent. But when the army goes into encampment in time of peace, the demon immediately gets busy. Typhoid is a country disease. It lurks perpetually in communities where sanitation is inefficient or non-existent. When the army goes into the country it enters a realm of danger that is equal to that of the frontier. The men from the city takes his family into the country all other conditions may be ideal, but the typhoid germ lies in wait.

The first necessity from a governmental standpoint is the protection of the army from this danger. That protection is rapidly being brought about

The next step that suggests itself in the protection of the vacationist from the danger that he faces. The people from the cities who go into the country in the Summer are generally of the educated class and are classed as intelligent seeking health benefit. It is expected that these will be the next to offer themselves for vaccination. When they go the military department may waste the source of infection into the country will be largely done away with.

The people who go habitually into the South, into the tropics, into the rural districts for business, should soon resort to vaccination and probably will. There is the great rural population which is habitually the source of infection and arousing those to the needs of the new treatment is the greatest of tasks.

Typhoid is a contagious disease and transmits itself from one person to another. This, however, must be through an actual contact, usually through a person whose hands are not washed after contact with the germs handling the food of other persons. When there is in the family or the neighborhood a person suffering from typhoid, the germs that enter the water supply, the milk of the neighborhood, the food of the family, the hands that nurse the patient, for instance, may waste the source of infection. In this way the disease is transmitted.

In most contagious disease a similar principle exists. The rational system in typhoid is the isolation of the patient. This scheme works and makes extermination possible in most diseases, but is hardly effective here. The difficulty here lies in the fact that the patient recovering from an attack may or may not become entirely free from the disease.

Three persons in a hundred who have had typhoid do not throw it entirely out of the system. They apparently recover but the germs remain in their systems and their associates are constantly menaced. You or I may be a carrier of typhoid and a constant danger to the people who are around us. We may have had the disease 20 years ago and the germs may yet be in our systems. Here and there, as occasionally, we fall a little short of absolute cleanliness and as a result a member of our family, an intimate or a friend, comes down with the fever and we have caused it. Although we may not be aware of it, this occasional chronic carrier of typhoid is an element that keeps the disease always with us. From this individual the disease may break out at any point at any time. For there are and always will be people who handle the food or the effects of others without first washing their hands. The unwashed hands of housemaids and housekeepers result in the death of thousands of people every year.

There is the case of "Typhoid Mary" in New York. She was a cook in many households. Wherever she went typhoid followed in her wake. She had suffered from the disease many years ago and the germs persisted in her system. They got into the food of the families in which she worked, for it is suspected that she was not over-zealous as to cleanliness. In the end she was tested for the germs, found to possess them, and isolated.

There are no vaccinations of the country. Some member of your household, a neighbor, a servant may be a carrier of the disease. The best way to prevent that the complaint crops out year after year in many places. But for this it could be put to rest. The Army has germs applied the best to thousands of men selected at random from 2 or 3 percent the menace has been found.

If the "Typhoid Marys" were careful as to cleanliness they could no longer be a menace. But they are not careful and therefore the body politic must protect itself against them. The Army Medical School is demonstrating that this may be done through vaccination.

EUTOPIA FOUND IN SOUTH PACIFIC WITH SCOTCHMAN, ROSS IV, KING

Coral Mon-arch and Fortune Owned by Hardy Highlander—Malay Who Visits London on Worldly Business—Perfect Climate—Keeling Island Contended and Happy.

LONDON, Sept. 17.—(Special.)—Folks have often wondered whether that dreamed of finding would be a monarchy or a republic. It is found now—the search is over. It has turned out to be an absolute monarchy—and the king is a Scotchman.

Perhaps the world would never have heard of this happy monarch or his kingdom if he hadn't turned up the other day in London on some stupid matter of worldly business. But once there, an unguarded allusion quickened interest. Inquiries were made and out came the whole secret.

Cocos-Keeling Islands is the name of this blissful monarchy, and Sidney Clunies-Ross, styled officially Ross IV, is its benevolent despot. The Cocos and Keeling Islands are a tiny little coral group set down in the middle of the bright blue South Pacific. Half a thousand miles from any land at all, and almost 1000 miles from the slender arts of civilization practised in the Straits Settlements.

Complete isolation, a perfect climate, a brave record, a happy people enjoying a prosperous trade—what more could be expected of Paradise itself? King Ross the Fourth inherits a dynasty of his dynasty that few monarchs can boast of. His forebears sprang from the granite stock of the northern Highlands, and fought for the Jacobites in the days of Queen Anne with Clan Chattan of Sutherlandshire. When this always hopeless cause was finally lost, Alexander Clunies-Ross was one of the fugitives who fled for life to the wild shores of the Shetland Islands.

Here he founded his family in surroundings that reared an untamed and hardy race. Here his great-grandson, known to Cocos as Ross I, was born in 1788. In a little cottage within reach of the spray of the sea. Trained in this briny atmosphere, John Clunies Ross found himself, at the age of 27, mate of the brig Olivia in the

South Sea, bound home with a rich cargo. But the war of 1812 was on and American privateers were the terror of the seas; so when, by a lucky chance, Ross was offered a captain's commission under the British-Javan government, he jumped at the opportunity.

The owner of the ship happened to be Alexander Hare, then governor in Java. Hare was the son of a pious London watchmaker, but the spell of the East made him an eccentric degenerates. His craze was oriental luxury, and when Ross first met him at Malacca, Hare was presiding over a goody court, with a retinue of slaves and musicians, and an extensive, cosmopolitan harem.

Hare was not without his good points and threw his fortunes in with Ross in search for more adventure in new lands. Ross built a ship of 425 tons, took his wife and sailed for America, while Hare started in the opposite direction, both planning to meet again in Java. But America did not suit, as Ross wanted the sound of the sea always in his ears; and Australia he regarded as only a convict colony. Thus did this virile Scotsman look over the whole new world in vain, until he happened on a little island in the South Pacific.

He had heard of Cocos before, and so it chanced, Hare had also.

When Ross arrived, he found his countryman already established, at the head of his court attended to a complete scale of ceremony. From the obvious fact that Hare's painted parasites of pleasure were not averse to a pioneer colony across the inevitable salt. One by one the men came over to a party of industry which gradually grew up around Ross, leaving Hare at last with his harem, at the head of the party of dalliance. A night rush made the severance complete, and Hare was quietly shipped away to Singapore, while King Ross I reigned supreme in Cocos.

Few realms ever had a more cosmopolitan population. Of the 15 human beings landed on the coral group, only 20 were white, while among the darker

skinned races there were Chinese, Malays, Pannans, Cape negroes, Hindus and East Indians from practically every island in the Archipelago. The resulting race today is a unique ethnological curiosity—a composite production from many strains.

Ross the First ruled with an iron hand. He wasn't content with having the cannon beat on the island, he sawed them off with a strong edge of interest for today is a unique ethnological curiosity—a composite production from many strains.

Two more events stand out in the record of the long reign of Ross I, both with a strong edge of interest for today. One was the visit of Darwin in 1836, on the famous Beagle. Cocos was the only coral island Darwin ever examined, and what he learned there played an incontestable part in the development of his scientific theories. The minor theory of subsidence, by which he explained how coral islands came to be, was wholly due to his trip to Cocos.

The other event was the Civil War. Among the scum of three continents then floating about the Southern Pacific, there landed at Cocos a cut-throat Yankee named Raymond, whose villainy severely strained relations between Cocos and the United States for many years. The present ruler visited New York recently, however, and professes himself quite reconciled.

A party of British bluejackets landed when Ross II was King, and took formal possession of his six-mile strip of territory in the name of Imperial England. It has been rumored and not denied that this expedition never meant to go to Cocos-Keeling, but to another

Cocos in the Andaman group. But the ceremony was a pleasant invasion from the outside world, and never made the slightest difference in the status of the island.

Ross II was as Scotch as his father, but his marriage with S'pla Dupongbut a Royal Solo-Malay lady, slightly darkened the color of his dynasty. His wife was a noble and gifted woman, however, and the Malay population always loved her with unwavering loyalty.

So Ross III, who succeeded in 1872, followed his example and married the dusky inn, another high-bred Malay woman, who made a brave and devoted wife. But the present successor to the throne, though this three-quarters native, speaks from under a long Malay mustache with a broad touch of Scotch burr. It will take many generations for the palm to choke out the thistle.

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scorpions, beetles and one staggering but well-authenticated monkey—all have assisted in demonstrating the life of the outer world. The invaders have not been welcomed, however. The natives have expelled the rats, for instance, to an island of their own, but some have escaped to the inhabited islands and have developed a curious capacity for climbing trees and chewing off the coconuts for food.

With the planting of every vegetable springs a new parasite as though from the empty air. Whence it comes nobody knows; it is Nature's conjuring trick. But it gets right down to work at once on the food provided for it by Mother Earth. For studying the problems of the survival of the fittest and variation of species, Cocos has many advantages.

Think of this realm! The most perfect coral island in the world, ranged like a necklace of pearls round a still, blue lagoon. Outside, a stiff southeast trade wind presides an even temperature. Green palms wave over the bits of the stately, curious natives, over the prosperous, unwarmed factories, where labor unions or wage scales are as yet undreamed of, and over the broad, comfortable palace of the monarch of his new Eden. Over the peaceful shores passes a cable which is never tapped for news, but clicks onward with the ceaseless clatter of the work-a-day world past dreaming, unconscious Cocos.

The orderly police, if needed by no police or military force. No agitation bruits about to revise the tariff, for there is no tariff; no reforms are set on foot to extend the franchise, for there is no franchise. No sensational writer excites the jingoism of the "Cocosans" for there is no press; no man pines to get into society, for there is no society such as a democracy reveals, only elementary aristocracy. There has been but one crime in the history of the island, and no divorce case. Typhoons are much more common than discontent—and there have only been four of those upheavals. Said I not at the beginning that Utopia had been found?

Then there is the brand new phase of the work. These men of the Army have recently attacked the disease. It is individual is found to have typhoid he is immediately vaccinated. This vaccination develops more rapidly than does the disease. Its object and effect is the development of an antitoxin, an element in the blood that will make the disease ineffective. The idea is new and the men of science who are handling it refuse to make any statement until it has been demonstrated over and over again that it is effective. It may be said, however, that some marvelous cures have been effected in this way. They would indicate that vaccination may reduce typhoid which has already developed to a disease that is of but half the force that it has under the old methods.

So the men of the medical school of the Army are getting to the point where they are willing to stake their reputations on the benefit of vaccination. They think that they have proven as a scientific fact that this is the method in which they believe that the system will be thousands of good American lives and that this is no mean accomplishment. They know, further, that the value of their demonstrations will depend largely upon an understanding of them sort of the people, for the time will probably never come when this sort of vaccination will be mandatory.

So, they hold the man who tells the story of the new method may save more lives than all the Carnegie heroism enumerated. The Government has prepared vaccine in abundance and will freely furnish it to practitioners in whom it has confidence, men whom they will agree to report results. It is being scattered broadcast in this way and soon all the world may come under its benedict effects.