CONTAGION AS A FACTOR IN THE SPREAD OF TYPHOID FEVER IN THE MILITARY SERVICE.

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The abstract of the report on the origin and spread of typhoid fever in the United States military camps during the Spanish War of 1898, by Majors Reed, Vaughan and Shakespeare showed conclusively that personal contact was a most important factor in the spread of typhoid fever in military camps.

The lesson of that experience was thoroughly taken to heart by the medical department of the army, and on request of the Surgeon General the attention of all officers and men was called to the importance of this method of infection and to the means of preventing it by the following circular:

[CIRCULAR No. 62.]

HEADQUARTERS OF THE ARMY,
ADJUTANT GENERAL'S OFFICE,
WASHINGTON, Dec. 24, 1902.

By direction of the Secretary of War, the following memorandum, prepared by the Surgeon General of the Army, on the subject of typhoid fever contagion and the means of preventing it is published to the Army for the information and guidance of all concerned:

PERSONAL HYGIENE FOR THE PREVENTION OF TYPHOID FEVER IN CAMPS.

Typhoid fever is a very common disease in the United States and is particularly liable to spread among soldiers in camp and garrison because of the intimate association of men gathered together in barracks and tents. It is conveyed by the fecal and urinary discharges of persons suffering from the disease.

It often happens that a soldier suffering from typhoid fever remains on duty for several days before he seeks relief at the hospital. Furthermore, very mild cases occur which are never treated as such.

The disease is not contagious in the sense that the mere presence of a case determines contagion, as in smallpox or measles, but particles of human excrement containing the germ of the disease may in many ways be transferred from the sick to the well and cause typhoid fever. In this sense it is contagious.

That an infected water supply is a common cause of the disease is well known, but it is likely that in camp life a greater number of cases occur from direct contagion, man to man, than from infected drinking water. It is not probable that several hundred men can be assembled in a camp without at least one case of typhoid fever being introduced from outside, and this case may not be recognized until infection of others has taken place. Therefore, the immediate destruction or disinfection of the discharges of all persons in camps without sewers is an imperative necessity.

The fever may be spread by flies from infected excrement settling on articles of food in company kitchens and in other ways; also, by dust containing dried particles of infected matter.

Therefore, wilful or careless soiling of the neighboring ground by excrement or urine should be counted a serious military offense, as it is quite possible for a single instance of this kind to cause the sickness or death of many comrades.

The disease can be easily transmitted by dirty hands, soiled clothes, filthy playing cards, and numerous other ways by which very minute particles of human ordure may obtain entrance to the mouth.

Therefore, the personal cleanliness of men in camp should be a matter of gravest concern to officers and noncommissioned officers exercising authority, and every soldier should be instructed in the very simple principles governing infection by personal uncleanness. The weekly bath should be insisted

on and facilities furnished for it. Daily bathing should be encouraged whenever possible.

Washing the hands with soap and water and the use of individual nail brushes after going to the sinks and before meals is a necessity in camp life if danger to health is to be avoided.

The use of toilet paper is essential to personal cleanliness, and each soldier should at all times have a supply with him.

Soldiers using underclothing, towels, pipes, nail brushes, etc., which have been used by other men, do so at the risk of infection. Clothing and bedding soiled by discharges from the body should instantly be washed, or if woolen, disinfected.

Complete protection of food from contamination by flies, dust, and promiscuous handling should be had at all costs.

When a case of typhoid fever is removed from a tent the site, the canvas, and the articles within the tent should be disinfected.

With simple precautions cases of typhoid fever may be and are handled by nurses and attendants in hospitals without danger to themselves.

Without such precautions on the part of all men typhoid fever once introduced into camp will undoubtedly spread.

By command of Lieutenant General Miles:

H. C. CORBIN,

Adjutant General, Major General, U. S. Army.

Since this circular was issued evidence as to the frequency of this method of transmission of typhoid fever in the military service has continued to accumulate. In the autumn and winter of 1904-5 a severe epidemic of typhoid fever occurred at Fort Dade, Fla., in which the disease was confined to the enlisted men living in the barrack, no case occurring among those living outside that building, though all used the same water supply. The evidence of place infection was very strong and a complete disinfection of the building and all its contents was followed by a prompt cessation of the disease.

A rather sharp epidemic of typhoid fever at Fort Niagara, N. Y., in the same year also gave every evidence of barrack infection. In eleven cases occurring at that post nine patients were occupants of the same barrack and one other was a soldier who spent most of his time there. The garrison consisted of four companies, each occupying a separate barrack with separate messes, but the same water supply.

In the autumn of 1906 a severe outbreak of typhoid fever occurred in Cuba among the American troops which had but just arrived in that island. There were sixty-five cases with two deaths in the command in the period from October 1 to December 31. In summing up the result of his careful investigation as to the mode of origin and spread of the outbreak, Major Birmingham, medical inspector, said:

I have been strongly impressed with two points, viz., what appears to me to be the fact that this disease was disseminated largely, if not wholly, by personal contact (either directly personal or secondarily through clothing, equipage, etc.), and, secondly, that the origin of the disease, with few exceptions, could be traced to the maneuver camps at which the troops were assembled the previous summer. An interesting fact, to which I have previously called attention, is that in the First Battalion, Twenty-eighth Infantry, which regiment was badly infected before leaving the United States, there was a cessation of the disease after the equipage and personal effects of the men were packed up on leaving the home station, and a recurrence of the disease fourteen days after arrival at their destination, after the unpacking of these probably infected articles, and this leads me to the important conclusion that an organization infected with typhoid fever should not, except in case of grave military necessity, be sent on an expedition of any kind until after segregation in a quarantine camp, provided with the necessary means of sterilizing all

appurtenances, and allowing sufficient time to elapse to insure an absolute eradication of the disease.

In view of these and other occurrences of a like character, the following letter was sent to all medical officers of the army:

I am directed by the Surgeon General to invite your attention to the necessity of giving careful attention to the details of disinfection in the effort to stamp out epidemics of typhoid fever. The evidence of barrack, company and latrine infection is constantly accumulating. Whenever, therefore, a case of typhoid fever occurs in a barrack room, quarters or tent, that room or tent, the latrine, bathroom and washroom used by the patient, and everything else used by him, should be regarded as infected and all persons occupying the same room regarded as suspects. The patient having been removed everything which has been infected should be thoroughly disinfected. All contacts should be kept under observation for the full period of incubation, during which time all their discharges should be disinfected and their blood tested by the Widal method at least twice a week.

In 1906 medical officers were further directed to regard typhoid fever as essentially a contagious disease.

In order to stamp it out the following measures are considered necessary:

1. Early recognition of all cases, especially those of a mild or ambulant type.
2. Isolation of all those infected.
3. Complete destruction of all typhoid bacilli as soon as they leave the patient.

All undetermined fevers are to be regarded with suspicion and managed as though they were typhoid until the contrary is proven. All cases of typhoid fever should be isolated in a separate room or ward and carefully screened against flies and other insects. In the field they should be immediately removed from the camp and treated in a stationary hospital.

Detailed instructions were also given as to disinfection of all excreta and articles which had come in contact with patients, and for the personal precautions to be taken by nurses.

There has been practically a continuous fall in the ratio of deaths from typhoid fever per thousand of mean strength in the Army since 1898, the rate for 1906 being 0.28, a lower rate than that which obtained prior to the Spanish-American War. The admission rate follows the same course up to 1906, when there was a marked increase in this rate notwithstanding the continued fall in the death rate. This increase, however, is believed to be largely due to two factors, of which one was the increasing recognition of mild cases as shown by the fact that the case mortality fell from 8.5 to 5.2 per cent., and the other to the presence of practically the entire mobile army in the field at maneuvers during the summer; 40 per cent. of the cases occurred in the summer camps and were believed to have been contracted while on the march through country districts.

FIRST PICTURES OF SURGICAL OPERATIONS EXTANT.

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A recent publication of the Carnegie Institution of Washington contains some material that will doubtless prove of great interest to surgeons and to those who are especially attracted to the history of medicine. Mr. W. Max Müller,¹ while on a mission for the Carnegie In-

stitution in the summer of 1904, discovered what are the earliest representations of surgical operations so far known. The date of the next earliest pictures of surgeons at work are probably at least a thousand years later. Because of this primacy of historical import, it has seemed worth while to reproduce the pictures for the medical profession, since they are buried in a publication that ordinarily is not likely to be consulted by physicians.

The pictures were found in a tomb excavated by Loret in the northern part of the necropolis or burying ground of Saqqârah at Memphis, which was the early capital of Egypt. Memphis, it will be remembered, was situated on the western bank of the Nile somewhat south of the present Cairo. It is said to have been built by Menes, who is usually considered as the founder of the first dynasty of Egyptian kings. The date of the foundation of the city is still in dispute, but was probably not long after 5000 B. C. Memphis continued to be an important city until after the Mohammedan conquest and down to nearly 1000 of our era; it then gradually fell into ruins, and the remains of Saqqârah, sometimes written Sakkara, are not far away.

The tomb on which the surgical pictures were found belonged to a high official who lived under the first king of the sixth dynasty, one of the Atotys or Othoes of the old historian Manetho. This would be one of the so-called Pharaohs of scripture history, and the date of the tomb is not later than 2500 B. C. It is not quite clear just why surgery occupies so prominent a place among the sculptures of the tomb of this official, but it is presumed that he must have had something to do with surgery, and this was a method of recalling it for posterity. If this is the real reason, then it seems not unlikely that surgery occupied a much more honorable place at this time than has hitherto been thought.

The pictures as given are sculptured on the door-posts at the entrance of the tomb. Their discoverer, Mr. Müller, describes them as follows:

The pictures which I have extracted here are sculptured on the door-posts of the entrance. The left side begins above with a scene unintelligible to myself. Is the operator the man to the right, of whom only one knee has been preserved? The operation ought then to be on the left hand of the person squatting in the middle. Or is the left side the important one? We might find an argument for this in the way in which the left "physician" looks, namely, away from the patient toward the hand to be operated on while the other "physician" looking at the patient, would rather seem to watch him, lest he should stir during the operation. I am at a loss about this operation. The left physician seems to open the hand of the patient or to do something with his fingers. Unfortunately the inscription gives no help, only the words of the patient, "Ye move (?) in (my ?) life," seem to suggest that the patient complains of pain. Below are operations on the hand (palm) and foot (toe), both not very clearly represented. The drawing of the hand holding the knife in the left scene is as impossible as some of the proportions of the limbs. The left patient says: "Do this (and) let me go." The physician replies: "I'll do as bids (or praises) me the king." Evidently this address is jocular, if I have translated it correctly. The patient to the right implores the operator: "Don't hurt me thus!"—a cry in which he has our full sympathy. Both patients hold their arms to suppress their pain. The operating knives might be metal (little square plates of copper sharpened on one side) not flint, but as the colors have gone, I can not decide this with certainty; also stone might be possible.

It is not surprising that the most interesting thing about the pictures is the fact that the patients are represented as suffering intensely at the surgeons' hands in

1. Egyptological Researches, Results of a Journey in 1904. Published by the Carnegie Institution in Washington, 1906.