ENTERIC FEVER IN INDIA—A PROBABLE FACTOR.

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Owing to the absence on leave of the officer in charge of the Jubbalpore Brigade Laboratory, I was asked by Colonel S. C. B. Robinson, Principal Medical Officer of the Jubbalpore and Jhansi Brigades, to enquire into the continued prevalence of enteric fever in Jubbalpore, during the months of February, March, April and May of this year.

A total of fourteen cases had occurred amongst the British troops, the first being admitted into hospital on February 15th, and the last on May 5th; the cases occurred at different intervals during this period, showing that the cause or causes were in existence the whole time. The British troops in Jubbalpore comprise one battalion of Infantry (60th Rifles) and a brigade of Field Artillery, three batteries with an ammunition column. Of the fourteen cases, eight occurred amongst the infantry, and six amongst the artillery. No cases occurred among the married people or the members of the serjeants' messes.

The unmarried men of the 60th Rifles occupy thirteen barrack-rooms; of their eight cases no two came from the same building; the Royal Artillery occupy eleven barrack-rooms and their six cases came from four separate rooms.

The water supply to the troops is piped, from a source some ten miles off. I was informed that the water had recently been analysed and found pure enough to render boiling unnecessary. The same water was supplied to the European community, amongst whom no cases of enteric fever had occurred.

The milk supply is from the Government Dairy Farm, which is up-to-date and well appointed and is stringently supervised by the Senior Medical Officer, Lieutenant-Colonel Geddes, R.A.M.C.

Neither the milk nor the water could reasonably be held to be responsible for the enteric fever.

I made the stereotyped inspections of the different lines during the morning hours, and as my visits were anticipated very little information was gained. However, the Artillery lines were noticed to be distinctly overcrowded; the ground is limited, with the result that the barrack-rooms, with their accompanying cook-houses, latrines, urinals, &c., are too close to each other. The horse lines and native followers' lines are sandwiched in between the Artillery and Infantry lines and are cramped and crowded, and too near the artillery barrack-rooms. The coffee shop and R.A.T.A. rooms of the artillery were not as clean as they might have been, flies were plentiful, some of the native servants dirty, and the "washing up" arrangements were not satisfactory.

On the other hand, the 60th Rifles' institutes were well looked after, but in spite of this flies were present, though to a less degree. Their
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lines are not unduly crowded and they are fortunate in the possession of an intelligent and trustworthy sanitary corporal. The general sanitary condition of their lines was much superior to that of the Artillery; but yet, proportionately to their strength, they were almost as severely attacked.

Crude carbolic acid was in use by both units for the latrine pans. Not being able to discover any definite incriminating agent, I decided to visit the lines in the evening with a view to seeing things as they existed out of inspection hours, paying particular attention to the institutes, urinals, and latrines. The institutes I found to be very largely patronised; the food supplied was good and cleanly served, but flies were fairly numerous before dark.

After dark, the urinals and latrines were in total darkness and no attempt was made to show where they are located. I found almost every pan in the various latrines had been used and remained unemptied and uncovered. One four-seated latrine situated only a few yards from the Artillery coffee shop, and consequently much used by the men, had its pans practically full of excreta; there was a most offensive smell, and—just before sunset—flies were numerous. The latrine nearest to the coffee shop of the British infantry was similarly largely used and in much the same state. In the few pans I found unused, no disinfectant fluid had been placed, and no doubt the same state of things existed in the used pans.

I did not see a single sweeper or sanitary orderly during the whole of my evening tours. It appears that the sweepers work from reveille to 5.30 p.m., so that from this hour to reveille next morning sanitation is not existent.

We here find all the conditions required for the spread of enteric fever:
(1) The infected person in the form of the enteric carrier (as there are over fifty recovered enteric cases amongst the British troops in Jubbulpore, a few of these are almost sure to be carriers). (2) The infected material, in the form of the fresh and undisinfected excreta, or urine of one of the infected persons, who chances to use the latrines after 5.30 p.m. (3) The presence of numerous flies in the coffee shops and the adjacent latrines. (4) The susceptible individual (no less than thirteen of the fourteen cases were uninoculated against enteric fever, the fourteenth having had only one dose).

That this cessation of sanitary measures between 5.30 p.m. and reveille exists in the great majority, if not every, station in India, is very probable. Experienced medical and regimental officers to whom I have spoken on the subject agree with me on this point. However, there can be no two opinions that, where it does exist this insanitary procedure should be at once altered. It will be interesting to note if there is any reduction in the number of cases of enteric fever in cantonments, when
the sanitary measures usually adopted by day are also adopted at night, or at least till "Lights out."

The following were the chief recommendations made to meet the case in Jubbulpore:—

(1) That the latrines and urinals used at night, particularly those adjacent to the institutes, be supplied with lights till "Lights out."

(2) That till "Lights out" arrangements be made to empty the pans as in the daytime—there is no necessity to remove the night soil to the trenches after dark, so long as it is placed in the covered iron receptacles, with a plentiful supply of disinfectant fluid.

(3) That saponified cresol (½ ounce to the gallon) be used in the latrine pans, and that sufficient fluid be placed in them to allow it to stand at least 1 inch deep.

(4) That a sanitary orderly, or other responsible individual, make an inspection of all the latrines at "Gun fire" and see that the pans are clean and filled with a double supply of disinfectant fluid for the night.

To carry out these recommendations it will be necessary, either to employ extra sweepers, or to place some of the present staff on night duty. Extra expenditure no doubt will be incurred, but this, to my mind, is a minor matter compared to the advantages gained. I cannot help thinking that given the grave sanitary defects described above we can never hope to eradicate enteric fever from cantonments in India.

It is interesting to note that no further cases of enteric fever have occurred in Jubbulpore since the above defects were remedied, nearly three months ago.

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**Reviews.**


We welcome with great pleasure the third edition of this useful little book, the second edition of which was published ten years ago. Whilst the principles upon which aseptic surgery is founded cannot alter, the manner of their application has undergone in those ten years many changes making for improvement and simplicity. Those who have read the previous editions of the book will notice this.

The importance of bacteriology in surgery is rightly laid great stress upon, it being pointed out that it is as important in this science as anatomy, physiology, and pathology.

The writer in the chapters on the bacteria of wounds enters succinctly, but quite sufficiently for the purpose, into the characteristics of the commonest micro-organisms, remarking, very truly, that "where accumulations