

REPORT ON THE OUTBREAK OF ENTERIC AND  
EFFECT OF ANTI-TYPHOID INOCULATION AMONG  
THE 17TH LANCERS, MEERUT, INDIA.

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ANTI-TYPHOID inoculation among the 17th Lancers was carried out by me, partly in Scotland, during the latter end of August, 1905, and partly on the voyage out, in September, 1905.

	Strength of Regiment on Embarkation, September 6th, 1905.		Number Inoculated in Scotland, and on Voyage, August and September, 1905.		
			First Dose		Second Dose
Officers.. .. .	19	.. ..	17	.. ..	16
Their wives .. ..	5	.. ..	3	.. ..	3
Non - commissioned officers and men ..	490	.. ..	130	.. ..	108
Women and children	79	.. ..	0	.. ..	0
	<u>593</u>		<u>150</u>		<u>127</u>

Of the 150 inoculated no less than twenty-three refused to have the second dose, on the excuse that it hurt them, or that they did not believe in it, and no amount of persuasion would make them submit to it.

On December 2nd, 1905, a draft of the regiment disembarked at Bombay and joined headquarters. Strength: Officers, 1; non-commissioned officers and men, 91; women and children, 4; total, 96. Some of these men had been inoculated before arrival; exact number not known, as nominal roll has not arrived yet.

Enteric broke out in the regiment a few weeks after our arrival, and fresh cases have been admitted every month, with the exceptions of January and March, 1906, and during these months there were some cases under observation for enteric.

The men inoculated were of all ages and evenly distributed among the four squadrons. Of the 130 non-commissioned officers and men inoculated 117 are under 25 years of age. The majority of the regiment consists of men between 20 and 25.

*Clinical Effects and Degrees of Discomfort caused by the Inoculations.*

*First dose, .5 cc. (F., August 4th, 1905).*—All the cases I saw complained of local and constitutional symptoms of varying degrees, first noticed three or four hours after inoculation.

*The local symptoms* consisted of redness at site of inoculation,

swelling, from varying degrees of serous exudation, pain and tenderness. There was some lymphangitis in a few cases, and enlarged glands in groin or axilla in some cases.

*The constitutional symptoms* consisted of malaise of varying degrees, nausea—a few cases actually vomited, but these occurred on the voyage and were probably due to sea-sickness—fever, varying between 99° and 101° F., headache and loss of appetite.

The constitutional symptoms only lasted over thirty-six hours in the case of an officer who suffered more than any one else; he remained in bed for forty-eight hours with rather a severe type of the above symptoms. Fever rose to 101° F. He got up, however, at the end of forty-eight hours, and the following morning was feeling quite well again. This same officer was inoculated against enteric on his way out to the South African War, and says that at that time he felt the effects of the inoculation more than any one else on the boat. Of the seventeen officers inoculated only one other remained in bed the following day; he complained of a slight headache, nausea, loss of appetite, and his temperature rose to 100° F.; he also complained of severe pain and tenderness at site of inoculation.

*Second dose*, 1 cc. (F., August 4th, 1905), was given after an interval of ten days or more. Nearly every person who received the second dose complained of some local pain and tenderness at site of inoculation, which the majority said was not to be compared to that following the first dose, the local symptoms being so mild and the constitutional symptoms hardly noticeable. There were a few who said that they were worse in every way than they were after the first dose, and there were some who said they felt absolutely nothing of it at all.

*Short History of Regiment from date of leaving England, 1905.*—September 6th, embarked at Southampton. Strength: Officers, 19; non-commissioned officers and men, 490. September 28th, disembarked at Bombay; September 29th, Deolali Rest Camp; October 2nd, Jhansi Rest Camp; October 4th, arrived at Meerut; segregated in rest camp, about half a mile north-west of the British Cavalry Barracks, which were still occupied by the 4th Hussars. The married families, "A" Squadron and half of "D" Squadron, occupied bungalows, the remainder were under canvas. October 6th, the 17th Lancers took over stables and horses from the 4th Hussars, and from this date many men used latrines in the 4th Hussars' lines. Twelve cases of enteric had been admitted from the 4th Hussars in August, 1905. Date of last admission, August 31st, 1905.

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October 10th, 4th Hussars left British Cavalry Barracks. October 8th to October 13th, diarrhoea very prevalent among 17th Lancers. October 19th to October 22nd, diarrhoea again prevalent. October 24th to November 4th, a mixed detachment of 112 non-commissioned officers and men of the 17th Lancers absent at Delhi on escort duty, twenty-eight men from each squadron. During this time three of these men were admitted to Delhi Hospital with enteric. November 1st, regiment moved into barracks from rest camp, the barracks having been thoroughly cleaned out and re-whitewashed. November 4th, Delhi detachment returned. December 1st, dry earth abolished in all latrines, and 2 per cent. carbolic acid solution substituted. Water substituted for carbolic about middle of January, 1906, for septic tank.

*Causation.*—Very few of the early cases appear to have gone out of their lines; a few had been to the Soldiers' Home, but none would admit having had food or drink from any native hawkker.

The bedding was obtained as follows: Each man was given a new blanket at Deolali; after reaching Meerut, on October 4th, each man received two extra blankets from the Divisional Store Depot. These were not new, but had been washed since previous issue; their history could not be traced. The men accommodated in bungalows in rest camp ("A" and half of "D" Squadrons), received mattress cases and coir from the stores of the Quartermaster, 4th Hussars, the cases being either new or washed, the coir being part new and part old. The men who were under canvas at the rest camp slept on "charpoys," and did not receive mattresses until they went into barracks on November 1st, when each squadron took over the mattresses, pillow-cases and coir of the corresponding squadron of the 4th Hussars. All mattresses and pillow-cases were washed before being taken into use. The regimental institutes, mineral water factory, dairy, &c., are under regimental supervision, and are kept very clean.

Flies were very prevalent at the rest camp, and in barracks, at the time of the greatest number of admissions, but as soon as the carbolic was used in the latrines instead of dry earth, the number of flies, and the admissions for enteric, diminished fairly rapidly. About 25 per cent. of the cases showed signs of early bronchitis, indicating the possibility of infection by dust.

Seventeen cases of enteric fever occurred among the 112 men who went to Delhi; three cases were admitted to hospital at Delhi within nine days of their arrival; six cases were admitted to Meerut Hospital within fifteen days of their return from Delhi, *i.e.*,

November 4th to November 18th, and three subsequently, who had been feeling unwell on or before November 16th. These nine latter cases may have contracted the disease at Delhi.

With regard to squadron prevalence, the cases, up to the end of 1905, were very evenly distributed.

			Cases.
"A" Squadron	..	..	12
"B" "	..	..	9
"C" "	..	..	12
"D" "	..	..	13

Of the forty-six cases which occurred up to the end of 1905, only three occurred in men over 25 years of age, and these three men were 26 years of age. In the Appendix is given a summary of all the enteric cases in tabular form; the several numbers correspond to the numbers opposite the dots in the spot map. The notes and charts of Troopers C. and R., the only men inoculated against enteric, are appended; both were men who refused the second inoculation. The majority of the bacteriological work was carried out by the medical officer in charge of the Divisional Laboratory.

Extract from the Sanitary Report, Meerut, 1905, by Senior Medical Officer, Meerut:—

(1) Meerut had 108 admissions and twenty-two deaths from enteric, as compared with eighty-five admissions and twenty-two deaths during last year.

(2) This year the disease had not been so prevalent at this station until October to December, when fifty-one cases occurred out of the total 108 for the whole year; forty-three out of the fifty-one occurred among the 17th Lancers.

(3) The source of infection could not be definitely made out, but its spread was probably favoured by dust, flies, latrines and urinals.

The proximity of native villages, bazaars and "syce" lines, to the regimental lines, and the constant intercourse which takes place between them, may have a good deal to do with the causation of this disease. The barrack clothing, bedding, &c., of enteric patients have always been strictly disinfected, according to regulations, as well as the barrack rooms themselves, latrines, urinals, &c. Every suspected case of the disease was treated as regards isolation, disinfection of clothing, barracks, &c., in exactly the same manner as a pronounced case of the disease.

(4) Several of the cases occurred while the men were still segregated in tents after their arrival, and before they had gone into the permanent Cavalry Barracks.

APPENDIX I.

17TH LANCERS.

APPENDIX TO ANNUAL REPORT OF MEDICAL TRANSACTIONS AND PREVAILING DISEASES AT STATION HOSPITAL, MEERUT.

Enteric Fever—October to December, 1905; January 1st to June 2nd, 1906.

No.	Rank and name	Squadron	Age	DATES OF ARRIVAL		DATES OF		Date of onset of fever	Duration of fever in days	COMPLICATIONS WITH DATES							Eruption, with date	Diarrhoea or constipation	Whether inoculated, with dates	No. of BARRACK ROOM		No. of days in hospital
				India	Station	Admission	Final result			Pneumonia	Bronchitis	Early delirium	Hæmorrhage	Perforation	Epistaxis	Thrombosis				Other complications	Rest camp, 4.10.05 to 1.11.05; barracks, 1.11.05; Delhi squad., 24.10.05 to 4.11.05	
1	Pte. B...	B	24	28.9.05	4.10.05	26.10.05	R., 20.1.06	23.10.05	20	..	3.11.05	..	17.11.05	..	..	..	..	31.10.05	Constipation	No	B5 tent .. ..	87
2	L.-C. I.G.	B	22	"	"	28.10.05	R., 13.1.06	25.10.05	14	..	28.11.05	..	6.11.05	..	1.11.05	..	4.11.05	Diarrhoea ..	"	" .. ..	78	
3	Pte. N...	A	20	"	"	30.10.05	R., 13.1.06	26.10.05	25	..	..	..	..	..	..	..	Retention of urine, 4.11.05	"	"	Rest camp A, bungalow	76	
4	" W...	D	22	"	"	7.11.05	Inv. enteric leg. 20.3.06	6.11.05	25	..	11.11.05	8.11.05	..	..	8.11.05, 7.11.05	17.12.05	7.11.05	Early diarrhoea, then constipation	"	9, for a few days, bed 65, D8 tent	134	
5	" J...	D	20	"	"	29.10.05	R., 13.1.06	28.10.05	29	..	..	Yes	Yes	..	Yes	..	2.11.05	Diarrhoea ..	"	Delhi tent D1, bungalow	77	
6	" H...	D	19	"	"	1.11.05	R., 13.1.06	29.10.05	10	..	6.11.05	3.11.05, 2.11.05	..	..	..	..	5.11.05	Constipation	"	9, for a few days, bed 10, Rest camp D bnglw.	74	
7	" C...	A	23	"	"	31.10.05	R., 22.12.05	30.10.05	12	..	..	..	..	..	..	..	4.11.05	"	"	Delhi tent A1, Rest camp A bungalow	53	
8	" McB.	C	23	"	"	3.11.05	D., 10.11.05	"	11	..	11.11.05	..	8.12.05	..	..	..	Incontinence of urine and faeces, vomitg.	"	Diarrhoea ..	"	8, bed 37 for 2 or 3 days. Rest camp tent C8	8
9	" W...	A	24	"	"	"	R., 20.2.06	29.10.05	39	21.11.05	8.11.05	5.11.05 to 15.11.05	..	..	..	..	..	Early diarrhoea, then constipation	"	2, bed 2 for a few dys. Rest camp A bungalow	110	
10	" T...	D	23	"	"	2.11.05	R., 22.12.05	1.11.05	14	..	..	..	..	..	..	..	9.11.05	Diarrhoea ..	"	Delhi tent D1, Rest camp, tent D2	51	
11	" B...	C	21	"	"	10.11.05	R., 16.2.06	6.11.05	R* 4 32	..	26.11.05	..	..	..	..	..	25.11.05	Constipation	"	5, bed 23 for a few days. Rest camp, tent C4	99	
12	" B...	C	23	"	"	7.11.05	D., 19.11.05	7.11.05	12	..	11.11.05	13.11.05	3 large hæmgs., 15.11.05	..	11.11.05	..	..	Diarrhoea ..	"	5, bed 19 for a few days. Rest camp, tent C4	13	
13	" W...	C	20	"	"	8.11.05	D., 20.11.05	6.11.05	15	9.11.05	7.11.05	9.11.05	..	..	..	..	..	Constipation	"	5, bed 34 for a few days. Rest camp, tent C9	13	
14	" H...	C	22	"	"	10.11.05	R., 31.1.06	9.11.05	20	..	16.11.05	..	..	..	..	..	18.11.05	"	"	5, bed 15 for a few days. Rest camp, tent C5	83	
15	Cpl. K...	A	24	"	"	12.11.05	R., 31.1.06	12.11.05	19	..	20.11.05	13.11.05	..	..	..	..	16.11.05	Early diarrhoea, then constipation	"	1, bed 68 for a few days. Rest camp A bnglw.	87	
16	L.-Cpl. R.	B	22	"	"	8.11.05	R., 18.1.06	4.11.05	16	8.11.05	5.11.05	9.11.05	..	..	..	..	14.11.05	Constipation	"	4, bed 26. Rest camp, tent B9	72	
17	Pte. D...	D	24	"	"	13.11.05	R., 20.2.06	13.11.05	26	..	..	..	..	..	..	..	23.11.05	Diarrhoea ..	"	10, bed 12. Rest camp, tent D5	100	
18	" H...	B	22	"	"	18.11.05	R., 2.3.06	18.11.05	R* 5 32	..	18.11.05	4.12.05	..	..	..	..	2.12.05	Diarrh. 3 wks., then constip.	"	4, bed 21. Rest camp, tent B8	105	

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19	W...	B	22		16.11.05	R, 2.3.06	15.11.05	39		25.11.05		3 large haemgs., 26.11.05, 30.11.05, 11.12.05						Diarrh., then constipation	8, bed 19. Rest camp, tent B6	107
20	B...	A	24			R, 20.2.06	14.11.05	31		14.11.05	23.11.05							Constipation	1, bed 40. Rest camp A bnglw.	97
21	W...	B	22		18.11.05	R, 19.2.06	17.11.05	27		20.11.05	1.12.05								4, bed 20. Rest camp, tent B8	94
22	B...	B	20		15.11.05	R, 19.2.06	14.11.05	25		28.11.05									3, bed 31. Rest camp, tent B6	97
23	T...	A	23		16.11.05	D, 8.12.05		25		3.12.05		30.11.05, 29.11.05, 28.11.05, 27.11.05	?8.12.05						2, bed 1. Rest camp A bnglw.	23
24	R...	C	22		20.11.05	R, 20.2.06	20.11.05	R* 5 14		21.11.05									8, bed 3. Rest camp, tent C7	93
25	Cpl. B...	C	26			R, 19.2.06	16.11.05	25		24.11.05									5, bed 25. Rest camp, tent C4	91
	Mrs. C...	—	26		18.11.05	R, 22.2.06	15.11.05	23		15.11.05	13.11.05								44, married qtrs. No. 7 bungalow	97
26	Cpl. M...	D	25		20.11.05	R, 20.2.06	18.11.05	23											9, bed 59. Rest camp D bnglw.	99
27	Pte. W...	A	22			R, 20.2.06	19.11.05	27											2, bed 2. Rest camp A bnglw.	93
28	B...	B	24		22.11.05	R, 19.2.06	22.11.05	21				Dysent. stools							4, bed 59. Rest camp, tent B10	90
29	Cpl. J...	A	23			Inv. en- teric fev., 20.3.06		28		22.11.05				5.1.06	1.1.06				1, bed 36. Rest camp A bnglw.	119
30	Pte. W...	D	20		25.11.05	R, 24.2.06	23.11.05	22		25.11.05									9, bed 67. Rest camp, tent D4	92
31	P...	C	24		28.11.05	R, 27.2.06	20.11.05	21							4.12.05				14, band bnglw. Rest camp, tent C3	92
32	Cpl. R...	C	24		23.11.05	R, 20.2.06	23.11.05	25		4.12.05									7, married qtrs. No. 42. Rest camp, married quarters	88
33	Pte. D...	A	24		29.11.05	R, 20.2.06	27.11.05	21											1, bed 64. Rest camp A bnglw.	84
34	C...	B	21		23.11.05	R, 24.2.06	21.11.05	17		25.11.05					4.12.05, 25.11.05				4, bed 23. Rest camp, tent B9	92
35	L-Cpl. M.	D	24		26.11.05	D, 3.12.05	25.11.05	9		3.12.05		2 very large haemgs., 18.11.05, 26.11.05		3.12.05					9, bed 26. Rest camp, tent D4	8
36	Pte. A...	C	21		28.11.05	R, 20.2.06	28.11.05	R* 3 12											5, bed 47. Rest camp, tent C2	85
37	T...	C	22		3.12.05	R, 28.2.06		46		11.12.05		15.12.05							8, bed 31. Rest camp, tent C	117
38	J...	A	24		6.12.05	R, 20.2.06	5.12.05	16							10.12.05 5.12.05				Qustr.'s stores. Rest camp A bungalow	77
39	J...	A	20		5.12.05	R, 2.3.06	2.12.05	29		15.12.05									2, bed 15. Rest camp A bnglw.	90
40	W.	D	22		10.12.05	Very se- vere case, inval. to Eng. 20.2.06	9.12.05	36		16.12.05	30.12.05 to 8.1.06								10, bed 30. Rest camp D bnglw.	101

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\* R = Relapse.

APPENDIX I.—Continued.

No.	Rank and name	Squadron	Age	DATES OF ARRIVAL		DATES OF		Date of onset of fever	Duration of fever in days	COMPLICATIONS WITH DATES											Eruption, with date	Diarrhoea or constipation	Whether inoculated, with dates	No. of BARRACK ROOM		No. of days in hospital			
				India	Station	Admission	Final result			Pneumonia	Bronchitis	Early delirium	Hæmorrhage	Perforation	Epistaxis	Thrombosis	Phlebitis	Other complications	Rest camp, 4.10.05 to 1.11.05 ; barracks, 1.11.05 ; Delhi squad, 24.10.05 to 4.11.05	No. of days									
41	Pte. R...	A	23	28.9.05	4.10.05	3.12.05	D., 20.12.05	1.12.05	20	19.12.05	16.12.05	13.12.05	..	..	13.12.05	..	..	..	..	..	..	..	9.12.05	Diarrhoea ..	No	1, bed 65.	Rest camp A, bunglw.	18	
42	" T...	D	21	"	"	13.12.05	R., 2.3.06	12.12.05	24	..	29.12.05	..	..	..	..	8.1.06	5.1.06	..	..	..	..	21.12.05	Constipation	"	9, bed 49	..	80		
43	" D...	D	26	"	"	16.12.05	R., 20.2.06	18.12.05	14	..	..	..	..	..	..	..	..	..	..	..	..	18.12.05	"	"	9, bed 63	..	67		
44	" C...	D	23	"	"	18.12.05	Invalid., change to Eng., 20.3.06.	14.12.05	56	..	25.12.05	29.12.05	28.12.05, 21.12.05	..	..	..	..	..	..	..	..	..	..	Diarrhoea ..	"	9, bed 17	..	93	
45	" B...	C	21	"	"	22.12.05	R., 17.3.06	17.12.05	15	..	..	..	..	..	..	..	..	..	..	..	..	..	25.12.05	Constipation	"	5, bed 4..	..	86	
46	" H...	D	24	"	"	29.12.05	R., 1.4.06	23.12.05	R 8	..	21.1.06	..	..	..	..	..	..	..	..	..	..	..	10.1.06	"	"	14, band bunglw.	..	94	
47	" P...	C	20	"	"	15.2.06	D., 18.3.06	15.2.06	26	..	20.2.06	24.2.06	4.3.06, 2.3.06, 1.3.06	12.3.06	..	..	..	..	..	..	..	..	26.2.06	Diarrhoea ..	"	5, bed 46	..	26	
48	" McD.	B	22	"	"	22.4.06	D., 8.5.06	20.4.06	19	..	24.4.06	25.4.06	..	..	..	..	..	..	..	..	..	..	27.4.06	Constipation, later diarrhoea	"	3, bed 22	..	17	
49	" L...	D	22	"	"	6.5.06	..	3.5.06	R 10	..	..	..	..	..	..	..	..	..	..	..	..	12.5.06	Constipation	"	10, bed 8	..	..		
50	L.-Cpl. S.	C	23	1.1.06	3.1.06	7.5.06	D., 25.5.06	5.4.06	21	..	..	18.5.06	..	..	..	..	..	..	..	..	..	..	14.5.06	Constipation, later diarrhoea	"	9, bed 47	..	19	
51	Cpl. S.	D	23	28.9.05	4.10.05	9.5.06	D., 18.5.06	7.5.06	12	..	12.5.06	15.5.06	..	..	..	..	..	..	..	..	..	..	15.5.06	Diarrhoea ..	"	9, bed 24	..	10	
52	Pte. B..	B	22	2.12.05	5.12.05	11.5.06	..	9.5.06	20	..	..	..	..	..	18.5.06, 8.5.06	..	..	..	..	..	..	..	12.5.06	Constipation	"	3, bed 10	..	..	
53	" W...	B	23	"	"	14.5.06	..	12.5.06	12	..	16.5.06	..	..	..	14.5.06	..	..	..	..	..	..	..	20.5.06	"	"	4, bed 3..	..	..	
54	" R. †	A	20	"	"	13.5.05	..	11.5.06	..	..	23.5.06	2.5.06	..	..	..	..	..	..	..	..	..	..	17.5.06	"	1.12.05 1 dose only	1, bed 62	..	..	
55	" A...	A	25	28.9.05	4.10.05	15.5.06	..	12.5.06	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	"	"	2, bed 10	..	..	
56	" M..	D	23	"	"	24.5.06	..	22.5.06	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	"	"	10, bed 16	..	..	
57	" McD.	B	21	2.12.05	5.12.05	"	..	"	..	..	..	..	..	..	26.5.06	..	..	..	..	..	..	..	4.6.06	"	"	3, bed 11	..	..	
58	Cpl. W..	C	22	"	"	26.5.06	..	25.5.06	..	..	..	..	..	..	28.5.06	..	..	..	..	..	..	..	28.5.06	"	"	8, bed 35	..	..	
59	S.-Sgt. L.	D	24	28.9.05	4.10.05	2.6.06	D., 8.6.06	30.5.06	10	..	..	7.6.06	..	..	1.6.06	..	..	..	..	..	..	..	..	..	Diarrhoea ..	"	10, bed 21	..	7
60	Pte. L..	C	22	2.12.05	5.12.05	"	..	1.6.06	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Constipation	"	8, bed 46	..	..

\* R = Relapse. † Pte. R. subsequently recovered.

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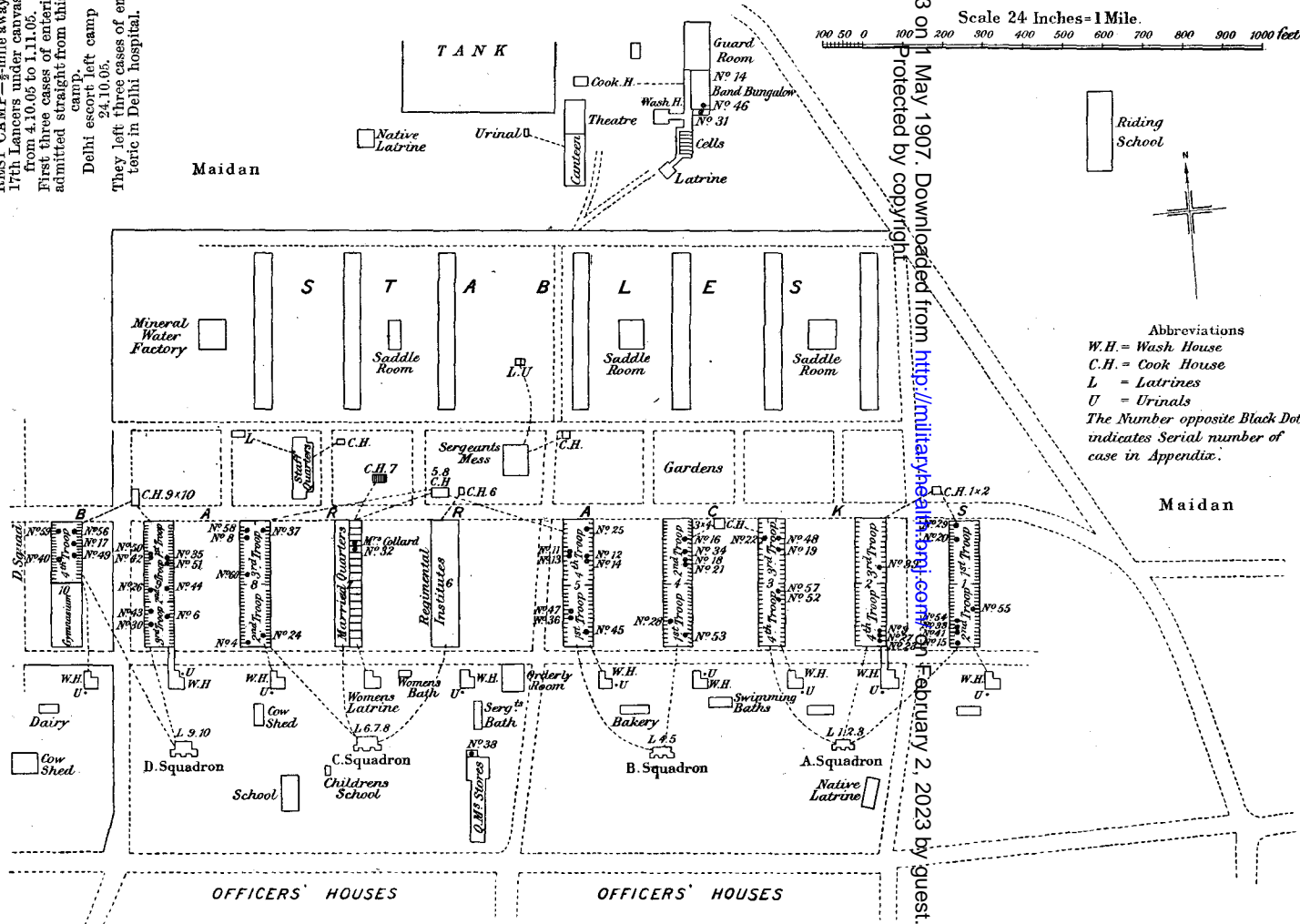
# BLOCK PLAN OF B. C. LINES, MEERUT

17th LANCERS ENTERIC SPOT MAP, 1905-6.

Scale 24 Inches = 1 Mile.  
100 50 0 100 200 300 400 500 600 700 800 900 1000 feet

REST CAMP— $\frac{3}{4}$ -mile away.  
17th Lancers under canvas  
from 4.10.05 to 1.11.05.  
First three cases of enteric  
admitted straight from this  
camp.  
Delhi escort left camp  
24.10.05.  
They left three cases of en-  
teric in Delhi hospital.

4 POLO GROUNDS



Abbreviations  
 W.H. = Wash House  
 C.H. = Cook House  
 L = Latrines  
 U = Urinals  
 The Number opposite Black Dot  
 indicates Serial number of  
 case in Appendix.

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500 *Report on Outbreak of Enteric among 17th Lancers*

(5) The drinking water in barracks and lines is supplied by the municipal waterworks from their filter-beds at Bhola, on the Ganges Canal, and is chemically and bacteriologically examined every fortnight in the Divisional Laboratory, and also by the Government Analyst at Agra, and has always been pronounced pure and free from contamination.

(6) The almost total failure of the rains in August and September, 1905, may have helped to produce this outbreak at the end of the year; the dust and flies were certainly much above the average at the season.

(7) The use of dry earth in the latrines was stopped, and a 2 per cent. solution of crude carbolic was used instead, starting on December 1st, 1905, with, apparently, good results.

(8) The Command Sanitary Officer made special investigations during the latter end of November, 1905, and after careful examination of barracks and all their surroundings, was unable to detect source of infection. He recommended the use of 2 per cent. solution of crude carbolic instead of the dry earth in the latrines.

Enteric fever subsided at the end of 1905, and there were no admissions during January, 1906, although there were several cases under observation for enteric.

The first case of enteric among the regiment in 1906 (No. 47), was admitted on February 15th. The disease was of a severe type, and the man died on March 13th, of peritonitis following perforation. No cause could be found for infection in this case.

The next case (No. 48) was not admitted until April 22nd. It was also very severe, and the man died seventeen days after admission. *Post mortem*: Extensive deep ulceration; no sign of perforation.

Nos. 50 and 51 were two very severe types of cases from the day of admission. They came in about the same date, and apparently they were both attacked with the same virulent strain of the organism, probably the same as attacked Case No. 48, although their blood did not give a positive reaction to Widal's test, while Case No. 48 did. Both men died of severe toxæmia, with cerebral symptoms and hyperpyrexia. *Post mortem*: In each case typical extensive typhoid ulceration of intestines; no perforation. Cultures from spleens sent to medical officer in charge of Divisional Laboratory showed the presence of Eberth's bacillus.

No. 54 is the case of a man who has been inoculated, first dose only. He came out in December, 1905, and was inoculated in Edinburgh, before embarkation, about December 1st (patient's

statement), as no nominal roll of cases inoculated in this draft has as yet arrived. Temperature chart and notes attached. Patient's blood did not give positive result to Widal's test, although examined five times, at intervals of six or seven days each.

No. 59 was a severe case, ending fatally, six days after admission, from toxæmia and hyperpyrexia; ninth day of disease. *Post mortem*: Extensive swelling of Peyer's patches; sloughs had not separated.

APPENDIX II.

ENTERIC FEVER AMONGST THE 17TH LANCERS IN INDIA,  
October, 1905, to June, 1906.

	1905			1906					
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
Admissions .. .. .	5	32	10	0	1	0	1	10	2
Deaths .. .. .	—	3	3	0	0	1	0	3	1

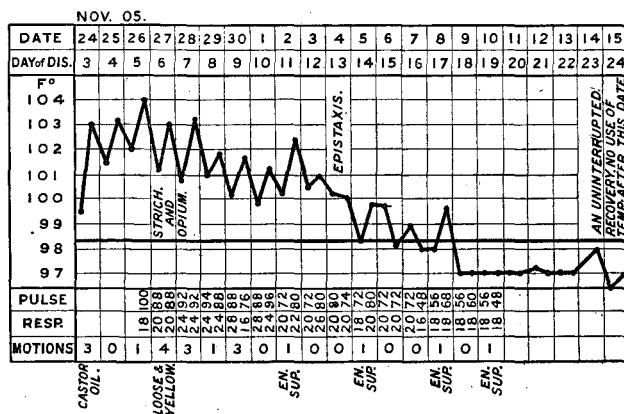
Arrived in India, September 28th, 1905. Arrived in Meerut, October 4th, 1905.

Note.—Since the date of this report a few more cases of enteric occurred in the regiment at intervals during the remainder of 1906; none of these were inoculated men. Detailed information not yet received.—W. B. LEISHMAN, Lieutenant-Colonel, R.A.M.C.

APPENDIX III.

MEDICAL CASE SHEET.

*History of Case of No. 34, Private C., aged 21.*—This man had been quite well up to November 21st, then had headache, slight pain in abdomen, no vomiting, nor diarrhoea. Detained at Station Hospital on



November 23rd. Admitted to No. 1 Section Hospital on November 24th, on which day he had slight epistaxis. Tongue coated, then white. Placed in observation ward for enteric. Milk, three pints; soda water, two bottles.

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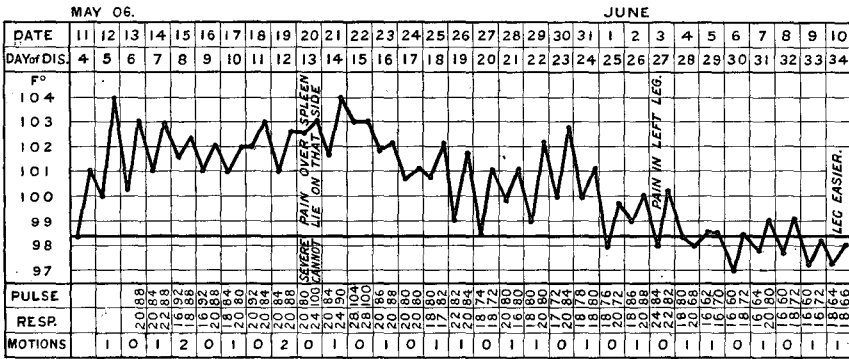
No pain except slight headache. No marked abdominal tenderness; slight in splenic area. Spleen just palpable. Occasional sibilant rhonchi in lungs. Ordered quinine sulph. gr. x. daily. 27th and 28th: Considerable diarrhoea of a thin yellow nature. Starch and opium enema given, since when diarrhoea has been checked. Fever has varied from 101° to 103° F. during the week he has been in hospital. 29th: He was ordered a mustard leaf to chest, as bronchitis was greater. Seen in consultation with Major Edye, R.A.M.C., yesterday and diagnosed enteric fever. Tongue slightly tremulous and furred. Taken off soda water; albumen water substituted for it. This morning temperature shows a tendency to fall, being 100·2° F. only. Respirations 23, easy; pulse 88, good volume and tension. December 1st: No alteration, condition fair. 2nd: Had sore throat; gargle, pot. chlor., ordered. 3rd: Feels rather better this morning, but no marked alteration in physical condition. 4th: Slight epistaxis last night; throat still injected and relaxed. 5th: Better; temperature normal; states that but for his throat he feels quite well, and is hungry. 6th: Temperature 99·8° F.; tongue cleaning; respirations 20, pulse 72. 8th: Temperature, normal; doing satisfactorily in all respects. 9th: Temperature, last night 99·6° F. after enema; this morning normal, feels well. 10th: Satisfactory; temperature, normal; respirations 18, pulse, 56.

From this date he made an uninterrupted recovery (*vide* chart).

MEDICAL CASE SHEET.

*History of Case of No. 54, Private R., aged 20.*—Admitted to Section Hospital on May 13th, 1906, with a history of having been ill since May 9th, 1906, with giddiness, weakness, headache, and pain just below spleen. Detained on May 11th, 1906. Temperature normal. Given castor oil, b. o., four times. Evening temperature, 101° F.; diet, milk and soda. On admission he did not look ill, but he complained of headache, and tongue was coated slightly. No epistaxis nor distension of abdomen and no spots; lungs and heart normal; spleen slightly enlarged; no abdominal discomfort or distension. Placed in observation ward for enteric. 14th: Abdomen slightly distended; ordered turpentine enema; temperature last night 103° F.; slept well. 15th: Complains of pain in back of neck. 16th: Is looking brighter this morning, says he feels well. 17th: Frontal headache, tongue coated, eyes look heavy. Diagnosed enteric. 19th: Slight abdominal distension, and a few suspicious rose spots; tongue cleaner, headache gone, sleeps well; spleen enlarged. It appears a much milder case than one would imagine from temperature chart 20th: Said to have “wandered in his mind” last night. This morning complains of severe pain over splenic area; the pain is of pleuritic type;

no friction rub detected, nothing but acute tenderness and enlargement of spleen can be detected. Temperature 102.4° F.; respirations 20, pulse 80; pain came on very suddenly, no rigor; he cannot lie on his back or left side; tongue coated; ordered mustard leaf and hot stupes, and given liq. opii. sed. 21st: Pain still very severe, increased on deep inspiration; no friction rub to be heard. 22nd: Says he feels well but for pain in his side, and he looks well considering the stage of disease (fifteenth day) and the range of temperature; pain in side less; ordered liq. opii. sed.,  $\mu$ x., pot. brom., gr. x.; slept well. 23rd: Pain in side gone; he can lie



on his back or side, no pain on pressure; he looks and feels well, tongue clean; no headache; temperature 102° F., respirations 20, pulse 80; a few sibilant râles in left chest, and coarse crepitations just above spleen. 28th: Doing well; nothing to note; temperature still keeps up, though normal yesterday morning. June 2nd: Pain in left leg; bellad. and glycerine; raised on pillow and bandaged. 3rd: Temperature normal; leg easier; doing well. 7th: Temperature normal four days. 9th: Temperature rose to 99° F. last night, otherwise nothing to note. 14th: Temperature normal since last entry, doing well; is not very much pulled down.