thesis when we remember that at the time typhoid fever was very rife in the prisoners' camp, and further assuming that typhoid infection can be airborne—the possibility, may the probability, of the infection being thus conveyed from the prisoners' camp to the military guards appears to be well founded.

3. But in addition to the assumption that the emanations from the prisoners' latrines may have conveyed infection to the military guard, it has to be recorded that the soil of the prisoners' camp gave peculiar facilities for the spread of the infection. The rank grass which originally covered the slope upon which the previous camp was arranged very soon disappeared, giving place to a reddish soil, so friable that dust was much in evidence, notwithstanding that it was the rainy season of the year. Now it is not unreasonable to reject as pure the dust of a camp in which at the time a formidable epidemic of typhoid fever was prevailing.

4. Lastly, the possibility of the infection being conveyed to some extent by flies must be considered. During the whole period that typhoid fever was prevailing in the prisoners' camp, flies in that camp amounted almost to a plague, the military camp being also infested, but to a lesser extent. Now flies being well adapted for the carriage of infection it is plain that, under the conditions existing in the prisoners' camp, there would be nothing to prevent flies laden with typhoid bacilli migrating from the prisoners' to the military camp, and thereby conveying to the latter camp the poison they carried.

I have endeavoured in this paper to review dispassionately the evidence bearing on the causation of the typhoid outbreak which occurred among the military guard at Diyatalawa Camp, Ceylon, during the closing months of 1900. I submit that I have shown—

(a) That all water avenues through which typhoid fever could have been conveyed to the military camp at Diyatalawa, were efficiently guarded, and therefore that a waterborne origin must be abandoned.

(b) That the infection was airborne, resulting from emanations from specifically infected latrines, infected dust, or bacilli-laden flies.

SO-CALLED "REMITTENT" OR "PRETORIA" FEVER.

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A GREAT many soldiers who stay for any length of time in Pretoria or its neighbourhood suffer from attacks of fever of a remittent type which is of short duration, and for want of a better name and a good deal from want of any accurate knowledge of its nature is returned either as "remittent," "malarial remittent," sometimes "simple continued" fever, and has even been given the special name "Pretoria" fever. To ally the complaint with malaria, however, is distinctly wrong, as it has no connexion whatever with it.

Below I only refer to the fever of the Pretoria neighbourhood. I do not include the simple continued fever so common at the beginning of the war amongst soldiers, especially in Cape Colony. This fever was more often of an intermittent type. True malaria does not, so far as I can ascertain, exist in Pretoria and its neighbourhood among the soldiers, except cases imported from Komati Poort and its surrounding districts.

I am informed, however, that amongst the poorer class of Dutch living on the low-lying ground near the river in Pretoria a low form of fever occurs, but I have seen no cases of a malarial nature amongst soldiers living near. I am also informed that about Penaar's River an intermittent fever occurs among the soldiers; the temperature rarely rises over 100°, and is unaffected by quinine. Personally I have neither heard of nor seen a single case of remittent fever, originating in this district, in which plasmodia have been found in the blood. Captain Beveridge, R.A.M.C., Analyst to the Army in South Africa, who has examined the blood of many of these cases, has not met with a single instance.

The onset of fever is, as a rule, sudden; the patient has

been feeling out of sorts probably for a day or two previously but not sufficiently so as to cease work. The attack commences with acute frontal headache, pains in the back and legs; sometimes acute pain in the lower part of the occipital region, which occasionally occurs in enteric fever and is rather a characteristic symptom when present; sensations of "cold water being poured down the back"; often vomiting; loss of appetite and *malaise*. In 24 hours the temperature may reach 104°, rarely higher. A history of diarrhoea previous to admission to hospital is often given.

When admitted generally after about twenty-four hours' fever, the patient's condition is usually as follows: Headache as above, also about this time slight abdominal pain located, as a rule, by the patient above the umbilicus, and passing from right to left, slightly griping in nature (an almost constant symptom). Vomiting, if present, rarely lasts more than twenty-four hours after admission. Diarrhoea is fairly common for the first day, sometimes longer, but occasionally the patient is constipated. He is heavy and languid, with flushed face. The temperature variable, between 100° and 104° as a rule. The tongue is generally thickly coated with white or yellow fur, sometimes inclined to be dry, sometimes quite moist; occasionally quite clean, even raw-looking and moist. No enlargement of the spleen can be felt, but as a rule there is tenderness over this region (below the costal margin), and sometimes over the liver. On the whole, the condition on admission is generally much more characteristic of an intestinal lesion than of malaria.

The temperature generally descends gradually, dropping one or two degrees in the morning, rising half to one and a-half in the night. The time of descent is variable, two days or much longer, but remittent in character. The symptoms rapidly ameliorate; the headache disappears within two or three days, and even though the patient has a temperature of 101° or 102° at night, he may be quite indignant at being kept in bed and on a light diet. Spots resembling enteric only occurred in one case of mine (at the sixth day), but not more than 20 per cent. of the enterics out here have characteristic spots.

The stools are rarely typically enteric. The pulse is slow and quite out of proportion to the temperature. In one or two cases it was markedly dicrotic, even when the temperature had become normal. In one case with a normal temperature and dicrotic pulse, a typical enteric "relapse" occurred.

The tongue may clean rapidly, but often the coat persists for several days after the temperature is normal. This generally prognosticates a relapse with all the features of true enteric fever.

In contrast with malaria sweating is not at all a constant feature towards the termination of the fever, and is not profuse when present. The duration of the fever is from five days upwards, if beyond twelve days the diagnosis has to be altered to enteric fever.

NATURE OF THE FEVER.

Personally I have had very many, I may say hundreds of cases of the above type, and the conclusion I came to some time ago was that they were almost invariably abortive attacks of enteric fever. The proofs of this seem fairly conclusive.

1. These short fever attacks more often occur in men who have been some time in the country, generally well over six months. For instance, in about one month, out of 11 successive cases of "remittent" fever (under thirteen days fever), 1 patient had been out five months (see list at end—he had a relapse), one 7, one 10, and the rest all over a year, three-quarters of them over eighteen months. The reason is that most of these old-service men are, under ordinary circumstances, immune to enteric fever. In the first six months out here many men if they get run down will get true enteric fever not "remittent." The remainder after six months are more or less immune, that is, their powers of resistance are very high; but even these—after prolonged exertion, bad food, etc., have their resistance broken down and fall victims to fever. So soon as they get rest and proper feeding the resistance reaches its former high level and the attack aborts; they have had "remittent" fever (otherwise abortive enteric).

Occasionally it happens that though the disease aborts their powers of resistance again give out, probably owing to their being debilitated by a prolonged light diet, and the men relapse with typical enteric fever.

2. Short attacks of "remittent" fever occur frequently in men who within a short time (1 to 12 months) have had a true attack of enteric fever. This occurred in my own person, and I have many cases in my notes. An attack of enteric does not prevent a second, but it undoubtedly makes the second attack milder in the majority of cases.

3. The symptoms and signs point more to intestinal mischief than anything else, and closely resemble at first the early stage of the enteric fever.

4. The absence of plasmodia in the blood of these cases, the failure of quinine to affect the course of the disease, and the absence of periodical attacks, etc., excludes malaria.

5. In a large percentage of cases relapses take place after the temperature has been normal for from three days to three weeks. I have notes of many such cases, and in most the relapses are typically enteric fever and run a typical course of twenty-one days or more. A few relapse and have only a short attack like the first, and I have 2 instances of short relapses followed by second ones typically enteric. In the list at the end it will be noticed that 5 out of 14 relapsed; 30 per cent. is about the average. Before the time when I could use Widal's test there was always the possibility of these cases having contracted true enteric fever whilst in hospital. However, the precautions against infection were so elaborate, and the fact that patients suffering from other diseases contracted enteric so rarely in hospital (not more than 1 in 300 at the most), and whereas my remittent fevers relapsed in more than 20 per cent. of cases, without Widal's test this possibility was negated.

6. Remittent fever is most prevalent when and where enteric fever exists.

7. It occurs during times of the year when malaria in malarial districts is not prevalent. I had a number of cases in September. Malaria does not become really bad in Komati Poort until December.

8. Out of 11 successive cases of remittent fever of duration from five to ten days, mostly under my care, collected during one month, I obtained Widal's reaction in all. The majority had had no previous fever, and had not been inoculated. By Wright's sedimentation method I obtained reactions at dilutions varying from 1 in 50 to 80 and 160 within twenty-four hours at the most, and with a control experiment, agglutination method (1 in 10 dilution) in 10 minutes usually,

maximum time one hour. The total number of cases I examined was 14. They all reacted. These tests were generally made when the patient's temperature had been normal two or three days, and in several cases a typical enteric fever relapse took place in periods varying from one to fourteen days after the test, helping to form a double proof of the nature of the case.

9. A natural objection to creating a new disease neither malarial nor enteric, and of which we know no pathology, when it can be included with a well-known disease.

It seems to me most important that it should be recognized that these cases of so-called remittent fever are in truth enteric fever, both for the sake of the sanitary precautions that should be taken when such cases occur in block-houses, etc., and for the sake of the patient himself. It must be borne in mind that possibly out of 100 mixed cases of enteric fever and remittent fever, as many as 40 may be returned as "remittent" fever.

As regards relapses, they are considerably more frequent than in ordinary enteric fever, the chief reason being that the patient feels so well that it is often impossible to keep him as quiet as he should be.

I must draw attention to the fact that some of these cases do not go to hospital at all, and when trekking or in temporary camps form a fruitful source of infection.

As regards the pathology of these cases it seems probable that in these short attacks the disease never reaches an ulcerative stage. Naturally this is almost impossible to prove.

TREATMENT.

The great factor in preventing relapse is absolute rest. Prolonged fluid diet after the temperature is normal appears to me unnecessary and debilitating. After giving "early feeding" in enteric fever a prolonged trial, it scarcely proved satisfactory, and relapses were more frequent. In "remittent" fever I give a light diet (beef-tea, jelly, custard) for six days, full diet about the tenth day—that is, half the time of ordinary enterics. I keep the patients in bed twelve days after the temperature is normal, allowing them to sit up on the ninth and tenth day.

I have met with no case of this kind that has been improved in the slightest degree by the administration of quinine. A more effective mixture is one that Dr. Ewart used to give to his enteric fever cases—namely, Tr. ferri perchlor. m viii—x , liq. hydrarg. perchlor. m xv—3ss ex aqua t. d. s. It helps to clean the tongue, and abdominal discomfort, or even distension, is certainly relieved by it.

Initials and Regiment.	Length of Service in S. Africa.	Previous Fever.	Inoculated.	Length of First Attack.	Relapse.	Result of Widal's Test, Sedimentation Method.
	Years.			Days.		
Trooper W., S.A.C. ...	$\frac{10}{11}$	"Fever," Komati Poort 6 months ago; none since	No	7	No	Yes, 1 in 50 dilution within 25 hours; well marked
Private MacG., D.C.L.I. ...	$\frac{1}{12}$	No	No	7	No	Yes, 1 in 50
Private M., 3rd Camerons..	$\frac{1}{14}$	No	No	9	Yes, after 18 days' normal temperature	Yes, 1 in 80
Lieut. C., N.S.W. Bushmen	$\frac{1}{15}$	Enteric 2 months ago	No	13	No	Yes, 1 in 50
Private H., 1st Camerons...	2	No	No	10	No	Yes, 1 in 50
Private K., A.S. Corps	$\frac{2}{21}$	No	2 $\frac{1}{2}$ ago	7	No	Yes, 1 in 80
Private F., Cam. Highlandrs	$\frac{1}{15}$	No	No	9	No	Yes, 1 in 80
Trooper M., S.A.C. ...	$\frac{1}{11}$	No	No	5	Yes, after 5 days' normal temperature	Yes, 1 in 50
Private L., A.S. Corps	2	No	No	11	Yes, after 10 days' normal temperature	Yes, 1 in 50
Private C., M.M.P. ...	2	Enteric 6 months ago	No	7	No	Yes, 1 in 50
† Private S., 13th Hussars...	$\frac{1}{12}$	No	No	6	Yes, after 16 days' normal temperature	Yes, 1 in 80
* Driver D., R.F.A. ...	?	Enteric 8 years ago	No	9	No	Yes, 1 in 160
* Driver D., R.G.A. ...	?	No	No	9	Yes, after 6 days' normal temperature	Yes, 1 in 80
* Private B., 2nd Beds. ...	?	No	No	12 complicated with dysentery	No	Yes, 1 in 80

† Widal taken second day of relapse.

Average length of fever, 8 $\frac{1}{2}$ days.

In addition to above there were several cases with fever from 12 to 15 days, all reacting to Widal's test.

These, with the exception of three marked with asterisks, were the total numbers of remittent fever cases in hospital during a period of four weeks.

The number of enterics in hospital during the same period was about 30.

Control experiments (agglutination test) accompanied nearly all above tests, dilution 1 in 10, time of reaction ten minutes to one hour.

The bacteriological examination of these cases was made in the Government Laboratory, Pretoria, by kind permission of Captain Beveridge, R.A.M.C.