Enteric Fever in the South African Campaign

1900

by Hugh R. Phillips MB Ch B Edin.
late Civil Surgeon to H M troops.
The following thesis on Entérie Fever in the South African Campaign is not intended to be a scientific treatise, as owing to the want of microscopes and staining reagents all microscopical work was impossible, but an attempt to describe the results of my own observations during the twelve months when I was a Civil Surgeon in charge of troops.

The headings have been arranged as nearly as possible as in Coker's "System of Medicine."

For the first four months (i.e. from the middle of January to the middle of May) I was attached to the 4th Battalion, Argyll and Sutherland Highlanders, proceeding with them from this country, and remaining with them until I myself became attacked with the disease. It was at the time I was with the regiment that the difficulty of diagnosis in the early days of the disease was brought home to me. The month of June was spent as a patient in the Scottish National Hospital, Kroonstad, and I was then inval-
aided to Cape Town. In August I was given charge of a Convalescent transport (S.S. Templemore) homeward bound, the majority of the convalescent to being cases of enteric. Finally in October, November, and December I was in charge of the Enteric Division of No. 8 General Hospital, Bloemfontein.

My observations were made for the most part in the last place, where in addition to the Enteric Division I had charge of the Observation Marquees to which were sent doubtful cases of all kinds.

The statistics as regards inoculation were chiefly those given at a meeting of the Clinical Society, London, held in March 1901, by Dr. H. H. Booth and Prof. Wright: the remaining statistics I collected myself and which I have endeavoured to give as accurately as possible, though in three instances I have mislaid the actual figures viz:-

1. Number of convalescent enteric patients passing from other hospitals through No. 8 General on their way to the base.
(2) Total number of Convalescent cases on board the transport "Templemore".

(3) The number of enteric cases among the latter.

These figures have been filled in from memory.

Special stress has been laid on the diagnosis of the disease, which was a matter of great difficulty owing firstly to the fact that in the early days of illness several forms of fever have similar symptoms as those of enteric, and secondly because according to the existing army regulations all cases are supposed to be diagnosed within seven days of admission to hospital, a rule which however was not always strictly adhered to.
Until the close of the war and the statistics are made up, it will be impossible to realise the exact percentage of our soldiers who have been attacked by the disease and also the mortality.

From February 14th (the date of disembarkation at Cape Town) to May 23rd, in the 4th Argyll and Sutherland Highlanders out of a total number of 23 officers and 917 men, 4 officers and 32 men on the sick list were diagnosed to be suffering from enteric fever either before or after admission to hospital, with only the death of 1 private. Since then the numbers of cases and the mortality have increased greatly.

From October 15th to December 14th there were 92 admissions into the enteric division of No. 8 General Hospital, Bloemfontein: on the former date there were already 17 acute cases in the division. Of these 109, 19 were transferred from other divisions of the hospital, and the remaining cases were admitted locally from camps round about the
In addition between 200 and 300 convalescent cases passed through the convalescent division on their way down to the base.

The total number of deaths was 6 giving a death-rate among the admitted cases, of 0.5%. There was one other death in the enteric division, that of a case of dysentery which had been diagnosed and treated as one of enteric throughout the course of his illness.
Time of Year.

Since the great outbreak of enteric which commenced early in 1900 and practically dated from Paardeberg, there has been no actual cessation of the disease, though the numbers diminished very much after July of that year. In parts of the Orange Free State and especially in Bloemfontein enteric fever is a regular annual visitor, being prevalent especially during the months of February, March and April.
Distribution, Race and Age.

(a) Distribution. Enteric Fever is met with in all parts of British South Africa. In Bloemfontein, during an epidemic in 1892, (according to a medical man of that town) it swept off over 5% of the entire population. During the present campaign it has been most prevalent in the Orange River Colony, then in the Transvaal, next in Natal, and in Cape Colony least of all.

(b) Race. The fever is not unknown amongst the natives (i.e. Kaffirs and other coloured races), and when these do get attacked, according to local reports, the attack is more severe than in the case of white men.

(c) Age. Out of the 109 cases under my care in hospital, 5 were over 35 years of age: 69 were between the ages of 20 and 30.
Mode of Contagion

1. Water. This was undoubtedly the main cause of the first terrible outbreak of enteric amongst the troops. During the progress of the fighting at Paardeberg practically the only water for all purposes included drinking was that from the Modder River. This river flowed through the Boer laager, and after the surrender of Cronje it was seen how terrible the contamination had been, as the river had been the receptacle for corpses, carcasses of oxen, and all kinds of excrement and other filth. At such a time as this namely during a week's fighting under a hot sun and in a dusty locality it is very hard even for officers to drink the first water they come across, not waiting until sufficient water has been filtered, boiled, and allowed to cool, much harder still it is for the ordinary improvident soldier, who does not think or
care about the future, so long as his present wants are satisfied: hence the cause of the commencement of the epidemic.

Afterwards all along the line of march it was quite the exception to find, after part of the army had passed, a pool or stream of water, near or in which there were not one or more carcasses of horses or trek oxen: also on more than one occasion I personally have seen dead beasts even in the wells. Such carcasses might form a breeding medium for the typhoid bacillus.

In connection with dissemination by water a cause which would probably account for a certain amount of spread of the disease is the method of carrying water for the regiments on the march. The military water-carts are merely barrels slung between a pair of wheels, the cleaning of which involves considerable time and labour, consequently the cleaning is too frequently merely perfunctory and there is left some dirty water at the bottom.
The water used is obtained as a rule from any springs or streams met with on the March, and is poured straight into the barrel, after a short time depositing a sediment. It can be well understood how frequent a form of contamination this might be, as often the cart might be filled half a dozen times without being flushed out, the sediment each time of refilling being stirred up and also having fresh additions made to it. Supposing then some tainted water is used the barrel would possibly become a perfect hotbed of infection.

2. Flies. When the disease had got a thorough footing in any one place, undoubtedly the flies were a great means of spreading the disease. There were such enormous numbers of them that it was beyond the bounds of possibility to keep them away from the patients and faeces on the one hand and from the food of the healthy on the other. Even
if they were prevented from settling on the faces in the bedspans themselves it was very hard to keep them off the faces and feeding utensils of the patients. In the larger hospitals the beds of enteric patients were provided with mosquito nets; many of the patients however objected very strongly to their use; in the field-hospitals it was impossible to use these.

Flies were also found in great numbers about the latrines, which in camps simply consisted of open trenches. From such sources of infection it is quite reasonable to suppose that a certain number of flies went straight and settled on the food of healthy men in the vicinity of the hospitals.

3. Sandstorms The fact that, at times of the year and in localities where sandstorms were prevalent, there was a well marked increase in the number of fresh enteric cases points to the probability of these
Sandstorms are being conveyancers of the disease. This was especially noticeable at Bloemfontein, as a greater number of fresh cases were admitted 10 to 14 days after a few days' wind than at other times. As the majority of camp latrines were simply open trenches dug a short way from the tents, one constantly saw fouled paper being blown about among the latter, so that it is more than probable that portions of faeces would also be included in the dust, hence these storms might account for a certain percentage of the total number of cases.

14. Contamination of the Soil. This appears to be a somewhat doubtful, but at the same time a possible cause of the spread of infection from the following observations made at No. 8 General Hospital. In August 1900 the number of cases of enteric fever had greatly diminished, and as that time the number of dysentery cases had increased...
at the end of the following month two tin huts were erected on the
ground which had previously been occupied by enteric marquess,
and these were soon filled with cases of dysentery. During the
latter half of October and during November six cases were sent
from these huts to the enteric division suffering from enteric,
five of whom at any rate had undoubtedly been suffering from
dysentery when first admitted to hospital, as they passed through
perfectly normal attacks of the disease and had been convalescent
for some time when their temperatures commenced to rise gradually and they
developed typical enteric. All these cases had been under
observation at least 21 days. The sixth case had been in
hospital only 10 days but had previously suffered from
diarrhoea accompanied by the passage of mucus and blood for a fortnight. In all these
cases the stools were typically dysenteric when in the
dysentery huts. It seems more
probable that these men became infected with enteric after admission than that they were actually suffering from both diseases at the same time.

6. From one person to another. This mode of contagion would account for many cases where the patient's condition had not been early diagnosed and he had remained in camp, being looked after by his friends. In hospital it would account for the majority of cases amongst the nursing sisters, orderlies and medical officers.
Symptoms.

1. Mode of Onset.

Comparing the mode of onset of the disease in S. Africa with that met with at home, in the former cases the prodromata were by no means so well marked. The majority of the patients "reported sick" at the morning sick parade having had a severe headache and back-ache for two or three days or perhaps a week, accompanied by diarrhoea and pain in the abdomen: the temperature on being taken was usually 2° or 3° above normal, sometimes even being 103°. On an average one out of every ten cases complained of having felt "chilly" followed by a "burning-up" feeling a night or two previously. The back-ache in the lower lumbar region frequently was the symptom most complained of, and this now and then continued to be a distressing phase during the acute period, keeping the
patient awake at night. In my own case this symptom gave rise to the most discomfort: the pain being dull, gnawing and incessant.

2. Temperature.

In the ordinary cases without complications the temperature rarely exceeded 103.4°. The course of the temperature in the different forms of the fever and of the complications will be dealt with under these headings. In most cases the temperature was quite typical, remaining up from 7 to 14 days, then returning to normal by lysis. In a few cases however the temperature seemed to terminate by crisis, as one night it might be 102.8° and the next morning down to 99°, rising again to 100° that night, and then dropping to normal on the following morning and remaining so.

When four-hourly charts were kept which was always done in the more severe cases, there was rarely a difference of more than 2° in the
24 hours until the lymph commenced when frequently the variation showed 3° or 4°.

3. Skin

A. Rose-pink spots.

On admission it was in many cases very hard to recognize any rash partly owing to the dirt and partly owing to irritation set up by the various kinds of vermin frequently found on the patients. When the typical rash did appear it was seen on the second or third day after the temperature had reached its maximum level. As a rule the spots were few in number, and not well marked. They appeared in crops consisting of about half a dozen, and remained out about 48 hours. The spots were confined to the abdomen and thorax. In two cases the rash was very extensive, almost resembling the rash of measles so close were the spots in one or two places.

As a symptom very little reliance could be placed upon
the rash itself

3. Taube Pleuratre. In only one case was this peculiar rash noticed: this was in a young corporal of 20, who was one of the six cases transferred to the enteric division from the dysenteric hut, having had a typical attack of dysentery. On the third day of the rise in temperature deep blue-coloured spots and patches appeared all over the abdomen, the inner aspects of the thighs and back. They varied in size from that of a pea to that of a crown. They disappeared within a week, and directly afterwards rose-pink spots appeared.
4. Circulatory System

A. Pulse rate. This was as a rule increased slightly in proportion to the temperature, but rarely exceeded 110, except in those cases where prostration was well marked after a lengthy acute period or when some complication supervened as haemorrhage, perforation or pneumonia. In such cases occasionally the pulse became so rapid that it was almost impossible to count the beats, but this condition was usually followed shortly by death.

B. Heart-sounds in most cases were normal. In several patients after a time there was some cardiac dilatation, in which case the sounds became feeble and temporary bruits could be detected which however disappeared as the patient recovered strength. This dilatation occurred in 18 cases out of 109. In one patient a systolic murmur developed in the mitral area about the third week which had
not been heard earlier, and this persisted up to the time the man was sent home: he had a history of two attacks of Rheumatic fever previously, but in his health sheet (which I saw) there was no mention of any cardiac lesion.

C. Pericarditis occurs in two cases, both of which recovered within 14 days.

D. Thrombosis and Phlebitis were very frequently met with especially occurring in those men who had been taken ill after having passed through a very hard time, marching, and whose ration allowance had necessarily been diminished. It was also more frequent in those hospitals near the front, and this can be accounted for in two ways: firstly there were so many cases and the number of beds available was barely sufficient to accommodate them, that as soon as was practicable the patients were shifted off to hospitals nearer the base in the early days of convalescence.
ence in order to make room for more urgent cases, and before they had recovered much of their strength: secondly because in these hospitals it was harder to get new milk and other forms of fresh diet. For these reasons general circulatory debility was more apt to set in. In one batch of 34 convalescent cases sent down from Pretoria to Bloemfontein 7 had well marked thrombosis, and this was about the general percentage of such convalescent parties.

But of 109 cases at No. 3 3 cases developed thrombosis and phlebitis but with absolute rest (they had been allowed to sit up in bed) and with the foot of the bed raised soon recovered.

5. Digestive System.

A. Sore mouths were present to a greater or less extent in all cases about the second week: in some men the lips were so swollen and cracked from this cause that it was only with the greatest difficulty...
They could articulate at all. The teeth were also rendered very foul by accumulations.

13. Pharyngitis. In three cases this was the first symptom complained of; these men were admitted to the observation marquee and on examination the pharynx and tonsils were found to be inflamed, with some swelling on the latter; there was also rise of temperature. This condition of the pharynx subsided after three or four days, without any marked fall in temperature, meanwhile other symptoms had developed, and in a few days a fairly typical attack of enteric was well marked.

In two patients pharyngitis occurred during convalescence but rapidly subsided under local treatment.

C. Anorexia was a constant symptom, both as a prodroma and also through the course of the disease until nearing the convalescent stage. In a few cases the nurses found it a very troublesome
business to persuade the patient to take any form of nourishment.

D. Thirst was almost always complained of, and was very
hard to relieve. In my wards patients were allowed as much
cold water, boiled and filtered, as they wanted, given a table-
spoonful at a time. Ice was also given to them to suck
when procurable.

E. Tongue. The appearance of the tongue was the feature
on which in the majority of cases the diagnosis was
largely based. It presented the usual enteric features
of being thickly furrowed, with red streaks running down
the sides and along the centre, the tip also being red.
Frequently appearing through the fur, as well as in the
remaining portion, papillae swollen and inflamed.

In later stages of the disease especially in cases
complicated by high fever, pneumonia and delirium
the tongue became brown, very parched and cracked.
Occasionally also in these cases it became so swollen that it could not be moved in deglutition or talking without causing great discomfort.

F. Vomiting was a common symptom occurring as a prodrome, and in many cases it was due to this that a man "reported sick." When at rest in hospital it almost invariably disappeared. In one patient however, whose habits had been alcoholic, it proved a very distressing symptom throughout the course of his illness. This man had been treated in hospital some years previously for gastrectasis, having his stomach daily washed out. When under my care there was no well marked dilatation. Every now and then it was necessary to resort to rectal feeding owing to the excessive vomiting.

G. Diarrhoea was another feature more frequently met with as an initial symptom before the admission of the patient to hospital.
patient would often complain of having had diarrhoea for some days previously; the stools usually were said to be frequent, greenish in colour, and offensive in odour, often also mixed with "slime and blood". On admission the general practice was to give the patient Calomel gr. V, unless the disease appeared to be further advanced than the second week, and after this had thoroughly acted constipation was very much more frequent than diarrhoea, continuing to be so until the patient had recovered. In only 3 cases in the Enteric Division was diarrhoea at all troublesome, one of which died and P.M. this was found to be a case of dysentery (the case of Pte Elliott described on page 68). The other two cases were gradually improved in this respect by frequent doses of Opium combined with acetate of lead.

H. Haemorrhage occurred in 6 cases out of 109. Usually it was easily controlled by the
administration of Pulv. Spec. C.
given thrice at four hourly
intervals. In one case, three days
before death, commenced to have
copious attacks of haemorrhage,
upon which nothing seemed to
have any effect.

1. Melena occurred in
several cases, but only gave
rise to slight discomfort, except
in the case of one patient and he
was only relieved by the intro-
duction of a long rectal tube.

K. Abdominal Pain was
more marked in the first two
weeks of an attack than later,
and was a common complaint
of patients when "reporting
dehs". The site of greatest pain
was usually the right iliac
fossa, but frequently was
referred to the umbilical and
hypogastric regions.

L. Tenderness was a
prominent symptom, frequently
accompanied by gnawing;
occasionally there was tender-
ness over the whole abdomen,
but more commonly was
limited to the right iliac
umbilical and hypogastric
DISEASE:

Dysentery:

Enteric - Perforation

Notes of Case:

Name: F. Rigott

Age: 22

Diet

Case Book No.

Date of admission: Oct. 12th 1900

Result: Death

Entered at Stationers' Hall

Printed and Published by Wodderspoon & Co. 7 Serle Street, Lincolns Inn

Gould's Clinical Chart
areas: when in the latter two without the former, it was not usually accompanied by gurgling.

M. Perforation. Out of 109 cases this unfortunate complication occurred in 2 men, both ending fatally. One of these men had got out of bed when the orderly had left the ward to get a bedpan. The following is an account of the case:

Junker F. Pjott, R.H.A. act.
22 was admitted to hospital on Oct. 12th suffering from dysentery from which he was convalescent and allowed to get up out of bed by Nov. 5th being on convalescent diet. On Nov. 10th he had a slight rise in temperature (100.2°) and complained of severe headache. His temperature continued to rise in the evenings, falling about 1° every morning until Nov. 15th when it was 103° and then there appeared a few pink spots on the abdomen, and his tongue became typical of
Disease: Enteric following Dysentery, Peritonitis

Notes of Case:

Name: John F. Rigott
R.H.A.

Age: 22

Diet:

Case Book No.

Temp. normal or subnormal.

Date of Admission: October 12th, 1900

Result: Death.

Entered at Stationer's Hall.
enteric, so he was then removed to the enteric division. It was also found that the area of splenic dulness was greater than normal. Dr. Quinim. Chlomeate prepared according to Burney's prescription was given three times a day without any appreciable effect, and as also the mixture was very distasteful to the patient it was discontinued.

Nov. 18th: Fricton on the left side of the thorax was heard postly.

Nov. 19th: While the orderly was absent from the ward for a few minutes, the patient got out of bed intending to wash himself. Immediately after, the Temp. was 101°. The same evening it rose to 102.8°, otherwise he seemed fairly well.

Nov. 20th-22nd: The Temp. varied between 103° and 104°. The patient complained of no pain except on the left side where pleurisy was well marked, there being no effusion.

Nov. 23rd: Temp. in the
morning was 102.2°, and gradually rose to 104.2° in the evening at 6 P.M. At 6.15 patient suddenly complained of violent pain in the lower part of the abdomen, and at 6.30 the temp. had fallen to 98.2°. The appearance of the patient was typical of collapse; he perspired freely and his extremities were cold and clammy. The pulse which had previously been full, beating under 100 a minute became feeble and thready, beating 130. Half an ounce of Brandy was given by the mouth and 8-1/30 Styrch. Sulph. was injected hypodermically. A catheter was passed, owing to his complaining of the pain especially in the hypogastrum, but only two ounces of urine were drawn off. Hot bottles were applied to feet and legs and hot fomentations to the abdomen. Shortly after the onset 300 iu. of Morphine was given. Injection of one pint of normal saline solution into the submammary connective tissue and the same quantity
into the rectum half an hour later somewhat revived the patient.

Half an hour after perforation had occurred the line of liver dulness was lost.

As much nourishment and stimulant was given by the mouth and rectum as the patient could stand.

Dec. 24th, 2 A.M. Temp. was 105°; at 6 A.M. it was 106.4°, and at 7:45 A.M. the patient died.

On Post Mortem Examination a small perforation was found in the ileum three inches above the ileo-caecal valve. General peritonitis had supervened. There was also exudation of lymph in the right pleura.

In the second case the patient was apparently progressing favorably with a temp. gradually becoming lower, when without any evident cause one afternoon his temperature dropped to 98°, he dying within three hours.

Post Mortem: Three distinct
and minute perforations were found in the ileum all being within a space of 3 inches.

The first case was quite avoidable, but there was no difficulty harder to cope with than the carelessness or ignorance on the part of many of the orderlies as well as the ignorance of the patients themselves. Neither seemed to grasp the importance of absolute quiet. Whenever there were serious cases in a ward the orderlies and nursing sisters had strict orders that it was never to be left without someone to look after the patients, but owing to the total number of orderlies available for ward duty being so small, it was hard to obtain a sufficient number to do the work in the ward thoroughly.

N. hives. In 8 patients the liver was enlarged about the 4th week: in several convalescent patient (i.e. those temporarily admitted on their way

* The full notes and chart of this case were accidentally burnt.
to the base from other hospitals, it was found to be enlarged.
Of these many complained of frequent biliousness.

O. Spleen. Enlargement of the spleen was rarely noticeable until the third week, and frequently it was impossible to detect any enlargement through the whole course of the disease. In 51 cases there was no doubt at all about the increase in the area of dulness, and in many of these it could be distinctly palpated below the costal margin, usually under these circumstances palpation was accompanied by considerable tenderness.

6. Respiratory System. 
A. Eupnea was an occasional early symptom but was not severe and occurred before admission to hospital. In one case it continued for about a week after admission; special treatment was unnecessary.
B. Pneumonia occurred in 8 cases out of 109; of these 4 died, as also one other. The death of the latter not taking place until after my giving up charge of the division. In the 4 cases which died the following is a short account of the course of the complication and the condition of the lungs when examined P.M.:

(a) Janer, Sec. Hutchinson act. 34. The right lower lobe first became affected about the 14th day of the disease (enteric); 3 days after the left lower lobe became dull, the patient dying 5 days later.

P.M. There was consolidation of both lower lobes.

(b) Ste. Wm. Janer act. 20. On the 11th day of enteric crepitations and dulness were first noticed at the left base. On the 17th day there were a few crepitations at the right base, but nothing noticeable about the percussion note.

P.M. Consolidation of left lower lobe, and in right
lower lobe there was a consolidated patch about the size of a tangerine orange, a quarter of which had become gangrenous.

(c) Pte E. Clarke aged 19 apparently had an abortive attack of enteric, and had a relapse 21 days after the temperature had become normal, he then being on light diet and allowed to sit up in bed. On the 4th day of the relapse the middle lobe of the right lung was dull and a few fine crepitations could be heard. On the 6th day the lower lobe of the right lung, and on the 7th day the lower lobe of the left lung became affected.

P.M. The above three lobes were consolidated, and there was some pleuritic exudation over the right lower lobe.

(d) Pte J. G. Paterson aged 28. The patient for some years had been suffering from recurrent attacks of bronchitis. On admission he had a very bad cough, rales and...
rhonchi being heard all over the chest, without any definite dulness on percussion

P.M. Both lungs showed general bronchitis, but in the right there were definite patches of Broncho-pneumonia. The right pleura was also adherent with some calcareous deposit.

The remaining 3 cases which survived showed signs of consolidation in the 3rd or 4½ weeks; all were cases of pneumonia of the lower lobes, two being on the right side and one on the left. In every case there was the typical rust-colored sputum.

C. Hydropatic congestion occurred in 10 cases usually from the 20th to the 30th day. In most of them there was marked cardiac dilatation or other evidence of weakened circulation.

D. Pleurisy occurred in 4 cases, 3 of which have been already noticed viz. Jume, Pigott, Deo Clarke and Paterson.
The fourth case was that of a patient aged 49, the peculiarity in this case being that a few days after friction was first heard it was entirely obliterated by a pericardial rub. Towards the end of convalescence this patient developed apical mischief of both lungs and was removed to a phthisical marquee.

The nervous system

A. Delirium occurred in 8 cases; 5 of the 6 enteric deaths became delirious towards the end: it was never of a violent form. The patients had to be carefully watched to prevent their getting out of bed.

B. Coma Vigil and Subsaultus Pendulum were seen in 3 of the above cases. In the same patients there was also involuntary evacuation of urine and faeces.

C. Melancholia was practically unknown in my observation. In the case
of James Diggs there seemed to be grounds for suspicion of melancholia, as after he had got out of bed he told a fellow patient he had done so on purpose knowing the serious risk he was running. It might be mentioned that this patient was a man of education, and I was told he had been a medical student.

8. Renal System.

A. Albuminuria. Traces of albumen were frequently present especially in cases where the temperature had been high for a week or two, but they disappeared as the temperature decreased.

One patient complained of severe pain in the lumbar region shooting also down the legs: on examination of his urine it was found to contain in addition to a considerable amount of albumen a small quantity of blood. This condition only lasted for about a week when both albumen
and blood had disappeared.

B. In the case of Mr. W. J. Tanner, who died, when a post-mortem examination was made, a large horse-shoe kidney was found in the left ala of which was a space about the size of a pительн, which contained a semisolid yellowish white substance. This cyst or abscess (owing to having no microscope it was hard to determine precisely its nature) had apparently ruptured: there was marked general peritonitis.

P.M. The ileum showed 15-20 ulcers, but none very deep and there was no perforation. In this case the urine showed frequently albumen and on one occasion there appeared to be a small quantity of pus, but the latter was not noticed at any other period.
In addition to these complications grouped under the heading "Symptoms" two others may be mentioned:

1. Tubercular Disease.
2. Otitis Media.

1. Tubercular Disease

Two cases developed apical mischief during an attack of enteric fever. In one of these after removal to the phthisical ward the disease made such rapid progress that both lungs became involved with formation of cavities, the patient dying within five weeks of the first appearance of the disease: in the last week of life the intestines became affected and patient had troublesome diarrhoea, the motion being very offensive.

P.M. General tuberculosis affecting lungs, liver, spleen, kidneys and intestine. This case showed well the scars and cicatrices of the enteric ulceration as well as the
A fresh tubercular ulceration occurred in one case: on admission in addition to the symptoms of enteric there was an offensive discharge from the middle ear. As the patient appeared to be very ill and there were no meningeal symptoms it was decided not to operate; he died within 10 days of admission to hospital.

P.M. Well marked ulceration of the ileum: the right middle ear was found to contain pus, the brain was normal with the exception of slight engorgement of the vessels of the right temporo-sphenoidal lobe. The spleen was enlarged.
Forms.

A Inoculation Form.

Under the heading of Prophylaxis inoculation as a preventative measure will be more fully discussed. From my own experience and from what several other medical officers serving in S. Africa have told me, it appears that inoculation considerably modifies an attack. Out of 109 fresh cases admitted to the enteric division at Bloemfontein 6 had been inoculated, and that once only, and none of these died. In all these cases and in my own case (I was inoculated once on board going out) the usual symptoms and prodromata of the first week of the disease seemed either to be absent or very much modified. I myself had had extra hard work three weeks after before falling ill chiefly amongst enteric...
**Disease.**

Enteric Fever modified by previous inoculation.

**Notes of Case.**

**Name:** Phillips  
**Age:** 26½  
**Diet:**

**Case Book No.**

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**Day of Ins.**  
**Pulse.**  
**Resp.**  
**Date.**

<table>
<thead>
<tr>
<th>4th</th>
<th>10th</th>
<th>20th</th>
<th>24th</th>
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<tr>
<td>30th</td>
<td>June 2nd</td>
<td>3rd</td>
<td>5th</td>
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**Date of admission:** May 30th, 1900  
**Result:** Recovery.

Entered at Stationers Hall.
patients, and with the exception of slight diarrhoea for a few days and which I took very little notice of, as since landing in the country I constantly had similar attacks of this complaint, I had no symptoms until on waking one morning I had violent headache and backache with a temperature of 102.8°. Similarly in all of the 6 cases mentioned the patients said that they had felt quite well until within 3 days of admission to hospital with the exception of diarrhoea.

In all the cases 2 or 3 days after admission spots appeared and the patients passed through a mild course. The temperature kept up for about 7 days, in no case rising above 103°, and convalescence was fully advanced within 3 weeks of admission. In none of these cases were there any signs of complications.
Diseases.

Enteroe modified by
Inoculation (Relapse)

Notes of Case.

Name: [Redacted]

Age: 20

Diet

Case Book No.

Date of admission: June 7th

Result: Recovery

Temperature (Fahrenheit)

Normal Temperature of body

Day of Dis.

Fties: 45°

Pulse:

Resp.

Date: [Redacted]
In my own case there was a slight haemorrhage in a motion on the 14th day after admission probably caused by sitting up in bed to reach a book.

Three officers were in the same incarceration in the Scottish National Hospital as myself who had been inoculated, and in all of them the symptoms of the first week were apparently absent. All of them ran a satisfactory and mild course except one who had a relapse on the 5th day after the temperature had become normal, but the relapse did not last long and the patient soon recovered.

B. Abortive Form

In 14 out of 109 cases there was apparently an abortive form of the disease. The patients were admitted having suffered from diarrhoea and headache. They generally had a typical enteric tongue. On admission the temperature varied from about 99.4° to
Disease:
Abortive Enteric
(Not inoculated)

Notes of Case:
Capt. B - C

Name:

Age: 29

Diet:

Case Book No.

Date of admission: June 16th, 1900

Result: Recovery

Entered at Stationers Hall
Printed and Published by Wdderspoon & Co., 7, Surls Street, Lincoln's Inn
101° and continued to rise for 2 or 3 days until it reached 102° or 103°; it remained up for 2 to 4 days and then subsided, becoming normal about 3 days after. Of these 14 cases 3 had relapses 10-14 days after the temperature reached normal and one man died. It must be however borne in mind that these cases may not really have been cases of enteric, but of one of the forms of simple fever simulating enteric, and that the patients who apparently had relapses really became infected from other occupants of the ward. It would have been invaluable in these cases to have had means of testing the blood for the "Widal Reaction."

In all these cases the symptoms were fairly similar. In addition to the headache and diarrhoea complained of on admission, there was very soon pain, tenderness
and sometimes jangling always referred to the right side fossa. In several there was some distension. Only 4 showed any signs of spots and these were doubtful. Most of them complained of backache.

In addition to these 14 cases I saw innumerable men who had been sent to hospital as cases of enteric. These men were first sent to the Observation Station and after a dose of grv of Calomel were quite recovered.

C Malignant

The only very severe case of enteric I saw was one admitted to No. 6 General Hospital, Naaspoort: on admission the temperature was 104.6. He died within three days of admission.

There were no very violent forms at No. 8 General Hosp. Bloemfontein.

When with the regiment I saw 2 cases in men belonging to another regiment. When I first saw them the Temp. was 104.8°
in the one case and 104° in the other. The two men reported sick the one a day after the other; and both complained of vomiting and severe headache for about 5 days. They were sent to hospital, one dying 3 days after admission and the other 5 days after. When first seen both these men were in a state bordering on collapse, and had a small pinkish rash resembling measles. One of them I saw 2 days before death and then the rash had disappeared, and what appeared to be subcuticular mottling had taken its place; I heard that the same phenomenon was seen in the other case. These men belonged to a Colonial corps which had seen very hard work on low rations, and had been camped for a few days in an unhealthy site near the stream into which the drains of Colesberg emptied itself. Both these men slept together under a small stuffy bivouac. From all these different points it...
seems to be quite a possibility that these men had been in reality cases of typhus rather than typhoid. It is very likely that these men too had been in some of the lower parts of the town, where I saw one or two cases of a low form of enteric which looked very much as if they might have been typhus. Other medical officers also told me they had occasionally seen cases very suspicious of typhus.

D Ambulatory

In active service it might be expected that one would find many cases of the ambulatory type, especially as several men would not care to report sick, as it might have appeared that they wished to shirk work. As a rule such cases did not appear to run a more severe course than those cases which were seen early in the disease.
The only case seen by one of this type was that of one of the nursing sisters who was under my care as a convalescent on the "Templemore." Her chart (which she brought with her) showed a rise of temperature only up to 99.6°, and that only for the first two days after admission, and afterwards the temperature was normal or subnormal. She told me that the medical officer in charge had said that her case was undoubtedly one of enteric fever. During the voyage home I examined her amongst the other patients and found her heart was dilated, and she told me that she was breathless after exertion. There was some oedema of the legs in the evenings.
Relapses

occurred in 11 cases out of 109 usually about the 4½ or 5½ week after the disease had commenced and from a week to 10 days of the temperature reaching normal, in 2 cases the relapse occurred 21 and 23 days respectively after the Temperature had become normal. In 3 men the relapse took place from the 10th to the 14th day of admission to hospital, these three being three cases of abortive enteric (supposed) already mentioned. One of these patients died, the fever being complicated by pneumonia which supervened during the second week of the relapse. In only 2 cases was there more than one relapse, one of the men relapsing a second time, while the other had seven relapses; the severity in each attack diminishing: in the latter patient the relapses apparently came on without any definite cause.
and the two last ran a short course of 7 to 9 days. When in charge of the Transport "Templemore" there were about 270 cases of men who had been suffering from enteric. Of these 3 had relapses on board, so they had been convalescent for over 6 weeks; the disease pursued a normal course, and on reaching Southampton the patients were sent to Netley Hospital all doing well.
Diagnosis.

The diagnosis of enteric fever on active service is one of great difficulty especially in a climate like South Africa where men are so liable to contract so many forms of diarrhea and so many varieties of ailments other than enteric having some symptoms in common.

The points which proved to be most reliable in diagnosing a case as that of enteric were as follows.

1. The locality. In the case of men coming from local camps, the particular camp from which they came was important, as undoubtedly some sites were considerably unhealthier than others. Care was also taken to ascertain particulars as to the position and source of the water supply.
2. The patient's temperature.
3. The condition of the tongue.
4. Presence of headache.
and pain in the back.

Other symptoms were very variable. Diarrhoea was more frequent as a prodroma than constipation, but the latter was more common after admission to hospital. The appearance of the stools varied, and as a matter of fact was of very little use as an aid to diagnosis after admission, because it was customary to give every case admitted to the observation marquee Colonel 897, unless the patient was in a very weak state.

Rashes were not to be depended upon, as very frequently patients had sudamina or bites from insects which occasionally somewhat resembled the rose-pink spots of enteric.

In discussing the question of Differential Diagnosis it seems to be the best plan to describe more or less in detail the ailments which have diarrhoea as
a prominent symptom and which might be confounded with enteric, and afterwards to mention other diseases which sometimes gave difficulty in diagnosis.

The following belong to the first class:

1. Endemic Enteritis.
2. Enteritis due to eating unripe, overripe or an excessive amount of fruit.
3. Heatstroke accompanied by diarrhoea.
4. Colitis caused by sand.
5. Dysentery.
6. Tubercular Enteritis.

1. Endemic Enteritis

Causals

(a) Change of climate.
(b) Drinking the water of the country which contains a much greater percentage of purgative salts than the drinking water in England. This peculiarity is common to the water all over British South Africa. By far the greater number of people
who go out to S. Africa get attacks of diarrhoea within a short time of landing from this cause. The average of the men in the regiment suffering from this complaint was about 76%. It is more prevalent in the country beyond the Cape Peninsula viz. commencing beyond the Hottentots and in the Great Karoo Desert. After a short time up country the men appeared to get used to the water more or less though amongst them all through the campaign it was far more usual for them to have loose motions than to be constipated. After a few days in the country it was very hard to differentiate between this form of enteritis and the next variety.

1) Lime of Upar is important as diarrhoea of this form is more prevalent in the summer months i.e. November to February, and therefore
corresponds to the summer diarrhoea common in certain districts of England.

Symptoms.

(i) Diarrhoea: the stools as a rule being watery and yellow in colour, the number varying from 6 to 20 in the 24 hrs.

(ii) Colic occasionally, but by no means a constant symptom.

(iii) Tenderness sometimes all over abdomen.

(iv) Anorexia in a slight degree.

(v) Tongue furred.

(vi) Temperature rarely raised.

Treatment

No special treatment required, as recovery usually took place in a day or two. If the colicky pains were severe & distinct, Chloroform or Morphia, 30x to 3f was given and this relieved both the pain and the attending diarrhoea.
2. Enteritis due to eating unripe, over-ripe or excessive quantity of fruit.

This form was very common a few days after landing in S. Africa and the regiment was on its way up country. After four weeks of ship's diet fruit was a great luxury, and at various stations along the line Kaffirs brought pineapples and grapes to the troop trains. The result was that many men who had money ate great quantities and in the course of a few hours commenced to suffer from diarrhoea.

**Symptoms**

almost precisely the same as the first form described, only they were more severe.

1) Diarrhoea. As a rule lasted a shorter period than in Endemic enteritis, but while it lasted the motions were more frequent and less in amount; colour brown or yellow. Occasionally in very severe cases the motions were streaked with blood and mucus.
(ii) Colic was the chief symptom and in a large proportion of cases (about 30%) it was of a choleraic nature, and temporarily completely incapacitated a patient.

(iii) Tenderness usually present over the whole abdomen.

(iv) Anorexia.

(v) Temperature. After a few hours the temperature frequently was as high as 100°.

(vi) Tongue thickly furred: breath offensive.

Treatment

(a) Rest—when possible the men were allowed to stay off all duties and lie down in their tents, if they had a severe attack.

(b) Nothing but milk and when obtainable Maizena or Benger's food. When condensed milk was ordered one tin a day was allowed each patient (roughly corresponding to 3 pints of fresh milk)

(c) Medicinal—As soon as patient was seen 60. Rizin 3; together with Tinct. Opium was given. Of diarrhoea co-
-tined a pill containing Plumb. Acetat et Morphin. was
given morning and evening.

To relieve the severe griping a
hot brick or flat stone wrapped
up in a puttie and applied
to the abdomen was found
efficacious.

These cases of Enteritis were
short in duration lasting
as a rule 24-48 hrs. In two
cases however, the patients
were ill for a longer period,
and in both instances they
had attempted to cure
themselves one by eating
cake-tobacco, and the other
by swallowing large lumps
of cheese without mastic-
ation in order, as he said,
to block his bowels. In
both these cases it was a
week before the men were
fit enough to resume duty.

3 Heatstroke accompanied

by Diarrhoea.

Constantly cases were
sent in by regimental medical
officers diagnosed as enteric
suffering from this form of
enteritis, which were only diagnosed after having been under observation for 24 hours. In many ways such cases resembled an abortive enteric type.

The history of one of these patients was usually that he had been working out under a hot sun, either doing guard or fatigue duty and had gone back to his tent or bivouac with a headache. The following day he would feel generally unwell, the headache would be worse, and he would have slight diarrhoea.

Symptoms:
(i) Diarrhoea variable in amount: frequently the patient declared he was passing "blood and mucus", which however was not usually seen after admission.
(ii) Colic was not a well marked feature.
(iii) Tenderness as a rule absent.
(iv) Anorexia was customary.
(v) Tongue thickly furred, but occasionally the tip was red.

(vi) Temperature as a rule was considerably above normal about 103°; in 2 cases it was over 105°.

(vii) Frontal headache was always a most pronounced symptom.

These symptoms lasted from 2 to 4 days, when the temperature suddenly dropped, the diarrhoea ceased and headache improved. 12 hours later the patient was apparently all right.

Treatment

(a) Rest in bed or in the tent until temperature was normal.

(b) Diet - Milk and Soda.

(c) Medicinal - Calomel 80 Fr. was immediately given. As soon as there was a suspicion of the case being one of heat-stroke a powder containing Quin. Sulph. 3 Fr. and Phenacetin 3 Fr. was given thrice daily and this
relieved the headache. Request
by an ice-bag was applied.
In cases when the temperature
was over 104° rapid or cold
sponging was ordered.
As a rule the diarrhoea
was not excessive enough
to require special treatment.

This form of enteritis was
undoubtedly the hardest to
diagnose when a case first
presented itself as for 48 hrs
it was almost impossible to
distinguish it from dysentery
and in some cases from Entere.

As might be expected it
was found under two conditions;
first in those places where there
had been previous encampments
and where in consequence the
surface had been trodden
into a dust; secondly in
windy weather.

The first of these conditions
was well brought out among
the men of the 4th Argyll and
Sutherland Highlanders. The
first place the regiment was
encamped at was for 10 days
Naauwpoort, which had previously been the camping-ground of a great number of troops, and consequently was very dusty, in addition to the locality being a naturally sandy one: a few days after arrival this form of diarrhoea commenced. Next the regiment moved to Arundel with similar effect. The next stopping place was Colesborg and here the battalion was divided into two halves, one going to an old camping-ground near the town, and in these companies the daily average of diarrhoea cases was maintained, while the other was encamped on fresh ground a few miles off, and amongst these men there were very few cases. The next move was to Springfontein where the camp was pitched on a grassy slope, the ground not having been previously used as an encampment, and here it was quite exceptional for a man to report sick with diarrhoea. The regiment
next went to Bloemfontein, and although the stay there was only for 30 hrs still several cases occurred. At Pretoria a fresh camping ground was used with the result of marked decrease in the number of cases. Finally at Kroonstad which was both dusty and windy diarrhoea commenced again.

Symptoms
(i) Diarrhoea: the stools were watery, numerous and accompanied after a few hours by streaks of blood and mucus.
(ii) Patients occasionally complained of tenesmus.
(iii) Colic was always well marked, and the griping caused great pain often doubling the patient up.
(iv) Tenderness all over the abdomen, but especially well marked over the transverse colon, although the whole course of the colon was frequently distended.
(v) Anorexia was well marked.
(vii) Vomiting occurred early in the majority of cases.

(vii) Tongue thickly coated; breath very offensive.

(viii) Temperature sometimes over 103° but usually about 101°, until the symptoms commenced to subside. The return to normal of the temperature was more a lysis than a crisis.

(ix) Headache all over usually complained of.

(x) Back ache in the lumbar region was a constant symptom.

The duration of the disease as a rule was from 3 to 7 days, leaving the patient very weak.

Treatment
(a) Rest in bed.
(b) Diet—Milk and soda, when temperature commenced to come down. Bengo's food or Manjina was given.
(c) Medicinally—At first Calomel gr. 5 or .1. Ricin. 380 and Inj. Opia ny v. given; 12 hours afterwards the following
mixture was found to do well.

Rx.

Bismuth. Subnit. 80 Xv
Per. Opii 7 M
Ag. Chloroform. ad 3 J

Sig.
given every 4 hours
until the diarrhoea ceased.

Occasionally suppositories
of lead and opium were
given if the tenesmus and
diarrhoea gave much trouble.
In two cases, the vomiting
was very tiresome, but was
relieved by the following powder:

Rx.

Bismuth. Subnit.
Per. Bicarb. 70 Xv

Sig.
Pre-powder to be given
three times a day before nour-
ishment.

Hot bricks or fomentations
were applied to the abdomen
when abdominal pain was
very severe.
5. Dysentery.

So frequently had similar prodromata to those of enteric that often for a few days the diagnosis would be left in doubt. In early cases always where there was the slightest uncertainty the patients were sent to the observation marquee and by the end of three days as a rule the diagnosis would be cleared up. The main points of difference were as follows:

(i) Time of Year. In S. Africa dysentery was most common in August, September and October and in those months the number of cases of dysentery admitted to No. 8 General Hospital exceeded those of enteric.

(ii) Previous History. In many cases the patients had served in Egypt or India previously and in those countries had been attacked with dysentery.

(iii) The prodromal symptoms were far less severe, the main complaint being colic: this was accompanied by
diarrhoea with the passage of blood and mucus in the motion, and a constant desire to go to stool.

(iv) The temperature was rarely above 102°.
(v) The tongue usually was red and dry.
(vi) The red-currant appearance of the stools was the chief help to diagnosis.
(vii) Diarrhoea occurred very frequently.

This paper is not the place to enter into full details of dysentery, as the cases were similar to those met with in other tropical and sub-tropical countries. The following case showing the extreme difficulty of diagnosis appears to be worth recording in some detail:

Pte W. Elliott - Royal Army Medical Corps act. 24 admitted Nov. 16th 1900 had been on duty as orderly in the Enteric Division of No. 8 General Hospital, Bloemfontein since his arrival in the country in May 1900. He had
never been abroad before, and had had no serious illnesses. Since he commenced duty in May he had not been on the sick list, though occasionally he had complained of attacks of biliousness which disappeared after the bowels had been well opened.

When paying my morning visit to the wards on Nov. 16th I noticed Elliott looked rather unwell. The temperature was 99.8°. He said he had a headache and pains in the stomach which first commenced 7 days previously: he had also slept badly for the last few nights.

Shortly after admission he vomited. On examination his tongue was moist and thickly furred. There was tenderness in the right iliac fossa and a shooting pain extending thence up to the nipple on the right side and striking through to the back. There was also tenderness over the transverse colon which seemed to be somewhat
distended. The liver dulness extended 1/2 in. below the costal margin and the lower edge could be palpated. There was also slight increase in the splenic dulness. There were no spots. Humps were normal. Heart — the 1st sound was feeble; pulse was thin, and the number of beats were 104 per min. (The sister in charge of the ward told me that when she felt his pulse during previous bilious attacks it was always feeble and rapid.) Bowels were constipated, there not having been a motion for 2 days.

As at the time the entire hut had some vacant beds, and he had worked there, it was decided to put him in a bed in the corner away from the other patients instead of sending him to the observation ward.

In the evening the temperature was 102°. Major Holmes, R.A.M.C. who was in charge of the Medical Division saw the case with me. He had
had great experience in Egypt, both in enteric and dysentery and he considered the case as being very suspicious of the former.

Colonel go v was given Nov. 17th Bowels freely opened, and patient seemed better. Temp. 100.6° A.M. 102° P.M. Had slept fairly well.

The patient was put on Milk and Soda.

Nov. 18th Passed bad night on account of abdominal pain and severe headache. Gentian tincture sprinkled with Met. Phor were ordered for the former and phrene- -clin go v for the latter which was repeated.

On abdomen two suspicious reddish spots were seen. Pulse was very feeble so Champagne was ordered (one pint in 24 hours) and also the following mixture:

R.

Dioc. Digital 30.75

Hig. Strychn. 30.75

Ag. Chloroform 15.325

Re. To be given thrice daily.
Nov. 19th. During the night pain in
the abdomen was so bad
that Morph. Sulph. 8 or 1/4 and
Atrop. Sulph. 8 or 1/60 were given
hypodermically. He continu-
ally vomited after his
milk, so it was peptonised.

Nov. 20th. Vomiting continued: consid-
erable abdominal pain:
sleepless. Intr. Opium 27 fix
was tried, then Iodinal
gr. 20 of which were
vomited. He however kept
down a draught of Pot. Brom.
gr. 5 and Chlor. Hyd. gr. 25
after which he slept at
intervals.

Nov. 21st. Temp. lower; and patient
seemed generally better.
Bowels regular, one or two
motions in the 24 hrs, and
these were yellow in colour
and unformed. Champagne
was stopped.

Nov. 24th. Pulse much improved,
being stronger and slower.
Mist. Digital. et Strychnin
was stopped. On this day
one motion was streaked
with blood, the motion
being yellow and more liquid
Nov. 25th. Patient had 2 motions both containing a small quantity of blood. Pulse rate rose to 136 per min. The patient himself felt better and there was no pain. The following mixture was prescribed:

Rx.

Ca. Feributh.

Met. Opium ad 17 x

Emuls. ad 3 g

Rx.

To be given every 4 hours.

Nov. 26th and 27th. Frequent diarrhoea with haemorrhages. An enema of starch and opium was given at first, but having no effect suppositories of Morph. 8½ and acid. nannie. were tried every 6 hours. Pulse weak, so champagne again ordered.

Nov. 28th-30th. There was still diarrhoea, but haemorrhage had ceased. The stools were small in quantity, dark
yellow and without mucous. 
The patient was becoming 
much weaker and complained 
of pain in the right iliac 
fovea.

Dec. 1st. Again haemorrhage and 
constant diarrhoea, the 
patient seeming to lose 
control of the sphincter ani. 
In addition to Parenteral 
and Opium Emulsion, D.ophin. 
gg ½ and Atrop sulph. ½ no. 
were injected twice a day. 
From now until death 
diarrhoea was more or 
less constant. 

Dec. 2nd-5th Patient delirious. 
No fresh haemorrhage, but 
clots were occasionally 
passed. On the 4th the 
pulse was feeble and 
Temperature was falling, 
and as the patient was in 
a state of collapse a 
poit of normal saline 
Solution was injected 
into the submammary 
connective tissue on the 
right side, which revived 
him.

Dec. 6th Patient seemed better early.
Later on in the day there was subcutaneous tendinitis, and the pulse was very feeble and rapid. One pint saline was injected beneath the left mamma. There was a renewal of the haemorrhage at intervals during the day.

Dec. 7th. Patient a little stronger and talked sensibly. There was more haemorrhage with the diarrhoea. In the evening he became very weak and at 9.15 p.m. pulse was barely perceptible. Vign. Sulph. gr. 1/30 was given hypodermically, then Ether 3 gr. was injected into the pericardial sac, and lastly one pint of saline was injected into the left median basilic vein. This only gave temporary relief and the patient died at 1.15 on the following morning.

Post Mortem.

Brain. Normal.
Lungs. Slightly congested at bases. Heart. Pale and flabby, no
marked dilatation and no disease.

Abdomen - Small Intestine - healthy.

Large Intestine - Caeceum congested: in ascending and transverse colon there were innumerable ulcers with ragged edges varying in size from that of a large pinhead to one measuring 4" by 4½"; this latter extended right through the muscular coat. The color was filled with blood-clot.

Liver was considerably enlarged especially the right lobe in the substance of which there were two large abscesses, which had eaten their way almost to the surface, one measuring 3½" by 3¼", and the other 2" by 2". The rest of the liver was studded with multiple abscesses of varying size.

Spleen - Slightly enlarged and had throughout its substance several minute foci of suppuration.

Kidneys - Slightly congested.
This case was seen often by Major Holmes and Col. Soggin, the principal medical officers as also by three of the civil medical officers attached to the hospital, and the case was considered to be one of enteric by all.

6. **Tubercular Enteritis**

There was rarely much difficulty in diagnosing this from enteric, as in the only two cases admitted to the Observation Marquee there was a distinct hereditary history of tuberculosis and in both of them there were marked phthisical symptoms at the apices.

In addition to these six diseases already described the following diseases occasionally gave rise to enteric, the cases being enteric when first seen:

1. Malarial Fever
2. Simple Fever
3. Rheumatic Fever
4. Pneumonia
5. Phthisis
1. Malarial Fever.

In Bloemfontein I did not see any cases of this, but one of the medical officers who had been in Natal told me that occasionally for a few days the diagnosis was in doubt, but was cleared up by giving quinine.

2. Simple Fever.

Various forms of simple fever were often seen, the commonest of which being "Slow Continued" Fever, or as it was generally known as the S.C. Fever. The cause of this was quite indefinite, but patients complained of headache and anorexia. Temp. 100°-102° occasionally diarrhoea. The temperature often remained up for a few days, and in a few cases for 2 or 3 weeks, but the patients showed no further symptoms.

3. Rheumatic Fever.

In its earlier stages gave a rise to doubt for a day or two, but was usually made plain by the swelling of
4. Pneumonia.

Usually were diagnosed almost immediately. In 2 cases the patient had diarrhoea as well and they were kept under observation for 48 hours, before one could be certain that they had not enteric as well as pneumonia.

5. Phthisis.

In one case only was there doubt. This man had a temperature of 102° in the evenings and about 100° or 101° in the mornings, and only slight physical signs; these however became more marked within the course of a week.
Sequelae.

As far as one could see, these were of very little importance. The most troublesome was that due to cardiac dilatation and impairment of the circulation. The result of this was breathlessness and oedema of the legs. Rarely there was pain in the legs. Out of 270 on board the "Templemore", 15 suffered from this sequela, but the inconvenience caused was very slight: of these 5 had had phlebitis of one or both legs.
Prophylaxis.

will be discussed under
the following headings:

1. Food and Drink.
2. Site.
3. Amongst the attendants
   on enteric cases.
4. Inoculation.

1. Food and Drink.
The problem of a pure water
supply to troops on active
service is one of vital importance.
In a country where there is
much dust and sand it is
almost an impossibility to
prevent men who have been
on the march under a tropical
sun for hours at a stretch from
drinking at the first stream
they come to. The ordinary
English soldier does not as a
rule think of anything except
the present and it is a rare
thing to find in a regiment
on the march a single man who
does not finish the contents
of his water bottle at the
first available opportunity, and
as a result long before a proper water supply is available he has become very thirsty. Efforts have been made to compel the men to drink only boiled or filtered water, but it can be hardly expected that thirsty men will after a march wait until sufficient water has been boiled in the camp kettles and allowed to cool. Berkefeld field filters were served out to regiments, but it takes some time to filter sufficient water for each company, especially as the earthenware cylinder ought to be thoroughly cleansed after the filtration of every few gallons.

Next as regards food, even the greatest care will not prevent flies from setting which have, as already been pointed, been considered one of the commonest vehicles of infection. There seems to be very little chance of preventing enteric epidemics from breaking out amongst our
armies in such a climate as S. Africa, until some method is introduced of quickly purifying water, and preventing food from becoming contaminated.

2. Site
The choosing of a site for a camp is very important. It is convenient to have it as near a water supply as possible, and the oftener the site is changed the better, as amongst regiments who are on garrison duty for some time in the same place it is found that there are fewer cases of enteric when the site is occasionally moved than when the regiment keeps the same old camping ground. This is very possibly due to the system of open latrines, which must in time contaminate the soil; some harm is prevented by the digging of fresh latrines daily and filling in the old. This diminishes the material which can be carried about by a wind, but on the other
hand it does not give the sun and fresh air time to disinfect the faeces etc.

3. Amongst the attendants or Enteric cases.

Naturally perhaps those most liable to acquire the disease are the nursing sisters, orderlies and medical officers who are daily in contact with it. The matter of chief importance is for each one to keep herself or himself in the best bodily health and if at all out of sorts to keep away from contact with enteric cases until recovered.

The chief reason why many orderlies have been attacked by the disease is in many cases due to their ignorance of the importance of personal cleanliness. Unless they are constantly reminded they will not wash or even dip their hands, after contact with bedpans and patients, in the basins of antiseptic lotion provided in the wards for that purpose.
Many of these men never think it necessary to wash their hands after leaving the ward and before eating their meals. At No. 8 the lotion used was a mixture of Lot. Carb. 1-40 and Lot. Hyd. Perchlor. 1-1000.

4. Inoculation.

This form of prophylaxis has thoroughly justified itself by the results already published given further on.

Out of 109 cases admitted to the entire division of No. 8 General Hospital, only 6 had been inoculated and those only once. All of them had the disease lightly.

Of the 4th. Argyll and Sutherland Highlanders 10 out of 23 officers were inoculated, and there were 3 cases of enteric (including myself)*, two of whom had been inoculated once, and one twice (the latter in India). No one had a severe attack, though the one who had been inoculated twice had a relapse.

Of 917 men, 24 were inoculated

*up to May 23rd
and only 1 of these got the disease (up to May 23rd). There were 31 other cases of enteric up to the same date.

The following are the statistics given by D.H. J. Doth in a lecture before the Clinical Society of London as regards the Portland Hospital:

<table>
<thead>
<tr>
<th></th>
<th>Inoculated</th>
<th>Not Inocul</th>
<th>Entered</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Staff (5)</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sisters (4)</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>N.C.Gs: orderlies</td>
<td>24</td>
<td>8</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>and servants (32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 41</td>
<td>28</td>
<td>13</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Of the cases of Enteric Fever admitted to the Portland Hospital:

<table>
<thead>
<tr>
<th></th>
<th>Recovered</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inoc:</td>
<td>Not Inoc:</td>
</tr>
<tr>
<td>Officers (34)</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>N.C.Gs and men</td>
<td>29</td>
<td>141</td>
</tr>
<tr>
<td>Total 232</td>
<td>50</td>
<td>153</td>
</tr>
</tbody>
</table>

Other statistics published are those of the 15th Hussars, Green點 (B.M.J. Febry 9th 1901) and those of the Scottish Hospital Staff (B.M.J. Jan. 12th 1901).
Of the 15th Hussars 360 were inoculated: there were 2 cases and 1 death; not inoculated 11 cases and 6 deaths.

Scottish National Hospital (S. Africa). First section: 61 doubly inoculated persons, no case. Record section: 82 for the most part once inoculated.

Of 35 inoculated nurses, no case of enteric; one uninoculated nurse contracted the disease. Of 46 doctors and orderlies nearly all inoculated 3 uninoculated and 2 (once inoculated) developed enteric.

The symptoms and regime of inoculation are so well known by now that it would be of no advantage to go into details. There are however one or two points, the result of personal observation, which may prove interesting.

The first is that it seems to be a pity that inoculation cannot be performed before embarkation more frequently instead of leaving
it until the troops are on board, because on the voyage out to S. Africa by the time many of the men have sufficiently recovered from the effects of sea disease, the weather has become warm enough to render it unpleasant to have to lie down below in one's bunk.

Secondly, it is undoubtedly of great importance to be inoculated twice. I have only seen one case with enteric who had been inoculated twice and that was the officer mentioned above, and in his case inoculation had been performed (I believe I am correct in stating) 9 months previously. For all that it is better to be inoculated once than not at all.

A third point is one, unimportant in itself, but which if observed adds greatly to the patient's comfort after the injection of the serum and that is preparing the patient as if for an operation. The first four officers inoculated...
on board were injected with
the serum after a good dinner,
just before going to bed, of
these, two in a few hours became
delirious with temperatures over
104°. In all these men the dose
was exactly the same. After
this I made it a rule to give
a purge the night before and
to advise those who were to
be injected to feed very lightly
on the day. The best time of
day was found to be about
5 o'clock in the evening, the patient
going straight to bed and having
some beef tea about 7 o'clock. Under
these circumstances the
patients frequently slept
through the greater part of
the night. With these simple
measures there were no
cases of delirium and the
symptoms themselves sub-
 sided much sooner.

In conclusion of these
remarks it seems like a matter
for regret that inoculation is
not more compulsory for those
going on active service to countries
where intense climate. As a rule
a large proportion of men who
had given their names in to be inoculated withdrew when they saw the effect it had on their comrades who had been done first.

Treatment.

will be dealt with as follows:

1. Accommodation.
2. Diet.
3. Therapeutics.

1. Accommodation.

In the entire division at Bloemfontein in Nov. 1900 there were two galvanised iron huts, lined with boarding and with a floor of boards. Each of these contained 24 beds. In addition there were 6 marqueses holding 8 cases each.

In October the nights were cold, and in that month as also in the succeeding two there were constant wind storms blowing sand everywhere, and owing to these I put down the
fact that bad cases ran
a more favourable course in
the huts than in the marquees.

All acute cases were sent
to the huts, and in the early
days of convalescence they were
moved to the marquees; if these
latter became overcrowded the
cases which were the strongest
were sent either to the Convales-
cent division of the hospital
or else to the Convalescent Camps.

2 Diet.

Milk and soda water was
the staple diet through the
acute stage of the disease.
Fresh milk was obtainable
as a rule, but occasionally
went sour, when condensed
milk had to be substituted.
As soon as the fresh milk
arrived at the hospital it
was tested by the orderly
medical officer and was
then, if sweet, sterilised
immediately. Two pints
of fresh milk were allowed
every 24 hours to each patient,
though it thought desirable an
extra one or two pints were
ordered. In addition to this two pints of soda water was the usual allowance and this was given with the milk. One tin of preserved milk made the equivalent of three pints of fresh and this was the daily allowance when fresh was unobtainable. There were a few patients who preferred condensed milk to fresh, and in two instances they were allowed the condensed as their diet. These men appeared to get on as well as the other patients who were on fresh.

As a change Horlick's Malted Milk was occasionally used and was often much appreciated. This could not be given as a rule in the mornings, because owing to its sweetness it frequently made patients inclined to vomit.

If the ordinary sterilised milk with soda caused vomiting then peptonisation was tried. In only one case was it found necessary to resort to rectal feeding. The patients were also allowed
as much water, previously boiled and filtered as they liked given 3 or 4 at a time.

Two days after the temperature was normal arrowroot or Benga's food was allowed.

If all went well four days later beef tea was given and six days after minced chicken and a little custard pudding were allowed and thence gradually on to full convalescent diet.

In cases which had been severe 21 days were allowed to elapse between the temperature reaching normal and the giving of any solid food.

Stimulants were not as a rule given during the acute stage unless the pulse was weak. In all cases where this was so, though the patient himself seemed fairly strong, Brandy or Whisky 2 to 3 fluid oz in the 24 hours was ordered.

In cases where further stimulation was needed, again
cases complicated by pneumonia one pint of Champagne in the 24 hrs was given.

During convalescence port ziv was allowed until the patient got out of bed when 1/2 pint of stout was substituted.

3. Therapeutic
(a) Sponging. In all cases of pyrexia over 103.4° sponging was employed sometimes tepid, rarely cold or iced, and this together with Phenacetin gr. V usually was effective for a time at any rate.

(b) Drugs. As a rule none were given during the acute stage of the fever except gr. V. Colonel on admission, and also in the treatment of complications.

For a time in several cases Burney's 1 gr. mixture of Aqua Chlori and Quinine was tried, but it did not seem to do much good except to deaden the motions.

As mentioned above in pyrexia Phenacetin gr. V was
given; in doses of 80 x it proved useful to cure the severe headaches.

For Constipation simple soap and water injections were used, if ineffectual Acanthi ZII was used instead.

Diarrhoea was treated by:

Rx.
Bismuth Subnit. 80 x
In. Opie. 75 x
Aqua Chlorof. a d 37 x

Sip.
To be given every 4 hrs until the diarrhoea ceases.

In obstinate cases suppositories of Morphia 8 x 1/2 were given.

For Haemorrhage Morphia and Tannic acid suppositories were used.

Internally was given:

Rx.
Cl. Terebinth
In. Opie. a d 75 x
Emuls. ad 37 x

Sip.
Every 4 hrs.
Diathermy was treated by the application of turpentine stipes. In one case it was found necessary to introduce a long rectal tube.

For Pain in abdomen fomentations were applied, when plain hot water fomentations were unsuccessful. Opium was sprinkled on them. If the pain was persistent and very severe opium was administered either as a suppository or hypodermically.

Backache occasionally proved troublesome. It was so in my own case, and with mustard leaves giving great relief to myself, this was the form of treatment I adopted with unravelling success.

For Sleeplessness and Delirium, the best mixture was:

```
Rx
Pot. Brom.  ₣ 80
Chlor. Hyd.  ₣ 60
Opi.  ₣ 4
Ag. Chlorsor. ad 37
```

It hastened.

Sฎ. To be taken at bedtime and
repeated in 3 hrs. time if necessary. 

Ammon. Carb. 800 \( \frac{v}{v} \)

Vin. Ipecac. \( \frac{m}{x} \times y \)

Inj. Billae.

Inj. Digital. \( \frac{a}{a} \times \)

Ag. Menth. Pip. ad \( \frac{z}{z} \)

Sig.: Every 4 hrs.

If the cough was very troublesome, Pulv. Ipecac. Go \( \frac{v}{v} \)

was given every 4 hrs.

In cases of Cardiac Debility the following prescription was given:

Dr. Strychn. Hydrochl. \( \frac{m}{m} \times y \)

Inj. Digital. \( \frac{m}{m} \times x \)

Ag. Chloroform ad \( \frac{z}{z} \)

Sig.: Every 4 hours.

It was found however that except in very bad cases alcohol had the same effect and the patient preferred it to a medicine. In severe cases both this mixture and also Champagne were given.

In cases of extreme weakness following haemorrhage or after perforation injection of
saline was tried, but with no beneficial results except temporary.

Operative procedure for perforation was frequently considered unjustifiable owing to the dust and sand being blown about.

Convalessent Treatment.

The patients were given Syr. Hyposph. B. 3î three times a day or else the following:—

Dr. Liqu. Strich. mj

Emuls. Marteaud 3î

Sip. 3 times a day after food.