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TYPHOID

HOW UNCLE SAM IS FIGHTING THIS DREAD DISEASE

Dr. General Russell

Preparatory Service for Inoculation

The history of the world's wars would show much of their horrors and more than two-thirds of their terrible losses of human lives if the frightful ravages of epidemics in military camps were omitted from the lists of dead charged against each campaign.

For disease, not the sword or bayonet or the deadly rifle nor the great cannon belching shot and shell, has been the real reaper of the great majority of soldier dead through all the ages. For every man dead from wounds four have died from disease. Plagues of many kinds have decimated the ranks of armies, but in modern warfare the bacillus of typhoid has been responsible for sending more men to the hospital in wartime than any other single disease.

This is because during actual war conditions many soldiers are speedily enlisted from civilian ranks and because the authorities of all nations have persisted, and for that matter, still do persist, in having sanitation around great military camps practically no better than those in use in the middle ages.

As a result, while during ordinary periods the rate of typhoid is less in the army than in civil life, the formation of great military camps preceding or following a declaration of war is almost certain to result in a tremendous increase in typhoid. In fact, in the Spanish-American conflict the death from typhoid alone far exceeded by many hundred per cent the loss by wounds.

FEWER CASES THAN DEATHS BEFORE.

The new anti-typhoid serum is far better than any possible cure for typhoid could be, for it absolutely prevents the disease, and in modern medicine even

more than in other sciences PREVENTION is recognized as far superior in efficiency than CURE.

From a strictly accurate scientific viewpoint the anti-typhoid serum is neither an antitoxin nor a vaccine. It is really a fortification of the blood with the principles that enable that fluid to kill off any typhoid germs that may from time to time find lodgment in the system. In other words, it is a specific when taken in advance of the entry of the disease germs, and in this characteristic it exactly coincides with the so-called anti-tetanus serum.

The making of the serum is interesting. The laboratory worker first starts with a collection of the very typhoid germs he desires to exterminate and cultivates them in a special bath which is extremely nourishing to this bacillus, so that the germs flourish amazingly and speedily mount into the millions, whose colonies they form in the broth.

This is done because the elements need to combat the germs also form in proportionate strength. Then the germs are killed by heat and the elements which are opposed to the typhoid germs are preserved in the culture by the addition of an antiseptic, which prevents any decay or fermentation or other chemical change. In this way, also, any contaminating germs are prevented from obtaining access to the broth, which otherwise would form a most attractive home for these vagabond and dangerous members of the bacillus family.

PUT UP IN TUBES.

Such a preparation is quite harmless. It is hermetically sealed in a tube, in which a glass and air-tight plunger has been inserted. When ready for use the slender glass end is snapped off and a sharp needle is attached to a rubber tip. When the plunger is firmly pressed the typhoid anti-toxin is forced under the skin and a small portion of the muscular tissue, after which it is slowly absorbed into the circulation.

THEORY NOT A NEW ONE.

The theory under which this preventive of typhoid works is one that is now fairly well known to the public—namely, that the entrance of every germ into the human body at once causes the formation in the blood of active principles hostile to the life of that disease germ. Now, then, the scientist in this case merely obtains a serum extremely rich in the principles that combat typhoid fever and introduces it into the blood.

which Uncle Sam's doctors undertake to altogether prevent any recurrence of the horrible typhoid slaughters of past military campaigns.

So far Major Frederick F. Russell, under whom the entire work has been handled, has merely inoculated a few volunteers from among the various military organizations quartered near Washington.

The photograph shows an inoculation against typhoid taking place in the army laboratory. The work is simple, practically painless and requires but a moment or two.

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The general result is an immunity from typhoid fever for about two years, the actual period of immunity depending largely on the particular individual and the state of his general health at the time of exposure to infection. The immunity granted is exactly like but not as great as that obtained by a man who has suffered one attack of the fever.

The infusion of the new serum with the blood causes on a very slight scale the symptoms of a mild attack of typhoid fever. The patient has a high fever for about eight hours and has no appetite or energy for from 14 to 18 hours.

In the cases so far treated in the United States Army the men have been inoculated about 2 o'clock in the afternoon and have usually been able to eat their breakfast next morning with a fair appetite. This means that for a slight sickness far from equaling the distressing symptoms of many a slight cold the soldier can now obtain the certainty that he walks unassailable through swarming germs of the typhoid bacillus.

The idea of attempting to attain for Uncle Sam's boys in blue khaki, safety from the terrible scourge that harvested thousands of their progenitors in the past was of this republic resulted in the sending abroad of Major Frederick F. Russell, of the Army Medical Corps, whose training and aptitude for this most important mission was recognized by the department as unusually fit.

Major Russell made extensive studies in Germany as to the workings of anti-typhoid serum in the German Army, especially as to the results obtained during military expeditions of the Kaiser's soldiery in Africa. He also visited the great British Army camp at Aldershot and



Infusing the Anti-typhoid Serum in a Human Body

studied the reports upon the anti-typhoid inoculation as practiced during the Boer war.

In neither the German nor the British Army had practical perfection been achieved. It has taken the United States considerable time and ingenuity to prepare for the final advance against typhoid the ranks of its brave soldiers.

When volunteers shall next be called for, as has been done by President McKinley during the first days of the Spanish-American War, these soldiers will in all human probability be inoculated against typhoid as soon as enlisted. In this way the terrible mortality which has hitherto ensued upon the herding together of thousands of men in hastily constructed camps will be avoided.

PRIVATE USE UNCERTAIN.

As to the use of the typhoid prophylactic in private practice there has been no word. The progressive members of the medical fraternity a weary campaign of education. In fact, it will probably be more easy to improve water supplies and sewerage disposal as to kill off typhoid through these means rather than through the serum of prevention.

If this serum were of value after the disease had once started the advertisement of its cures would undoubtedly lead to its frequent use as a preventative. Unfortunately, while it can ward off the germs of typhoid, it cannot do battle with them once they have found lodgment in the human system and multiplied in such numbers as to produce even the early symptoms of headache and lassitude typical of typhoid.

Hence the usefulness of the serum being prepared by Uncle Sam's scientists in his army laboratories for widespread use in private practice is doubtful. It is essentially a war measure in every sense of the word. It is fitted primarily against the typhoid plagues that stalk in the sands and kills its hundreds inevitably

once a great military camp has become impregnated with the bacilli.

A WAR MEASURE FIRST.

But as a war measure it is of the very first rank. It will, once war has been declared, increase the efficiency of our soldiers even more than a new improved rifle or some new-fangled smokeless powder.

Napoleon was wise in his generation for he declared an army's strength depended on the ability to keep those regiments fed. Today Uncle Sam has made a step forward for he will be able not only to feed his men, but to make sure that the dreaded scourge of a typhoid fever epidemic does not stalk through the ranks, marking its victims and turning them from capable military units into diseased impediments, useless against the enemy and a source of terrible danger to their still healthy and combative comrades.

FACTS AND FIGURES.

The largest pontoon bridge in the world connects Calcutta with Howrah.

A combined Danish and French expedition will visit the Danish West Indies in an effort to determine the part played by blood-sucking insects in the spreading of leprosy.

Motorists who suffer with cold hands while driving their cars may have relief by using a steering wheel provided with electric heat. An English invention describes a steering wheel with a core that carries two electrically heated coils insulated one from the other and from the outer rim.

ONLY POSSIBLE REASON.

Myrtle—She is going without a hat this year.

Myrtle—For what reason?

Myrtle—Because she has no hat.

THE GATUN DAM



The Gatun Dam has a well-established position as the backbone of the canal.

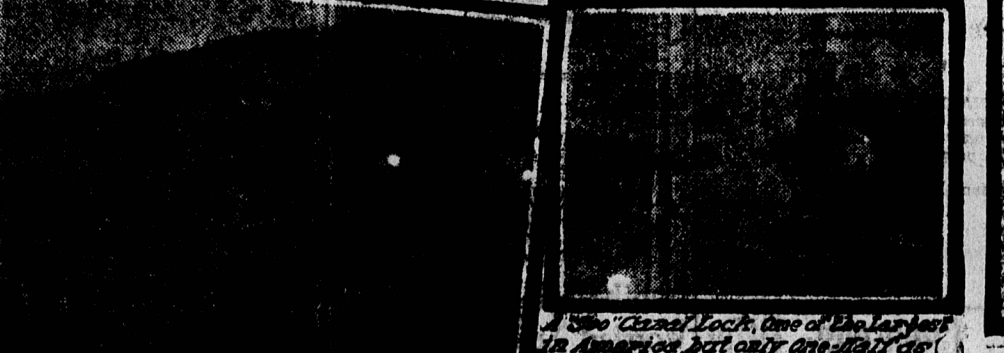
The Gatun Dam has a well-established position as the backbone of the canal. The Chagres used to be the arch-bogy, but now the structure which is designed to restrain that vexatious stream has usurped the first place in the interest and apprehension of the public. The objections and suspicions that have been directed against the great dam can only be accounted for by the fact that it is the key to the whole plan and the most essential feature of it. Any discredit that can be cast upon it affects the entire lock level project, and so the opponents of the canal concentrate their attacks on what they consider the most vulnerable quarter. The average individual, lacking technical knowledge of the subject, is prone to accept these strictures. To him the mere size of the huge mound involves a measure. But this is a mistaken view.

As a matter of fact, a considerable degree of its safety lies in its enormous bulk and weight.

The Gatun Dam will fill the gap in the hills enclosing the Valley of the Chagres through which that river passes on its way to the Atlantic Ocean. The obstruction of its course will force the stream and its tributaries to empty on the upper side of the dam and to form a lake about 100 miles in extent. The water in this immense reservoir will stand at an elevation of 85 feet above sea level and its depth will range from 45 to 75 feet, so that very little excavation will be needed. The canal course across the Gatun Lake will be 23 miles in length, or more than half the entire distance from shore to shore. Along this stretch ships will have the advantage of open and unrestricted navigation.

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The Canal Lock, one of the largest in America, but only one still to be built on the Gatun Dam.

material, such as engineers always look for in a large fill.

On the line they fully expected something of the kind and anticipated before the dam is completed. It should be understood that there is no saving in nor falling down of the Gatun Dam, as stated in several sensational published accounts of the affair. The Gatun Dam is not in existence. If it were, it should be very near the end of our task. The preliminary work upon it has just begun and it was in connection with this that the little slide occurred, whose rumble is still echoing throughout the States, although on the Isthmus it hardly caused the turning of a head.

As has been said, it is proposed to support the dam at its front and back with walls of rock.

The material for these has been dumped during the past few months, as it was taken out of the excavation at Bas Obispo. At the close of last summer a mound of this rock was made on the west bank of the old French canal, which

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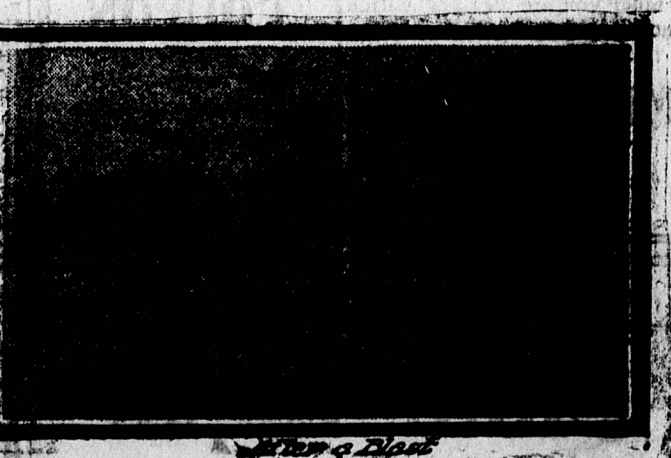
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