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THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH,  
MEDICAL AND SANITARY REPORT

ON THE

NATIVE ARMY OF BOMBAY

FOR THE YEAR

1877.

FRAMED ON THE MONTHLY AND ANNUAL RETURNS, ON THE REPORTS OF  
REGIMENTAL MEDICAL OFFICERS, AND ON THE INSPECTION REPORTS  
OF DEPUTY SURGEONS GENERAL.

WITH STATISTICAL TABLES.

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*Compiled in the Office of the Surgeon General, Indian Medical Department.*

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Bombay :

PRINTED AT THE  
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1878.

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# MEDICAL AND SANITARY REPORT

ON THE

## NATIVE ARMY OF BOMBAY

FOR THE YEAR

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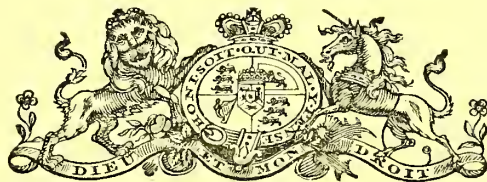
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THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH,

No.  $\frac{S. B.}{208}$  OF 1878.

FROM

THE SURGEON-GENERAL,

INDIAN MEDICAL DEPARTMENT,

TO

THE SECRETARY TO GOVERNMENT,

MILITARY DEPARTMENT.

*Bombay, July 1st, 1878.*

SIR,—I have the honour to submit, for the information of His Excellency the Governor in Council, the Medical and Sanitary Report of the Native Army of Bombay for the year 1877.

2. The separate regimental reports, drawn up in the first instance on a revised plan, have been carefully gone over, and those portions of their contents only which possess practical value have been printed. The tables placed at the beginning of the reports will, I think, be found a useful addition, as showing at a glance the more important of the general statistical facts connected with the health of each corps.

3. The total average strength of the Bombay Army, as will be seen from the table in the margin, was 22,561, nearly the same as that for 1876—only 22 less.

*Bombay Presidency.*

Years.	Average strength.	Average daily sick.	Average daily sick per cent. to average daily strength.	Admissions.	Deaths
1872 ...	22,903	1,040·0	4·54	36,209	226
1873 ...	22,967	876·2	3·82	29,035	165
1874 ...	22,750	835·7	3·66	26,601	176
1875 ...	22,819	772·7	3·38	25,475	213
1876 ...	22,583	856·8	3·79	26,918	247
1877 ...	22,561	788·3	3·49	25,130	215

The average daily sick has diminished by 68·5, and is 33·4 below the average of the preceding three years; the percentage of daily sick to average strength has also declined. The total admissions show a satisfactory reduction of 1788 as compared with those of the last twelve months, and are actually fewer than they have been in any of the previous six years. The percentage borne by admissions to strength was 111·3; that for 1876 was 119·2.

4. During the year under report the total number of deaths was 310, or 14 more than in the preceding year. Of these, 215

Mortality and Invaliding. took place in hospital, and 95 out of hospital and on leave. The mortality per thousand of strength was 13·7, that for the year previous having been 13·1. There were 1057 sepoy's invalided for discharge from the service, equal to a percentage on average strength of 4·68. Last year the total number and percentage were 1013 and 4·48 respectively. The men sent on sick leave numbered 476.

5. The average daily strength of the army in the Presidency Division was 3196·4, or 10·6 less than in 1876. The average daily sick has diminished by 24·5. The number of admissions has, however, been greater by 184. The percentage of admissions to strength was 110·9 as compared with one of 104·8 for the previous year. Forty deaths occurred, equal to 1·1 per cent. on the total treated.

*Presidency Division and Aden.*

Years.	Average strength.	Average daily sick.	Admissions.	Deaths.
1872 ... ..	3,297	144·0	4,731	33
1873 ... ..	3,358	140·2	4,513	28
1874 ... ..	3,343	133·4	3,861	32
1875 ... ..	3,288·5	125·4	3,551	36
1876 ... ..	3,207	128·7	3,363	45
1877 ... ..	3,196·4	104·2	3,547	40

6. In the Poona Division the average daily strength was 7771·6, or an increase of 323 on that of the preceding year. The average daily sick has risen from 220·4 to 261·2, and the admissions during the past twelve months have been more frequent than in 1876 by 1422. This increased sickness must be attributed chiefly to the greater prevalence of malarious fevers and, to a less degree, of bowel disorders. The percentage of admissions to strength was 111·5, while for the previous year it was

*Poona Division.*

Years.	Average strength.	Average daily sick.	Admissions.	Deaths.
1872 ... ..	8,577	319·7	10,703	51
1873 ... ..	8,209	250·4	7,334	35
1874 ... ..	8,197	241·2	6,855	36
1875 ... ..	8,145·9	224·2	7,607	40
1876 ... ..	7,448·6	220·4	7,249	42
1877 ... ..	7,771·6	261·2	8,671	72

97·3. The deaths numbered 72, or 30 more than last year, and 32·7 in excess of the average of the three preceding years. The increased mortality is principally due to remittent fever, cholera, and diarrhœa.

7. In the Northern Division the average strength of the army was 8601·3, or a decrease of 336. There has been a reduction in the average daily sick, as compared with that of the previous year, of 71·1, and in the admissions of 2200. The percentage of admissions to strength was 104·3, while for the preceding year it was 125·1. Malarious fevers and bowel diseases have been much less frequent. The mortality was 67, just one less than in 1876.

*Northern Division.*

Years.	Average strength.	Average daily sick.	Admissions.	Deaths.
1872 ... ..	8,054	427·4	15,735	68
1873 ... ..	8,450	392·9	13,498	52
1874 ... ..	8,362	376·2	12,426	53
1875 ... ..	8,547·1	318·2	10,714	105
1876 ... ..	8,937·3	365·5	11,177	68
1877 ... ..	8,601·3	294·4	8,977	67

8. The average strength of the army in the Sind Division has remained nearly the same. The average daily sick has diminished by 13·7; and the admissions, owing to the lesser prevalence of malarious fevers, have decreased by 1194. The percentage of admissions to strength, although not so low as in some former years, was 131·5; in 1876 it reached 171·5. The deaths have been only 36, as compared with a mortality of 92 in the preceding year, when a large proportion of it was due to cholera.

*Sind Division.*

Years.	Average strength.	Average daily sick.	Admissions.	Deaths.
1872 ... ..	2,975	148·0	5,040	74
1873 ... ..	2,950	92·7	3,690	50
1874 ... ..	2,848	84·9	3,459	55
1875 ... ..	2,837·5	104·9	3,603	32
1876 ... ..	2,999·4	142·2	5,129	92
1877 ... ..	2,991·7	128·5	3,935	36

9. Taking the army as a whole, its standard of general health would appear to have undergone a decided improvement. Examined

*General Health.*

by Divisions, however, this is not found to be maintained throughout. In the Northern and Sind Divisions there has been a very considerable improvement, malarious fevers, especially in the latter Division, having prevailed to a much less degree than in the previous year. In the Presidency Division general health has experienced little or no alteration, either for better or worse. The army in the Poona Division shows a lower standard



of health than it has done since 1872. The regiments at Sholapore, Dharwar, and Satara suffered very severely from the malarious fever which decimated the Deccan population after the famine. Syphilis and, more especially, bowel diseases have also told adversely on the health of the troops in this Division.

10. The principal diseases which swell the returns are, as usual, malarious fevers. The total treated for these disorders during the period under review amounted to 11,240, as compared with 12,528 in the previous year—equal to a percentage on total treated for all diseases, for the two years, of 43·3 and 45·3 respectively. Taken by Divisions, the total treated for malarious fevers in the Presidency was 1431, Poona 3848, in the Northern Division 4205, and in Sind 1756; for the preceding year the numbers were 1490, 3083, 5111, and 2844 respectively. It will thus be seen that there has been an increased prevalence of fevers in the Poona Division, but a decrease in the Presidency, Northern Division, and Sind—in the latter Division a very marked one indeed. In the Presidency Division malarious fevers were 39·4 per cent. of the total treated, in Poona 43·5, in the Northern Division 45·2, and in Sind 42·3. For the year 1876 the percentages were 43·0, 41·2, 44·6, and 54·0 respectively. Amongst the regiments in the Presidency Division the 17th at Surat again shows the largest number treated for fevers—692 in a total treated of 1515. It can hardly be doubted, moreover, that a considerable proportion of the other sickness contributing to this large total must also be ascribed to malarious influences. At Bombay in the 20th N. I. the treated for fevers has been somewhat less, while in the 21st it has exactly doubled; neither has, however, suffered to any unusual extent. Bassadore maintains its evil reputation, with a treated for fever of 135 in a total of 201. At Aden fevers have diminished in frequency by one-half, as compared with the treated for 1876. The regiments stationed at Poona continue to exhibit a large number of treated for malarious fevers: in the 1st L.C. the figures are nearly double those of the year previous, still the total for all the regiments taken together has diminished. The returns of the 4th Rifles at Satara, the 3rd N. I. at Kolapore, the 12th at Dharwar, and the 19th at Sholapore all show an increase in the treated for malarious fevers, the latter regiment especially having suffered most severely. In the Northern Division the 1st Grenadiers at Ahmedabad, the 22nd N. I. at Baroda, the 11th at Bhuj, the 23rd and 25th at Mhow, the 10th at Neemuch, the 24th at Mehidpore, and the 16th at Nusseerabad show the greatest amount of sickness from fevers. The 10th Regiment, although transferred from the malarious station of Mehidpore in the latter part of 1876, appears to have suffered to an even greater degree than before. Out of a total treated of 1277, no less than 948 cases, or 74·3 per cent., were due to fevers; the percentage of fevers to total treated at Mehidpore in 1876 was 66·9. The 24th N. I., which replaced it from Neemuch, shows 381 cases of fever, or a percentage on total treated of 60·2, as compared with one of 50·1 at Neemuch in the preceding year. Both the regiments at Mhow show an increased number of admissions, and the same observation applies to the 11th N. I. at Bhuj. A great improvement has taken place in the 16th N. I. at Nusseerabad; the number of fever cases, though still large, was 505 as compared with 862 in the year previous. Amongst the troops at Rajkôte and in the wing at Agar fever has been much less prevalent. The abolition of Barda Chowki as a station has helped materially to reduce the figures for this Division. All the Sind regiments, especially the 27th N. I. at Hyderabad, and the 30th N. I. and 3rd Sind Horse at Jacobabad, show a very satisfactory diminution in the number of fever cases as contrasted with the returns of recent years.

11. The numbers treated for small-pox exhibit a further increase on those for 1876, 101 cases with four deaths having occurred, as compared with 57 cases and one death in the previous twelve months. Although vaccination was carefully carried out, the continuance of the disease in the army can scarcely be wondered at, considering that

another severe epidemic visited the civil population in most parts of the Presidency during the past year. Seven cases occurred in the Presidency Division, all amongst the troops stationed in Bombay. In the Poona Division there were 13 cases in the 1st L. C. and the 5th and 8th regiments at Poona, 4 in the 15th at Ahmednagar, 5 in the 13th N. I. at Malligaum, 7 in the 19th at Sholapore, 4 in the 12th at Dharwar, and 3 each in the 14th at Belgaum and the detachment at Kaladgi. No deaths occurred either in this or in the Presidency Division. In the Northern Division there were 15 cases, with one death, in the 22nd N. I. at Baroda, and 4 in the 9th Regiment at the same station. Ten cases with 2 deaths occurred in the 25th N. I. at Mhow, and 7 cases in the 23rd. There were 3 cases each in the 1st Grenadiers at Ahmedabad, the 3rd L. C. and 10th N. I. at Neemuch, and the 16th at Nusseerabad. In the 11th at Bhuj and in the wing at Agar there was one case each. In Sind there were 4 cases, with one death, in the 27th at Hyderabad, and one case in the 29th at Kurrachee. At both the latter stations the disease was particularly virulent amongst the civil population.

12. There has been no cholera in Sind this year. In 1876, however, there were no less than 68 cases, all amongst the troops of the Frontier Field Force. Leaving Sind, therefore, out of consideration, there have been 67 cases in the other three Divisions during the past as compared with 44 in the preceding year. In the Presidency Division the number has been the same for both periods—13 with 9 deaths. Three cases occurred in the detachment of the 4th Rifles at Bombay, 4 in the 20th N. I., and 3 in the 21st. There was one in the wing of the 7th at Tanna, and two in the 17th at Surat. In the Poona Division there were 18 cases altogether, of whom 12 died. One case each was admitted in the 26th at Poona, the detachments of the Poona Horse at Dhulia and the 3rd N. I. at Kaladgi, and the 19th N. I. at Sholapore. Three cases occurred in the 12th at Dharwar, the same number in the 13th at Malligaum, and 2 in the 15th at Ahmednagar. In the 2nd Grenadiers at Belgaum there were 6 admissions with 5 deaths. In the Northern Division a serious outbreak of cholera took place in the 9th N. I. at Baroda in October; 13 cases occurred, of whom 8 died. In the 22nd N. I., after it had moved to Ahmedabad in September, an outbreak also occurred, when 16 men were attacked and 7 died. These figures include a few cases which appeared in a small detachment of the regiment on its way to Sadra. There were 4 cases in the 1st Grenadiers at Ahmedabad, and one each in the 23rd N. I. at Mhow, the 10th at Neemuch, and the 24th at Mehidpore. Considering the great extent to which epidemic cholera prevailed in the Deccan, the Konkan, and Guzerat during the past year, the comparative immunity of the troops from this disease is very satisfactory.

13. A notable decrease has occurred in the treated for rheumatic affections. The total was 1316, or a diminution on the preceding year's returns of 349. There were only two deaths. The most material improvement has taken place in the Northern Division, the numbers having fallen from 822 in 1876 to 575 in the past year. In the other three Divisions the proportionate decrease has been less considerable. The percentage of treated to strength for the Presidency Division was 6·9, for the Poona Division 4·3, for the Northern Division 6·6, and for Sind 6·0. In the year previous the figures were 8·1, 5·2, 9·2, and 6·3 respectively. The regiments which show the largest proportion of cases this year are the 6th N. I. at Aden, the 1st Grenadiers at Ahmedabad, the 22nd N. I. at Baroda, and the 3rd L. C. at Neemuch.

14. Syphilitic affections appear to have been somewhat less frequent in the Presidency and Northern Divisions. A small increase has taken place in Sind, but a very considerable one in the Poona Division. The total number of cases treated during the period

now under review was 632; in 1876 it was 506, or a percentage of treated to total average strength, for both years, of 2·8 and 2·2 respectively. For the Presidency Division the percentage of treated to strength for the past year was 2·1, for Poona 4·4, for the Northern Division 1·4, and for Sind 3·0. The corresponding percentages for the preceding year were 3·0, 2·5, 1·5, and 2·4. The regiments of the Presidency Division which were most affected were of course those stationed in Bombay; these have, however, suffered to a much less extent than in 1876, the cases in the 21st N. I., for example, having diminished more than one-half. The frequency of the disease amongst the troops stationed at Poona continues nearly the same—99 cases as compared with 101 the year before. In the Sappers and Miners at Kirkee the cases have increased from 10 to 18, in the 4th Rifles at Satara from 12 to 29, in the 2nd Grenadiers at Belgaum from 2 to 17, in the 12th at Dharwar from 5 to 44, and in the 19th at Sholapore from 18 to 73. The total treated for syphilitic disease for the whole Division has increased from 193 to 345. In the Northern Division the regiments at Bhuj, Mhow, Neemuch, and Nusseerabad have had the largest proportion of cases. In Sind the number treated in the 27th N. I. at Hyderabad has increased from 20 to 33, those at Kurrachee and Jacobabad remaining about the same.

15. There has been a slight increase of scurvy in the Presidency, Poona, and Sind Divisions, but in the Northern Division the Scurvy. treated for scorbutic affections have diminished by nearly one-half. The total treated numbered 182 as compared with 203 in the preceding year. The returns from Aden show 41 cases, or an increase of 16. None of the regiments stationed in the Deccan appear to have suffered more than usual. In the Northern Division, as regards the troops at Rajkote, there has evidently been a considerable improvement,—judging at least from the returns,—the numbers entered as treated for scurvy having been two-thirds less than in 1876. At Jacobabad there has been a slight increase of the disease.

16. Respiratory affections have been less frequent; the treated numbered 1193, including 45 deaths, as contrasted with 1493 and Diseases of the respiratory organs. 55 deaths in the previous year. The percentage of mortality to treated was, for the two years, 3·7 and 3·6 respectively. In the Presidency Division lung diseases have increased from 123 cases with 4 deaths to 149 and 6 deaths, the 17th N. I. at Surat showing the greatest amount of sickness from this cause. In the Poona Division, on the contrary, the numbers have fallen from 463 cases and 13 deaths to 345 and a mortality of 11. The 8th and 26th Regiments at Poona and the 3rd at Kolapore appear to have suffered most. There has been a very considerable reduction in the number of admissions in the Northern Division—viz., 519, of whom 15 died, as compared with 727 and 9 deaths in 1876. The 11th N. I. at Bhuj, however, with an increase of treated from 37 to 76, is the principal exception to a satisfactory general diminution of sickness in this Division from diseases of the respiratory organs. In Sind the total treated was 180, the same as in the preceding year; the mortality has fallen, however, from 29 to 13, severe pneumonia having been less prevalent than formerly.

17. The total treated for diarrhœa was 806 and 13 deaths, and for dysentery Diarrhœa and Dysentery. 807 with 6 deaths. In the previous twelve months the treated for each disease numbered 779 and 738, including a mortality of 10 and 8 respectively. In the Presidency Division diarrhœa has increased slightly, while dysentery has diminished in frequency. In the Poona Division the treated from the former disease have risen from 132 to 241, including 5 deaths; those from dysentery have increased from 212 to 341. The 8th and 26th N. I. at Poona, the 15th at Ahmednagar, the 1st and 14th at Belgaum, the 3rd at Kolapore, and the 19th at Sholapore have suffered the most severely from both maladies, the last-mentioned corps especially. The

causes which appear to have produced this greater prevalence of bowel diseases amongst the troops stationed in the Deccan will be discussed further on. In the Northern Division there has been a marked and general falling off in the frequency of admissions for diarrhoea and dysentery. The regiments at Ahmedabad, Mhow, Mehidpore, and Nusseerabad show the largest number treated for these diseases. In Sind diarrhoea has been slightly less frequent, but dysentery has prevailed more. The regiments at Jacobabad have been the chief sufferers.

18. Guinea-worm has nearly disappeared from amongst the troops of the Presidency Division, only 6 cases having occurred during the year, viz., 3 in Bombay, one at Tanna, and 2 at Aden, the latter probably imported. In the Poona Division there has been a general increase, and the total has risen from 37 to 72. At Dharwar, the station of all others which formerly was most infested with this parasite, there has, I am glad to say, been no increase, only 14 cases having been treated. Several admissions occurred at Poona, Kirkee, Malligaum, Kolapore, and Kaladgi, all of them stations which were free from the disease in 1876. The Northern Division returns nearly the same total as before, with the same general distribution of admissions, Mehidpore and Neemuch showing, as usual, the greatest number. In Sind the cases have diminished from 17 to 8. The total treated for the whole army was 155 as compared with 136 in the year previous. Under the subject of water supply the cause of the greater prevalence of guinea-worm in the Poona Division will be alluded to.

19. There has been a further diminution in the total treated under this heading, the numbers having fallen from 2984 in 1876 to 2658 in the year under review. The fact that there has been little or no line-building in progress, nor many movements involving lengthened marches, will be a sufficient explanation of the reduction that has taken place in the frequency of admissions for injury.

20. A late and copious rainfall in the Deccan resulted in an extraordinary development of malarious fevers during the last three months of the year. The civil population of the eastern and southern districts suffered most severely, nor did the troops escape. The 19th N. I. at Sholapore shows 567 admissions from fever as compared with 104 in the previous year. The change, however, to Kurrachee in November effected a great and sudden improvement in the health of the regiment. The Northern Division, in consequence of a short rainfall, has been less malarious than usual. The 10th N. I. does not as yet seem to have derived much benefit by its transfer from Mehidpore to Neemuch; an excessive amount of sickness still exists amongst the men. The regiment, during its stay at the former station, became so saturated with malaria that the full effects of the change will not be manifested for some time to come. The fruits of the abandonment of Barda Chowki are already seen in the lessened returns of sick from the 28th N. I. A moderate overflow of the Indus has resulted in the climate of Sind having been somewhat less malarious than was the case after the extensive inundations of 1876.

21. No effort has been spared to maintain the lines, so far as their many weighty defects will permit, in the best sanitary condition possible. I must here again bring prominently to notice the vital need which exists for the thorough drainage of the subsoil in the majority of the cantonments. I have no hesitation in asserting that this dampness of the ground on which the sepoys live is the main source of the malarious fever and lung diseases which cause so great a loss of strength annually. As an extreme instance of the evil, nothing can well be more instructive than the history of Mehidpore, where the camp stands on a site which is below the level of the river when in flood; this ground is not

only incapable of being drained, but is liable to inundations during the rainy season. It is no matter for surprise, then, if, notwithstanding the various so-called improvements which have been effected in the cantonment within the last few years, the amount of sickness from malaria has in no way abated; on the contrary, it tends to increase. A regiment which is unfortunate enough to remain there more than eighteen months comes away enfeebled to such a degree that nothing but a prolonged residence in a salubrious station will suffice to restore the shattered health of the men. The present condition of the 10th N. I., recorded at p. 76, is a case in point. If Mehidpore is to be retained as a military station, no time should be lost in removing the camp from its present position to the site at the old cavalry lines, as recommended by Deputy Surgeon-General Wyllie at p. 71 of this report. Experience has shown the futility of attempting to effect any improvement at this station so long as the existing site continues to be occupied. I beg also to draw attention to the extreme unhealthiness of the cantonment at Surat; last year it was even worse than Mehidpore. This can only be attributed to wet subsoil and defective drainage—or, to speak more truly, to the entire neglect of drainage. If, from its position with regard to the river Tapti, the site cannot be rendered dry, another should be selected. Mhow also suffers from want of drainage to a very considerable degree. The evils of subsoil dampness at Jacobabad have been sufficiently discussed in previous reports. Bassadore is notoriously malarious, and Gwadir, which has recently been added to the list of stations in the Persian Gulf furnished with detachments from the 21st N. I., promises to rival it in unhealthiness. In both instances wet subsoil is the cause. The subsoil of all cantonments in which there is the smallest suspicion of dampness should be properly drained, and if from local circumstances, as at Mehidpore, this cannot be accomplished, the huts should be removed to another site. Means should also be adopted to ensure the rapid removal of surface water. Until the measures above indicated are carried out, the sick returns of the army will continue to show a large proportion of disease from removable causes. All expenditure incurred with the object of doing away with such sources of inefficiency would be well repaid. The medical officer of the 1st L. C. at Poona attributes, with apparently good reason, much of the fever which has prevailed in his regiment to an increase in the area of irrigated land in the vicinity of the lines. It is not desirable in any case that irrigation should be carried on so close to the huts, and steps should be taken to prevent it from coming nearer than three hundred yards. The 8th N. I. at Poona and the Sappers and Miners at Kirkee now occupy new lines built on the standard plan; these are a very great advance on the old habitations, but as regards bathing arrangements there is still room for improvement. In fact, as long as bathing-places are allowed inside the huts or in the verandas, so long are these liable to be rendered damp, dirty, and unhealthy. At Satara, Kolapore, and Disa new lines are required; those of the latter station have long since been condemned.

22. In several instances the permanent latrines, owing to their defective construction, are not so clean as they should be. In spite of every care, the fluid portions of the excreta soaking into the surrounding earth give rise to a persistent nuisance. Nor in other respects, too, is it practicable to prevent these badly constructed privies from becoming more or less foul, and eventually growing into sources of disease. The trench system of latrine, when properly carried out, is undoubtedly the best for native regiments, but when from local circumstances its adoption is not feasible an improved kind of permanent latrine should be introduced. The sepoy in some instances do not seem to take kindly to the trench system, but prefer the jungle. Since, however, in other cases they resort willingly enough to the trenches, there is no reason why those who now object should not also be induced to overcome their repugnance to a system of this kind. At some stations the excellent plan of growing a crop of vegetables on the ground previously used for trenches is followed, and should be adopted wherever circumstances will admit.

23. Water is said to have been, with few exceptions, good and abundant.

Water Supply.

At Mehidpore and Neemuch, however, it has been scarce, and at the former station of indifferent quality.

At Kurrachee and Jacobabad the water, though sufficient in quantity, is far from pure. Notwithstanding the short rainfall of 1876, none of the medical officers in the Poona Division complain of any particular deficiency of supply having occurred, even during the hot weather. Although the wells may not have dried up, except in very few instances, they must, in the nature of things, have been lower than usual, and it can hardly be doubted that this circumstance was in some way concerned with the greater prevalence of guinea-worm amongst the troops in the Poona Division. The measures about to be taken for the improvement of the water supply at Asseerghur will, I trust, result in the final settlement of a matter which for some years past has given rise to a vast deal of trouble.

24. Although the cost of food was everywhere much greater than usual,

Food.

reaching famine rates in the Deccan stations, there has in no instance been any difficulty in obtaining a sufficient supply.

The quality has been good, except in the Poona Division, where large quantities of damaged grain were brought on the market. Here, in spite of the large amount of grain compensation allowed, men with large families were more or less pinched; and in consequence of this, and from the sepoy having been induced, by the lower rate at which it was offered, to purchase the spoiled and inferior grain to a considerable extent, bowel diseases, especially diarrhoea and dyspepsia, naturally became more prevalent. The same cause has also operated to a slight degree in temporarily reducing the standard of general health and physique of the troops stationed in the districts affected by the recent famine. The want of fresh vegetables, or an efficient substitute, is still felt at Aden. Since the malarious outpost of Barda Chowki was relinquished scurvy has been less prevalent at Rajkot, but the disease will not be entirely got rid of till a proper supply of green vegetable food is provided.

25. The remarks and suggestions made by the medical officer of the 2nd Sind

Clothing.

Horse, at page 86, on the clothing of the Sind Frontier Force deserve the earnest attention of Government.

As regards the question of warm under-clothing for the army in general, I can but repeat the opinion expressed in paragraph 26 of last year's report. It is to be hoped that the adoption of sandals in place of the present clumsy and ill-fitting boots will soon render the annual loss of strength from contused and blistered feet a thing of the past. There can surely be no valid reason why neat sandals should be looked upon as unsightly. Let them, however, be regarded so or not, their use would certainly add much to the comfort and efficiency of the sepoy, and reduce to a minimum the numbers treated for injury.

26. The duties of the troops in portions of the famine districts, in the way

Duties.

of guards, escorts, &c., were increased to a moderate extent, but no ill result followed.

27. With respect to the majority of the regimental hospitals favourable re-

Hospitals.

ports have been received. Except in very few instances, and these from temporary causes, the accommodation has

been sufficient. New hospitals have not yet been provided for Sirur and Satara, although the building at the former station has long since been condemned, and that at the latter is a hired house in the bazar. Now that a full regiment instead of a wing is stationed at Malligaum, it will be necessary to increase the hospital accommodation there. At Jacobabad an additional ward has been erected for the 1st Sind Horse, and a new hospital is in progress for the 3rd Sind Horse. It is to be hoped that these structures, designed on an improved plan, will help in some degree to remedy the unfavourable conditions as regards hospitals so frequently complained of at this station.

28. The regiments at Ahmedabad and Baroda are always liable to be attacked by cholera, which appears to be endemic amongst the civil population of those cities and of the surrounding villages. The past year has been no exception. An account of the epidemic in the 9th N. I. at Baroda in October will be found at pages 52 and 53 of this report, and at page 55 is a note on the outbreak in the detachment of the 22nd Regiment on its march from Ahmedabad to Sadra. Both cases, as well as that of the 1st Grenadiers at Ahmedabad, are instructive as manifestations of the facility with which the disease may be carried about from infected centres. Cholera had existed in Guzerat during the greater part of the year, but in October many towns and villages were visited by a most severe epidemic, the infection of which it is nearly certain was conveyed by the pilgrims from Dakor, a town situated halfway between Baroda and Ahmedabad, where a large assemblage had gathered after the rains were over, and amongst whom the disease existed. The recruiting party and men on leave from the 9th N. I. mentioned by Surgeon Roberts may possibly have brought the seeds of the disease with them from Dakor, but it seems more probable that it was communicated from Baroda itself. At Ahmedabad cholera was already present in the city when the troops at that station were attacked, and it is far from unlikely that the disease was, in some cases at least, contracted in the city by one or more of the numerous jail and treasury guards, and carried thence to the cantonment. It is always essential to bear in mind the possibility of such a mode of introduction, as in the majority of instances where regiments suffer from an outbreak of cholera it will be found that the disease had previously made its appearance in the neighbouring town. Such cases as this, and others of a similar nature, must, in spite of every care, continue to occur from time to time; and that they do not occur oftener speaks favourably for the precautionary measures adopted, more especially when we consider the frequency with which cholera has of late years visited the cities and towns of this Presidency. The fact that cholera, introduced from without in various ways, has in no instance spread to any particular extent is sufficient evidence that the general sanitary condition and conservancy of the cantonments have been carefully attended to. It is impossible, however, that those who are responsible for the duty can be too frequently reminded of the absolute necessity which exists for invariably maintaining the cantonment and its vicinity in a state of the utmost practicable cleanliness. They should ever remember that epidemic cholera is liable at any moment to occur in localities contiguous to, and in communication with, the cantonment, and that a constant state of preparedness is the best security they possess against an invasion of this terrible disease.

I have the honour to be,

Sir,

Your most obedient servant,

W. G. HUNTER, M.D.,

Surgeon-General.





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[The Regiments are placed as they stood in the Army List on the 1st July 1877.]

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# MEDICAL AND SANITARY REPORT

OF THE

## NATIVE ARMY OF BOMBAY

FOR THE

### YEAR 1877.

(The regiments are placed as they stood in the Army List on the 1st July 1877.)

#### PRESIDENCY DIVISION, ADEN, AND BOMBAY MARINE.

Average Strength Present during the year.....	3,196·4
Average Daily Sick per cent. to the Average Strength .....	3·2
Ratio of Mortality per cent. to the Average Strength .....	1·2

#### H. M.'s 20th Regiment N. I.

BOMBAY.—In medical charge of Surgeon-Major J. G. ASHER, M.D.

Average Strength.....	679·0	Deaths in Hospital .....	5
Do. Present .....	596·4	Do. out of do. ....	7
Admissions .....	568	Invalided .....	44
Daily Sick .....	23·5	Sick Leave.....	32

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Bombay.....	101·7	4·8	1·1
1875 .....	Do. ....	98·9	4·8	1·4
1876 .....	Do. ....	119·1	7·0	2·1
	Average...	106·6	5·5	1·5
1877 .....	Bombay.....	95·3	3·8	0·8

The regiment was stationed in Bombay from the 1st January to the 30th November, on which latter date it proceeded to Baroda, and was stationed there for the remainder of the year.

Location and movements.

2. Since the 1st of December the regiment has occupied the lines previously tenanted by the 9th Regiment N. I. at Baroda;\* they consist of a number

The Lines and their surroundings: present condition, hygienic and otherwise.

of pendals with tiled roofs, the walls being of bamboo plastered inside with mud; those occupied by married men are divided into rooms, while those occupied by single men are not so divided, except in some instances by low partitions made by the sepoy themselves; they are fairly well ventilated, but the space afforded per man is much less than that sanctioned by the Government of India (namely, 70 superficial feet for each single man, and 120 for each family), and the men are as uncomfortable and discontented as they can well be. The lines are situate at the N.E. corner of the general parade-ground, in a spot well open to the breeze, but devoid of shade and infested by white ants, and are not to be compared in respect of comfort and individual privacy with those formerly occupied by the 22nd Regiment N. I. while at this station, but now vacant. The drainage of the lines and cantonment and their general sanitary condition are fairly good, and the sanitary condition of the bazaar is satisfactory.

The quarter-guard occupied by the regiment is that previously occupied by the 22nd Regiment N. I., and is a very suitable building; it contains two solitary cells, which in respect of cubic space and ventilation are all that can be desired.

Conservancy.

3. The system pursued in Bombay was the same as in former years.

In Baroda the trench system of latrines is established, two enclosures (for men and women respectively) being situated to the north of the lines: this arrangement is much disliked by the men, and I think must always be practically more or less a failure, as many of the men, sooner than use them, wander into the surrounding country after dusk and defile the ground in the neighbourhood of camp.

I believe it is arranged that the permanent latrines (which are now used by the inmates of the hospital only) shall be used by the regiment generally during the rains.

4. In Bombay good and sufficient, from Vehar Lake. At Baroda there are four wells in the lines, which at present yield a sufficiency, but, the rainfall

Water supply.

having been very scanty, it is expected that there will be a scarcity in the hot weather: the water is slightly brackish.

Food.

5. Food was abundant in Bombay, but dearer than in former years. At Baroda supplies are dear compared with Bombay, and of inferior quality.

6. The work performed by the regiment in Bombay was the same as in former years, and does not appear to have had any special effect upon the

Duties, exercise, and amusements: their effects on health.

health of the men: they had an average of little over three consecutive nights in bed. At Baroda the duties are lighter; the Residency and Rewa Kanta Jail guards are the only large ones furnished, and the average number of consecutive nights in bed is four and three-quarters. For exercise the men have their ordinary parades, with running drill in the cold weather.

No regular amusements (such as a *talimkhana*) appear to have been kept up during the year, but sports have occasionally been got up for the men.

7. The hospital at Baroda consists of one large well-raised pendal near the eastern limit of camp, and close to the Guicowarec village of Gowlee Poora:

Hospital and its immediate surroundings: present condition, hygienic and otherwise.

it is about ninety feet long by twenty broad, capable of holding comfortably about twenty-four beds, and having wide verandahs, which can be utilised for extra accommodation.

The hospital is clean, well ventilated, and in good repair, and its general hygienic condition good.

The quarters for medical subordinates are very inferior, being *cutch*-built, deficient in space, and badly ventilated; the senior hospital assistant has only one small room and a little cookroom, and there are no quarters for any other medical subordinate.

General health and physique.

8. Fairly good.

9. The total admissions into hospital were 568, the average daily number of sick 23.5.

Details of treated.

Of the total admissions 206 were due to fevers, chiefly malarial, of which 13 only were remittent in type. Five cases of small-pox occurred: all recovered. Rheumatism, syphilis, bowel complaints, and contusions fur-

\* A description of the lines, hospital, &c. &c. occupied by the regiment while stationed at Bombay will be found in the report of the 9th N. I.

nished their usual quota. Four cases of cholera occurred in Bombay; of these three died, the other was transferred to the Goculdass Tejpall Hospital, where he also died. Thirty-two men were granted sick leave to their own country for periods varying from two to six months.

Mortality and its causes. 10. Five deaths occurred in hospital: of these three were due to cholera, one to locomotor ataxy, and one to asphyxia (suicidal).

Vaccination and re-vaccination. 11. These were duly attended to; the records show 41 successful primary operations, and 21 successful re-vaccinations.

Invaliding and its causes. 12. Forty-four men were invalided, their disabilities being as follows:—Eruptive fevers 1, malarious affections 1, rheumatic affections 3, syphilis 3, scurvy 1, diseases of nervous system 1, eye disease 1, heart disease 1, lung diseases 3, dysentery 1, skin disease 1, other local diseases 4, old age and debility 22, injury 1.

Recommendations and requirements. 13. New and proper quarters for the medical subordinates are urgently required. I would also strongly recommend that the regiment be permitted to occupy the lines formerly tenanted by the 22nd Regiment N. I. (now vacant) before the advent of the hot season, as from the absence of shade in their present lines, the want of privacy, cramped space, &c., I foresee much discomfort for the men if this be not granted.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 7th January. I was satisfied with the care and attention bestowed on the sick, but found some shortcomings in subsidiary details, explained by ill-health of the medical officer and the fact that the 1st class hospital assistant had only recently joined.

This corps, previously stationed at Bombay, arrived on the 1st ultimo, and is occupying the temporary lines constructed for the 9th Regiment some three years ago. They are less commodious, and inferior as a protection to the permanent huts vacant since the departure of the 22nd.

The hospital is an old schoolroom extemporised for the 9th in 1875. It has various drawbacks, and is particularly objectionable as being close to cantonment limits, and only twenty-four paces distant from a native village where many cattle are kept, with large collections of manure offensively near to the sick. The original Native Hospital was made over to the Senior Medical Officer, British Troops, just before the arrival of the 20th, on the ground of it being desirable to treat native followers in a separate building from Europeans.

**H. M.'s 21st Regiment N. I.**

BOMBAY.—In medical charge of Surgeon-Major W. DAVEY.

Average Strength .....	654·3	Deaths in Hospital .....	78
Do. Present .....	632·6	Do. out of do. ....	65
Admissions .....	524	Invalided .....	15
Daily Sick.....	15·9	Sick Leave .....	9

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Bombay.....	97·5	4·0	1·3
1875 .....	Do. ....	90·1	3·2	0·9
1876 .....	Do. ....	80·6	2·5	0·4
	Average...	89·4	3·2	0·9
1877 .....	Bombay.....	82·8	2·5	1·1

The head-quarters and main body of the regiment has been stationed in Bombay throughout the year, besides furnishing the usual detachments in course of annual relief to the Persian Gulf and Indian Government steam vessels, as per subjoined details :—

Baghdad .....	10
Bushire .....	15·8
Bassadore .....	12
I. G. S.S. "Dalhousie" .....	8
Ditto "Abyssinia" .....	8
Ditto "Magdala" .....	8
Ditto "Kwangtung" .....	7·8

Two new detachments have been furnished to Gwadur and Jask, and Chandwad, as per following strength :—

Gwadur and Jask .....	36
Chandwad .....	20

The detachment of twenty strong at Yeola, which was a new call on the regiment last year, has not been furnished this year.

2. The same as reported in previous years with the exception of the construction of a new open drain towards the north-east for the conveyance of regimental sewage to the Sonapur drain. This is not strictly an addition to the past sanitary arrangements of the lines. This drain was in existence before, but it was covered, and cleaned periodically. It has now been enlarged, kept open, and flushed daily.

The Lines and their surroundings : present condition, hygienic and otherwise.

Conservancy.

3. The same as reported in the previous year.

4. From Vehar for drinking purposes, and from wells in and near the lines for washing and other purposes. The quality of Vehar water has been excellent, but the supply has not been so constant as in previous years. Owing to the short supply of water through the hospital stand-pipe during the day, when water is much needed, the patients and other men of the hospital have been greatly inconvenienced during the year.

Water supply.

5. The same as reported before. The Deccan famine had the effect of considerably raising the price of the grains which form the staple food of the sepoys throughout the year; this high rate of prices is still maintained in the local market, and the sepoy's food is not yet procurable at its usual price.

Food and clothing.

6. Not heavy. The men had on an average  $5\frac{1}{4}$  nights in bed. During the year under report two parties in charge of transport convicts to the Andamans proceeded from Bombay as far as Allahabad.

There are no gymnasia. The men occasionally indulge themselves in cricketing. A few young sepoys of this corps compete for the prizes at the annual running, jumping, climbing, and sack-races on the Esplanade.

At the last races some prizes were gained by sepoys from this regiment. The opening of a gymnasium in connection with the regiment would materially aid a recruit in the development of his body, and would be much resorted to by the younger sepoys.

7. The hospital accommodation has been sufficient, and there was no overcrowding.

Hospital and its immediate surroundings : present condition, hygienic and otherwise.

The hygienic condition of the hospital and its surroundings has been the same as reported before, but owing to its proximity to the European officers' quarters and the regimental lines no accommodation is supplied for the reception of patients suffering from contagious diseases. Such cases have generally to be transferred to the J. J. Hospital for treatment.

8. The general health of the men has, on the whole, been good throughout the year.

General health and physique.

The regiment is recruited from two classes of men, viz. Mohamedans from the north, and Hindoos from the Konkan. The Mohamedan recruits are generally more healthy and strong in physique, for they live singly, unencumbered by the burden of maintaining their wives, and can therefore afford to take a more nutritious diet than the Purwarees, who have to maintain a large family consisting of several souls. The physique of the Purwarees has, however, on the whole been fair during the past year.

Details of treated.

9. Nothing particular to call for remark.

10. During the year under report there have been eight deaths, five more than last year. **Mortality and its causes.** Two deaths from remittent fever complicated with pneumonia, one from cholera, one from acute rheumatism, one from dropsy of the heart, one from bronchitis, one from double pneumonia, and one from hepatitis.

11. Although there have been many cases of cholera during the year in the Native **Epidemics.** Town, only two sepoys were infected, but they were not seized with the attack in the regimental lines. One case occurred in June, and one in September. Both cases were fatal. Besides these there were three cases among the families in June and July. There was one case of small-pox, in March. The subject was a female who had no marks of previous vaccination, though stated to have been vaccinated.

12. 97 children have been primarily vaccinated. Of these 95 cases were successful and **Vaccination and re-vaccination.** 2 unsuccessful. Of the latter one child was successfully re-vaccinated.

13. Fifteen men were invalided by the Annual Invaliding Committee held in November **Invaliding and its causes.** last. Of these twelve were recommended by the commanding officer of the regiment as being old and worn-out men, unfit for further service. The rest were presented by me. Two were invalided for paralysis, and one for scorbutic affections. Of the two paralytic invalids one suffered from hemiplegia, and the other from paraplegia.

*Inspection by Deputy Surgeon-General MOORE.*

I inspected the lines and hospital of the 21st Regiment on the 23th of December, and when in Bombay have visited the hospital weekly, and the lines on various occasions. The lines are now perhaps in as good order as the circumstances and the nature of the locality admit. Some much-required improvement has been effected to the drainage. The latrines used by the regiment are a long distance away, owing to the locality; this is unavoidable. Some complaints were made of an insufficient supply of Vehar water during the year. It may be here noticed that since this water was first supplied, in 1865, until last year, no case of cholera occurred in these lines. There is no gymnasium, but the men sometimes practise wrestling and club exercise. Wards for contagious diseases are a desideratum for the regimental hospitals in Bombay, the present plan of using tents when epidemic disease occurs being almost impracticable during the rainy season.

**Right Wing, H. M.'s 7th Regiment N. I.**

TANNA.—In medical charge of Surgeon W. A. BARREN.

Average Strength .....	341	Deaths in Hospital .....	5
Do. Present .....	293	Do. out of do. ....	0
Admissions .....	218	Invalided .....	20
Daily Sick.....	6·3	Sick Leave .....	4

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Tanna .....	91·8	2·5	0·7
1875 .....	Do. ....	88·7	2·7	1·7
1876 .....	Do. ....	61·9	1·5	0·7
	Average...	80·8	2·2	1·0
1877 .....	Tanna .....	74·4	2·8	1·7

The lines, which may be divided into the old and new ranges, have been built to accommodate four companies, and are bounded on the north by the jail and the parade-grounds, on the south by a row of private houses, on the east by the creek, and on the west by the European Civil Lines. The new range of lines, which is separated from the old but improved ones by a road 56 feet in breadth, is arranged in five rows but variously-sized sections.

Ventilation is effected in the old lines through the doors and eaves of the huts. The huts in the newly erected sections have, in addition to the former method, ridge ventilation; and the rooms situated at the extreme east and west are furnished each with a window.

2. The drains run freely, and are always clean and in good condition. There are two *pukka*-built latrines,—one for the men, and the other for the women,—situated near the creek, to the south-east direction of the lines. One central well-built drain carries away the liquid collections of the latrine into the creek. The dry-earth system has not been as yet introduced. The latrine ordure is removed twice a day during the cold months, and thrice at least during the hot season, and emptied into the creek to the north of the jail. The conservancy cart removes the line sweepings twice a day.

3. Water is obtained from wells situated in and near the lines. Although drinking-water is furnished by six wells, yet the supply appears to be insufficient during the hot weather; good potable water from Pokrun can without any difficulty be now secured.

4. During the famine months food was dear; but there was no marked want or insufficiency of grain.

5. These, which are very light indeed, and by no means injurious to the health of the men, consist of guards over the jail, and the ordinary parades and drills.

6. The hospital is surrounded by the civil and police hospitals, the police lines and the bazar, and some outlying houses occupied by natives. It is too closely surrounded and closed in by buildings and dwellings to allow of thorough and proper sanitation. The building is a poor one, but for the detachment it generally suffices (occasionally there is a little overcrowding) to contain all the sick.

7. General health good, although there are several men in the wing who cannot but be considered unfit for active service. Physique is fair.

8. The general enfeebled appearance and condition of the men is no doubt greatly due to the constant exposure to malaria.

9. There have been 224 persons treated during the year, viz., for malarious fever 94, cholera 1, rheumatic affections 12, syphilis 4, scurvy 2, diseases of the nervous system 3, eye diseases 6, heart diseases 2, lung diseases 9, diseases of the stomach and intestines 33, diseases of the liver 4, spleen diseases 2, gonorrhœa 4, ulcers 3, skin diseases 13, debility 2, and injuries 18.

10. There have been 5 deaths—from heart disease, meningitis, remittent fever, hepatic abscess, and cholera respectively.

11. There were two cases of cholera admitted into the hospital, viz., one private and one woman (wife of a private): both cases proved fatal.

12. Vaccination and re-vaccination have been carried on regularly. There have been 41 primary vaccinations, of which 5 proved unsuccessful, and 4 re-vaccinations.

13. Twenty men were invalided during the year, viz., one for syphilis, one for hemiplegia, one for lung disease, three for heart diseases, two for diseases of the stomach and intestines (*i.e.* one for piles and one for dyspepsia), one for hypertrophy of spleen, nine for old age, debility, and defective vision, and two for local injuries.

14. Better quarters for the hospital assistant are required, as the present building is a mere hut. Accommodation is also required for 2nd class hospital servants and for infectious and contagious diseases.



*Inspection by Deputy Surgeon-General MOORE.*

The hospital and lines of the Right Wing, 7th Regiment N. I., were inspected by me on the 25th of September. The lines were in a very cleanly condition, and their structure, relative position, and appearance generally are satisfactory. The drainage also is good, both naturally and by made drains. The regimental latrines were in good order. The hospital is one of a range of buildings used as the regimental, police, and civil hospitals. The regimental hospital is calculated to contain sixteen patients, and is in good repair. As mentioned by the medical officer, the hospital is too closely surrounded and closed in by buildings, which somewhat impede thorough perfation. The hospital assistant's quarters are also unsatisfactory.

**H. M.'s 17th Regiment N. I.**

SURAT.—In medical charge of Surgeon-Major G. F. H. BROWN.

Average Strength.....	702·1	Deaths in Hospital .....	6
Do. Present .....	635·9	Do. out of do. ....	4
Admissions .....	1,501	Invalided .....	31
Daily Sick .....	29·8	Sick Leave.....	25

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Poona .....	87·3	3·2	0·8
1875 .....	Poona.....	120·2	3·4	0·4
1876 .....	Surat .....	189·0	5·6	2·4
	Average.....	132·1	4·1	1·2
1877 .....	Surat .....	210·9	4·2	0·8

Location and movements. The regiment has been stationed at Surat throughout the year.

2. The lines are built parallel with the left bank of the Taptee river, about a hundred yards distant from it; the ground is very slightly undulating, but level with the river-bank; there are no villages in the immediate neighbourhood, but the highroad to Domus passes immediately in front of the lines. They are not built on plinths, but are slightly raised above the ground, varying from 1 foot to 2½ feet in height; the lines are in good order and repair, and as regards accommodation afford the usual average of native huts. As regards their hygienic condition, the immediate neighbourhood of the river and their low site cannot conduce to the health of the inmates. The drainage is as effectual as the situation will allow; the refuse water from the huts escapes through a hole in the wall, and either pereolates into the soil, or is carried off by the main covered drain that runs into the Taptee.

3. There are three latrines situated to the south-east of the lines, about 350 yards away. Conservancy. The night-soil is removed in filth-carts every day, and deposited about 1½ miles distant. The lines and cantonment are kept clean.

4. The supply of water is abundant, but it varies much in quality; all the wells in camp are more or less braekish, but very fair drinking water can be obtained close to the lines. Water supply.

5. Food at Surat is generally abundant and cheap; this year it has been dear, and probably the dearness of grain has had some effect upon the health of the men; for, although they get compensation, they have most of them families or followers to feed, for whom no compensation is allowed. Food.

Duties, exercise, and amusements : their effect on health.

6. The duties at this station are very light, and the amusements of the men are principally of their own invention.

The Hospital and its immediate surroundings, hygienic and otherwise.

7. The regimental hospital is situated to the west of the lines, about 150 yards from the river Taptee. It is an upper-storied building, roomy and well ventilated; the wards of the hospital afford accommodation for 22 patients, and the spacious and roomy verandahs above and below afford room for as many more. I have had as many as 80 men in hospital, which perhaps was a little overcrowded, but the ventilation is good, principally from the doors and windows. The native village of Utava lies at the back of the hospital, about 150 yards distant,—much too close, I think, though I cannot say I have traced any ill effects from it as yet; in other respects the situation is undoubtedly good.

General health and physique.

8. There is no doubt that the general health and physique of the men have not improved since their residence at Surat. This may be attributed to drink, malaria, and the enervating nature of the climate,—certainly not to their duties. They are a fine-looking body of men, but men are constantly falling out from parade, from faintness and indigestion. There is no malingering about this, as the men who do this are always sent to me for inspection. I think, however, the dearness of grain may have had some effect in producing this state of things.

Influence of climate or local circumstances on health.

9. I do not know of any special causes further than those already enumerated for the ill-health of the men. The only additional cause that may have had an indirectly bad effect on the health has been the small amount of rainfall, much below the usual average—viz., 18 inches 25 cents.

Details of treated.

10. The total number of admissions from all causes was 1,501, a considerable increase over last year, which was 1,194; of these ague gives 672, febricula 409, remittent fever 16, dysentery 27, diarrhœa 47, bronchitis 51. These are the principal admissions from grave disease, and the following facts are elicited thereby, viz., that compared with last year there was a great increase of sickness from malarious fever, less from bowel complaint, and an increase from chest disease, principally bronchitis; ulcers, as usual, give a large number of admissions, viz., 54, principally from shoe-bite. Two cases of cholera ending fatally were admitted for treatment. The treatment of these diseases has been carried on much as usual, the only thing to remark being that, owing to dearness of provisions, men under treatment showed rapid signs of great weakness, entailing a large use of medical comforts.

Mortality and its causes.

11. The mortality has been less than last year, the number of deaths in hospital exclusive of cholera being four, including cholera six; one death occurred from enteritis, one from intermittent fever complicated with bronchitis, one was a case of suicide by hanging when under treatment for ague, and one death was from remittent fever. These were all ordinary cases, requiring no special remark, and, considering the actual amount of sickness, is very favourable as compared with last year. I believe this may be attributed in some measure to the habits of the men as regards drinking having much improved, after the subject having been fully and forcibly explained to them; four men have died out of hospital, viz., two from ague, one from remittent fever, and one from chronic diarrhœa.

Epidemics.

12. There was an epidemic of small-pox in Surat and the suburbs, and indeed, I believe, all over the country in the immediate neighbourhood, at the beginning of the year, which fortunately did not materially affect the regiment; four cases only occurred, amongst the women and children. The measures adopted were to forbid intercourse with the city, to strictly carry out vaccination, and isolate the cases in tents.

Vaccination and re-vaccination.

13. Vaccination and re-vaccination have been well and successfully carried on; the lymph has been remarkably good.

Invaliding and its causes.

14. Thirty-one men have been invalided from the following causes :—

Chronic rheumatism .....	4
Syphilitic affections .....	2
Disease of the lungs.....	3
Disease of the stomach and bowels .....	3
Disease of spleen.....	1
Ulcer .....	1
Varicose veins .....	3
Old age and debility .....	14

*Inspection by Deputy Surgeon-General MOORE.*

I inspected the hospital and lines of H.M.'s 17th Regiment N.I. at Surat on the 14th of November, going carefully through the lines in company with the Commanding Officer and the Surgeon. There are twenty rows of double lines, not favourably situated with reference to the prevailing breezes. The lines are, fortunately, a considerable distance apart, and there are numerous trees affording shade, but, owing to position, while one face of the lines, to the S.W., obtains perfation, the other sides, looking in the opposite direction, are close and unventilated. The men therefore lie outside, to which practice may be attributed a considerable proportion of the fever and bronchitis they suffer from. In front of all the houses is a mud wall, which, while securing privacy, impedes ventilation, and renders the interiors very dark. The floors are scarcely raised from the level of the ground, although there is an attempt at plinth outside. This is made of mud, and instead of rendering the interior dry must conduce to an opposite result. The washing-water used inside, and probably urine, is conducted by a "kutchu" drain from each house into the central street, or to an adjacent tree. But it is frequently absorbed by the earth before reaching its destination, and, percolating through the ground, must also tend to render the interiors damp. The drainage of the central streets is merely a slope of the ground; and the drainage, such as it is, passes to a long drain running at right angles the whole length of the lines. From the centre, where the ground is a little lower, a barrel drain leads to the Taptee. But when rain floods the river the water rises in this drain, rendering the central part of the lines very wet, and sometimes flooded. To the absence of proper ventilation; to the position of the lines facing away from the prevailing breeze, thus inducing the men to sleep outside; to the bad drainage from the houses, and to the vicinity of the Taptee and the floods therefrom, may therefore be attributed much of the febrile malady from which the men suffer. The lines are in good order and repair; the whole locality was very clean, and no overcrowding in the huts,—saving clauses, where so much is radically bad. During the year as many as 672 cases of ague, 16 of remittent fever, and 409 of febricula were admitted. These admissions occurred principally during the autumn, and were made the subject of several references from my office. Doubtless many of the cases returned as "febricula" were in reality of a malarious character. It appears that although the rainfall of the last season was small, there was a heavy early fall, followed by a long period of dry weather, when the men began to suffer as above indicated. There were only two cases of cholera in the regiment during the year; of the other diseases treated none require special notice.

The hospital was formerly an upper-storied bungalow, having chunam floors below, and wood flooring above. The wards are spacious and well ventilated, and the back verandah, which is wide, may be used as an additional ward. Laterally there are office and store rooms, the staircase, and an ophthalmic ward. The whole is raised on a good plinth. The hospital, surrounding buildings, and compound were clean and in good order, the instruments and medicines well kept, and the establishment reported upon favourably.

Vaccination has been carried on successfully and thoroughly.

**H. M.'s 6th Regiment N.I.**

ADEN.—In medical charge of Surgeon-Major A. M. ROGERS.

Average Strength .....	656·5	Died in Hospital .....	7
Do. Present.....	644·4	Do. out of do. ....	4
Admissions .....	346	Invalided .....	62
Daily Sick.....	14·6	Sick Leave .....	6

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Belgaum .....	37·4	1·1	0·4
1875 .....	Do. ....	58·3	1·8	0·6
1876 .....	Aden .....	62·6	2·1	0·6
	Average.....	52·8	1·7	0·5
1877 .....	Aden .....	53·7	2·3	1·1

H. M.'s 6th Regiment Bombay N.I. has been located at Aden since November 1875, and whilst quartered there it has furnished the usual detachments both to the island of Perim and to the isthmus; the detachments were relieved about every two months. During the period of 1877 now under review—about eleven months—detachments have been moved to and from Perim on five different occasions, and on the 10th of December the head-quarters of the regiment, consisting of two companies, left Aden for Mhow, on board the S.S. *Dalhousie*, reaching the Presidency on the 19th, and Mhow on the 27th, of December 1877. I resumed medical charge of the regiment on the 15th of November, and left Aden with the head-quarters on the 10th of the following month.

2. There are no tanks in the lines, and no surface or other drains, so that after a copious shower of rain the lines become flooded,—rendered nearly impassable, the water coming up almost to the edge of the low plinth upon which the huts are built. Upon the whole, the pendals are in a fair state of repair, and afford tolerably good accommodation, but the lines occupy a very unfavourable site,—close to and behind a large portion of the Native Town which stands between them, and the only openings in the crater through which the sea-breeze blows for several months of the year; the town thus excludes, to a great extent, the sea-air, whilst they are, on either side, and in the rear, surmounted by lofty igneous rocks, which absorb and radiate the intense heat. Thus it will be seen that the ventilation in the lines is greatly impeded, and their hygienic condition much deteriorated; the atmosphere in them, as may be readily imagined, is during the coolest season of the year hot, close, and oppressive, but in the hot season it must be almost unbearable; indeed, I have been told that in the hot season the men are in the habit of sleeping in the open air, and almost in a state of nudity.

3. The conservancy is easily and effectually carried out. Where there is, as at Aden, only a very trifling—in fact little more than a nominal—annual rainfall, and where there is even less vegetation, there is little to increase the filth, or augment the work of the scavenger. There are regimental latrines, well built, well situated, but too far from the lines, and of very defective construction; hence they are offensive even at a distance. Dammered iron pans are in use, and their contents are emptied into large buckets, and removed daily in a large air-tight filth-cart to a place a considerable distance from the town and lines.

4. The sources from which the water supply at Aden are obtained have already been described in former reports. None of the water in Aden is tempting to drink; it is not absolutely unpalatable, but it is insipid, flat, neither aerated, nor sparkling, nor pleasant to the taste. I had neither time nor opportunity to test it chemically, but I drank it and bathed in it, and was very much dissatisfied with it.

5. The rations of the men are supplied by Government, and consist of the same materials and in the same quantity as described in the annual report last furnished.

If the sepoy had this ration for himself alone, it would be enough—indeed ample—for him, and keep him in good health. I think, however, that in a place like Aden his diet should be more varied, and that fish, meat, and potatoes should be introduced occasionally—that is to say, in the diet of all those sepoys who will use such provisions. In connection with this subject it must ever be borne in mind that the sepoy, as a rule, is either a married man with a lot of children, or he has a number of poor relatives living in a great measure, if not altogether, upon him, so that after providing for them there is but very little left for himself, and hence the indications of insufficient nourishment so often observed in men for whom, as men individually, an ample supply is provided by Government.

6. The duties consist of the ordinary routine duties, such as parades, drill, musketry instruction, guards, and orderly duties,—in fact such work as troops in garrison usually perform. The average number of nights in bed has been—for the men in camp  $3\frac{1}{4}$ , for those at the Isthmus 3, and for those at Perim 10 nights. They have extra guard duty in the hot weather, so as to save the European soldier that duty at the arsenal and main guard. The duties of the sepoys at Aden have proved so arduous that they have exhibited no desire for additional exercise, nor for amusements; and there can be no question that they have more guard duty than is desirable.

7. The hospital is a very suitable building; it has recently undergone thorough repair. The floor is of a composite material, chiefly asphalte, and is the best I have ever seen. It is a very well constructed building, with a good tile roof, is well ventilated, and affords excellent accommodation. Its surroundings are in every respect, hygienic and otherwise, very satisfactory.

8. Considering that the regiment has been two years at Aden, considering the depressing and peculiarly enervating climate of the place, and the arduous duties which the men have had to perform, I am of opinion that the general health of the regiment may be considered good, though very few of the men are entirely free from a scorbutic taint.

9. The remarks made in the preceding paragraph, respecting the health and physique of the men, apply here to a great degree. Climate, excessive work, bad water, a scanty supply of inferior vegetables and other food, all aid in undermining the constitution, lowering the vital power, and thereby rendering the individual liable to the invasion of disease—almost inviting it. Scurvy, rheumatism, and debility result from these facts.

10. The number of admissions registered for the year under review is only 346, and of these more than half are accounted for under three headings: viz., chronic rheumatism (and lumbago) 70, diseases affecting the alimentary canal and digestive system generally 85, and ague 48—making 203 out of the total, 346. There are 29 admissions under diseases of the cutaneous system (including 16 for boils), and only 20 for diseases of the respiratory system. Scurvy accounts for 31, wounds and injuries for 24, and burns 4. Diseases of the generative system 3, urinary organs 2, organs of locomotion 2, cellular tissue 1, syphilis 2, conjunctivitis 3, diseases of the nervous system 9, and debility 9, complete the number, and show, almost at a glance, the diseases from which the regiment suffered during the year under review.

The diseases which exhibit unfavourably, and from their numbers demand attention, are the following, viz.—Diseases of the digestive system generally and alimentary canal 85, chronic rheumatism 70, fever 48, scurvy 26, and diseases of the respiratory system 20. I am inclined to think that the large excess of admissions under these various forms of disease may be accounted for, at least to a great extent, by what has been already noticed,—hard work, bad and exhausting climate, inferior and insufficient food, bad water, and sudden and severe vicissitudes of temperature, often the result of carelessness as to dress, exposure to draughts, &c.

11. There have been eleven casualties during the year, seven in and four out of the hospital—viz., one each from pneumonia, bronchitis, phthisis, and asthma; one from diarrhœa, one from fracture of the spine, and one from scurvy and debility. All the casualties but the last named occurred before I resumed medical charge of the regiment. The casualty from fractured spine occurred in a man who was under observation as a case of dementia; the man escaped from hospital one night, and fractured his spine by a fall from the high rocks near the hospital, to which he had wandered, and whilst endeavouring to escape from the men sent to take him. Of the four casualties out of hospital, two were cases of suicide, death being produced in both cases by gunshot wounds of the chest: in one case the aorta and trachea were divided, in the other the heart was smashed to pieces; both cases occurred in the lines. The other two casualties out of hospital occurred in men on sick leave.

12. There has been no epidemic during the year under review.

13. Vaccination and re-vaccination have been very regularly performed.

14. Sixty-two men have been invalided during the year 1877, and six proceeded on leave—on sick certificate. The majority were invalided on account of general debility, some on account of loss of teeth, others for irregular action of the heart, some for chronic rheumatism, chronic bronchitis, scurvy, inability to march, asthma, and one for Bright's disease of the kidney, of which the man died shortly after having been invalided.

15. I have again to urge the advisability of providing all hospitals with a good filter—an inexpensive and necessary addition to every hospital dispensary.

*Inspection by Deputy Surgeon-General MOORE.*

The hospital and lines were inspected on the 6th of December, previous to the departure of the head-quarters of the regiment. The lines are well built, but not sufficiently raised from the ground, and the latrines used by the native officers are badly placed. The whole locality is maintained in a very clean state. The regimental latrines are some distance away,

on the side of the hill. Owing partly to leakage, partly to the carelessness of those resorting thither, and partly to the slope of the floor from the interior not being sufficient, much water lodges within and without these latrines. This defective condition was brought to the notice of the Brigadier-General Commanding, and the remedial means indicated. The hospital is a well-built, airy, spacious structure with broad verandahs and asphalte flooring. There is space for 67 patients. There are all the necessary out-buildings, and the locality was clean, and the conservancy satisfactory,—more than can be advanced on the latter head for the conservancy of the adjoining town generally.

### H. M.'s Aden Troop.

KHOR MAKSAR.—In medical charge of 1st Class Hospital Assistant J. F. FERNANDES.

Average Strength .....	100	Deaths in Hospital .....	0
Do. Present .....	87·7	Do. out of do. ....	0
Admissions .....	159	Invalided .....	3
Daily Sick .....	4·3	Sick Leave .....	4

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Khor Maksar .....	352·8	3	0·6
1875 .....	Do. ....	207·3	6·1	.....
1876 .....	Do. ....	176·5	6·8	0·1
		244·2	5·3	0·2
1877 .....	Khor Maksar .....	159	4	.....

The number of men treated in the Aden Troop during the year amounted to 162, Details of treated. being two cases more than in the preceding year.

There were 73 admissions from fever, 5 from chronic rheumatism, 5 from scurvy, and 4 from lumbago. There were five cases of bronchitis, two of asthma, and one each of pneumonia, catarrh, and hæmoptysis: all were of a simple nature except the case of pneumonia; the man was sent on sick certificate for seven months. Amongst diseases of the digestive system there were eight cases of dysentery, four each of diarrhœa and colic, and one from splenitis. Under the heading of local injuries 18 cases were admitted; one was a sprain, and the rest were contusions of different parts of the body.

2. Eight children were vaccinated, and all the cases were successful. There was no Vaccination. infectious disease during the year.
3. An excellent hospital was handed over on the 1st March 1877; it accommodates Hospital. twelve patients, and it gives a cubic space for each patient of 3,212·3 c. ft. The accommodation is sufficient, and the ventilation good.
4. A range of outhouses is required for the second class hospital servants.

#### *Inspection by Deputy Surgeon-General Moore.*

The Aden troop hospital and lines were inspected on the 4th of December. The lines consist of two well-built rows widely separated, so as to admit of a double line of horses in the centre. The men's quarters have been recently improved by the addition of cooking-houses to the rear of each line. The married men's quarters are grass-work or mat-work structures, and are dangerously liable to fire. The hospital is calculated to contain twelve patients, and is sufficient for the purpose. It was clean and in good order, with the exception

of the earthen flooring, which was much cut up, rendering the place very dusty, thus tending to the excitement or aggravation of ophthalmic maladies, already sufficiently common at Aden from unavoidable causes. There are two latrines attached to the hospital, both unfortunately placed,—one with reference to the prevailing winds, and the other next to a cookhouse.

The room intended for a dead-house is also close to the ward, and has therefore been utilized for stores. Hospital Assistant Fernandez, in charge, was not in good health, but had hitherto performed his duties satisfactorily.

There is a large quantity of vegetable matter—bedding from the horse lines, &c.—thrown not only on the roads, but on the whole surface of the ground around the lines and hospital. This is done to secure more easy walking, and to prevent dust from the sandy soil. I was assured on good practical authority that in the dry climate of Aden no evil results from this practice. But as the grass dries it becomes powdered, and, although much is blown away, much remains on the surface, or incorporated with the surface of the ground, and this deposit is constantly being covered with fresh layers. Any extraordinary increase of febrile affection in the detachment would therefore be regarded with suspicion, as possibly due to contamination of the atmosphere by emanations from decaying vegetable matter. The unlimited use of vegetable material in the manner above indicated is, on sanitary grounds, not desirable.

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### Outpost Perim.

In medical charge of Assistant Apothecary GILLESPIE; Strength 46·6.

A detachment of fifteen men furnished by the Native Infantry stationed at Aden is located here for two months at a time.

2. The troops live in a series of long barracks (8½ feet wide, 10 feet high), situated in the fort, which are in good habitable condition; there is sufficient accommodation and free ventilation. The fort and its surroundings are kept clean and in a good hygienic condition.

Lines.

accommodation and free ventilation. The fort and its surroundings

3. The latrines are cleaned out twice daily, and the excreta conveyed in closed receptacles to leeward of the fort and buried. All sanitary arrangements are satisfactory.

Conservancy.

4. The water for drinking purposes is condensed on the island, and the troops, &c. receive a liberal supply. The brackish water used for washing purposes is sometimes very good, and is brought in *dhow*s from the neighbouring coasts of Arabia and Africa.

Water.

Food.

5. The rations are of good quality, and the supply sufficient.

6. Besides mounting guard the men have occasional parades, and are employed in various fatigue works, such as making and repairing roads, &c. All the amusements are indoor.

Duties.

7. The hospital is a spacious room situated at the S.E. extremity of the fort, and capable of holding eight to ten beds. Its surroundings are always clean, ventilation free, having windows, loopholes, and roof ventilators, and it is in a good hygienic condition.

Hospital.

8. With the exception of the large number of admissions in the month of November 1877, the general health of the several detachments during the year has been good.

General health.

9. The climate is very healthy, and the prevailing winds, S.E. and N.E. at the different seasons of the year, render the atmosphere agreeably cool and pleasant, except in the hot months, when it is sometimes very close and oppressive.

Climate.

10. The principal admissions during the year have been from febricula, ague, chronic rheumatism, scurvy, muscular rheumatism, lumbago, bronchitis, dyspepsia, dysentery, diarrhoea, colic, hepatitis, abscess (foot), ulcer, tinea tonsurans, debility, sprain, contusion and wounds; and of the total number, 33, two were re-admissions and five transferred.

Details of Treated.

The number of admissions and daily attendance in November 1877 exceeded those of corresponding months for some years past, and this increase was due to the change in the climate, by the setting in of the south-easterly chilly and strong winds which prevail at this part of the year, and the detachment then stationed here seemed to suffer more than any other at that period. The average daily sick in hospital during the year (from 1st January to 7th December 1877) have been 0·9, and the average daily attendance from colic, diarrhœa, bronchitis, catarrh, rheumatism, febricula, constipation, and wounds have been 1·5. All the injuries were accidental, and received from stones (black rocks) while employed in fatigue work among them.

11. The hospital latrine, which is situated in an objectionable spot with reference to the Commanding Officer's quarters, as pointed out to the Deputy Surgeon-General at his inspection, needs another in its place, in a more suitable and unobjectionable site. The sweeper attached to the hospital is in want of proper quarters, being obliged to live in a low wretched hut outside the fort.

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*Inspection by Deputy Surgeon-General MOORE.*

The Perim detachment hospital and barracks were inspected on the 7th of December. Both barracks and hospital are situated within the limits of the fort,—the men's quarters on one side, and the hospital on the other. The whole locality was clean, although in some confusion, consequent on the relief of the detachment of the 6th Regiment N.I. by the detachment 25th Regiment N.I., then in progress. Both barracks and hospital are sufficient for the small number of men stationed at Perim. The physical condition of the men of the detachment leaving the island was fairly good, and no evil result appears to arise from residence at Perim, more than the general deterioration resulting from the Aden climate. The latrine of the detachment, situated without the fort, was not so clean as it should have been, owing partly to carelessness, and partly to leakage from the iron vessels. The hospital latrine is very unfortunately situated, being very close to the officers' quarters, and if much used would become an intolerable nuisance. New cooking-houses are being constructed outside the fort, and they will be an improvement on the places now used.

A great want at Perim is accommodation for the few menial servants employed by the detachment. These people at present reside outside the fort, under miserable grass or mat shelter, scarcely to be dignified even by the name of huts.

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POONA DIVISION.

Average Strength Present during the year... ..	...	...	...	7771·6
Average Daily Sick per cent. to the Average Strength ... ..	...	...	...	3·3
Ratio of Mortality per cent. to the Average Strength ... ..	...	...	...	0·9

H. M.'s 1st Regiment Light Cavalry.

POONA.—In medical charge of Surgeon-Major C. K. COLSTON.

Average Strength .....	492·4	Died in Hospital .....	2
Do. Present .....	432·7	Do. out of do. ....	1
Admissions .....	524	Invalided .....	19
Daily Sick.....	15	Sick Leave .....	15

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Poona .....	96·6	4·5	0·7
1875 .....	Do. ....	118·1	3·4	.....
1876 .....	Do. ....	111·7	3·9	0·7
	Average...	108·8	3·9	0·5
1877.....	Poona .....	121·1	3·4	0·4

The head-quarters of the regiment was at Poona throughout the year ; one squadron, with an average strength of 145·9, was on detachment duty at Baroda up to 30th November 1877. Figures giving the details of treated, &c., of this squadron are included in those of the head-quarters.

2. I can add little to previous reports regarding the lines. I quite agree in the opinion

The Lines and their surroundings : present condition, hygienic and otherwise.

expressed by the late Surgeon McAlister that the courtyards connected with the huts, although they give greater privacy to the occupants, from a sanitary point of view are objectionable, as they affect ventilation and are a cloak for dirty habits.

Drainage is chiefly natural. Superficial drains have been cut through eight of the twelve lines during the year and roughly paved with stone, the remaining four having been unoccupied for eleven months. To the east and south cultivation is carried on throughout the year up to within 150 or 200 yards of the lines. There has been, I am informed, a great increase in the amount of irrigated land since the introduction of the Kurruckwasla water. The land, in my opinion, should not be irrigated nearer than 300 or 400 yards, and this I have represented to the Officer Commanding, as probably the great increase in the number of ague cases was due to this irrigation. On the highroad to the south-west of the lines,  $\frac{1}{4}$  mile distant, is the village of Ghorpoorie, the sanitary arrangements of which are very unsatisfactory, as the inhabitants perform all the calls of nature on the land and in the nullahs in the immediate neighbourhood, and the odours are very strong, especially in damp weather. This has been brought to the notice of the authorities, and it is not quite as bad now as formerly, I am told ; still there is great room for improvement.

3. The lines have been kept clean, and the latrines regularly cleaned out twice daily:

Conservancy.

they are well situated to the east of the most northerly line of tents, distant 140 yards; the excreta are removed daily by the

conservancy cart to the cantonment manure-ground.

4. Is very abundant, and is received direct from the Kurruckwasla waterworks through pipes; the water is not clean, but is reported to be wholesome. There is a good supply of pure well water also, but the sowars and families for the most part prefer the former.
- Water supply.
5. The supply of provisions in the bazaar is good and plentiful, and vegetables are easily procured; owing to the late famine, the prices are generally high.
- Food.
6. The duty is for the most part light, the men getting on an average  $5\frac{1}{2}$  nights in bed. There is a gymnasium, where a few of the men exercise themselves, and the effect on the health of those who practise gymnastics appears to be beneficial.
- Duties, exercise, and amusements: their effect on health.
7. The hospital is an excellent one, and was very fully described in the report for the year 1874; it will accommodate 29 patients within the walls, but more accommodation has been required during the last month of the year, owing to the number of ague cases admitted: the excess have been placed in the verandahs. The greatest number at one time in hospital was 37. The dry-earth system has been carried out in the hospital latrine.
- Hospital and its surroundings: present condition, hygienic and otherwise.
8. The health of the regiment was good up to the end of September. The physical condition of the men appears to be good, for the most part.
- General health and physique.
9. The influence of the Deccan climate on the regiment during the past  $6\frac{3}{4}$  years appears to have been favourable, and sickness and mortality have been low.
- Influence of climate or local circumstances on health.
10. Including the figures for the squadron at Baroda, there were 289 admissions for fevers, of which 4 were of the remittent type; there were 2 cases of small-pox, both in men protected by vaccination. Of other diseases 152 cases were admitted, none of which were, however, of any particular interest; and of trifling injuries there were 72 cases.
- Details of treated.
11. There were two deaths during the year—one from pneumonia, and the other from ague and diarrhoea. This latter man returned from escort duty in a very weak and emaciated state.
- Mortality and its causes.
- Epidemics. 12. None.
- Vaccination and re-vaccination. 13. Vaccination and re-vaccination were carried out carefully.
14. Sixteen men have been pensioned—one for impaired vision, two for disease of the lungs, and thirteen were old and worn out.
- Invaliding and its causes.

*Inspection by Deputy Surgeon-General BEATTY.*

The sanitary condition of the lines as regards drainage has been improved; superficial drains have been cut and roughly paved with stone through eight of the twelve lines during the year.

The general health of the regiment has, in the opinion of the medical officer, suffered in consequence of the cultivation which has taken place in proximity to the lines since the introduction of the Kurruckwasla water, and the statement submitted showing the number of admissions from ague during the last three years would tend to justify this view.

The hospital is an excellent one; 29 patients can be accommodated within the walls, and in addition the verandahs utilized in case of emergency. The dry-earth system is used in the latrine.

At the time of inspection the hospital was found to be in a state of perfect cleanliness, the books and instruments in excellent order, and the organization and management generally reflected credit on the medical officer and his establishment.

H. M.'s 5th Regiment N. I.

POONA.—In medical charge of Surgeon-Major H. DAY.

Average Strength .....	694	Deaths in Hospital .....	5
Do. Present .....	606	Do. out of do. ....	...
Admissions .....	847	Invalided .....	39
Daily Sick.....	18·8	Siek Leave .....	17

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Belgaum .....	62·8	2·1	0·3
1875.....	Do. ....	64·2	2·3	0·6
1876.....	Do. ....	187·7	3·7	.....
	Average.....	104·9	2·7	0·3
1877.....	Poona .....	139·7	3·1	0·8

The regiment has been stationed at Poona; small detachments of eighteen men each have been sent to Kulwan, Egutpoora, and Nandgaum, and fifty men marched to Neera and back on escort duty.

Location and movements.

2. The pandals are much out of repair and require re-roofing, as they leak badly in wet weather. The floors of the bathrooms have been paved, so as to prevent soakage into the ground as much as possible.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. There has been no change in the conservaney; the latrines are cleaned out twice a day. The drainage is surface.

Conservaney.

4. The water supply from Kurrukwassa has been sufficient. This water at all times holds much detritus in suspension. It is to be hoped that a new tank now being constructed will assist its deposit. I have

Water supply.

had to call attention to what must be considered a dangerous condition of the main pipe from the Kurrukwassa works which passes near the lines of the regiment; it was placed in a nullah, and covered by water at times little better than liquid sewage. In company with the Deputy Surgeon-General the main on one occasion was inspected, and solid fœces were resting on one of the joints. As it is impossible that the main can always be kept charged with water the danger is obvious; this state of things has since been remedied by a wall having been built to isolate the main.

5. Food has been very dear, and, in spite of the large grain compensation, men with large families have been much pinched. Vigilance was used in the bazaars to keep out bad grain. A prolonged break in

Food and clothing.

the rains caused great scarcity of green vegetables at that time of the year. As bearing on the question of food I may mention that the time of the month appears to influence the number of admissions, for I find that 468 men have been admitted during the fortnight before pay-day, and 379 men after pay-day,—possibly showing that when in funds, and therefore able to buy sufficient food, the sickness in the regiment is less.

Gaiters have been given to the men and brought into use. I fear nothing can be said in favour of them. They are fastened by a strap just under the knee-joint, which, to be of any use, has to be drawn tight so as to form a ligature round the upper part of the leg, and I have heard of one case where numbness in the foot was caused by a walk of only five miles. If they get wet and heavy with mud I have no doubt they would fall down over the heels and feet and impede movement. No tolerable tightness of the strap would be sufficient to prevent the falling down of the gaiter, I am convinced.

I understand that these gaiters have been given to this regiment, as a tentative measure, before issue to the army at large. I can only say that I think them, as at present fitted, in every respect inferior to trowsers.

Duties, exercise, and amusement; their effects on health.

6. During the first half of the year, before the 8th Regiment N.I. had finished their lines, the duties were very heavy.

The men have used the gymnasium freely, and no doubt much to the benefit of their muscular development. No accidents of any consequence have occurred.

Hospital and its immediate surroundings: present condition, hygienic and otherwise.

7. There has been no alteration in the hospital and its surroundings; its present condition is very good.

8. The general health and physique in reducing the standard of health; age is telling on many, who no doubt are much older than is stated.

may be pronounced fair perhaps, but has been much impaired by the great number of cases of ague, conducing to splenic cachexia. Insufficient food, no doubt, this year has been a factor in reducing the standard of health. I do not consider that the physique of the men is what it should be; age is telling on many, who no doubt are much older than is stated.

9. Influence of climate or local circumstances on health.

There is a very general opinion prevailing that the increased irrigation consequent on the making of the Kurruckwasla Canal has the effect of making the station less healthy; perhaps this may be so, but I am unable to compare the present time with the past in this respect.

Details of treated.

10. Ague.—Under this head 553 cases have been admitted, against 779 last year.

266	once	admitted.....	266
75	twice	„ .....	150
20	three times	„ .....	60
14	four	„ „ .....	56
3	five	„ „ .....	15
1	six	„ „ .....	6
<hr/>			
379		Total.....	553
<hr/>			<hr/>

Many of these cases were severe; when complication occurred it was usually of the lungs. After the rains fever appeared to have some association with the east wind. There have been 21 admissions from chronic rheumatism, against 11 last year; men of about twenty years' service seem very liable to this disease. Seven men have been admitted under the head of primary syphilis; in all cases I have endeavoured to find out the woman by whom the man had been infected. I have succeeded in some cases in tracing it, and have reported the woman to the officer in charge of the Lock Hospital. Last year six cases were treated. Of secondary syphilis eighteen cases have been admitted. Twelve cases of dysentery have been admitted, the same number as last year; the disease does not appear to be at all formidable in this station. Twelve cases also of diarrhœa have been treated; in two cases death took place. Four cases only of gonorrhœa have been treated,—a fact which, I think, illustrates the value of the Lock Hospital.

11. Mortality and its causes. Five men have died in hospital—one from fatty heart, two from fever, and one each from diarrhœa and abscess of the liver.

Epidemics.

12. There has been no epidemic disease.

Vaccination and re-vaccination.

13. Vaccination has been carefully carried on.

14. Invaliding and its causes.

Thirty-nine men have been discharged with a pension, nearly all for old age and debility; many of them were enlisted in the time of the Mutiny, and were, no doubt, much older than their official age.

Requirements and recommendations.

15. Having made four post-mortem examinations, I have found great inconvenience from not having a dead-house.

The gaiters of the regiment require alteration; instead of being supported at the knee, as already mentioned, they should be cut so as to fit the leg and brought further over the ankle. I am of opinion that if properly fitted, so as not to bag about the ankles, they would keep up without the band below the knee.

16. During this year I have tried the application of cold, with some success, in fever cases. Finding that great terror of the cold bath existed, I had the men put instead on an empty cot and cold wet sheets applied: I found it easy in this way to reduce the temperature three or four degrees.

Special observations, new experiences in treatment, sanitation, &c. &c.

I have used boracic acid lotion in the treatment of wounds. I find that, unlike carbolic acid, it does not hinder cicatrization; it is a very useful application for foul ulcers.

During the rains I taught a small class Physiology and the Practice of Medicine and Surgery—I think with some practical utility; but since that time I have not been able to get a class together, their duties preventing attendance.

*Inspection by Deputy Surgeon-General BEATTY.*

The sanitary condition of the lines is good; conservancy carefully attended to.

The water supply derived from Kurruckwasla waterworks is abundant and pure. The medical officer drew attention to the unprotected state of the main pipe, which passed close to the lines of the regiment, and which, from being placed in a nullah and covered at times by liquid sewage, obviously became a cause of danger. This state of things has been remedied by a wall built so as to isolate the main, and thus protect the contained water from pollution.

The general health may be pronounced fair, but has to some extent been impaired by ague, caused, it is supposed, by the increased irrigation consequent on the opening of the Kurruckwasla canal.

At the time of inspection the hospital was found to be in a state of the highest efficiency, and it was very evident that Surgeon-Major Day evinces the utmost care and solicitude for the men of his regiment, not only whilst in hospital under immediate observation, but also when in the lines.

**H. M.'s 8th Regiment N. I.**

POONA.—In medical charge of Surgeon-Major T. MILLER.

Average Strength.....	686·3	Deaths in Hospital .....	6
Do. Present.....	631·6	Do. out of do. ....	6
Admissions .....	951	Invalided .....	30
Daily Sick .....	24·3	Sick Leave .....	11

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Poona .....	93	2·8	0·2
1875 .....	Do. ....	200·1	4·1	0·4
1876 .....	Do. ....	191·6	4·1	0·2
	Average...	168·2	3·7	0·3
1877 .....	Poona .....	155·7	3·8	0·9

The head-quarters of the regiment have been permanent during the year: one party of eighteen men was sent on guard duty to Sattana, in the Nassick district, and another detachment of two native officers and sixty-two men was sent to guard the prisoners from the Yerrowda jail who are working at present at the Neera canal.

2. The new lines were finished in the month of April, and the old ones were then vacated by the two companies of sepoy who continued to occupy them till the huts for them were finished in the present lines.

The new lines are situated on the western edge of the elevated plateau forming the military parade-ground, and form a continuation of the lines of the two other Native Infantry regiments stationed here. The ground on which they are built is sufficiently sloped to ensure efficient surface drainage. The site is a little to the north of the other lines, and is quite open and exposed to the breeze, and no fault can be found as regards the ventilation.

The huts are built according to a standard plan sanctioned by Government in 1874.

The drainage of the lines is altogether surface. The ground slopes considerably towards a nullah to the rear of the lines, into which the water is carried by means of open drains and gutters running down the sides of the different streets. It would be a great improvement if the bottoms of the gutters were laid with tiles, as the water would then run off much quicker, and there would not be so much danger of the ground, which in some parts is chiefly black soil lying on a bed of "moorum", getting water-logged during the rains. The regimental bazaar is situated to the rear of the lines at a little distance from the huts, and consists of two blocks of buildings, which are each divided into six shops.

The lines, bazaar, and cells are kept clean and in very good repair.

3. This is carefully looked after, and the streets and latrines are kept as clean and sweet as possible. There are two latrines situated to the rear towards the north side of the lines, and at a distance of about 250 yards. One is for the males, and has fifty-six compartments, and one for the females, with twenty-four compartments. The seats are separated from each other by bamboo partitions, and the night-soil is received into an iron pan which slopes towards the back of the latrine, where is placed a zinc pail to receive the urine, and which, therefore, is not mixed with the solid excrement. I believe this is a new system introduced lately, and seems to answer. The latrines, however, have no roof over them, and as the part on which the sepoy stand or sit is made of iron it gets very hot during the day, especially in the hot season, and complaints are made, I believe, of the heated iron hurting their feet while standing on it.

The night-soil and urine are removed twice a day, and carried to a distance by iron-tank carts and buried in a deep trench. The sweepers use plenty of water in cleaning the latrines, and quicklime is also freely sprinkled about.

4. The water is supplied from the Kurruckwasla water-works, and is generally of good quality, and the supply sufficient. Sometimes after a fall of rain it is very muddy, and has to be filtered before using it for cooking or drinking purposes. The water, from flowing a long distance along an open canal, is liable to receive impurities from various causes, and more especially during the monsoon, when a good deal of surface water must run into it; otherwise I am not aware of any other likely sources of impurity.

During the past year the grain used by the men has been scarcer and much higher in price.

The sepoy, having usually a family or several friends to support besides himself, has suffered considerably in the way of diet, as his pay, although he gets some compensation-money on account of the dearness of provisions, is not large enough to provide proper food for others besides himself, and many of the men are at present suffering from complaints arising, I believe, in many cases from there not having a sufficiency of proper food.

6. The sepoy of this regiment have been employed for nearly three years back in building the new regimental lines, which not being the regular duty of the sepoy, and the work being of an entirely different kind to what they have been accustomed to, many of the men have become considerably weakened and broken down, and seem more liable to attacks of fever, &c., than they would otherwise have been. This, together with the prices of provisions, has had a bad effect generally on their physique. The ordinary duties are rather heavy at this station, as, besides the regular regimental and brigade parades, they are employed in furnishing guards to the different jails, and in performing the different orderly duties of the station.

A good many cases of fever and bowel complaints are sent from the jail guards, caused, I believe, by the men not having shelter enough from the cold winds at night, and from their not getting their food so regularly as they do in their own lines.

The exercises and amusements are of the usual sort for natives. There is at present no regimental gymnasium, but the men usually attend the meetings at the station gymkhana,

and practise running, leaping, &c., and small prizes are given to the most successful. Some of them also make articles of clothing, furniture, and fancy articles for the annual Soldiers' Exhibition; and there are schools, which are well attended by the boys and girls of the regiment. Such amusements have a good effect generally on the health of the men, and prevent numbers of them from loafing about in the bazaars, and getting into bad habits.

7. The hospital is well built, and raised on a plinth about two feet from the ground. Hospital and surroundings, &c. has a very good stone floor, and is roofed with double tiles. It consists of two wards, with a surgery and office room between, is very well lighted and airy, affords accommodation for about thirty-five beds, and is provided with a very good cook-room and store-room. The hospital compound is very small, and immediately adjacent to the Staff lines, and also to a row of small houses which are occupied by conductors and other Government officials and their families, and which is a bad arrangement both for the patients in hospital and the occupants of the houses. The hospital was originally built, I believe, for a store-room, and was condemned a year or two ago, and a site for a new building settled on, but as yet nothing has been done; but, now that the new lines are finished, the building of the new hospital should be at once begun.

The present quarters for the servants are not *pukka*-built, but temporary, and always require repairs, and there is no dead-house or separate ward for contagious diseases; there is also no guard-room for the hospital guard, who during the cold and rainy seasons have to sleep either in the verandah or in the hospital. In the case of any contagious disease breaking out tents have to be applied for. The ventilation is very good. There is generally no overcrowding, but lately the number of fever cases has increased, and some of the milder cases are treated in a tent. The conservancy of the hospital is well looked after.

In front of the hospital is a small flower-garden, which affords an agreeable lounge for convalescents.

8. The general health of the regiment has been very fair during the year. A good many General health and physique. of the men have suffered, as previously stated, from the dearth of provisions, and from their having been employed in building the lines. The physique of the regiment is also fair, but a good many are men who were enlisted during the Mutiny of 1857, and, having been considerably over the usual age when enlisted, are now beginning to show signs of old age and general breaking up.

Influence of climate, &c., on health. 9. As to the influence of climate on health there is nothing particular to remark.

10. The total number of cases treated during the year was 961, of which 951 were admitted from the 1st January to the 31st December, which, compared with those treated in 1876, shows a decrease of 376, Details of treated. the number treated for that year being 1,337. The decrease seems chiefly to have occurred in the smaller number of cases of ague, rheumatic affections, diarrhoea, pleurisy, and syphilitic complaints. The most prevalent diseases have been malarious fevers, of which 517 were under treatment, and 502 discharged; of rheumatic affections 39 cases treated, syphilitic affections 30, diseases of the lungs 40, diseases of the stomach and intestines 37, and cutaneous affections 39 cases. Of injuries and contusions 119 cases were treated, and 117 discharged. The greater number of these were contusions of the upper and lower extremities, and shoe-bites. There were 30 cases of conjunctivitis under treatment, generally of a very mild character, and 29 were discharged; and of minor operations 28 were performed. The average daily number of sick was not large, being 24·3, the daily number being, however, on many occasions much over this, as many as 40 having been on several occasions under treatment, and tents having to be used for their accommodation.

11. There were six deaths during the year, three of which were from fever of a remittent form, and which latterly took on symptoms of a typhoid nature; one was from acute hepatitis with fever, one from bronchitis, and the sixth from debility and chronic catarrh. Mortality and its causes.

Epidemics.

12. There has been no epidemic in the regiment.

13. Vaccination has been carried out as carefully as possible. 101 cases have been operated on, of which 83 were successful, and 18 unsuccessful. Re-vaccination was also performed in 10 cases, of which 7 turned out successful. Vaccination and re-vaccination.

14. The number of men invalided was 30; of these 17 were cases of old age and debility, 8 were cases of rheumatic affections, 1 disease of the nervous system, 1 melancholia, 1 disease of the eyes, 1 disease of the lungs, and 1 scorbutic affection. Eleven men were sent away on sick leave. Invaliding and its causes.

15. As the present hospital was condemned some time ago, I would beg to recommend that the new one should be built as soon as possible. The site chosen is a very good one, and much more convenient than the present, which, as before stated, is too near the Staff quarters and too far from the lines.

Requirements and recommendations.

16. I have nothing particular to remark under this head. The ordinary class of diseases has been under treatment, and nothing new has occurred.

Special observations.

The ordinary malarious fevers have been treated with quinetum, which seems to be efficient in the milder cases, as also is the sulphate of cinchonidine, but in the more severe cases quinine has to be fallen back on.

With the conduct and acquirements of the hospital assistants I have every reason to be satisfied.

*Inspection by Deputy Surgeon-General BEATTY.*

The new lines, which are situated on the western edge of the plateau joining the parade-ground, and in continuation of the lines of the two other Native Infantry regiments, were completed in April last. The site has been well chosen, and good surface drainage with sufficient ventilation ensured. The huts are built in accordance with Government standard plan, and are kept scrupulously clean.

Conservancy is carefully looked after, the night-soil and urine are removed twice daily, and the latrines kept clean by being washed constantly with a plentiful supply of water.

The general health of the regiment has been fair, but the medical officer considers that a good many of the men have suffered from their having been engaged for nearly three years in building their lines, a description of work to which they were hitherto unaccustomed.

The dearness of provisions, and the impoverished condition of system occasioned thereby, have likewise contributed to create an injurious effect on the men's health.

The present hospital having been condemned some time ago, it appears unnecessary to give any further description of the building. The site for the new one has been judiciously selected, being much nearer the lines than the present one. At the time of inspection the hospital, which has been frequently visited, was found remarkably clean, the books written up to date, and the organization of the establishment all that could be desired.

**H. M.'s 26th Regiment N.I.**

POONA.—In medical charge of Surgeon-Major G. Y. HUNTER.

Average Strength.....	691·5	Deaths in Hospital .....	4
Do. Present .....	581	Do. out of do. ....	1
Admissions .....	780	Invalided .....	48
Daily Sick .....	23·5	Sick Leave .....	12

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Surat.....	195·2	4·8	0·9
1875.....	Do. ....	201·9	5·6	1·7
1876.....	Poona .....	132·5	5·1	0·8
	Average.....	376·5	5·2	1·2
1877.....	Poona .....	134·2	4·0	0·7



The regiment was stationed at Poona during the whole year 1877. There were no movements beyond small detachments to Nassick, Dindoree, Peint Sowsthan, and a large detachment of 134 men to Sholapoor.

2. The lines occupied by the regiment are bounded on the north by the lines of the 8th Regiment N.I., which being in close proximity do not admit of that free ventilation which is desirable in that direction; on the south they are bounded by the lines of the 5th Regiment N.I.; on the east by the general parade-ground, a large open plain; and on the west by a smaller open space through which runs a large nullah carrying away all the rain-water during the monsoon. The ventilation east and west is excellent, and is all that is desirable for the comfortable location of a native regiment. The lines being erected on the elevated ground with a good incline towards the western nullah, every facility is afforded in the way of natural drainage.

3. There are two latrines situated about 183 yards to the west of the lines (to windward of them). The night-soil is removed early in the morning by means of two iron-tank carts to a place beyond camp limits four miles distant to the east, far off enough to prevent any injury to health, or nuisance, being caused by its disposal. The waste water from the sepoy's huts and the bathing-places is carried by small channels into open drains running along the sides of the lines, and by them into a large nullah to the west of the lines. The rain-water also runs off in the same manner.

4. The water supply is good and abundant. No wells in camp have been used for drinking purposes since the introduction of Kurruckwasla water, which is supplied by means of three stand-pipes running into masonry reservoirs to the south-west of the lines. The waste water from these runs into the regimental garden, and after irrigating it the superfluous water flows into the nullah adjoining the lines.

5. The grain sold in the Poona market is in ordinary times good and fairly cheap, but in the year under review such was not the case, and some of the sepoy's seem to have suffered from the effect of the famine, as evinced by their general appearance. No improvements seem to have been yet made in the dress of native sepoy's of this Presidency. The scarlet coat buttoned up close to the throat, the black cloth trowsers, and the troublesome regulation boots would not seem to be a suitable dress for a native of a tropical country; and, what makes the matter worse, the same dress is worn all the year round, without regard to variations of the season.

6. The duties of the sepoy's in the year under report were light compared with former years, when the 8th Regiment N.I. was wholly occupied in line-building. In addition to parades they were employed in furnishing guards for jail and for orderly duties. The duties performed by the men seem to have had no bad effect on their health.

The sepoy's scarcely have recreation beyond attending the regimental gymnasium. A few seem to be well up in weaving, sewing, and carpenters' and blacksmiths' work.

7. The hospital is situated at the distance of about four hundred yards from the lines, and consists of two separate buildings, one of which is thatched and contains a large ward ninety-six feet long and twenty-two broad, and is, on the whole, well suited for the purpose required, the only defects being the thatched roof and the mud floor. Although the roof is annually repaired, with the view of making it proof against rain, yet the old grass forming the inner layer of the chupper does not seem to have been removed for the last five or six years, and is infested by birds, rats, lizards, if not by serpents. The mud floor of the building has not in any way been improved, although it seems to have been brought to notice by medical officers previously in charge of the hospital.

The other hospital building contains two small wards for the segregation of special cases, and, although otherwise well built, the ventilation is defective. The head subordinate's quarters and the guard-room are also thatched, and are in the same condition with regard to chuppers as the hospital building.

There are two latrines attached to the hospital; they are built of bamboo slips and have mud floors, and, there being no provision made for keeping the solid excreta separate from

urine, great difficulty is experienced in keeping the latrines clean. The earthen pots intended to hold urine repeatedly tumble down, and tend to keep the floor always damp, which is most objectionable.

The hospital has a large and spacious compound.

There is no proper direct road between the lines and hospital.

8. During the first three months of the year the general health of the men was reported good, and ague was less prevalent than in the corresponding months of the previous year; but afterwards, as the weather became hotter, sickness increased, and the health of the regiment was only pronounced fair. The men were employed on work in the lines—making gutters, repairing roads, building a workshop, finishing the gymnasium, digging up ground for a plantation, &c., in addition to regimental duties; however, they had  $3\frac{1}{2}$  nights in bed per week, so it cannot be said that they were overworked.

Influence of climate or local circumstances on health.

9. The dry climate of Poona seems to have agreed with the men after the relaxing climate of Surat.

10. The admissions from ague (349) were 38 more than in the previous year. The disease was most prevalent during the months of April, May, June, October, and December, and was, as a rule, of a moderate type, and yielded to ordinary treatment. In very mild cases cinchonidine and the cinchona mixed alkaloid were used, but for the severe cases it was found necessary to give quinine. The admissions from respiratory diseases were forty-two—two from pneumonia, ten from asthma, and the remainder for bronchitis; out of these twelve cases were of a bad type, viz. six bronchitis, two pneumonia, and four asthma, and one chronic pneumonic phthisis. Of diseases of the stomach and bowels sixty-nine cases were admitted, out of which thirty were cases of dysentery, nineteen of diarrhoea, and the remaining eighteen of colic, &c. Thirty-eight cases were admitted with venereal diseases, which includes three re-admissions; from what I can gather, it would appear that in the great majority of cases the disease was contracted in the Poona city or cantonment, and not in the vicinity of the lines. Out of the total treated two were cases of gonorrhoea, and thirty-six were syphilis, of which nine were of a bad type, and were in hospital for a long time.

The remaining two hundred and forty-five cases from all other causes do not require any special remark.

11. Out of 780 admissions four deaths occurred during the year, from the following causes:—bronchitis with ague, splenitis with ague, remittent fever, and malignant cholera.

Mortality and its causes.

12. There was no epidemic during the year, with the exception of cholera, which prevailed in the city and cantonment for a short period, and one case occurred in the 26th Regiment in the month of December, and ended fatally. All requisite precautions were adopted as to isolation, disinfection, &c.

Epidemics.

13. Fifty-eight children were vaccinated during the year; all the operations were successful. Besides these, 64 recruits were re-vaccinated, of which number 45 were successful. Vaccination was performed in the months of January, February, March, June, and July.

Vaccination and re-vaccination.

14. Forty-eight men were invalided, for the following causes:—Rheumatic affections 14, syphilis 7, scurvy 3, lung disease 6, chronic hepatitis 1, and old age and debility 17.

Invaliding and its causes.

15. I suggested that a stone floor be laid down in the bathroom, and a drain constructed to carry off the refuse water, and also that one of the three water-pipes in the hospital compound be extended to the bathroom, so that the sick could bathe without exposure to heat or cold; this suggestion, I am glad to say, has been sanctioned, and is being carried out.

Requirements and recommendations.

The remaining requirements are as follows:—

A double-tiled roof and stone floor for the hospital; alteration and improvements of the hospital latrines; road between the lines and hospital.

I am happy to state that 2nd class hospital assistant Gunesh Suckharam has performed his duties to my satisfaction, and native medical pupil Hanmant Chowan is well conducted, and is doing his best to improve himself.

*Inspection by Deputy Surgeon-General BEATTY.*

The lines being situated on elevated ground sloping towards the western nullah, every facility is afforded in the way of natural drainage for the escape of rain-water. Ventilation is excellent, and the sanitary arrangements are all that can be desired.

The hospital, which has been frequently visited, was, at the time of inspection, found to be in a state of efficiency, but the medical officer particularly brought to notice the condition of the roofing and the objectionable mud flooring.

**H. M.'s Sappers and Miners.**

KIRKEE.—In medical charge of Surgeon-Major W. NIVEN.

Average Strength .....	505·7	Deaths in hospital.....	5
Do. Present.....	470·1	Do. out of do. ....	2
Admissions .....	452	Invalided .....	27
Daily Sick.....	16·7	Sick Leave .....	2

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Kirkee .....	85·7	2·1	0·2
1875 .....	Do. ....	55·8	1·8	0·7
1876 .....	Do. ....	46·7	2·0	0·6
	Average...	62·7	2·0	0·5
1877 .....	Kirkee .....	96·1	3·5	1·1

The corps is permanently stationed at Kirkee, or rather at New Jhansi, which is the name given to the lines of the Sappers and Miners. One company is always on duty at Aden. No. 1 company left headquarters for Aden on the 3rd, and on the 25th November No. 4 company returned from thence to Kirkee.

2. The lines are new, built according to the standard plan, and situated between Holkar's Bridge and the Deccan College, in an angular piece of ground between the Ahmednagar and Poona roads, on the east side of the Moola river. The streets run east and west, and the ground slopes northward, towards the Ahmednagar road and the river. The native officers' houses are placed on the north side, and also the three masonry dipping-tanks, and therefore on the lowest level of the slope. The hygienic condition of the lines is fairly good.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. There are two privies, one for males and one for females, situated on the east corner of the lines. The night-soil is carried away by a conservancy cart to the general manure-yard on the Kirkee side of the river.

Conservancy.

4. The water supply is obtained from the Kurruckwasla canal by means of pipes; it is of good quality and abundant in quantity.

Water supply.

5. During the past year, on account of the famine, the food-grains have been dear, and the quality not so good as usual.

Food.

6. The duties are considered heavy, as the men have to mount guards in the Kirkee cantonment, as well as carry on the usual work and special drill of the Sappers and Miners. The magazine and ordnance factory guards are two miles from New Jhansi. There is a gymnasium, and the usual games are indulged in by most of the men.

Duties, exercise, and amusements: their effect on health.

7. The hospital is built on the standard plan, with a bathroom and privy at each end, but quite distinct and separated from the wards, and also from the verandahs. The building is placed on sloping ground about five hundred yards from the Deccan College,—in fact the compounds of the college and the hospital adjoin each other, being, however, separated by the Alundi road and a double row of trees. The hygienic condition is satisfactory with the exception of the floors, which are composed of earth, both in the wards and in the verandahs. This kind of flooring is objectionable on account of the dust which rises from it, and the patients are besides much annoyed at times by finding their clothing eaten by white ants, which come through the floor during the night.

8. The general health of the men is not quite so good as in former years, owing to the dearness of provisions and their inferior quality—alluded to in para. 5. The distance of the lines both from the Kirkee and Poona bazaars renders the supplies of meat and vegetables somewhat irregular and uncertain, but this defect will, no doubt, be remedied, as the New Jhansi bazaar develops itself, and by and by local gardens may be set up by the men themselves, or by pensioners from the corps. The physique of the men is good.

9. Including the returns from the company at Aden the total treated numbered 468. Details of treated. The principal diseases were—malarious fevers 128 cases, rheumatism 34, syphilis 18, and diarrhœa and dysentery 24.

10. Five deaths took place in the hospital; the men were all of over twenty years' service, with the exception of one man who died of dysentery, and he had fourteen years' service. One death took place out of hospital.

Epidemics. 11. There were no epidemics during the year.

12. Primary vaccination was carried on to the full requirements; at the end of the year there were twelve children unprotected, and they were all too young for the operation. No re-vaccination was performed.

13. A greater number of men were invalided than in some former years. Twenty-one were invalided at head-quarters, and four at Aden. Two were discharged for unfitness, not having completed the specified period for pension.

The following were the reasons for invaliding:—5 for debility from premature old age, 3 for defective vision and general debility, 2 each for general debility and loss of teeth. For jaundice, varicose veins, night-blindness, leprosy, paralysis, impairment of mental faculties, chronic dysentery, chronic bronchitis, and loss of voice there was one each invalided.

14. I would strongly recommend the floors of the hospital to be reconstructed with concrete, and asphalt to be laid down both in the wards and in the verandahs.

#### *Inspection by Deputy Surgeon-General BEATTY.*

Conservancy arrangements are strictly attended to. Water supply is good and abundant.

The hospital, which faces the west, is built in accordance with the standard plan. With the exception of the flooring, which is composed of mud both in the verandahs and ward, the hygienic condition was satisfactory.

The medical officer complained of the objectionable construction of the flooring, both on account of its uncleanness and unhealthiness.

At the time of inspection several of the patients complained that their clothing, if laid on the floor, was eaten by white ants during the night. The medical officer strongly recommends that the floors of both wards and verandahs be reconstructed with concrete and asphalt.

The general health of the men was not so good as in previous years. This may be attributed to the dearness and inferior quality of the food procurable during the past famine season.

The hospital, at the time of inspection, was found to be in the highest state of efficiency, and the books and records carefully written up to date.

H. M.'s Poona Horse.

SIRUR.—In medical charge of Surgeon ALEX. K. STEWART.

Average Strength.....	455.2	Deaths in Hospital .....	4
Do. Present.....	424.1	Do. out of do. ....	0
Admissions .....	226	Invalided .....	18
Daily Sick .....	10.2	Sick Leave .....	10

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Sirur .....	48.1	2.1	0.2
1875.....	Do. ....	80.8	3.1	1.0
1876.....	Do. ....	69.1	3.1	0.4
	Average...	66.0	2.7	0.5
1877.....	Sirur .....	53.7	2.4	0.9

The head-quarters of the regiment are at Sirur, and with the exception of a march into and from Poona on the occasion of the Viceroy's visit, when they were absent nine days from the 18th September, they have been stationary since the last report. There is a detached squadron of 150 men stationed at Dhulia.

The lines are situated too near the town: hence any outbreak of epidemic disease is very apt to be transmitted to the regiment, and when the town is in quarantine it is very difficult to prevent the men going into it. They are situated north and south, so that the prevailing south-westerly winds readily pass through and ventilate the open streets. The new magazine, which has been built close beside the hospital and to the south central aspect of the lines, is far too close to be consistent with safety. The room used as a lock-up room or cell is, as has before been reported, unfit to confine a man in for more than a single day: it is worse than badly ventilated, and the sun striking on the two back walls makes it a perfect oven.

3. The present dry-earth system is scarcely quite satisfactory, as it is not properly carried out, the fluid and solid excreta being deposited in shallow pits which are cleaned every day, and though by this means comparative cleanliness is obtained, yet the fluids soak into the earth, and the corner of the yard in time becomes saturated with urine. To obviate this I propose having elongated "koondies," which can be obtained very cheaply, or long iron pans. The night-soil is utilized by being deposited on land under cultivation some distance to leeward of camp.

4. The water supply is obtained from the river Goreh, about half a mile distant, and is fairly good and plentiful, though the pernicious habit of growing water-melons in the river-bed is very much practised by the natives both of Sirur and the villages higher up,—quantities of human excreta, more than of other manures, being in request for this culture. As regards the effect of the water on the troops no harm seems to be produced, and according to an analysis by the late Surgeon Gordon, though there is a considerable quantity of salts and suspended impurities in it, it seems not to be an unwholesome water on the whole.

5. Owing to the famine during the past year, food has been very dear, and many of the men, especially those with large families, must have been sorely pinched, since grain compensation is only given per man, and not in proportion to the family he possesses. Food has, however, always been obtainable, and the men can get it at cheaper rates in the new regimental bazaar than they could in the town itself. During the most pressing time grain was obtained from beyond Nagar and other places.

6. The duties of the men are not excessive. Polo is played three times a week, and, besides being a healthy exercise, it teaches the boys and Oomedwars of the regiment to ride. There is a regular gymnastic course now for all recruits and men who have recently joined, men having been sent to Poona to learn the course, and these in turn acting as instructors to the regiment. On the whole the regiment may be said to be very healthy, the percentage of average daily sick having been only 24.

Duties, exercise, and amusements : their effects on health.

Hospital and its immediate surroundings : present condition, hygienic and otherwise.

modation enough, there being only sufficient for twelve patients, and there are no quarters for the hospital subordinates.

8. The general health of the troops is decidedly good. Many cases of syphilis do not make their appearance, unless in the late secondary or tertiary forms, but often Oomedwars and recruits, nearly all sons of men in the regiment, are found to have had or to have it.

General health and physique.

This existence of disease in the regiment is undoubtedly greatly due to the fact that Sirur lies just between Poona and Ahmednagar, two towns in which the Contagious Diseases Act is in force; hence if women are not passed in either of these places they in some cases make a move to Sirur with a view of evading the Act,—such I know to have been the case both from Poona and Nagar.

9. On the whole, this may be said to have been a very healthy year, the total admissions, including those of the detachment at Dhulia, having been only 226, as compared with 288 on the same numerical strength last year. The greatest number of admissions was, as usual, from intermittent fever, being 82. Contusions, fractures, and blistered feet, 34, come next on the list. There have been three cases of epilepsy,—rather an unusual number,—and one case of acute mania, which was cured. There were thirteen admissions from rheumatism, some of them very bad and obstinate, thirteen of diseases of the eye, and four guinea-worm. The only case of scorpion-sting admitted, though many occurred, very nearly died, and was not discharged for weeks. Other admissions unimportant.

Details of treated.

10. There have been four deaths in the regiment; the first was a case of sub-acute cystitis of syphilitic origin, which came down from the detachment at Dhulia; the second, that of the Wordee Major, was from snake-bite when the regiment marched into Poona; and the third and fourth occurred at Dhulia, from cholera and cancer respectively.

Mortality and its causes.

11. There were three epidemics during the year in the town, syce and regimental lines : namely, ophthalmia, small-pox, and cholera; but ophthalmia was the only one which affected the men to any extent, though two cases of cholera occurred among the children of the regiment, and one amongst the men. Altogether I had 35 cases of cholera under treatment in the town and lines. There were 13 cases of small-pox among the women and children, of the syces principally.

Epidemics.

12. The total number of primary vaccinations was 59, and of re-vaccinations 30. Five children were too young to be vaccinated. Of 13 cases of small-pox that occurred, one died.

Vaccination and re-vaccination.

13. The number invalided this year was unusually large, being eighteen; of these six were from rheumatism, four from nervous diseases, five from old age and debility, and three from defective vision.

Invaliding and its causes.

14. First, that a new hospital be built on the site proposed, large enough for the requirements of the regiment, and having suitable quarters for the hospital staff, bathrooms, urinals, &c., in all of which points the present hospital is deficient. Second, that the present building used as a lock-up room or cell be done away with, and a proper standard cell be erected. Failing this it is my opinion that no man ought to be confined in the present cell for more than two, or at the outside three days. Thirdly, that elongated earthen koondies or long iron pans should be put into pits in each backyard, as the system now in use is not quite satisfactory.

Requirements and recommendations.

16. Special observations in accordance with Memo. No. 1202 of April 1877 from the Deputy Surgeon-General were carried out with reference to the effects of cinchona mixed alkaloid (quinetum) in malarious fever, depressing nausea having been one of the chief objections to its use in previous experiments. In all, 50 cases were treated from 16th June to 4th September 1877. It was administered in two-grain doses every two hours in the fever interval, and six grains just before the accession. In seven cases nausea was produced—in four of these cases slightly, and in two of the remainder it was followed by vomiting. It only failed in one case, when quinine was beneficially substituted. The conclusions drawn were that it was a most useful drug in milder cases, where depressing nausea was not of much moment, and, considering the expense of quinine, that it was undoubtedly a most valuable substitute.

Three or four cases of guinea-worm were experimented upon—1st, by the application of the electric battery to the worm, and, 2ndly, by stinging it with a living scorpion. In both cases large portions of worm came away, and in the case of the scorpion-sting a large shrivelled piece came away the next morning. Enough cases, however, did not come under observation to enable me to draw any positive conclusion, but it is my intention to pursue the subject further when opportunity offers.

*Inspection by Deputy Surgeon-General BEATTY.*

The sanitary condition of the lines, which consist of four parallel streets, is good. They are situated north and south, so as to permit free ventilation from the prevailing south-westerly winds.

The water supply is obtained from the river Ghori, and is fairly good and plentiful, but is subject to contamination from the practice of growing water-melons in the bed of the river.

The general health of the regiment has been very good.

The hospital, which has in former years been unfavourably reported on, should be at once replaced by a new one. It may here be convenient to quote the opinion, with which I fully concur, of Dr. Hewlett, the Sanitary Commissioner, who in his sanitary report on Sirur writes:—"The present hospital, too, is in front of the lines, which, although it would make an excellent standard guard-room, is utterly unsuited in every way for an hospital; but I would desire to represent to Government, with all the earnestness I can, that the provision for a new hospital for the Poona Horse is a matter of urgent necessity, as in the present building the men are made sick when sometimes the beds are necessarily so close as to be nearly touching. I look upon the hospital at Sirur as one of the worst places I have ever seen, and trust that immediate measures may be taken to provide the men of the regiment with a building in which their diseases should at all events not be aggravated, and one where proper quarters for the hospital establishment can be provided. At present there are absolutely none of any description whatever."

**H. M.'s 15th Regiment N. I.**

AHMEDNAGAR.—In medical charge of Surgeon-Major E. P. BURROWS.

Average Strength.....	706	Deaths in Hospital .....	7
Do. Present .....	585	Do. out of do. ....	0
Admissions .....	593	Invalided .....	0
Daily Sick .....	17·3	Sick Leave.....	6

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Ahmednagar.....	54·3	2·1	0·1
1875 .....	Do. ....	85	2·4	0·3
1876 .....	Do. ....	67·8	3·3	0·7
	Average...	69	2·3	0·3
1877 .....	Ahmednagar.....	101·3	2·9	1·2

The regiment has been stationary at Ahmednagar since December 1875. During the past year several small detachments were furnished to the talukas. No special sickness occurred amongst the men engaged in these duties.

2. The lines are in good habitable condition throughout. The surface drainage has been well attended to, and the surrounding ground generally is open, clean, and well drained. The desirability of improving the ventilation of the huts by ridge ventilation was remarked last year. Bathing-places of pukka brick and chunam are being constructed in the verandahs of the married men's quarters, which will improve the sanitary condition of the dwellings, by preventing all soakage within them.

3. The conservancy of the lines is good. The regimental latrines are kept very clean. The hospital latrine is connected with the main building by a covered way. Dry earth is plentifully supplied to the iron pans, the contents of which after use are regularly transferred by the sweepers to iron receptacles and removed early in the morning by the conservancy cart. The latrine should be better ventilated and dammered. Iron pans should be supplied for use in front of the *chulas* to collect urine and ablution-water, much of which at present runs on to the stone pavement.

4. The water from the Kapurwarree aqueduct, which supplies the lines, has been of good quality, but was not sufficiently abundant during the hot months and the early part of the monsoon.

5. Owing to the general scarcity throughout the district, food of all kinds has been at famine prices. A few samples of the grain forming the staple food of the sepoys—such as wheat, bazree, and jowaree—have been found of very bad quality. The remarks made, however, in my report for 1876 on the subject are especially applicable to the past year. A large white turban has been substituted for the small puggree wound round a cap previously worn, and is a better protection from the sun. Badly made, ill-fitting native boots are still worn, with the usual result of some temporary inefficiency of healthy men from contused feet.

6. The duties, owing chiefly to the number of men absent on detachments, have been heavy. The average for the year of consecutive nights in bed has been under four; and this, though the duties have not been exceptional in their nature, represents a good deal of continued work and exposure. Though its effects have at no time been instantly apparent, it has no doubt made its expression on the general total number of sick for the year.

7. The hospital is in good repair throughout; the ventilation good. It has afforded sufficient room for the sick during the year. The hospital compound and surrounding ground are clean, open, and well drained.

8. The general health of the regiment has been good, the increase in number of sick over the previous year having been apparently chiefly due to temporary and exceptional seasonal causes. The physique of the majority of the men is of fair standard. That of the recruits enlisted in the year has been quite up to the average.

9. The season has been an unusual one, and the marked way in which the sick list was affected, apparently by the rainfall after an unusually long period of drought, is seen in the table below:—

Months.	Rain.		Sick.
	In.	cents.	
January .....	0	18	24
February.....	0	7	28
March .....	0	26	38
April .....	0	28	31
May.....	1	37	57
June .....	10	3	120
July.....	0	45	34
August .....	4	8	51
September .....	5	6	44
October .....	2	94	49
November .....	0	41	58
December .....	0	13	59
Total.....	25	26	593



10. The returns contrast unfavourably with those of the previous year. The admissions into hospital from all causes in 1876 numbered 396, of which 100 were re-admissions. In the past year the admissions have been 593, the re-admissions 201. In comparing the monthly returns for the two years, the increase is seen to have occurred chiefly under the headings of febricula and conjunctivitis. Cases of remittent fever have been of more frequent occurrence, numbering sixteen, against eight in the previous year. They were most common in May, when six were admitted. The cases occurring later, however, were of more severe form, two out of the three admitted in September terminating fatally, one in eighteen, the other in twenty-five days. Of the 201 cases of febricula treated, 120 were admitted during the latter part of May and in June. In the majority of these cases the fever lasted four to five days only. In a few the normal temperature was not reached until the tenth or twelfth day; in four cases the fever returned after an interval of a week's convalescence. Headache was a prominent symptom in all. There were 85 cases of ague, against 110 in the previous year. Two cases of mumps occurred, one in March, the other in May. Three cases of acute and four of chronic rheumatism came under treatment,—an unusually small number. There have been 14 admissions from syphilis, 10 of primary and 4 of secondary disease. The total under this head in the previous year was 17. Of diseases of the digestive system there were 77 admissions; of these 36 were for dysentery and 25 for diarrhœa. Dysentery was most prevalent in the months of July and October. The admissions under this heading last year numbered 72.

11. There have been 7 deaths—one from cholera, two from remittent fever, one each from anæmia, acute bronchitis, asthma with affected heart, and paraplegia. Two men died out of hospital—one, on leave, from heart disease, and the other of small-pox on detachment duty at Sungumneir.

12. Four men were admitted with small-pox—the first three in February, the last in April. All had been previously vaccinated and they made good recoveries. One man, however, suffered severely, the eruption being partially confluent. Two women and five children were also treated during the same period; one child died. The disease has been very prevalent in the town and surrounding districts this year. There have been two cases of cholera—one in June and one in August; the former was fatal. This disease was also reported prevalent in the town and surrounding districts from the middle of May to the end of October, and during that time the men were not allowed to enter the town.

13. Arm-to-arm vaccination has been maintained at the hospital throughout the year, and all children in the lines and in the regimental bazaar who were under two months old, recruits, and those of the men considered badly protected, have been re-vaccinated.

14. Eighteen men were invalided, all Hindoos; twelve were aged and worn-out men, and six weakly and no longer active enough for service. Their average age was forty-one. The oldest, forty-nine years old, had served in the ranks over thirty-one years; the youngest, aged thirty-eight, had served between nineteen and twenty years.

15. The desirability of improving the ventilation of the lines by ridge ventilation, the bad flooring of the hospital, and the better accommodation required for special cases than the general ward now affords were noted in my report last year.

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*Inspection by Deputy Surgeon-General BEATTY.*

The hospital and head-quarters were inspected on the 16th November 1877.

The lines were kept clean and well drained, but the defective ventilation of the huts was brought to notice by the medical officer. Improved bathing arrangements in the verandahs of the married men's quarters were being constructed. The conservancy arrangements for both lines and hospital were excellent.

The medical officer particularly called attention to the badly made and ill-fitting native boots furnished to the men; fourteen admissions were entered under the head of injuries on account of sore feet induced by badly fitting boots.

The hospital at the time of inspection was clean, the books and records carefully written up to date, and the organization and management generally good.

## H. M.'s 13th Regiment N. I.

MALLIGAUM.—In medical charge of Surgeon-Major W. T. D. TICEHURST.

Average Strength .....	689	Deaths in Hospital .....	4
Do. Present .....	618	Do. out of do. ....	3
Admissions .....	662	Invalided .....	30
Daily Sick.....	15·7	Sick Leave .....	17

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Ahmednagar.....	85·9	2·4	.....
1875 .....	Do. ....	80·5	2·2	0·3
1876 .....	Malligaum and Ahmedabad	115·7	3·1	0·7
	Average...	94	2·6	0·3
1877 .....	Malligaum and Ahmedabad	107·1	2·5	0·6

The left wing of the regiment joined head-quarters from Ahmedabad on the 8th September. Small detachments have been supplied as treasury guards at the following places:—Peint, Kulwan, Niphar, Sinnar, Yeola, and Dindoree.

Location and movements of corps.

2. In the lines occupied by the right wing the huts are clean and kept in good repair ; the accommodation is sufficient ; ventilation imperfectly effected through doorways and roof ; the drainage is natural and good. The buildings occupied by the left wing are the arsenal, a European barrack, and other buildings ; they are all in a good state of repair, are kept clean, and, although a little overcrowded, the ventilation is very good ; their sanitary condition is also good. The sanitary condition of the bazaar is well looked after.

Lines and their surroundings.

Conservancy.

3. The trench system of latrines is in use, and works most satisfactorily.

4. The supply of water is generally sufficient and of good quality, but during the latter months there was some scarcity felt, owing to the small rainfall, and it is feared that if a fall of rain does not soon come there will be a water famine. The water from the wells is drawn only for drinking and cooking purposes. For washing and bathing the water of the river Moosam is used. The river is conveniently situated, being only a short distance from the lines.

Water supply.

5. Owing to the partial failure of the crops in most of the districts around Malligaum, supplies of grain, wheat, and vegetables have been scarce, and often of an inferior quality ; the prices have been higher.

Food.

6. There have been the ordinary duties of a regiment in cantonments—parade, guards, orderlies, and escort duties. They cannot be considered to have been heavy, or in any way prejudicial to health ; the average number of nights in bed has been 10·9. There is a very good gymnasium with a qualified instructor. Some of the men are very efficient in the different gymnastic exercises. All the recruits on first joining have to go through a course, and this appears to have a very good effect on their physique.

Duties, exercise, and amusements : their effects on health.

7. The hospital is situated behind and near the lines. The river Moosam runs at the back. It is kept clean and in a good state of repair, but, now that there is a whole regiment stationed at Malligaum, the accommodation is insufficient. Two new wards are required, a bath-room and guard-room. Quarters are also required for the 2nd class hospital assistant and medical pupil. The drainage and sanitary condition in and around the hospital compound is good.

Hospital and its immediate surroundings : present condition, hygienic and otherwise.

8. The general health and physique of the regiment may be considered good. The average height of the regiment is 5 feet 7½ inches. The recruits who joined this year are, with a few exceptions, very promising.
- General health and physique.**
9. The season has been a very trying one, especially to Europeans. The heat was very great during the months of March, April, and May. During the months of November and December there was a good deal of variation of temperature, which was the cause of much fever amongst the natives.
- Influence of climate or local circumstances on health.**
10. Including the sick of the detachments at Ahmedabad and Sadra, the total number of cases admitted during the year was 662, which with 12 cases remaining from 1876 gives a total of 674 treated.
- Details of treated.**
- The prevailing diseases were—ague 202 cases, rheumatic affections 41, dysentery 37. Of diarrhoea 23 cases are recorded, and most of these occurred during the hot season, some of them being of a most severe character. Contusion of the lower extremities furnished the formidable number of 68; the majority of these were cases of shoe-bite, from wearing ill-fitting boots.
11. There were four deaths in hospital—one from ague in a feeble and intemperate subject, and the others from remittent fever, cholera, and phthisis. Three deaths occurred out of hospital, and were reported to have been caused by general debility, cholera, and heart disease respectively. The two former cases occurred in men who were away on leave, and the latter case occurred in a Subedar who died on his way from Dhulia to Malligaum.
- Mortality and its causes.**
12. Cholera, which had been prevailing in a great many of the villages near Malligaum all the hot weather, made its appearance in cantonment on the 7th July. Two men were attacked, of whom one died. The hospital *goorga* also contracted the disease and died; then one woman and two children—the former recovered, but the children died. The disease thus quite left the regiment: but on the arrival of the left wing from Ahmedabad, on the 8th of September, the disease again appeared, but it was confined almost solely to the women and children of this wing. They appeared to have contracted the disease on the road. Five women and two children were attacked; only one woman died. One sepoy of the left wing was also attacked, but recovered. The families were put into tents just outside of the cantonment; the huts they vacated were completely purified by fumigation, the floors were dug up and made with fresh earth, and the walls were scraped and whitewashed. After the families had remained about a fortnight in tents, they were allowed to go back to the lines, and no more cases appeared. Five cases of small-pox occurred during the year; the disease was of a mild modified form. All the patients bore good marks of vaccination.
- Epidemics.**
13. Vaccination has been carefully attended to during the year. The total number of primary vaccinations was 82, of which 69 were successful; of re-vaccinations there were 66, of which 47 were successful and 19 were unsuccessful. At the end of the year only 6 children remained unprotected, and these were of too tender an age.
- Vaccination and re-vaccination.**
14. Thirty men were invalided during the year, from the following diseases:—chronic rheumatism, chronic bronchitis, old age and debility, weak eyesight, and rupture. Seventeen men were sent away on sick certificates, suffering from the following diseases:—one debility, one epilepsy, one rheumatism, two ague, one scurvy, four dyspepsia, six bronchitis, and one dysentery.
- Invaliding and its causes.**
15. Plans have been sent in by the Executive Engineer for enlarging the hospital, by adding two new wards and a guard-room; also for new quarters for the 2nd class hospital assistant and medical pupil.
- Requirements and recommendations.**
16. The cinchonine mixed alkaloid has been substituted for quinine in the treatment of ague. It answers very well in mild cases of this disease, but in the severer forms of ague it fails, and then I have found quinine succeed generally in checking the disease.
- Special observations; new experiences in treatment; sanitation.**

The detachments which were stationed at Peint and Kulwan as treasury guards suffered very much from malarious fever of a severe type. The former place is notoriously unhealthy and malarious, and the water is reported to be very indifferent. I am glad to say that both these detachments were relieved by the police at the close of the year.

### Detachment H.M.'s 4th Rifles N.I.

ASIRGARH.—In medical charge of Surgeon J. S. WILKINS.—Strength 149·2.

The detachment 4th N.I. (Rifles) has been here since the 18th December 1875. In December of this year it was increased in number by 18 men from the head-quarters at Satara, in consequence of the heavier duty the men had to perform.

2. Since writing the annual report for last year there has been no alteration in the general condition of the lines. There is one drain (pucka) which runs at the western end of the lines north to south. This drain empties itself over the side wall. There is also another pucka drain which runs halfway down the main street, and also empties itself over the walls; beyond these there are in reality no other drains. These two pucka drains are virtually useless, as, with the exception of a few houses in their immediate vicinity (and amongst these houses are some inhabited by the native officers, who have themselves built small tile-drains leading from their houses to the pucka drains), most of the water from the huts finds its way into puddles, which are almost as bad as cesspools, or sinks into the ground. To remedy these defects I would recommend the building of pucka drains between every two blocks running at a slope and meeting a central one which should empty itself over the walls. All drains to be well flushed with water. This condition of the drains has already been brought to notice.

3. There is no alteration since my last report, and the system employed has answered admirably, there being no unpleasantness. There are two new latrines built: one, which is a pucka building with well rammed floor and iron pans with dry earth, built for the use of the State prisoners, in place of their old one, which was condemned. This was mentioned in my last report as calling for alteration, being too near the drinking-water. Another latrine has been built for the use of the work-people of the P. W. D. near the Seven Gates. The mule lines, which were within the catchment area of one of the tanks, have been removed to a site selected near the Seven Gates.

4. In continuation of the history of the water supply to this fort I must call attention to the fact that the scheme for the supply of potable water was that the Mamoo Banja tank should be cleaned out. This was done at considerable expense during the hot weather of 1876, and the result, as shown by the analysis given in my last report, was a complete failure. After this the Sanitary Commissioner of the Central Provinces was ordered here to report on the water supply, and to give his opinion as to the best means of having pure water. The result was that a long drain was built running above the tank, the object being to cut off the contaminated water which would flow into the tank from those houses in the catchment area of the tank, and by so doing to have a clean catchment. The tank was also cleaned out a second time, and a well sunk in a ravine to the south-west of the tank and about thirty yards away. This well has been made through rock except at the western side or the side furthest from the tank, where there is a wedge of moorum. The quantity of water measured in the tank after the rains was twenty-one feet, and in the well about forty feet. The water in the tank was not disturbed, and every precaution was taken to keep it pure. The water was sent for analysis in September last, and the following is the result:—

“Statement showing the result of the examination of a sample of water forwarded by the Subordinate Officer, P. W. Department, Asirgarh, with letter No. 553 of 24th September 1877, taken from the Mamoo Banja tank: arrived at the laboratory September 26th.

“Total solids, grains per gallon .....	13
Chlorine „ .....	1·23
Free ammonia, parts per million .....	·53
Albuminoid ammonia „ .....	·46
Sediment copious, consists principally of green vegetable matter; Rotifers and Paramecia present.	

“From the above it will be seen that the water is very bad and not fit to drink.”

Another sample of water, taken from the well sunk in the ravine leading to Mamoo Banja tank, was sent to Dr. Lyon in October last, and the analysis is as follows:—

“Total solids, grains per gallon .....	29·400
Chlorine „ .....	1·33
Free ammonia, parts per million .....	·04
Albuminoid ammonia „ .....	·14
Sediment scanty; Paramecia, vegetable matter, and mineral fragments.”	



this scheme with the exception of making a large reservoir instead of the covered well. The Suckur tank and well have also been ordered to be cleaned out during the year 1878. This I sincerely trust will end the vexed question of the water supply. In concluding these remarks on the water supply of the fort I may mention that no injurious effects have been attributable to the drinking water from the present available sources of supply, and this I think is very much in its favour, although the albuminoid ammonia may be in excess of the prescribed standard, and I believe that the potable water here would compare favourably with that of most of the other stations with regard to its purity.

5. The food as supplied here is of fair quality, but higher prices were paid in consequence of the famine. There is, as usual, a great want of green vegetable food during the hot months, owing to the scarcity of water for irrigation purposes.

6. The duties for the year have been excessively heavy; owing to the removal of the Europeans, all the guard duties have fallen on native troops; and I have no doubt that this has been the cause of the greater number of admissions into hospital in this as compared with last year.

7. The hospital, with the buildings attached, forms a long line of buildings extending for about fifty yards along the south-eastern wall. It is in the same sanitary condition as described in my last report. The new hospital will not be built this year (1878).

8. The general health has been very fair, when we consider the hard duty the men have had.

9. The climate is very healthy. The greater number of the fever cases have been admitted during the latter portion of the year, and the admissions for rheumatism and diseases of the respiratory system have been more during the months of January and February. The average amount of daily sick is more this year, being 7.3 as compared with 5.5 of last year. The healthiest months are March, April, May, and June.

10. There were in all 230 cases admitted into hospital: of these there were 113 admitted for malarious fever; 28 for wounds and accidents, chiefly shoe-bites; 20 for eye diseases, chiefly acute ophthalmia; 9 for rheumatism; 7 for respiratory diseases; 7 for dysentery; 2 for remittent fever; 2 for diarrhoea; and one each for venereal disease (gonorrhoea), scurvy, and hepatitis.

11. One death occurred in June last from a foreign body having become impacted in the œsophagus. One death from heart disease occurred out of hospital.

12. There were no cases of epidemic disease amongst the troops. There were several cases of small-pox in the pettah at the foot of the hill, but as quarantine was established between the fort and pettah we had no cases.

13. All cases not vaccinated were operated on when small-pox was found to exist in the pettah, with the exception of two boys and one girl, infants, who will soon be vaccinated.

14. Six cases were sent before the annual Invaliding Board at Bombay, and all were passed; of these three cases were for heart disease, and one each for abdominal aneurism, varicose veins of both legs, and old age.

15. The want of pukka-built drains for the lines is one requirement, another is the new hospital promised so long ago. A dead-house, bathroom, and operating-room for our present hospital are much needed.

H. M.'s 4th Rifles.

SATARA.—In medical charge of Surgeon-Major C. G. H. Ross.

Average Strength .....	540·5	Deaths in Hospital .....	4
Do. Present .....	508·4	Do. out of do. ....	2
Admissions .....	617	Invalided .....	60
Daily Sick.....	17·1	Sick Leave .....	9

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissious.	Daily Sick.	Deaths in Hospital.
1874 .....	Satara and Bombay .....	96·6	2·9	0·4
1875 .....	Do. do. ....	89·2	2·4	0·6
1876 .....	Do. do. ....	100·9	2·6	0·8
	Average...	95·8	2·9	0·9
1877 .....	Satara and Bombay .....	121·3	3·3	0·7

The head-quarters have been stationed at Satara during the year. Detachments of two companies each formed part of the Asirgarh and Bombay garrisons.

2. The lines and their surroundings are unaltered. The close proximity of the Sadar bazaar is objectionable on many accounts. The sepoy's huts are overcrowded, and without means of ventilation. The surface drainage in shallow gutters is inefficient. These gutters, as has often been suggested, should be deepened, widened, faced with masonry, and covered to prevent their nauseous contents from contaminating the air.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. Conservancy arrangements have been altered by the introduction of trench latrines, but with, I should say, indifferent or negative results, as the sepoy's do not trouble themselves to work the system, or give it a fair trial. They prefer going into the jungle. The trench system, when carefully attended to, is perhaps the best under all circumstances.

Conservancy.

4. The water in use by the sepoy's and their families is obtained from wells in the lines. These dry up in the hot weather, and the supply is then brought from a well in the "Ranee's Garden," distant half a mile, or from the river Yena, which is still further off. A new well (there were three formerly) has been dug during the year. The water in the lines is considered good by the sepoy's, but according to the Chemical Analyser to Government it is only of "fair quality."

Water supply.

Food and clothing.

5. In consequence of the scanty rainfall, food rose to famine prices.

I still think the regimental dress, of invisible green, unsuitable for tropical wear, except in the cold weather. In the hot season *khakee* is worn by the sepoy's, but it never looks well, nor keeps long clean. Serge pantaloons might be substituted with advantage for the cloth ones, and *khakee* abolished. Sepoy's when off duty don native attire and wear no under-clothing. Were our sepoy's to wear flannel next the skin, they would, I believe, suffer less from fever, bronchitis, and rheumatism than is now the case. The helmet worn by the European officers of the regiment should be discarded for one lighter in colour and weight. The present one is in no sense a proper protection from the sun's rays.

6. The ordinary routine of duty at this station is light, and does not harass the men; but when extra guards for the treasury and jail fell to their lot, on the removal of the police to the famine districts, the men had only 2½ nights in bed, and the admissions for fever alone numbered one hundred in November. During all the months of the year the health of the

Duties, exercise, and amusement: their effect on health.

men was reported good except in November, when it was pronounced "tolerably good." Since last report a *talimkhana* has been instituted, and gymnastic exercises are in favour with the younger soldiers of the regiment.

7. The regimental hospital is still a hired bungalow in the Sadar Bazaar. As stated in former reports, a properly appointed hospital out of the bazaar is urgently needed. The building itself is weather-proof, for the bungalow is a new one, but its position in the bazaar ought to condemn it.

Hospital and its immediate surroundings : present condition, hygienic and otherwise.

8. In the monthly return for December I thus wrote (having recently returned from furlough):—"The appearance of the men strikes me as less robust than it was a year ago;" and there is a falling off, I think, in physique too. The general health, though pronounced "good," has deteriorated during the year under review.

General health and physique.

9. No doubt the general health of the men was influenced unfavourably by the exceptional character of the climate, due to deficient rainfall, and the presence of famine in the land.

Influence of climate or local circumstances on health.

10. In the list of general diseases, ague prevailed more than any other, and furnished 297 admissions. A solitary case of chicken-pox occurred, and one case of mumps was met with. Chronic rheumatism gives 22 admissions, and syphilis, primary and secondary, 17 and 19 respectively. Scurvy was treated in 3 cases. Hemiplegia is the only example of diseases of the nervous system. Conjunctivitis gives 39 admissions. Diseases of the respiratory system are illustrated by 26 cases of bronchitis and 1 of pneumonia. For diseases of the digestive system there were 35 admissions, for diseases of the cellular tissue 7, and for injury 42.

Details of treated.

11. There were four deaths during the year—one was due to bronchitis, and the rest to cholera.

Mortality and its causes.

12. Forty-five children were vaccinated successfully; the lymph was reported good.

Vaccination and re-vaccination.

13. Sixty men were invalided for the following causes:—chronic rheumatism 10, syphilis (secondary) 6, scurvy 2, hemiplegia 1, defective sight 3, palpitation of the heart 1, dyspepsia 1, laryngitis 1, diseases of the lungs 9, injury 1, and old age and debility 25.

Invaliding and its causes.

14. The requirements and recommendations may be thus summarized:—(1) New lines, with a plentiful and perennial supply of pure water, which could with little engineering difficulty be brought from the neighbouring hills, is the first requirement. (2) A properly appointed hospital out of, and at a considerable distance from, the Sadar Bazaar, is the second requirement.

Requirements and recommendations.

15. In the Sadar Bazaar itself sanitation, though better than when I first knew Satara, is still susceptible of great improvement. The prostitutes who live there, and prowl about camp in all directions, are under supervision of no kind. The propriety of establishing a Lock Hospital has often been insisted on in annual reports, and is again recommended in this one.

Special observations, new experiences in treatment, sanitation, &c. &c.

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*Inspection by Deputy Surgeon-General BEATTY.*

The lines and surroundings are unaltered. The crowded and unventilated state of the sepoy's huts has been previously brought to notice. The hospital, which is a hired building, is, from its close proximity to the bazaar, totally unsuited for the purpose. The building itself was found to be clean, but the accommodation for sick is extremely limited. The books and records were carefully written up to date.



**H. M.'s 2nd (Prince of Wales' Own) Regiment N. I. (Grenadiers).**

BELGAUM.—In medical charge of Surgeon C. T. PETERS, M.B.

Average Strength.....	705	Deaths in Hospital .....	9
Do. Present .....	631	Do. out of do. ....	1
Admissions .....	356	Invalided .....	20
Daily Sick .....	19·3	Sick Leave.....	18

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Aden .....	66·8	2·6	0·8
1875 .....	Do. ....	60·2	2·3	0·1
1876 .....	Belgaum .....	63·8	2·6	0·8
	Average.....	63·8	2·5	0·6
1877 .....	Belgaum .....	56·4	3·0	1·4

The regiment has been stationed in Belgaum throughout the year. A detachment of thirty rank and file, under the command of a native officer, was sent on the 12th October 1877 for guard duty with the extra-mural gang of convicts working at Gokak, and returned to Belgaum on the 10th December 1877. Numerous escort parties have been sent to different places during the famine with treasure, but they have been only absent from the regimental head-quarters for about eight or ten days at a time.

Location and movements.

2. The regiment is occupying the same lines they occupied last year, which are in good condition. A good portion of the ground between the lines and the Khanapur Road, used for rice cultivation, was under water for several months during the monsoon, and to this cause a good deal of the malarious fevers which prevailed towards the latter part of the year may be attributed.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. The same as last year. The latrines are wanting in repairs. A requisition has been made upon the Barrack Department, and it is believed that they will be shortly repaired.

Conservancy.

Water supply.

4. Good; obtained from wells as described last year.

5. The men have suffered a good deal owing to the scarcity of grain which prevailed throughout the year. Most of the grain was imported, and at times it was impossible to get good wholesome grain in the market, the good having been adulterated with damaged grain; but the supply has improved since October.

Food.

6. The men have had regimental and garrison guard duties, escorting treasure to the famine district, and escorting prisoners to various places; they have had, on an average, 3½ nights in bed. Some of the men have been employed during leisure hours in gardening, tile-making, pottery (some of which carried off prizes at the Poona Exhibition), and at a printing-press, which was started about ten months ago, and promises to succeed well. Several people, mostly young men, go to the gymnasium; a few cases of accidental injuries sustained while in the pursuit of some athletic games were treated in hospital, but none of them were of a serious nature. A cricket club has also been started, and appears to be popular. With the exception of the cholera cases brought in by escort parties, which will be detailed hereafter, the duties, exercises, and amusements have not produced any prejudicial effect upon the men.

Duties, exercise, amusements: their effect on health.

7. The building is in good condition; but it has only accommodation for twenty patients. This number has been frequently exceeded during the past year; but when the number reached above twenty-one the excess of patients were treated either in tents or in the spare hospital assistant's room, one hospital assistant having been absent on famine duty almost the whole year.
- Hospital and its immediate surroundings: present condition, hygienic and otherwise.
8. The scorbutic taint which some of the men acquired in Aden still manifests itself during exhausting attacks of illness, and a good many of the men had a tendency to it during the famine. Four men have been invalided on account of scurvy. The men have not made as steady a progress in health as was expected after their return from Aden, owing to the unhealthy season succeeding a year of famine.
- General health and physique.
9. In consequence of the unusually dry weather extending over about eight months, from September 1876 to May 1877, succeeded by heavy rains, Belgaum and the surrounding districts have been unusually unhealthy, cholera having prevailed during the hot months; and with the rains, when this epidemic began to abate, remittent fever, in some cases resembling typhoid fever, broke out, and continued till the end of the rains, when intermittent fever began to rage, and still prevails.
- Influence of climate or local circumstances.
10. There were 356 admissions, of whom 261 were the actual number of persons treated during the year; the others (95) were re-admissions. There were 19 remaining at the beginning of the year: making the total treated 375, against 410 of last year. The principal causes of sickness were malarious fevers,—in which the remittent type predominated,—dysentery, diarrhoea, rheumatism, diseases of the respiratory system and of the liver and spleen. Primary syphilis gave 15 admissions, against 1 of last year; secondary syphilis 2, and gonorrhoea and bubo 5. This large increase in venereal diseases is due to the presence during the year of a large number of women who came into the station from the famine districts; very few of the cases were traced to the registered prostitutes in the bazaar.
- Details of treated.
11. There were nine deaths—from cholera five, and from remittent fever, bronchitis, diarrhoea, and copper-poisoning one each. There was one death in the lines, caused by gunshot wound (suicidal) of the chest, involving the liver, lungs, and heart. Fragments of the bullet were found lying loosely in the posterior mediastinum.
- Mortality and its causes.
12. Cholera, which prevailed to a certain extent in the preceding year, increased in intensity during the early part of 1877; one case was admitted in February, four in May, and one in June—in all, six cases. All these were imported from the districts, the first by a recruit party, and the poor lad who died was a recruit just coming to join the regiment. The five cases admitted in May and June occurred in escort parties returning from the districts after escorting treasure, chiefly from Gokak. This epidemic gradually disappeared as the monsoon set in.
- Epidemics.
13. There have been 63 primary vaccinations and 11 re-vaccinations; of the former 3 were performed on European children, 57 children belonging to sepoys, and 3 to the regimental bazaar; all these were successful. The 9 children re-vaccinated belonged to the regimental bazaar; 5 of the cases were successful.
- Vaccination and re-vaccination.
14. Two men were invalided before a special Board, and eighteen men by the General Invaliding Board. In all there were twenty men (including two native officers) invalided during the year; of these, four were for chronic scurvy, two for irregular action of the heart, two for defective vision, four for chronic bronchitis, seven for general debility, and one for prolapsus ani. Besides invaliding, a very large number of men had to be sent away on sick leave, in consequence of their health being so weakened, after the severe illnesses they had undergone, that it was necessary to give them leave to proceed to their native country.
- Invaliding and its causes.
15. The cinchona alkaloid has been largely used by me as a substitute for quinine for the last six months or so, and, with the exception of its sickly odour, I find it to be a valuable remedy—more efficacious than cinchonidine (which in large doses gives rise to giddiness and headache), and as good as quinine in the treatment even of the severer forms of malarial fevers. I give it in the same doses as quinine, viz. five to ten grains per dose, and up to fifteen grains per day, and in one instance, where the man had an obstinate attack of tertian fever, the return was effectually checked by giving five grains three times a day of the cinchona alkaloid, and this result was observed even after quinine had failed.
- Special observations, new experiences in treatment, sanitation.

*Inspection by Deputy Surgeon-General BEATTY.*

The lines are in good condition. The latrines required repair, but a requisition had been made on the Barrack Department to have them put in proper order.

At the time of inspection the hospital was found to be in excellent order, the beds clean, patients well attended to, and the books and records written up to date. Surgeon Peters particularly noticed the want of a filter, especially for dispensary purposes, and no doubt this means of supplying pure drinking water should be provided for every hospital in the service.

**H. M.'s 14th Regiment N. I.**

BELGAUM.—In medical charge of Surgeon-Major C. F. OGILVIE, M.D.

Average Strength .....	694·5	Deaths in Hospital .....	4
Do. Present .....	598·1	Do. out of do. ....	9
Admissions .....	439	Invalided .....	17
Daily Sick.....	20·9	Sick Leave .....	14

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Kolhapur .....	67·0	2·9	0·7
1875 .....	Do. ....	77·5	3·5	0·8
1876 .....	Belgaum .....	82·6	3·5	3·1
	Average...	75·7	3·3	1·5
1877.....	Belgaum .....	73·4	3·5	0·6

The head-quarters of the regiment have been stationed at Belgaum during the year. Location and movements. Several detachments have been sent on escort duty in charge of treasure and of convicts. A company proceeded to Kadgi on 23rd November to relieve a company of the 3rd Regiment N.I.I.

2. The lines are kept in very good order. I think there are too many trees; and too much vegetation is allowed to grow in front of the huts in the monsoon, preventing as free a current of air as is desirable. There is a large nullah at the rear of the lines, which in the monsoon conveys a large volume of water to rice fields which are in too close proximity, and are in my opinion the cause of much of the fever which I have seen since I arrived at this station, about eight months ago.

3. The latrines situated to the rear of the lines are well looked after; the night-soil is carried away in an iron cart, but the present arrangement might be improved for carrying off the ablution water, which at present soaks into the surrounding soil. The dry-earth trench system should be introduced.

4. This is abundant, quality pure and palatable. It is derived from five wells which are situated a considerable distance from any cesspools or graveyards. Being covered, they are not liable to become contaminated by any objectionable matter falling into them. Water is to be had also from a spring called the Naggiri, and I believe this is used by some of the sepoys.

5. The food chiefly used by the sepoys has been very dear during the past year. Rs. 7-14-1 was paid by Government to the sepoys as compensation for dearness of provisions in the month of August. Rs. 2-1-10 was paid to each man in the month of February. The former was the highest, the latter the lowest amount paid during the year. A great quantity of very inferior grain which had been buried for years was thrown into the market at a cheaper rate, to tempt, and too often

with success, poor people to purchase it. In consequence of there being no rain from September 1876 to April 1877, there was almost no grazing for animals; their flesh was very lean and deficient in nourishment. A short time ago a chicken could not be obtained in the bazaar, even on market days.

6. The duties of the regiment at head-quarters have been those of ordinary parades and guards. Escort parties have proceeded to the districts in charge of treasure and gangs of convicts. The average number of consecutive nights in bed has been 3·71. Some of the men, when off duty, have amused themselves in gardening. There is a cricket club in the regiment, and some of the men play twice a week. Some of them train for foot races, and have taken prizes at the Gymkhana meetings. There is no gymnasium in the lines of this regiment, but I believe some of the men avail themselves of that in the lines of the other native regiment. The men practise a good deal with clubs, at wrestling, &c.

7. The building is in good condition, but it is too small, having accommodation for only eighteen patients. Tents have been frequently pitched in the hospital compound for the treatment of ordinary cases of sickness, because there was not room in the hospital.

8. These may, I think, be considered satisfactory. At the close of the year fifteen men remained in hospital, but eleven of them were cases of a slight nature.

9. Belgaum and the surrounding districts have been very unhealthy; this may be attributed to the long period of dry weather during the last four months of 1876 and the first four or five months of 1877, followed by heavy rain. Cholera prevailed during the hot months. Remittent fever of a severe type prevailed till the rains were over, since which time intermittent fever has prevailed to a great extent all over the districts. So great has been the demand for quinine for sale in the districts that at one time I was unable to meet the demand at the Civil Hospital.

10. The total number of treated during the year was ~~437~~<sup>53</sup>, of these ~~423~~<sup>39</sup> were admissions. There were 34 re-admissions, so that the total number of persons treated was ~~469~~<sup>46</sup>. Ague gave ~~12~~<sup>34</sup> of the total number of admissions, and there were 18 from remittent fever. Respiratory diseases gave 28 admissions; the largest number (6) was in the month of November. There were no admissions in August and December. There were 27 admissions from diarrhœa, and 24 from dysentery. Hepatitis gave 5 admissions, and venereal diseases 22. Of these latter only 4 were cases of primary syphilis.

11. There were four deaths in hospital,—one each from remittent fever, Bright's disease, asthma, and diabetes. There were seven deaths out of hospital.

12. From chicken-pox there were three admissions in January, three in February, four in March, five in April; in all, fifteen cases. One case of measles was admitted in the month of March.

13. There were 79 children vaccinated, one being the child of a European officer; 69 were native children belonging to the regiment, and 9 belonged to natives in the regimental bazaar; 34 children were re-vaccinated. There are 8 children unprotected, but they are either under three months old, or are not at present in a fit state of health to have the operation performed.

14. ~~Sixteen~~<sup>Seven</sup> men were invalided during the year. Nine men were invalided by the General Invaliding Committee. Eight of these were for old age and debility, and one for glaucoma. One man suffering from arteritis was discharged with a gratuity. Seven men were invalided by special Invaliding Committees; two were for asthma, and one each for the following causes:—anæmia, hepatitis, rheumatism, old age and debility.

15. I am still of opinion that in severe cases of remittent and intermittent fevers quinine is the only reliable remedy we possess. In the milder forms of these two fevers I use the cinchonidine and cinchona alkaloid, but they can only be recommended, in my opinion, on the score of economy.

*Inspection by Deputy Surgeon-General BEATTY.*

The lines are kept in good order, but are unfavourably situated at the south-east end of the cantonment. Conservancy and sanitary arrangements are attended to, and the latrines kept clean. The dry-earth trench system might be introduced with benefit. The water supply is abundant and pure. It is obtained from five wells which are covered, and are far removed from cesspools or other sources of contamination. Although a better site not only for this hospital, but also for that of H.M.'s 2nd Grenadier Regiment, might have been selected, there is nothing objectionable in the building itself.

The medical officer strongly advises the introduction of good filters for purifying the water used in dispensing medicines, in which suggestion I entirely concur.

**H. M.'s 3rd Regiment N. I.**

KOLAPUR.—In medical charge of Surgeon J. MACGREGOR, M.B.

Average Strength .....	695	Deaths in Hospital .....	4
Do. Present .....	637.4	Do. out of do. ....	0
Admissions .....	713	Invalided .....	17
Daily Sick.....	19.1	Sick Leave .....	15

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Almedabad .....	13.8	3.9	0.3
1875 .....	Do. ....	175.0	4.6	2.1
1876 .....	Kolhapur and Kaladgi.....	95.3	2.7	0.3
	Average.....	94.7	3.7	0.9
1877 .....	Kolhapur and Kaladgi.....	111.8	2.9	0.6

On 14th November 1876 one company left head-quarters for Kaladgi to join another detachment which had been at that station since 6th February 1876. Both these detachments have since rejoined head-quarters. On the 8th November the left wing left for Sholapur, where, after a march of fifteen days, they arrived on the 23rd of the same month.

2. The lines are placed on the summit of a low rocky eminence with a slight but efficient declination on all directions, leading for the most part into black cotton soil. The huts are built almost on the bare rock, without any plinth. There is no system of ventilation, and but for the loose workmanship of the doors, roofs, &c. the atmosphere of these rooms would not be eniable when the doors are closed. These huts have certainly outlived their day, and were last year reported on, and justly condemned, by Surgeon-Major Johnson, then in medical charge of the regiment.

3. There are two latrines for each wing—one for males, the other for females. They are built of pukka masonry, and with the dry-earth system of conservancy are quite sufficient for the wants of the regiment, and in every way satisfactory.

4. The water, abundant and good, is drawn from four wells in the vicinity of the lines. Last year two of these were deepened, which ensured a more certain supply towards the end of last dry season. Notwithstanding this, water was all but scarce just before the rains, and one or two of the wells dried up; but then this year the rains, though finally more than usually abundant, were late in coming, so that we may safely anticipate a sufficient water supply at this station, except under very extraordinarily dry circumstances.

5. Food was neither abundant nor of good quality throughout the greatest portion of the year, but has materially improved of late. Prices also, which were at first very high, are now much more moderate. Food and clothing. The men should wear more under-clothing when on night guards at this season of the year, but their tunics seem too small to admit of this. Their shoes also fit very badly, and occasion numerous shoe-bites. Beyond this, and the increase of cases of pulmonary disorders at this season from the cold, I cannot trace any ill consequences to deficient or badly fitting clothes.

6. During most of the year two companies had been at Kaladgi, and, as most of the Kolapur infantry (State regiment) had been out in the districts on famine duty, our sepoy were more than sufficiently occupied, having to supply guards which the Kolapur infantry usually supplied. Duties, exercise, and amusements: their effects on health. The two Kaladgi companies have since rejoined head-quarters, and, as the Kolapur infantry had mostly come in from the districts, the work would have been lighter but that the left wing has left for Sholapur, which again throws a great amount of work on those that remain. Nights in bed average three per week. The sepoy amuse themselves a good deal at native gymnastics. Neither duty nor exercise seems to affect their health injuriously; on the other hand, one can at once distinguish the gymnast (of whom there are several amongst them) by his appearance and the condition of his muscles.

7. There are two detached hospital buildings, one larger than the other, and each excellent. Only one of these is generally occupied by patients, the other being reserved for women; and only once since I joined the regiment in March was I under the necessity of putting sepoy in this smaller building. This was during the rains, when the number of patients was greater than usual. Both buildings are well ventilated and are kept in excellent order. Hospital and its immediate surroundings: present condition, hygienic and otherwise.

8. The physique of the men is pretty good, but there are a number of puny fellows among them, not worth anything on active service, and whom the regiment would be much better quit of. General health and physique.

9. Including the sick of the wings at Kaladgi and Sholapur, the total treated numbered 727. The chief diseases were malarious fevers, which gave 273 admissions, rheumatic affections 35, syphilis 23, diarrhœa 24, dysentery 34, and diseases of the lungs 45. Details of treated.

10. There were four deaths—two from ague, and one each from pneumonia and bronchitis. Mortality and its causes.

11. Cholera and small-pox, especially the former, prevailed to a considerable extent in the city of Kolapur and Baura. Every precaution was taken, and neither of these diseases attacked the regiment. Epidemics.

12. There were sixteen primary vaccinations, all on infants, and all successful; three cases of re-vaccination, all on adults with previous vaccination scars, and all unsuccessful. Vaccination and re-vaccination.

13. There were seventeen cases of invaliding, from the following causes:—From old age and debility nine, bronchitis two, varicose veins two, and one each from pneumonia, cardiac disease, ulcer, and leprosy. Invaliding and its causes.

14. It would be advisable to have a road made from the hospital to the main road, which is only two hundred yards distant. At present there is no road at all leading to the hospital. Requirements and recommendations.

*Inspection by Deputy Surgeon-General BEATTY.*

The sanitary condition of the lines was good, and the drainage sufficient. The water supply, which is drawn from four wells, is abundant and pure.

Though cholera and small-pox prevailed to a considerable extent in the town of Kolapur, neither of these diseases attacked the men. This immunity was unquestionably due to the precautions exercised by the commanding officer assisted by the medical officer of the regiment.

The hospital, which was originally built for a European regiment, is admirably constructed for the accommodation of sick. It was found to be in a state of perfect cleanliness and efficiency, and the books and records were neatly written up to date.

**H. M.'s 19th Regiment N. I.**

SHOLAPUR.—In medical charge of Surgeon R. BOWMAN.\*

Average Strength .....	707·7	Deaths in Hospital .....	9
Do. Present.....	613·1	Do. out of do. ....	0
Admissions .....	1,043	Invalided .....	6
Daily Sick.....	32·1	Sick Leave .....	7

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Sholapur .....	145·7	4·2	0·6
1875 .....	Do. ....	93·6	2·1	0·3
1876 .....	Do. ....	51·6	1·7	0·5
	Average.....	96·9	2·7	0·5
1877 .....	Sholapur .....	117·1	5·2	1·4

The regiment arrived from Sholapur at Kurrachee on the 15th of November 1877. Location and movements. Small detachments were absent from the regiment during the year.

2. The general physique of the men is good. Their health, considering the unfavourable circumstances under which they were placed at Sholapur, is fair. While at this station the regiment was much exposed, during the latter part of the year, to malarious influences. A large number of the men also suffered from primary syphilis. The dearness and inferiority of provisions have also had their effect on the general health.

3. Out of the total number of 1,043 treated during the year, 565, or more than half, were admitted suffering from ague. The fever was of a very weakening character, and difficult to shake off. This was also aggravated by the scarcity of food, and the consequent low state of the health of the men. Amongst the other diseases of this class there were seven cases of small-pox, and one of malignant cholera. There has been a marked increase in admissions from primary syphilis; 58 men were admitted during the past as compared with 5 in the previous year. The disease was very rife at Sholapur, and in several cases, owing to the low state of the men, was complicated with severe sloughing buboes. The admissions from secondary syphilis, lumbago, and rheumatic affections are much the same as in 1876. A large increase in the admissions for diseases of the digestive system has also occurred; 118 were treated, as compared with 38 in the preceding year; of these 46 suffered from dysentery, and 40 from diarrhoea. Two cases of each proved fatal. The diarrhoea cases were both much weakened by prolonged attacks of fever. None of the other diseases treated were of any particular importance; there were 45 cases of injury, all of a trivial nature.

4. There were nine deaths—two each from ague, dysentery, and diarrhoea, and one each from cholera, typhilitis, and intestinal obstruction.

5. Small-pox occurred to a slight extent; seven men were attacked with the disease, but were immediately separated, and all source of infection removed from the vicinity of the lines. One case only of cholera is recorded.

Vaccination and re-vaccination. 6. Carefully attended to.

7. Six men were invalided during the year for hemiplegia, paraplegia, bronchial catarrh, malposition of testicle, and debility.

\* Since arrival at Kurrachee the regiment has been in medical charge of Surgeon W. H. Henderson, by whom the annual report has been compiled.

*Inspection by Deputy Surgeon-General JOYNT.*

This corps, just arrived from Sholapur, presented a sick list of over 15 per cent. of fighting strength, chiefly made up of syphilitic and fever cases, for which the hospital accommodation was quite inadequate. Within a few days, however, Surgeon Henderson, medical officer in charge, reported a considerable decrease in the number of sick, and a sufficiency of hospital accommodation. The present sanitary condition of the lines and hospital is most satisfactory.

**H. M.'s 12th Regiment N. I.**

DHARWAR.—In medical charge of Surgeon H. W. B. BOYD.

Average Strength.....	675·3	Deaths in Hospital .....	6
Do. Present.....	648·7	Do. out of do. ....	0
Admissions .....	521	Invalided .....	10
Daily Sick .....	14·1	Sick Leave .....	2

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Dharwar .....	90·8	4·4	0·5
1875 .....	Do. ....	52·9	2·7	0·5
1876 .....	Do. ....	47·1	2·1	0·6
	Average...	63·6	3·1	0·5
1877 .....	Dharwar .....	80·3	2·2	0·9

Location and movements.	
Kaladgi and Bijapur .....	173
Kalghatghi .....	23
Rambednur .....	23
Gadag .....	23
Roan.....	22

The regiment has been stationary for the past year. Detachments were furnished in November 1876 for the protection of the talukas, of the strength noted in the margin. They returned in April 1877. Since then one detachment, consisting of 54 men, has been sent with prisoners to Gokak, where it still remains.

2. The lines have been fully described in the annual report for 1875. A great deal of attention has been paid to them; they are models of cleanliness, the light trenches for carrying off surface water are well looked after, and the planting of trees in front of the dwellings answers well to keep the houses cool and absorb any stagnant water. The dwellings are well ventilated, by holes in the wall, and also through the tiled roof. They are kept clean and neat, and in front of each is a small garden where flowers and shrubs are grown. The bazaar is situated about a hundred yards from the rear of the lines. This is also clean and well kept, and is in a good sanitary condition. It is fairly supplied, but the men prefer getting their provisions in the town, though it is two miles distant.

3. The conservancy arrangements are on the trench system. The latrines are situated to the south of the lines. They are made according to the plan supplied from the office of the Quarter Master General. They have bamboo screens, with partitions, as a protection from inclement weather. Several improvements have been introduced during the year; the trenches, instead of being dug across the side of the hill, as formerly, are now dug with their long axes downwards, and consequently receive less rain water and are kept drier. To prevent the disagreeable smell arising from the decomposing urine, vessels were placed at the head and foot of the trenches; but, as it was found difficult to get the men to make use of them, zinc gutters are being placed in front of each; at the lower end of the gutter a vessel is placed into which the urine flows, and when full it is carried away and emptied into a hole dug a distance from the lines.



4. The water supply is obtained in sufficient quantity from three wells—one situated to the rear of the lines, for the Purwarees; another situated to the south-east, for the use of Hindoos and Musalmans; the third well is used principally by the European officers of the regiment and by the hospital.

Water supply.

5. Food has been exceedingly dear during the past year, though the markets were well supplied. The highest amount of grain compensation allowed to the sepoys was in the month of August, when it reached Rs. 9-3-1, and the lowest in December, when it was Rs. 3-5-6. Vegetables were abundant and cheap during the year.

Food.

6. The regiment possesses a very good workshop, and, when not engaged on military duty, some of the men are occupied at carpentry, bootmaking, tailoring, and smiths' work. They were successful in obtaining several prizes this year at the exhibition held in Poona. The gymnasium has been much resorted to, especially by the recruits, who are taught gymnastics by a qualified sepoy who has obtained a certificate at Poona.

Duties, exercise, and amusements, and their effects on health.

7. The hospital has been fully described in the annual report for 1876. No alteration has since been made, with the exception that a dead-house has been built. A well is also being sunk about fifty yards to the south of the hospital. It will be a very great advantage, as up to the present the bheesties have had to bring water from the well situated near the officers' quarters, which is a long distance from the hospital. The present state of the hospital is very satisfactory. It is kept scrupulously clean. It is well ventilated, and its conservancy arrangements are punctually carried out. I consider the mud floor of the hospital might be replaced with advantage by either a wooden or a stone one, as any dressings, excreta, &c., which may happen to fall on it are absorbed, and may possibly form a source of infection.

Hospital and its immediate surroundings: present condition, hygiene and otherwise.

8. The general health of the troops has been good during the past year. The prevailing diseases have been ague and syphilis. The physique of the men is good. The appearance of the recruits who joined lately has been beyond the average.

General health and physique.

9. There has been a large increase in the number of admissions as compared with the year previous. I attribute it to the famine that has so extensively prevailed here, and the consequent dearth of provisions. The climate has not been favourable. An unusual quantity of rain fell in the months of September and October. In November and December the weather was exceedingly cold, with a dry east wind, and during those months the number of admissions for intermittent fever was very much increased.

Influence of climate or local circumstances on health.

10. There were altogether 521 admissions. There were 170 admissions from ague, which were treated, the graver cases with quinine, and the lighter with cinchonidine. I have found a mixture of both medicines in equal proportion to answer well for ordinary cases. Four cases of small-pox were admitted, also one of remittent fever, and three of malignant cholera. There were seventeen cases of chronic rheumatism, and thirty-two of primary syphilis; none of the other diseases were of any particular importance.

Details of treated.

Mortality and its causes.

11. There were five deaths during the year—two from cholera, and one each from red softening of the brain, hepatitis, and apoplexy.

12. There were seven cases of cholera in the cantonment in the early part of the year, out of which one recovered. There were two sepoys attacked; the remainder of the cases occurred amongst the relations of the sepoys, and the camp followers. Six cases of modified small-pox occurred; two of those admitted were children, the other four sepoys.

Epidemics.

13. Vaccination has been very carefully carried out. There were 76 operations, of which only one was successful. There were 19 re-vaccinations, of which 8 were unsuccessful. These latter operations were performed solely on recruits.

Vaccination and re-vaccination.

14. There were 22 men sent before the Invaliding Committee at Belgaum, of whom ten only were passed. The causes of their being invalided were—two from chronic bronchitis, one from debility and hemicrania, and seven owing to their being old and worn out.

Invaliding and its causes.

15. I think it would be a great improvement if the windows on the south-west side of the hospital were fitted with shutters to keep out the glare of the sun. One small room, which is used for ophthalmic cases, especially requires them. To guard against the contamination of the wells by surface water, &c., I have suggested that they should be covered, and the ground drained and paved around them.

16. I have no special observations to make, with the exception that the jail authorities have ordered a new burial-ground, about four hundred yards to the south-east and in rear of the officers' quarters, and just outside the cantonment limits. I look upon it as too close to the lines, especially as the east wind blows at this season continually over the place in the direction of the cantonment.

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*Inspection by Deputy Surgeon-General BEATTY.*

The site for the lines has been well chosen. There is excellent surface drainage, and a free ventilation through the streets between the huts. The water supply, which is derived from three wells, is sufficient in quantity, and of good quality. The general health of the men has been good. The present state of the hospital, which is a model of cleanliness, was found to be highly satisfactory. It is well ventilated, and its conservancy arrangements carefully attended to. A dead-house, situated about thirty yards to the north of the hospital, has been added since last report. The medical officer brought to notice the inconvenience experienced by the dust rising from the mud floors, and suggested its being replaced by either a stone or wooden one.

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NORTHERN DIVISION.

Average Strength Present during the year.....	8,601·3
Average Daily Sick per cent. to the Average Strength .....	3·4
Ratio of Mortality to the Average Strength .....	0·7

H. M.'s 1st Regiment N. I. (Grenadiers.)

AHMEDABAD.—In medical charge of Surgeon H. McCALMAN, M.D.

Average Strength .....	728	Deaths in Hospital .....	6
Do. Present .....	666·9	Do. out of do. ....	6
Admissions .....	629	Invalided .....	50
Daily Sick.....	22·1	Sick Leave .....	14

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Poona .....	91·5	3·3	0·6
1875.....	Do. ....	123·7	3·9	0·4
1876.....	Ahmedabad .....	124·1	4·2	1·5
	Average.....	113·1	3·8	0·8
1877.....	Ahmedabad .....	94·3	3·3	0·8

The regiment remained at Ahmedabad during the entire year. A detachment numbering 56 was stationed at Sadra for eight months.

2. The lines have already been fully described. In the quarters of the married men, one corner of the room is set aside for bathing purposes, but it is not lined with impermeable material. Waste water is conveyed from those places by small underground channels into shallow basins constructed round the roots of young trees recently planted in the streets. The regimental bazaar is clean and well kept, and there is nothing about it or the other surroundings of the lines likely to prejudice their hygienic condition.

3. The latrines provided are four in number, placed to leeward of the camp, and at as great a distance as is consistent with their easy access. They are substantially built, and each is partitioned off into single compartments. Iron receptacles are in use, and at regular and frequent intervals these are withdrawn and replaced by others as required. Twice a day the mixed excreta are removed to a distance of two miles and buried. Dry earth is employed as a deodorant. The floor of the latrines is not paved, neither is the ground immediately in rear, so that the surface is constantly wet from the water used in ablution, and the soil is saturated with the worst impurities. It is not, therefore, to be wondered at that the atmosphere in the vicinity is generally intensely disagreeable, in spite of the precautions taken to prevent a nuisance.

4. There are four wells in the lines, and one just outside the hospital compound. The Water supply. supply drawn from those sources is ample and of good quality.

5. The supply of food was good, in quantity and quality. Married men with families were somewhat pinched on account of the dearness of provisions. In their case grain compensation does not make up for high prices. Fresh vegetables ought to be more plentiful than they are.

6. The duties and exercises appear to be judiciously regulated to the strength and vigour of the men, and are in no way excessive. Admissions to hospital from over-fatigue or its consequences are very rare. In the hot months the length of the march to the city jail, dis-

Duties, exercise, and amusements: their effects on health.

tant three miles, is sometimes complained of by the men furnishing the guard. The verandah asked for last year has been granted, and they are now well protected from the sun. All recruits practise gymnastics, chiefly on the horizontal and parallel bars, under the supervision of a subedar.

7. In March last, in consequence of the removal of the European hospital to another situation, the ward given up to the sick of another regiment was returned to the Grenadiers. Taken together, the two wards now available give accommodation for thirty patients. Hospital and its immediate surroundings: present condition, hygienic and otherwise. Ventilation is accomplished by opposite doors and windows, and an upward current is provided for by vertical shafts passing out at the roof. The floor is well paved—a great advantage. There is good natural drainage in the direction of the river. No fault can be found with the surroundings.

8. The general health of the regiment, as deduced from admissions to hospital and the average daily sick, shows an improvement on the two previous years. Causes which at one time affected it severely (scurvy, severe remittent fever, and heavy duties) are no longer in operation, though their effects can still be seen in many permanently impaired constitutions. A large proportion of those cases, however, have been weeded out by the Annual Invaliding Committee; and under better conditions of health, and by the careful selection of recruits, the physique of the corps will no doubt steadily improve. At present it is very fair. General health and physique.

9. The local circumstances which may be presumed to affect the health of the regiment have reference to the lines. The floors of the huts are sunk and unpaved; there is no system of ventilation, and surface water is not carried off rapidly enough. These facts have a bearing on the annual amount of sickness from ague, pulmonary diseases, and rheumatism. Influence of local circumstances on health.

10. The greater number of admissions were furnished by the following diseases, viz.,— Details of treated. ague 234, or about 37 per cent. of the total; rheumatic affections 77, pulmonary diseases 54, diseases of the skin 38, diarrhœa 33, dysentery 24, diseases of the eye 27, injuries 53, debility 16. Of the total treated, 610 were discharged to duty. The cases of ague were not of a severe type, and proved readily amenable to full doses of quinine or cinchonidine. Bronchial catarrh was a frequent accompaniment, more rarely hepatic or splenic engorgement. Only one instance of remittent fever came under observation, and it terminated favourably. Rheumatic affections were chronic in character, and occurred in men of long service, especially those who considered themselves entitled to pension. Of diseases of the respiratory system, chronic bronchitis had its usual high complement. There were eleven cases of pneumonia; most were of an adynamic character, and two proved fatal. Under the head of injuries, most of the cases were abrasions of the lower extremities from ill-fitting shoes, and the remainder contusions and sprains of little moment. There were, however, two severe gunshot wounds. The first was suicidal, and immediately fatal; the other accidental, and resulted in the loss of a finger. Malignant cholera gave four admissions, with one death. The cases of small-pox were all modified by previous successful vaccination, and were uncomplicated throughout. Venereal disease was uncommon: gonorrhœa gave seven admissions, primary and secondary syphilis one each, soft chancre with suppurating bubo one.

11. Amongst the treated six deaths occurred. Out of hospital there were also six deaths—two from chronic diarrhœa; one case was on sick certificate, the other on detachment duty at Sadra; and one each from valvular disease of the heart, debility, and suicidal gunshot wound, and hepatic disease. Mental distress accounted for the suicide. The man shot himself in the abdomen with his rifle. Mortality and its causes.

12. Cholera appears to be almost endemic at this station, as it is an annual visitant, and its introduction from without can seldom be proved. It was prevalent at Baroda in the month of October, when the wing of the 22nd N. I. removed to Ahmedabad from that station, and a case occurred on the march to Sadra among the men of the detachment, a few days after the arrival from Baroda. On the 27th October another man of the same company was attacked with the disease, in camp. On the 30th there was a case among the Grenadiers, another followed on the 5th, and a third on the 12th November. All three did well. Two women succumbed to the malady a week later. After a considerable interval, and when it was thought the epidemic had died out, the last case was admitted. The man had been ill some time in the lines with Epidemics.

vomiting and purging, and on arrival at hospital was almost moribund. Death resulted in a few hours. The huts which had contained cholera cases were thoroughly disinfected, and, along with those immediately adjoining, vacated for the time. As there was plenty of spare accommodation in the lines, and no evidence of a localized infected area, it was not thought necessary to move any part of the regiment under canvas. No fresh outbreak occurred in the families removed. There were six cases of modified small-pox of a very mild character, five between 26th January and 16th April, and one in December; all had been previously vaccinated with success. The probable source of infection was a neighbouring village where the disease was present for the greater part of the year. All precautions were taken to prevent its spread.

13. Vaccination was performed 34 times, and the quality of the lymph was good. There were 84 primary and 118 re-vaccinations; 78 of the former and 86 of the latter were successful.

14. Forty-nine men were returned unfit by the annual Invaliding Committee, and a case of gunshot wound of the hand was invalided subsequently. The causes were as follows:—for chronic bronchitis 17, rheumatism 13, old age and debility 14, varicose veins 3, and for eczema, mental incapacity, and injury 1 each.

15. Some of these were embodied in last report, and I need only repeat them. The floors of the huts should be raised and paved, and suitable provision made for ventilation. The loss in cubic capacity would be trifling, and a purer atmosphere in the interior secured. Damp and malaria would also be avoided. The channels in the several streets for surface water require deepening in many places, as the slope of the ground is but slight. I would recommend, for reasons already stated, that the line and hospital latrines have their floors made impermeable, and that no water be allowed to stagnate in their vicinity, rendering the soil soaked and filthy. A contagious ward is very much needed, and a bathroom for the patients would be an acquisition in the matter of comfort and cleanliness.

*Inspection by Deputy Surgeon-General WYLLIE.*

Health was much better than in the two previous years, the improvement chiefly due to decrease in malarious fevers. Hospital good and sufficient, with complete out-buildings, except that there is no contagious ward. Tents have hitherto been used to meet this want, which should be supplied, and as both native hospitals are in the same enclosure one building of two rooms would be adequate. I agree with the medical officer that the floors of the latrines should be paved. Lines—clean and in good order; sewage from family quarters is now led by pipe-drains to trees recently planted; but they are nearer to the huts than is desirable, and the open surface drain would be better.

**H. M.'s 9th Regiment N. I.**

BARODA.—In medical charge of Surgeon H. P. ROBERTS, M.D.

Average Strength .....	711·7	Deaths in Hospital .....	13
Do. Present .....	671·3	Do. out of do. ....	5
Admissions .....	478	Invalided .....	27
Daily Sick.....	15·2	Sick Leave .....	12

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Ahmedabad .....	60·7	2·3	0·3
1875 .....	Baroda .....	74·2	2·6	1·6
1876 .....	Do. ....	68·2	1·8	0·9
	Average...	67·7	2·2	0·9
1877 .....	Baroda .....	71·2	2·2	1·9

The 9th Regiment remained during the year in Baroda until the 29th November, when they proceeded by rail to Bombay, relieving the 20th Regiment.

Location and movements.

2. The lines\* are situated between the Crawford Market and the Carnac Bunder, about ten minutes' walk from the hospital. The vicinity is thickly populated on the north side, but on the south there are principally sheds and buildings connected with the G. I. P. Railway.

The Lines and their surroundings : present condition, hygienic and otherwise.

On the east is the Carnac Bunder, on the west the Crawford Market. The lines have recently been undergoing a revision as to drainage, and the work is now approaching completion.

3. The latrines are situated in the north-east corner. They are surrounded by a high brick wall which is fenced off by wooden palings about two feet from it, and the latrines themselves are made of iron with iron

Conservancy.

divisions and roofs. The refuse is removed daily by the conservancy carts. The latrines are too few, the men state, for the number of inhabitants of the lines, which with the addition of the detachment 4th Rifles cannot be well under 2,000 men, women, and children.

4. The men obtain water from four iron tanks which are supplied by Vehar water. The water can be drawn off by numerous taps fixed in these tanks.

Water supply.

5. Food is abundant but somewhat dear. During the months of June, July, and August grain was at an extremely high price in Baroda, but then the men received the usual compensation.

Food.

6. The duties in Baroda were light, and the additional work here has only been for so short a time that it is not possible to express any opinion.

Duties, &c.

Hospital.

7. This has been described and reported upon at pages 2 and 3, Army Medical Report for 1876.

8. The health of the men, and their physique, is very fair. Within the last two years upwards of 70 of the oldest and most worn-out men have been invalided, and the recruits are a very fine body of men.

General health and physique.

Influence of climate or local circumstances on health.

9. The health of the regiment was certainly not improving in Baroda, and the change to Bombay is a beneficial one.

10. The principal causes of sickness were 177 admissions from ague, 28 from rheumatism, diseases of the lungs 36, dysentery 22, small-pox 4, diarrhoea 11, and from cholera 13. Many re-admissions are

Details of treated.

included in the first three figures ; the remaining causes, such as eye affections, dyspepsia, itch, &c., gave few admissions, whilst shoe-bites furnished the usual proportion.

11. Two deaths occurred from ague with complications, one from sunstroke, one from pulmonary phthisis, one from hepatitis, and eight from cholera, giving a total of 13.

Mortality and its causes.

12. An epidemic of cholera occurred in Baroda, commencing in October and terminating in November. The first case occurred on the 2nd October, the next on the 9th, another on the 12th, and after

Epidemics.

that it became more general. Not much evidence could be obtained as to the cause of this outbreak. The man admitted on the 2nd October, and who subsequently died, had been to Baroda city two days previously, and had cooked and eaten his food near a tank in the city. But there was no cholera in Baroda at that time, nor did any cases occur for three weeks at least after that. About a month before this case occurred there had been three suspicious deaths in the bazaar, which were returned as cholera; but the number was limited to these. The second case was admitted on the 9th. The history given by the man and his friend was this:—that he had left the lines in the morning, and gone to a village some three miles from Baroda, where he had purchased some fowls. On his return, he with another friend had their food together, as usual. About 11 o'clock in the afternoon he was seized with cholera. There was no report or evidence of cholera at this village. The first case was a Mussulman; this one a Purwaree; and they lived in lines quite apart. On the 12th the woman who had cooked for him was admitted, and died on the 13th. The only cholera known to exist within any distance of Baroda was in Dakoor. Here a recruit-

\* A description of the lines and hospital occupied by the regiment when at Baroda will be found in the report of the 20th N. I., at page 2.

ing party had been, or some men had been there on leave; it was known, at any rate, that within three or four weeks of the outbreak sepoy had arrived from Dakoor. The only other supposition which could be made had very slender grounds for support: it was that the men, under the expected orders to march shortly to Bombay, had been turning out all their old kit and household goods, which consisted (as was seen when the families moved, and who suffered most) of the most dirty, foul-smelling collection of all sorts of rags that could well be brought together. As there had been an epidemic in 1875, it was possible that some cholera germs lying hidden in those rags became developed and diffused on their exposure to the air.

The regiment moved out under canvas on the 13th October, to as good a site as could be chosen at the time of the year, when all crops were standing high. The direction was then to east of camp. The season was termed the north-east monsoon, but the wind veered daily 16 points. In a few days several cases occurred amongst the women and children, but only one sepoy was admitted between this and the 20th. The families belonging to the right half-battalion were separated, and removed from where they had ensconced themselves, near a hedge and beneath some trees, to a more airy spot, and here they remained free for seven days. The families of the left half-battalion were then attacked, and these too were removed to a distance; finally the regiment itself marched to a spot some three and a half miles from the first camp, and to the westward of Baroda. Here they were only encamped one day, as complaints were made that the tents were in too close proximity to the road where H. H. the Gaekwar took his evening drive. The regiment then moved about two miles to northwards, and here the admissions decidedly increased and deaths occurred rapidly. On the next day but one the regiment again moved one mile to the eastward, where the epidemic eventually disappeared.

In the mean while, after a lapse of seven days, cholera broke out in the families of the right half-battalion, whilst it still continued in the left, so that both wings were moved to a spot about two miles to the north-east. There was great difficulty in selecting grounds for encamping: either the crops were high, or the ground was low, with marshy strips here and there, or there was no water supply near at hand. Cases still continuing to be admitted, the families were again moved about three miles to the northwards, when the outbreak ceased.

The total number of attacked was 45 men, women, children, and followers. The deaths were 8 sepoy, 9 women, 5 children, and 2 followers. In one family, that of the havildar Ram Sawant, three children were attacked, with the interval of a week between each attack, but nothing special could be traced as to cooking-pots or the grain used by them. Of the two followers, one was a dhooly-bearer, and the other a sweeper. These five cases point to contagion; but, taking the remaining cases as a whole, the men and others attacked were not by any means crowded together, or, indeed, in any close proximity. The attacks were sprinkled generally over the camp in an arbitrary manner. The caste which suffered most, as might be reasonably expected, was the Purwaree. The treatment was various—morpheus subcutaneously to relieve cramps; chlorodyne, hydrate of chloral, inhalation of nitrate of amyl, with digitalis internally, &c. No cases amongst the men recovered until this epidemic was on the decline; the cases were mild from the first amongst the women and children.

13. Eighty-nine children have been vaccinated during the year; with the exception of ten infants all the children of the regiment are protected. On the appearance of small-pox on the 1st December the regiment was paraded and each man examined. Forty-nine showed no scars of vaccination, so they were vaccinated immediately at the nearest chowkey. All these operations were returned as successful.

14. Twenty-seven men were invalided for the following causes:—general debility 13, rheumatism 6, lung affections 4, and one each from dysentery, diarrhoea, disease of the spleen, and strabismus.

*Inspection by Deputy Surgeon-General MOORE.*

H. M.'s 9th Regiment N. I. arrived in Bombay from Baroda on the 29th of November, and occupies the lines and hospital formerly in the possession of the 20th N. I. The annual inspection was made on the 28th of December, in company with the commanding officer, the adjutant, and surgeon, but the lines have been frequently visited, and the hospital weekly seen when tenanted by the 20th Regiment. The lines are, as often mentioned, in a bad position, and during and after the rains, owing to obstruction to the drainage, the locality is very

damp and in a foul condition—so much so that the commanding officer desired to move the men into tents. Much improvement has, however, recently been effected in the way of drainage, and a recurrence of the condition prevailing in the autumn can scarcely take place. The medical officer notices that the latrines are too few, and this is undoubtedly correct. In the morning, both from the regimental latrines and from the neighbouring conservancy work, the characteristic foecal odour is often strongly apparent. The men's houses are, however, tolerably good; they have a sufficient supply of Vehar water from tanks raised on a stone plinth, conveniently situated; and the neighbouring Crawford Market affords ample opportunity of procuring cheap, wholesome, and varied food.

The hospital is situated too far from the lines, and its vicinity to Sonapore and to the Scotch burial-ground is unfortunate. It has, however, a sea front, and although some of the out-buildings are badly placed, resulting from confined space, it has been healthy, the number of sick being ordinarily few. The hospital and its stores and medicines are in good order, and the establishment is reported upon satisfactorily.

The health of the regiment, which suffered from an epidemic of cholera previous to removal from Baroda, appears to have improved since arrival in Bombay.

### H. M.'s 22nd Regiment N. I.

BARODA.—In medical charge of Surgeon-Major H. A. LEWIS.

Average Strength .....	712·8	Deaths in Hospital .....	15
Do. Present .....	645·6	Do. out of do. ....	...
Admissions .....	794	Invalided .....	58
Daily Sick .....	36·3	Sick Leave .....	28

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Baroda .....	181·2	5·2	0·8
1875 .....	Do. ....	117·6	4·0	1·3
1876 .....	Do. ....	97·9	3·4	.....
	Average...	132·2	4·2	0·7
1877 .....	Baroda .....	122·9	5·6	2·3

The regiment was located in Baroda until the 19th September, when the right half-battalion moved by rail to Ahmedabad, and were joined on the 14th December by the left half-battalion.

Location and movements.

2. The situation of the lines\* has already been described. The mud floor of the huts is on a lower level than the ground; all the huts are white-washed inside and mud-washed outside. The bathing-place in each family-quarter is in one corner of the verandah, with an open drain which conveys the refuse water to a nullah about ten feet in front of each hut. The streets are kept clean and in good order, and the whole lines are well shaded by large trees.

3. The conservancy of the lines is carried out by the regimental sweepers. There are two pukka-built latrines for the use of the men and women, but these are used only during the monsoon months. At present the trench system is followed.

Conservancy.

\* The description of the lines and hospital refers to those now occupied by the regiment at Ahmedabad.



4. The water supply is obtained from numerous wells near the lines. These wells are free from any source of contamination. The water contains a quantity of chlorides, but its quality is, in the majority of the wells, considered wholesome. During the hot season some of the wells run dry.
- Water supply.
5. The food consists of meat of fair quality, fish, and ordinary country vegetables and fruits.
- Food.
6. Parades, guard-mounting, picquet duty. They do not exert any bad effects on health. Average number of nights in bed—6. There is a regimental *talimkhana*, which is used by the men and recruits.
- Duties, exercise, and amusements: their effects on health.
7. The regimental hospital stands in a shady spacious compound to the south of the lines, and some five hundred yards distant from them. It has two wards, having accommodation for thirty sick, with good ventilation. There is a verandah on each side of the building.
- Hospital and its immediate surroundings.
8. The general health and physique of the men during the past year has not been satisfactory. It is evident that the climate of Guzerat is telling on their constitution. There has been more sickness than in previous years.
- General health and physique.
9. I am only able to state that soon after the arrival of the wing at Ahmedabad the rainfall had great influence in causing fever of a malarious type amongst the men, and the cold winds brought on complications, such as pneumonia, bronchitis, &c.
- Influence of climate or local circumstances on health.
10. The total treated during the year numbered 814. The prevailing causes of sickness were—malarious fevers 253 cases, rheumatism 71, eye and lung diseases 154 and 58 respectively, and dysentery and diarrhoea 36.
- Details of treated.
11. There were fifteen deaths—seven from cholera, two each from pneumonia and remittent fever, and one each from hepatitis, diarrhoea, small-pox, and epilepsy.
- Mortality and its causes.
12. Cholera broke out in the regimental lines on the 27th October. The last case admitted was on the 1st December. There were altogether sixteen admissions, with seven deaths. The disease was throughout of a virulent character, and the origin of the outbreak is difficult to determine. There were fifteen cases of small-pox, with one death—the only confluent case.
- Epidemics.
13. There were sixty-six children successfully vaccinated during the past year, and forty-nine men were re-vaccinated.
- Vaccination and re-vaccination.
14. Fifty-eight men were invalided, for the following causes:—Fever two, rheumatic affections twelve, eye diseases two, lung diseases six, ulcer one, old age and debility thirty-five.
- Invaliding and its causes.
15. The requirements are a female ward, and a ward for the treatment of special diseases.
- Requirements and recommendations.

*Note on the outbreak of Cholera in the Detachment at Sadra, in charge of  
Apothecary A. S. DESOUZA.*

A man of the detachment 22nd Regiment N. I. was attacked with symptoms of cholera at a place called Paratia, midway between Ahmedabad and Sadra, and was brought into this station on the morning of the 16th October 1877, and the detachment itself marched in an hour and a half after. On the morning of the 18th idem a woman was attacked. Both the man and woman, I learnt from inquiries, had been suffering for some days previously from diarrhoea. On the 22nd idem the detachment was moved into camp, and between the 18th and 22nd there were four more attacked. On the night of the 22nd a woman was attacked in camp, and no other case occurred until the night of the 31st idem; diarrhoea, however, continued more or less, and did not disappear until the detachment was again moved to a fresh encamping-ground, this place being higher and dryer than the first spot.

After the detachment had been at the fresh camp but a few days, both diarrhoea and ague cases became less frequent, and finally disappeared a fortnight later. The first case of cholera among the civil population occurred on the morning of the 18th October, or two days after the arrival of the detachment in the village of Sadra, the house in which it occurred being nearly half a mile from the lines and south of it; the direction of the wind was

then, and had been for two or three days previously, south-east. The detachment had, however, marched in from that direction. A day after, another case occurred in the same house; and then cholera began to spread in a south-easterly direction for about a week, being entirely confined to the village, the wind being all this while north-east; then it followed a north-easterly course, though still prevailing in the first direction; and by the end of October cholera had travelled again near the lines through the bazaar, the direction being west. It seemed at times to travel with, and at times against, the wind. Before the arrival of the detachment it appears, from inquiries made by the Political Agent, Mahi Kanta, that not a single case of cholera had occurred, nor was there any unusual prevalence of diarrhœa or fever in either the bazaar or village of Sadra.

Inspection by Deputy Surgeon-General WYLLIE.

This corps, previously stationed at Baroda, arrived at Ahmedabad, the right wing on the 19th September, and the left on the 14th of December. Health less satisfactory than in previous year, and the admissions have advanced from 97·90 to 124·83, chiefly from increase in ague and malarious conjunctivitis—most probably in connection with prolonged stay in Guzerat; for I realize that many of the men are of impaired physique. Cholera appeared in the regimental lines at the end of October, and lingered till the beginning of December, four deaths resulting; and thus the mortality was nearly double its usual average.

The hospital accommodation is ordinarily sufficient, but latterly it has been crowded. The building is now partially unroofed, for repair. The lines are in fair order, and clean throughout, with ample provision for hut ventilation.

**No. 1 Mountain Battery.**

RAJKOT.—In medical charge of Surgeon J. PARKER; Strength 117.

This battery has been stationed in Rajkot during the year. Eighteen gunners and two naiks were transferred to No. 2 Mountain Battery at Jacobabad in the month of February.

2. The lines, built on the standard plan, are well situated, clean, well ventilated, roomy, and in good repair. The drainage is all surface; bathing-water from the huts passes to the base of trees planted recently in front of the houses.
 

Lines and their surroundings: present condition, hygienic and otherwise.
3. The native officers are provided with latrines in their own huts, on the dry earth system. Situated about 140 yards to the east of the lines are two pukka-built latrines, one for the use of gunners and drivers, the other is used by the women and children of the battery.
 

Conservancy.
4. This is from wells, of which there are two; there is a fair amount of water in them now, but that will rapidly fail as the hot season approaches. The mules are watered at a river which runs about half a mile from the lines.
 

Water supply.
5. Food has been expensive, but of good quality. Vegetables were both dear and scarce. The uniform worn by the battery has been altered; that now in use is similar to the one worn by the Punjab batteries, and has been found very comfortable.
 

Food, &c.
6. The gunners have erected a *talimkhana* in the lines, where they go through different calisthenic and other amusements.
 

Duties, exercise, and amusements: their effects on health.
7. The hospital, which is a good roomy building, well situated, ventilated, clean, and in good repair, also accommodates the sick of the right wing of H. M.'s 7th Regiment N. I., and 3rd Squadron 2nd Regiment L. C. The latrines are situated north-west of the hospital, and in close proximity to a well used by the patients; its site has been condemned, and another selected.
 

Hospital and its immediate surroundings: present condition, hygienic and otherwise.

8. The general health has been good for the past year. The total number treated was 75, as against 84 for the previous year, and of these 25 were re-admissions. In physique they are a fine, muscular lot of men.
 

General health and physique.

9. The chief causes of admission into hospital were ague, chronic rheumatism, diseases of the respiratory system, and affections of the liver.  
 Details of treated.

Mortality and its causes. 10. One death occurred in hospital from remittent fever, in August.

Vaccination and re-vaccination. 11. Twenty-five children were vaccinated (primary); sixteen of the operations were successful. Twenty-nine re-vaccinations took place, twenty-one being successful.

Invaliding and its causes. 12. One gunner and one trumpeter passed the annual Invaliding Committee at Ahmedabad for chronic rheumatism with sciatica, and general debility, respectively.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 19th February: health good throughout, and only one casualty in past year. Lines on standard plan, clean, properly ventilated, and roomy, with adequate arrangements for the disposal of sewage. The sick have suitable and sufficient room in the hospital wing 7th Regiment, the least satisfactory feature of which is the floor (here of earth, as at Deesa and Bhuj), involving much trouble to keep it tidy. Asphalt should be substituted, for reasons of cleanliness, comfort, and economy.

**H. M.'s 7th Regiment N. I.**

RAJKOT.—In medical charge of Surgeon R. H. BATTY.

Average Strength.....	354	Deaths in Hospital .....	2
Do. Present .....	306	Do. out of do. ....	5
Admissions .....	212	Invalided .....	15
Daily Sick .....	8·9	Sick Leave .....	7

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Rajkot .....	128·7	3·1	10·6
1875.....	Do. ....	121·7	2·9	1·2
1876.....	Do. ....	183·2	5·7	0·5
	Average.....	144·5	3·9	4·1
1877.....	Rajkot .....	69·2	2·9	0·6

The head-quarter wing H. M.'s 7th Regiment N. I. has been at Rajkot for the past five years.  
 Location and movements.

2. The permanent condition of the lines has been fully detailed in former reports. The huts are smaller than those laid down in the standard plan, and in number sufficient to accommodate only two companies. The Lines and their surroundings: present condition, hygienic and otherwise. The wing, not counting the men on furlough, recruiting duty, or in hospital, may be said to consist of three and a half companies. One complete company is located in the 28th Regimental lines, while the remaining two and a half occupy their own lines, thus exceeding the complement for which they were built by half a company, or forty men. The excess occupy bachelors' quarters, each hut containing two instead of one. The huts are in good repair, and the ground around them is kept clean and in excellent order.

3. There are two latrines, 563 yards to the left front of the lines—one for males, and the other for women. Each seat is furnished with an oblong iron pan, which is emptied thrice a day, after having  
 Conservancy.

been well covered over with dry earth, into iron receptacles. The latter are conveyed by carts to some distance from camp, and their contents buried in pits. The rubbish, collected twice daily from the lines, is also emptied into the pits dug for the reception of the latrine accumulations. The bathing-places are situated in the verandahs of the huts. The bath-water is allowed to flow from the vicinity of the huts through kutchu-built surface drains.

4. Drinking water is obtained chiefly from the well situated about three hundred yards to the north of the lines. This supply is ample; every man is allowed to draw as much as he requires. The high brick surrounding wall, and the absence of drains from the immediate vicinity of the well, account in great part for the excellent quality of the water.

Water supply.

5. The duties consist chiefly of parade and guard duty. Under the head of exercise are included morning and evening parades, running drill during the cold season, wrestling, and sword exercise. Music and singing are the principal amusements. The duties are by no means injurious to the health of the men.

Duties, exercise, and amusements: their effects on health.

6. The hospital is a large well-ventilated building. The latrine is in close proximity to the well which supplies the hospital and several of the officers at camp with drinking water. The condition of the earth in and around the latrine is bad, and may prove injurious hereafter. The soil is thoroughly saturated with bowel and kidney excretions, and, unless precautionary measures are adopted to prevent contamination of the hospital well water, specific bowel complaints may result.

Hospital and its immediate surroundings: present condition, hygienic and otherwise.

7. The health of the corps for the past year contrasts most favourably with that of the previous one; this is due in a great measure to the withdrawal of the detachment from the unhealthy outpost, Burda Chowkey. There was a decrease of 154 in the number treated during the past year as compared with that of the previous one, the average strength of the corps being almost the same during the two years. The physique of the men is about the average.

General health and physique.

8. I doubt whether the climate of Rajkot has, to any extent, been prejudicial to the health of the men. Under the head of 'local circumstances' I think I might venture the opinion that the want of good substantial food, such as good fresh vegetables, a variety of new grain, fair mutton, fish, &c., for a continuous period of five years, has helped greatly to affect the general health and physique of the men.

Influence of climate or local circumstances on health.

9. During the year 1876, with an average strength of 280, the total number treated was 384; while during the past year, with an average strength of 306, the total number treated was only 230. Ague in both years was the prevailing disease; the number treated from this cause during 1876 exceeded that of the past year by 75 cases. Scurvy only gave eight treated, of whom four remained from the previous year.

Details of treatment.

10. Two deaths occurred during the year, one from debility, the other from pneumonia.

Mortality and its causes.

11. There was no epidemic disease.

Epidemics.

12. Vaccination and re-vaccination have been carried on assiduously; 32 primary and 30 successful re-vaccinations took place. The lymph was good.

Vaccination and re-vaccination.

13. Fifteen men passed the annual Invaliding Committee at Ahmedabad, principally for general debility, chronic rheumatism, and impaired vision.

Invaliding and its causes.

14. There is no place of residence attached to the hospital for the native medical pupil.

Requirements and recommendations.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 19th February. There was much less sickness than in the previous year, and, as in the case of the 28th Regiment, the improvement dates from the abandonment of the unhealthy and malarious outpost of Burda Chowkey, and is largely shown in the decrease under ague and scurvy, as well as in cases of debility—the outcome of both. Hospital in fair repair, and has sufficient room to accommodate the native sick of other arms. Lines

clean and very tidy. Permanent latrines, common to artillery and cavalry, in use throughout, owing to rocky ground; but in the case of the wing they are much out of the way, being at the very inconvenient distance of 563 yards from the lines.

The objectionable proximity (75 feet) of the hospital latrine to the well—one of the best at the station—has long been complained of, and frequently represented. There is now, however, some promise of remedy, as a committee has recently selected a site for a new latrine. I have accordingly directed application for plan and estimate, in view to the amount being included in next budget for station works.

**H. M.'s 28th Regiment N. I.**

RAJKOT.—In medical charge of Surgeon J. PARKER, M.D.

Average Strength.....	702·5	Deaths in Hospital .....	4
Do. Present.....	622·6	Do. out of do. ....	1
Admissions .....	377	Invalided .....	25
Daily Sick .....	15	Sick Leave .....	13

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Rajkot .....	176·9	4·6	0·8
1875.....	Do. ....	130·3	3·6	2·2
1876.....	Do. ....	110·5	3·8	2·1
	Average...	139·2	4·0	1·7
1877.....	Rajkot .....	60·5	2·4	0·6

The head-quarters have been at Rajkot for the period under review. A detachment eighty-nine strong was sent to Dwarka in the month of February to relieve that of the previous year, and has remained there since. Two escort parties were furnished during the year, viz., one to Wudwan in August, strength 43, under a Jemedar, to accompany the Political Agent to Rajkot; the other to Joonagar in November, strength 89, under a European officer, to meet His Excellency the Governor.

2. The general description of the lines has been given in previous annual reports. A slight improvement has been made in the drainage system, viz., the channels which convey bathing-water from the houses have been tiled in such a manner as to afford a complete covered passage for the water, which is ultimately carried to the trees in the lines. The earth around the trees is dug up from time to time, and care is taken that obnoxious matter does not accumulate in the passages. The lines are sufficiently commodious, well ventilated, and clean. The huts are in good repair. There is no regimental bazaar; articles are procured from the bazaar of the 7th Regiment N. I., and cantonment.

3. The dry-earth system is in use in the native officers' lines, the excrementitious matter being removed twice a day. Trench latrines situated south-east of the lines are used by the sepoys during the hot season, their place being taken by pukka-built latrines to the south-west of the lines during the monsoon.

4. The water supply is obtained from wells. I submitted a report on this subject, in December last, pointing out the fact that the water failed considerably in quantity during the hot season. The depth of water in each well (Government) was ascertained on 27th September, and again on 14th November, 1877, the result demonstrating a marked falling off of the supply. In the report alluded to, I have recommended deepening and general enlargement of the wells, with a view of striking a spring.

5. Suitable compensation is allotted to each fighting man when the price of grain exceeds a certain fixed rate. The want of fresh vegetables is still felt, these being both scarce and expensive.

## Food.

6. I have in some cases traced the origin of acute bronchial and pulmonic lesions to exposure while on night duty during the cold weather. I at once recommended the adoption of greatcoats as an article of wearing apparel on such occasions, with good results. "Kneeling drill" in the case of recruits just joined from the Deccan has given rise to vague lesions of the knee-joint; out of a batch of sixteen, five were admitted into hospital soon after this drill began,—the right knee in each case was swollen more or less from general infiltration of its surrounding cellular tissue: this condition was very persistent, requiring in four cases leave to their native country for change of air. A *talimkhana* exists in the lines; the sepoy collect there occasionally, and go through different calisthenic and other exercises.

7. The hospital is a good one, well situated, fully ventilated, clean, and in good repair. Duties, exercise, and amusements: their effects on health. Accommodation for the hospital establishment is defective, and would be found more so if the sanctioned subordinate staff was present.

8. A great improvement has taken place in the health of this corps for the past year, as compared with that of the previous one. In 1876 the admissions were 677, while for the year under report they were 377. General health and physique. The abolition of the Burda Chowkey outpost may reasonably be taken as chiefly instrumental to this improved condition. In physique they are a fine body of men, with the exception of a few old sepoys, who will probably be invalided this year.

9. Under this heading I wish to draw special attention to the prevalence of scurvy; it appears to be rooted in the corps, and is an almost constant complication of disease. The scarcity and dearness of vegetables, as before alluded to, would account for it. But I hope when the evil effects of the Burda Chowkey climate have been thoroughly eradicated from the sepoys' constitutions we may see a marked diminution in the number of admissions from scorbutic lesions. Influence of climate or local circumstances on health.

10. The following table contrasts the causes of admissions into hospital for 1876 and 1877; the chief diseases are noted:—

Details of treated.

	1876.	1877.
Febricula.....	17	32
Ague.....	215	74
Chronic rheumatism.....	64	19
Soft chancre.....	6	1
Scurvy.....	34	5
Bronchitis.....	36	6
Asthma.....	7	7
Pneumonia.....	6	4
Dysentery.....	39	15
Diarrhœa.....	11	5
Colic.....	22	6
Guinea-worm.....	2	5

Mortality. 11. Four deaths took place in hospital and one on sick leave.

Epidemics. 12. None appeared.

13. Forty-five primary vaccinations were performed, and 85 re-vaccinations. The subject has received strict attention during the year. Vaccination and re-vaccination.

14. There were twenty-three men invalided from the following causes:—chronic rheumatism, and diseases of the eye, two each; dyspepsia and right inguinal hernia, one each; and general debility seventeen. Invaliding and its causes. The general cause of debility was old age, with perhaps a rheumatic taint, combined in some cases with scurvy. Two men were discharged from the service as unfit, viz., one, a sepoy of six years' service, on account of epilepsy, the other a recruit who had sustained a severe sprain of his knee-joint.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected February 20th. The sanitary state of this corps has undergone great improvement since the date of last report, the ratio of treated to strength having declined from 103·74 in 1876 to 56·26 in the past year. Health was thus particularly good, and only surpassed in the wing of the 24th Regiment at Agar; while mortality was also exceptionally low. This favourable change has been in progress since the withdrawal of the detachment, in November 1876, from the sickly outpost at Burda Chowkey, and is chiefly shown under the heads of ague, scurvy, rheumatism, and bowel complaints, due notably to the gradual disappearance of the scorbutic taint with which much of the previous excess of such cases was connected.

Hospital suitable, with ample room, but deficient in out-offices: arrangements all properly ordered, and duties carefully conducted. Lines excellent, huts roomy and well ventilated, and conservancy efficient, trench latrines being in use during the fair season.

**H. M.'s 11th Regiment N. I.**

BHUI.—In medical charge of Surgeon-Major P. W. COCKELL.

Average Strength .....	750·1	Deaths in Hospital .....	5
Do. Present.....	684·1	Do. out of do. ....	4
Admissions .....	738	Invalided .....	25
Daily Sick.....	29·7	Sick Leave .....	11

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Bhuj .....	55·1	2·1	0·7
1875 .....	Do. ....	46·8	2·4	0·5
1876 .....	Do. ....	71·5	2·8	0·2
	Average..	57·8	2·4	0·5
1877 .....	Bhuj .....	108·0	4·3	0·7

The regiment has been stationed at Bhuj since 1874. No movement has taken place of either the regiment or detachments.

The Lines and their surroundings: present condition, hygienic and otherwise.

2. The lines are very old, the houses very low, and the cubic space somewhat deficient.

3. The conservancy is on the trench system; the trenches are filled in every evening with earth. The men very much object to the use of these, and often go to other places, to avoid them. Pucka latrines are built but not used, as there are not sufficient conservancy carts to carry away their contents, there being only one cart allowed for the whole cantonment.

4. There are three or four sweet water wells which supply the regiment, and five or six with brackish water. The sweet water is of good quality, and the wells hardly ever dry.

5. Bhuj is very badly off for vegetables, there being little cultivated land in the immediate neighbourhood; consequently the sepoys seldom get more than a little bajee or Indian spinage now and then in the bazaar. Nohl-kohl and cabbages thrive in well watered gardens, but they are not obtainable by the sepoys, being too costly.

- Duties, exercise, and amusements : their effects on health.
6. The duties consist of parades and guards, musketry in the season, and occasional escort duty to Ahmedabad or Mandvie. Amusements are chiefly shooting.
7. The hospital is one of the best in the Bombay Presidency, situate on high ground, well exposed to every good wind, but sheltered from the N.E. winds by a long range of hills. It is well ventilated by three ridge ventilators, and has two capital verandahs, each capable of accommodating sixteen beds. There is a store, bathing, and spare room for special cases, lately made under the southern verandah, and a capital dispensary and surgery in the northern verandah. The hospital is at present in very good repair.
- Hospital and its surroundings : present condition, hygienic or otherwise.
8. The general health and physique of the men has considerably deteriorated from the date of arrival of the regiment from Satara, four years ago. The men have lost flesh and spirits. They are very liable to have scurvy, and unable to undergo any prolonged or great exertion. The death rate is about 13·15 per thousand per year, and the invaliding about 36·54. The chief disease is intermittent fever, which certainly weakens the men a good deal.
- General health and physique.
9. The climate of Bhuj is a trying one in the summer months ; fearful dust-storms come from the west, and, the soil being sandy, there is no vegetation or grass on it to check the storm. The redeeming feature is the cool nights, due to the sea breeze from the Gulf of Cutch. After the rains, which this year were very heavy for Cutch (15 inches), we get north-east and easterly winds from the Runn, which bring fever into camp.
- Influence of climate or local circumstances on health.
10. The chief disease here is intermittent fever, from which cause alone there were 297 cases treated in hospital last year ; of scurvy there were 10 cases, bronchitis 29, muscular rheumatism and lumbago 34, primary syphilis 10, and chronic rheumatism 8. Of bronchial catarrh there were 44, of gonorrhœa 8, and bubo 7 cases ; and of contusions 87 cases, which with other diseases make a total of 764 cases treated.
- Details of treated.
11. There were 9 deaths, 5 in hospital and 4 out of hospital ; of the 5 who died in hospital two died of remittent, and one of continued fever, one from hæmoptysis, and one from having eaten a large quantity of crude opium. Of the 4 who died out of hospital two were unfits sent to be invalided at Bombay—one of these dying from disease of the lungs, the other from old age ; one was found drowned in a pool of water in the nullah at Bhuj ; and the fourth died at Bombay (disease unknown).
- Mortality and its causes.
- Epidemics.
12. There have been no epidemics.
13. There were 94 primary vaccinations and 7 re-vaccinations. Those re-vaccinated were the wives of men returning from furlough. The 91 vaccinations were all children, with the exception of 7 recruits. Only one case of small-pox occurred, and on him the marks of previous vaccination were very obscure. He made a good recovery.
- Vaccination and re-vaccination.
14. There were 25 men invalided—9 from diseases of the lungs, 5 from old age and debility, 1 from rheumatic affection, 3 from scurvy, 3 from impaired vision, and one each from disease of the stomach and intestines, constantly recurring attacks of fever, leprosy, and injury to the thigh bone.
- Invaliding and its causes.
15. Under this head I should recommend that more conservancy carts be allowed to the regiment, and that the latrines be brought into use, as undoubtedly the men often use the open country (and that part of it in the neighbourhood of the lines, between the lines and the city) for purposes of nature, in preference to the trenches.
- Requirements and recommendations.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 11th February. The ratio of treated has been gradually increasing since 1875, when it stood at the exceptionally low figure of 49·48 to strength. This, while doubtless due in part to lengthened residence, is still largely accounted for by ague in connection with heavy rainfall in September, the admissions under that head having risen from 78 in the above year to 294 in the past. Nevertheless a fair average standard of health was maintained



till towards the close of the year, and at this date malarious fevers have declined to the normal level. Hospital accommodation adequate and excellent, and all its arrangements well-ordered. Lines clean, and in fair repair, but old; huts wanting, beyond all, in cubage—a defect, however, counterbalanced by the width of the streets, which is greater here than elsewhere. Trench latrines in use throughout, and all conservancy details efficient.

**H. M.'s 2nd Regiment Light Cavalry.**

DEESA.—In medical charge of Surgeon-Major A. BARRY, M.D.

Average Strength .....	496	Deaths in Hospital .....	3
Do. Present .....	459	Do. out of do. ....	1
Admissions .....	301	Invalided .....	19
Daily Sick.....	11.9	Sick Leave .....	3

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick	Deaths in Hospital.
1874.....	Deesa and Rajkote .....	11.2	3.7	1.0
1875.....	Do. do. ....	83.2	3.1	0.4
1876.....	Do. do. ....	74.8	2.4	0.4
	Average...	86.4	3.1	0.6
1877.....	Deesa and Rajkote .....	65.6	2.6	0.6

The regiment has been at Deesa throughout 1877. One squadron was stationed at Rajkote. A party of fifteen sabres were, as usual, on outpost duty with the Political Agent at Palanpur. They were relieved monthly.

2. The lines are low-lying, too near the Sadar bazaar; accommodation insufficient, and the ventilation defective. Sanitation is well attended to, and the state of repair is, on the whole, satisfactory. As there are no plinths in the huts and the cubage is ample, I have recommended that the floors should be raised one foot, and, if not too expensive, composed of chunam.

3. The Cantonment Committee having appointed a Conservancy Sergeant and two native inspectors, the streets and houses are kept clean, all decomposing matter being carefully removed. The latrines are kept very clean, and are in a good state of repair. During 1876 sullage from family quarters was collected in chatties outside the huts, and removed daily; but in March 1877, in compliance with an order from the Quarter Master General's Department, all bathing and house refuse water and urine have been conveyed out of the enclosures into a plot of ground planted with young trees, in front of the men's houses.

Water supply. 4. Supply ample, quality excellent.

5. The great diminution of rainfall has caused considerable distress among the inhabitants of Deesa. Cereals have for the past two months been double the usual price. The only alteration in the clothing since last year is the discarding of the old forage cap for a conical red one, around which is wound a very long blue pugree edged with gray, leaving only the point of the cap visible. This is a great improvement, being an excellent protection against sword-cuts, cold, and the sun's rays.

6. Duties light, but the men have considerable work in cleaning horses and accoutrements. Their chief exercises and amusements are tent-pegging, tilting at the ring, tug of war, single-stick, and wrestling, all having a beneficial effect.

Duties, exercise, and amusements: their effects on health.

Hospital and its immediate surroundings : present condition, hygienic and otherwise.

7. Hospital excellent in every way. Surroundings very favourable, and its present condition leaves nothing to be desired.

8. General health and physique. chest circumference over the nipple line at rest.

Physique rather above the average. Great attention is paid to selecting able-bodied recruits with good chest capacity, no man being passed who is less than 32 inches

Influence of climate or local circumstances on health.

9. Although the rainfall was less than half the average, malarial disease gave six more admissions than in 1876.

10. Including the figures of the squadron at Rajkote, the chief causes of inefficiency were, as usual, contusions and ague, the former amounting to 70, the latter to 69 cases. There was only one case of remittent fever. The following are the remaining cases, in the order of frequency, viz., rheumatism 24, colic 14, conjunctivitis 12, dysentery 14 (all mild), bronchitis 7, and sprains 5.

Details of treated.

11. Only one death occurred at head-quarters, from diarrhoea, and two at Rajkote, from Mortality and its causes.

dysentery and enlargement of liver respectively.

Epidemics.

12. None in camp, but there were about twenty cases of cholera in the Guicowar lines, two miles from Deesa.

Vaccination and re-vaccination.

13. There were 41 cases of primary vaccination, all successful ; no re-vaccination.

14. There were nineteen men invalided, eighteen receiving pension, and one discharged Invaliding and its causes. blindness, gunshot wound of hand, and varicose veins.

the service with gratuity. The causes of disability were general debility, chronic rheumatism, chronic conjunctivitis, night-

*Inspection by Deputy Surgeon-General WYLLIE.*

Health up to date of inspection (November 15th) very good. Hospital adequate in every respect, with suitable supplemental buildings—unless that there are no separate contagious wards. But, as those of the infantry hospital are conveniently near, this want is not felt.

Lines in fair order; the huts, having a larger cubage than any elsewhere, would allow the floors to be raised, and add to their comfort. The removal of sullage by *puckalies* from family quarters has been discontinued, and trees planted to absorb it.

**H. M.'s 18th Regiment N. I.**

DEESA.—In medical charge of Surgeon-Major A. N. E. RIDDELL.

Average Strength.....	672·6	Deaths in Hospital .....	0
Do. Present .....	611·1	Do. out of do. ....	3
Admissions .....	389	Invalided .....	23
Daily Sick .....	11·8	Sick Leave .....	3

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Deesa .....	165·8	4·5	0·6
1875.....	Do. ....	123·5	3·6	.....
1876.....	Do. ....	81·1	2·5	0·4
	Average...	123·5	3·5	0·3
1877.....	Deesa .....	63·6	1·9	.....

The regiment has been stationed in Deesa since the end of 1873 and commenced in 1874. A detachment of 42 of all ranks arrived at headquarters from Mount Abu in the month of January.

Location and movements.

2. The lines are old, dilapidated, and past repair. The huts are not built on plinths; on the contrary, the floors are for the most part below the level of the surrounding ground. The roofs are tiled. Many of them leak, and the huts are in consequence damp during the rains. The ventilation is through the doors and roofs. The drainage of the lines and of the cantonment is surface drainage. The huts are shaded by numerous fine trees. The bazaar is about 300 yards distant, and its sanitary condition is satisfactory. New lines are much needed.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. The trench system of latrine is used. The latrines, two in number, one for each sex, are situated in the sandy bed of the river in the dry weather, and on the river bank in the wet weather. This system seems tolerably well suited to the locality. The lines are kept clean.

Conservancy.

Water supply.

4. There are six wells in the lines, and one in the hospital compound. The supply is sufficient, and quality fairly good.

5. Owing to the deficient rainfall (only 12 inches and 90 cents for the year), all articles of consumption have risen in price, and will yet become dearer. The men, as a rule, appear to me under-fed. As regards clothing, a lighter dress for the hot weather would be, as I remarked in my last annual report, of real benefit to the sepoy.

Food and clothing.

6. The ordinary garrison duties and escort parties, parades and drills, give the men abundant exercise. There is no gymnasium, but the men occasionally compete for prizes in running, jumping, &c.; neither their duties nor exercise seem to affect the health of the men prejudicially, whilst athletic amusements in moderation do good.

Duties, exercise, and amusements: their effects on health.

7. The hospital is well situated, clean, and in excellent repair. Its immediate surroundings are the subsidiary buildings for the hospital establishment and subordinate medical department, two contagious diseases wards, a dead-house, and a latrine. The latter is built of masonry, and is kept clean by the hospital sweepers, who remove the excreta into covered receptacles, which are taken away at night in the conservancy carts. There is ample accommodation in the wards, and there has been no overcrowding. Ventilation is secured through apertures in the roof and near the ground, as also through the doors and windows. The water supply, obtained from a well in the compound, is sufficient, and its quality fairly good.

Hospital and its immediate surroundings: present condition, hygienic and otherwise.

8. The general health has been very good. The physique of the men is not what I could wish; 57 recruits have joined during the year, and certainly I cannot call them fine men, nor likely to become so—average height 5 feet 6 inches.

General health and physique.

9. There were 389 admissions into hospital during the year, including 27 re-admissions, being 115 less than during the previous year. There were no deaths in hospital. Three men were allowed leave of absence on medical certificate—one for fever (since dead of bronchitis at Lucknow), one for debility, and one for iritis. There were 98 admissions from ague, being 15 more than in the previous year. The cases were for the most part slight, uncomplicated, and yielded readily to treatment. The principal diseases in order of frequency of admission were as follows:—ague 98; injuries to the lower extremities, including "shoe-bites," 59; cutaneous diseases 41; rheumatic diseases 32; intestinal diseases 24; diseases of the eye 22, principally conjunctivitis; debility 22; lung diseases 12. There were 9 admissions from syphilis, and 2 from gonorrhœa. 7 cases of guinea-worm were treated, all of which appear to have been contracted elsewhere than in Deesa.

Details of treated.

10. There were no deaths in hospital. Three men died out of hospital: one, a Purdasee, committed suicide by shooting himself; one died of bronchitis whilst absent on leave; and the third from starvation whilst returning from leave of absence.

Mortality and its causes.

Epidemics.

11. Neither small-pox nor cholera.

- Vaccination and re-vaccination. 12. Carefully and uniformly carried out according to existing regulations.
13. Twenty-three men were invalided—2 by a special Invaliding Committee at headquarters, on account of failing eye-sight, and 21 by the General Invaliding Committee at Ahmedabad, viz., old and worn out 14, for ophthalmic disease 5, and one each for rheumatism, pulmonic disease, leprosy, and varicocele.
14. As recommended last year, a small latrine is required for the regimental solitary cells. Prisoners confined there have to march under a guard to the hospital latrine, at a very inconvenient distance.
15. There can be no doubt that much more is now required from the native soldier than was formerly the case. The new systems of drill, &c., and especially of musketry, give a man more work than formerly: consequently he is sooner worn out. I think the majority of men are now-a-days pretty well worn out after twenty years' active service. As regards new experiences in treatment, &c., I have but little to record, but wish to remark that I have found cinchonidine a useful febrifuge when given in five-grain doses three times daily; also that where this treatment fails quinine then seems to act with greater rapidity. Rest and extra diet are often more useful than medicine in the treatment of many diseases.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 14th November. Health very favourable, no mortality, and no instance of epidemic disease throughout. Hospital accommodation ample and excellent, subsidiary buildings complete, and all in good order. Establishment commended for attention and assiduity.

Nothing has been determined as regards the lines, the unsatisfactory state of which has been often noticed; although dampness was less complained of than usual, from short rainfall.

The only want brought to my notice was that of a small latrine for the regimental cells, the existing arrangement being most inconvenient.

**H. M.'s 23rd Regiment N. I.**

MHOW.—In medical charge of Surgeon J. SIMPSON.

Average Strength .....	702·5	Deaths in Hospital .....	4
Do. Present .....	651·4	Do. out of do. ....	2
Admissions .....	804	Invalided .....	23
Daily Sick .....	23·1	Sick Leave .....	12

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874.....	Nusseerabad .....	130·5	3·7	1·0
1875.....	Do. ....	105·7	2·8	0·1
1876.....	Mhow and Indore .....	140·4	5·6	0·6
	Average...	125·5	3·9	0·6
1877.....	Mhow and Indore .....	123·4	3·5	0·6

- The head-quarters of the regiment have been stationed at Mhow during the year; the left half-battalion was stationed at Indore up to June, when it rejoined the head-quarters; in October the wing again left for Indore.
- Location and movements.**
2. The lines are situated at the north end of the camp, on a black soil plain; they are in the usual style of single-tiled huts, with no special arrangement for ventilation, and are in the rainy season damp and scarcely fit for habitation, as they are not raised on a plinth of any kind, and are only kept habitable by constant repair. The streets are narrow; and, as they run north and south instead of east and west, they do not get the benefit of the prevailing winds, thus rendering their ventilation very defective.
- The Lines and their surroundings: present condition, hygienic and otherwise.**
3. During the rainy season the covered-in permanent latrines are used; at other times the trench latrines are opened. Both are placed too far from the lines. An annual crop of vegetables is grown after use of the trench latrines.
- Conservancy.**
4. Water, from wells at the north end of the lines, is as a rule good and plentiful, but Water supply. scarcely so towards the end of the hot months.
5. A good and plentiful supply of food is always to be got in the bazaar at Food. this station.
6. The duties consist of parades, guards, and ordinary garrison duty with frequent escort duty. There is a gymnastic instructor in the regiment, Duties, exercise, and amusements: their effects on health. and a good many of the young sepoy and boys take advantage of his teaching; there are some who indulge in other athletic exercises, such as wrestling and clubs; these men are the healthiest in the regiment.
- Hospital and its immediate surroundings: present condition, hygienic and otherwise.**
7. The hospital is in every way suited for the treatment of the sick of a Native Infantry regiment.
8. The health of the regiment has been good during the year. The physique of the men is good, and the recruits have been up to the average.
- General health and physique.**
9. The climate of Mhow has had a beneficial effect on the health of the regiment after being so long in Rajpootana. The duties at this station are Influence of climate or local circumstances on health. not heavy, and the men have a fair average of nights in bed.
10. Of the admissions into hospital for the year, malarious fever stands highest, giving 290. Injuries come next, chiefly from shoe-bites caused by Details of treated. ill-fitting boots. Skin diseases stand high; nearly all, however, come under boils and ulcers. Rheumatic affections, including lumbago, have contributed a large share. Of diseases of the stomach and bowels diarrhoea and dysentery stand very low, while other causes are made up of colic and dyspepsia. As a rule all the cases have been of a mild character.
11. Four deaths occurred in hospital during the year, from fever, cholera, phthisis, and abscess in the prostate respectively; two deaths occurred out Mortality and its causes. of hospital, one from apoplexy, and one, while on sick leave, from disease of the liver.
- Epidemics.**
12. There was one case of cholera at Indore.
13. Vaccination has been carried on among the recruits and children of the regiment, although not quite so successfully this year as usual.
- Vaccination and re-vaccination.**
14. Twenty-three men were invalided during the year—three for rheumatic affections, three for diseases of the lungs, one each from syphilis, scurvy, Invaliding and its causes. and disease of the spleen, and fourteen from old age and debility.
15. The only recommendation that I have to make is that new lines of a better Requirements and recommendations. description should be built at this station, either on the present site, or, if possible, on higher ground.

*Inspection by Deputy Surgeon-General WYLLIE.*

Health has been tolerably good throughout, showing improvement on previous year. Hospital has ample and excellent accommodation, and is complete in subsidiary offices. My inspection, 25th December, was fully satisfactory, unless as respects the lines, the defects of which remain as formerly reported; and the rocky nature of the ground offers an obstacle to tree-planting, in improvement of sullage drainage, as involving much labour. The trench latrines have been brought more conveniently near since last visit; the distant permanent ones are only used in the rains.

**H. M.'s 25th Regiment N. I.**

MHOW.—In medical charge of Surgeon D. N. PARAKH.\*

Average Strength .....	685·6	Deaths in Hospital .....	2
Do. Present .....	633·5	Do. out of do. ....	1
Admissions .....	844	Invalided .....	10
Daily Sick .....	24·5	Sick Leave .....	9

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Mhow and Indore.....	181·8	5·6	0·8
1875 .....	Do. do. ....	138·1	4·0	0·3
1876 .....	Do. do. ....	130·4	5·1	0·1
	Average...	150·1	4·9	0·4
1877 .....	Mhow and Indore.....	133·2	3·8	0·3

The regiment was stationed at Mhow from the beginning of the year till the 20th of November, when the first detachment with head-quarters left Mhow, and arrived in Aden on the 6th of December. The second detachment left Mhow on the 14th of December for Aden, where the third and fourth detachments are expected to arrive shortly. A detachment of 50 men was sent to garrison the island of Perim on the 6th of December last. It is arranged that the reliefs are to take place every two months. The left wing was stationed at Indore from June to October.

2. The general health of the troops, on the whole, is good. They are well made, and are, in my opinion, capable of bearing much hardship.

3. Including the figures of the wing at Indore, there were 844 admissions during the year. Although this seems a very large number, still the diseases were chiefly of a slight nature. There were two deaths during the year. One European officer also died at Mhow. Nine men were sent away on sick certificate, and ten men were invalided. The daily average number of sick in hospital was 24·5. The principal cause of sickness was ague, of which 389 cases were treated; small-pox gave 9 admissions, rheumatic affections 32, syphilis 11, diseases of the respiratory system 55, stomach and bowel diseases 98, and injuries 104.

4. During the year there were 2 deaths among the troops from small-pox.

5. Of epidemic diseases among the troops there were 9 cases of small-pox, and 2 cases of chicken-pox.

\* Surgeon D. N. Parakh continued in medical charge till the head-quarters left for Aden. Since that time, however, Surgeon B. L. Dutt has been officiating, as a temporary arrangement. The annual report has been compiled by the latter officer.

6. There were 74 vaccinations during the year; of these 42 were males, and 32 females; 18 were over, and 56 under 1 year; 70 cases were successful, and 4 unsuccessful. There were also 18 re-vaccinations during the year; of these 11 were successful, and 7 unsuccessful.

7. There were 10 men invalided during the year. The chief causes of invaliding were the effects of repeated attacks of ague, ending in debility and blood deterioration, long-continued bronchitis, and chronic rheumatism. One man was invalided for extreme debility caused by a combination of conditions all due to syphilis.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 25th December. This charge is at present a weak wing under orders for Aden, and separated from head-quarters only since the 21st ultimo. There has been no sickness worth mentioning in the interval. The hospital is excellent, with complete out-buildings, and the arrangements are satisfactory. Lines adjoin and are similar to those of the 23rd, but lying lower they are even more defective.

**H. M.'s 24th Regiment N. I.**

MEHIDPUR.—In medical charge of Surgeon J. A. HOWELL.

Average Strength.....	436.3	Deaths in Hospital .....	8
Do. Present .....	404.5	Do. out of do. ....	6
Admissions .....	613	Invalided .....	19
Daily Sick .....	13.7	Sick Leave.....	3

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Neemuch .....	208.3	6.3	0.9
1875 .....	Do. ....	166.4	3.6	1.1
1876 .....	Mehidpur .....	120.7	2.8	1.0
	Average...	165.1	4.3	1.0
1877 .....	Mehidpur .....	151.5	3.4	1.9

The regiment was at the Imperial Assemblage at Delhi at the beginning of the year. It left Delhi *en route* for Agar and Mehidpur on the 11th January. The regiment remained at Agar till the 7th March, when the wings separated, the head-quarters and right wing arriving here on the 10th March.

2. The lines are about 150 yards from the river, in eight rows, and are laid out from north to south; they are in very fair order, and built on plinths. The Lines and their surroundings: present condition, hygienic and otherwise. Ventilation is defective, however, and drainage bad. The accommodation is enough for one wing.

Conservancy. 3. The trench system is in use during the fair season, and in the rains covered latrines.

4. This is from the river Sipra, and from three wells in camp; a new well has lately been sunk near the bank of the river. The water is both scarce and very defective in quality. Well-water (especially that from the well in the mess compound) is better than the river water. Deficient and bad water supply is one of the chief objections to this station.

5. This year the price of food has risen considerably, although there has been no famine. There is always a great dearth of vegetables.
- Food.
6. Parade three times a week, musketry practice in the cold season, and guards. Duties, exercise, and amusements: their effects on health. There is a gymnasium, at which all recruits and young soldiers attend; and some of the men fish and shoot. Duties have not exercised an unfavourable influence on health.
7. The hospital is situated 60 yards to the north of the lines. The roof has been thoroughly repaired, and the want of light and ventilation remedied. There has been no overcrowding. The flooring is in very bad repair; this I trust will soon be remedied.
- Hospital and its immediate surroundings: present condition, hygienic and otherwise.
8. The men were in very good health on their arrival from Delhi, but have to a certain extent deteriorated since. Being chiefly composed of Hindus (Mahrattas), they are not of very good physique.
- General health and physique.
9. The cantonment of Mehidpur has been always considered one of the unhealthiest stations to which a Native Infantry regiment is liable to be sent. Its low situation, proximity to the native town,—in which sanitary measures are held in contempt,—periodical inundations, and very bad water supply, render the place very unhealthy. Malaria is in consequence endemic, and is the chief cause of sickness. The climate, though pleasant, is almost all the year far from being invigorating. The local circumstances enumerated above can never be fully remedied, and the place is always likely to remain unhealthy. The best plan would be to abandon the station altogether, or else, if it is necessary to have a wing of a regiment stationed here, to build a fresh camp on a better site.
- Influence of climate or local circumstances on health.
10. Under this heading I purpose giving details of treated of the whole regiment from 1st January 1877 to 7th March, and of the right wing from the latter date to the end of the year. Twenty cases remained under treatment at the end of last year. There were 147 admissions from an average daily strength of 629·8 up to 7th March; and 13 deaths—7 in and 6 out of hospital. Of the 147 admissions, 51 were from ague, 34 from affections of the chest, 17 from contusions and slight injuries, 16 from diarrhoea and dysentery, 1 each from sunstroke, acute hepatitis, and pericarditis; the remaining few from trifling complaints. The admissions from ague do not call for any comment. Chest affections, both pneumonia and bronchitis, were very severe on the march. The great prevalence of this disease was due to exposure to cold, and fatigue.
- Details of treated.
- The total number of admissions from the 8th March up to the end of the year from the right wing, of an average strength of 353·5, was 466, with one death. This compares very favourably with the admissions of the different regiments stationed here from time to time. The principal diseases treated in the wing at Mehidpur were—in their order of frequency—malarious fever, intestinal disorders, chest affections, diseases of the eye, and rheumatism. Malarious fever was the chief cause of admission—323, or nearly three-fourths of the total treated, being under this head. They were principally cases of ague. Only one case of remittent fever was admitted. The disease was most prevalent during the months of September and October. There was nothing special in their treatment. Quinine, cinchonidine, and liquor arsenicalis were administered as required. A few obstinate cases were transferred to Agar, where they rapidly improved. Recruits suffered a great deal from ague.
11. There were fourteen deaths; thirteen occurred on the march from Delhi to Agar (seven in, and six out of hospital); one death occurred at Mehidpur. The deaths in hospital were one each from malignant cholera, pericarditis, hepatitis, and diarrhoea, and four from pneumonia. The deaths out of hospital were one each from ague, asthma, and bronchitis, and three from pneumonia.
- Mortality and its causes.
12. Small-pox was raging in the town in the hot weather. Two cases of cholera occurred in December. It had been raging for some time at Ujeen, 26 miles from this, and I believe the first case that occurred must have contracted the disease at that place, where he was on duty. The man was attacked on the third day after arrival from Ujeen, and died in two days. No other case occurred for a fortnight, when a camp follower was attacked, but this man recovered. On the occurrence of the first case a tent was pitched at the extreme end of the parade ground, and all precautionary measures were taken to prevent the disease from spreading. Cholera has not visited the town of Mehidpur this year.
- Epidemics.



- Vaccination and re-vaccination. 13. Twenty-nine primary and twelve re-vaccinations were performed: four of each were unsuccessful.
- Invaliding and its causes. 14. Twenty-three men were sent up: 18 have been pensioned, 1 discharged with a gratuity, and 4 returned to duty. They were invalided for the following disorders:—3 for anæmia, 1 each for ague, dropsy, facial paralysis, rheumatism, and scrofula (discharged with gratuity), and 11 for old age and debility.
- Requirements and recommendations. 15. It is to be hoped that the present camp will soon be done away with, and a new one built, on a better site, near the old Cavalry lines.

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*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 15th December. Health so far has been exceptionally favourable, owing to unusually small rainfall; and ague much less prevalent, although admissions under that head are still much in excess of ordinary incidence, as are those from lung disease. Since last inspection a separate building with aggregate accommodation for 16 beds has been completed to supplement the hospital, and a contagious ward added—the latter unfortunately, and seemingly unnecessarily, placed close to the roadside. The lines are poor, but the best has been made of them, and I note with satisfaction that all the men have now been provided with *charpoy*s to sleep on—a provision that will go far to obviate the effects of dampness.

I visited the old Cavalry lines, and consider the site to be greatly preferable to that of the present cantonment, not only because the ground is well raised and free from any risk of flooding, but especially for its perennial supply of clear sweet water. There are three large wells, some 300 yards apart from one another, the water-level standing from 22 to 24 feet from the ground surface. In one I found 18 feet of water, and in each of the others 6,—a supply that deepening could add to indefinitely; while at the same date the cantonment wells were practically dry, the best one having only one and a half feet of water, and the men being dependent on the impure river supply.

This site, therefore, has natural advantages which would, beyond question, remedy the ill-health that characterized the existing cantonment, which results from lowness of ground, and concurrently defective drainage and liability to flooding, together with a very bad water supply.

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**H. M.'s Left Wing, 24th Regiment N. I.**

AGAR.—In medical charge of Surgeon J. E. FERGUSON.—Strength 245·1.

Location and movements. On the 1st of January the regiment was encamped at Delhi. Leaving Delhi on the 11th January, it arrived at Agar on the 1st March. The right wing separated on the 8th of March to proceed to Melhidpur, leaving the left wing stationed at Agar.

2. The vast majority of the huts have no windows; the interior, even when the door is ajar, is partially dark. Ventilation is deficient. Only 96 huts have bathing-places in their verandahs. To prevent the water permeating under the floor, and rendering the house damp and unhealthy, the majority of the *nanees* are formed of a basement of chunam work or stone flags. The water flows off through a hole in the wall to a small surface drain which leads to the main drain, about thirty feet in front of the doors. When it is convenient, it is conducted to a plot containing a tree. Accumulations of dirty water are always taking place in these drains, the levels being bad, and the sepoy, as a rule, not troubling themselves to keep them clean. This condition of the drainage is the most apparent sanitary defect in the lines; but there are other minor points on which improvement is also desirable.

3. The night-soil is removed to a place 400 yards from the lines. The sweepings are removed by the station conservancy carts.

4. The water supply is derived from wells. Except in three of the wells in the lines, the quality of the water is good, and the supply plentiful. The three line wells excepted are now undergoing repairs, as they were found to be too shallow, and the masonry work was defective. It was on this account that the water in them was muddy and brackish.

5. Fresh vegetables are supplied to the men occasionally from the regimental garden. Food. The price of grain is low.

6. The duties are the usual routine work of parades, musketry, and sentry duty, and are by no means excessive. The average weekly number of nights in bed during the year was  $6\frac{1}{2}$ . There is no gymnasium for athletic exercise, nor is there any substitute. The men, as a rule, take no more exercise than they can help. There is much need for some incentive to healthy physical exercise, and no doubt a very simply constructed gymnasium would be a great boon in aiding the physical development of many of the sepoys.

Hospital and its surroundings : 7. The hospital is well situated and well ventilated, present condition, hygienic or clean, in good repair, and has ample accommodation. Conser- otherwise. vancy is carefully attended to.

8. Judging from the relatively few admissions into hospital, as well as from the appearance and testimony of the sepoys themselves, the general health of the wing during its stay at Agar has been all that could be desired. The general physique of the majority of the men is, however, only middling.

9. The climate of Agar is undoubtedly good, and conducive to the health of native troops; there are no local circumstances which appear to have any deleterious effect upon health.

10. The average daily strength of the wing from the 8th of March was 245.2; the admissions into hospital were 109. The greatest number of patients in hospital on any day during the year was nine, on the 26th May. The months of March and October give the greatest number of admissions; in the first, probably on account of the fatigue after the march from Delhi; in the second, from an excess of fever cases. The chief cause of admission was intermittent fever, which gives 43 admissions, or 39 per cent. of the whole, and in the ratio of 17.5 per cent. to the average strength of the wing. The average period under treatment in hospital of all cases of intermittent fever was five days. Second in frequency come venereal diseases, which give nine admissions—five for bubo, three for soft chancre, and one for gonorrhœa. Pulmonary diseases come third in the order of frequency, giving eight admissions—six for bronchitis and two for pneumonia. There was one admission from sunstroke, and one from dysentery. The remaining admissions were for diseases of a less important nature, the majority being for slight contusions, colic, diarrhœa, and chronic rheumatism.

11. Twenty-six primary vaccine operations were performed, fourteen of which were successful.

12. Two subedars and one havildar were sent to the head-quarters of the regiment in view to their being invalided on account of inability from old age. Two men were sent on sick certificate, one on account of the after-effects of sunstroke, and who has now been discharged from the service as insane; the other from lameness caused by guinea-worm.

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*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 17th December. Health highly favourable, average daily sick to date 3.5 in a mean strength of 291.64. No mortality. Hospital buildings, site, and general arrangements all very good, only inconveniently far from the men's quarters. Lines in poor repair, and less tidy than ordinary, partly through recent rains, and the regimental wells are out of order. I drew attention to these matters, and learned that steps had already been taken to clean and repair the latter.

Here there is a flourishing garden, instituted some four years ago, and maintained by the men, which provides them with vegetables daily at a monthly charge of only six pies per sepoy.

H. M.'s 3rd (Queen's Own) Regiment Light Cavalry.

NEEMUCH.—In medical charge of Surgeon-Major C. J. F. MACDOWALL.

Average Strength .....	480·2	Deaths in Hospital .....	0
Do. Present .....	443·8	Do. out of do. ....	1
Admissions.....	461	Invalided .....	13
Daily Sick .....	12·6	Sick Leave .....	6

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Neemuch .....	15·5	4·0	0·7
1875 .....	Do. ....	116·9	3·6	0·2
1876 .....	Do. and Nusseerabad.	133·8	3·5	0·4
	Average...	88·7	3·7	0·4
1877 .....	Neemuch and Nusseerabad	103·8	2·8	.....

The regiment arrived from Delhi at Neemuch on the 22nd February 1877. A squadron is always absent at Nusseerabad. It is changed every second year. A small detachment, which is changed monthly, patrols the roads between Neemuch and Mundisoor.

2. I venture again to call attention to the peculiarity of Native Cavalry lines in general, and here in particular. Each hut save those of the bachelors

The Lines and their surroundings: present condition, hygienic and otherwise

has a courtyard for the females to bathe in, &c., since these *pardah* women cannot or will not frequent public latrines or wash-houses. But public latrines and baths would be better, if

practicable, than either a bathing-place inside the hut or in a small courtyard. Although these courts are kept comparatively clean, the question of doing away with them has long been discussed, and I have come to the conclusion that, as a preventative against the evils of bathing, &c., &c., in-doors, they need only be made larger; the washing-place should be cemented, as also the outlets leading from these to the gutter outside. The immediate drainage of the lines is surface, and satisfactory. Several new surface drains have been made. The courtyards of the huts are almost all drained by a runlet coming through and under the wall to the gutter or surface drain outside.

3. The Magistrate has supported me in every case by fining all people concerned in permitting or causing nuisances of any sort in the cantonment.

Conservancy.

Conservancy carts and sweepers are not numerous enough.

Filth is not always removed as soon as it might be, although it is deposited in allotted spots, and is removable day and night, whether in the lines or in the bazaar. There are masonry latrines for the troops on the rocky ground (too far off), and earthen ones for the bazaar, where the ground is soft. This ground is so limited that it can scarcely be cultivated.

4. This is obtained mostly from wells, of which analyses have been furnished before.

Water supply.

I submit my own analysis (made last year) of the four military wells:—

Water decanted after subsidence.	Grains per gallon.		Grains per gallon.	
	Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.
Royal Artillery well .....	26	4·96	None.	·0042
H. M.'s 68th Foot well .....	20	2·99	·0007	·0056
24th Regt. N. I. well .....	24	2·48	·0056	·0112
3rd Light Cavalry well.....	24	2·12	None.	·0042

## Sediments :—

R. A. well-water, after about one month's settling down.	Greyish-brown, flocculent, abundant. Vegetable <i>débris</i> , spores and cells, for the most part motionless; some woollen threads.
68th Regiment do.	Not abundant, flocculent, brownish-grey; vegetable cells and filaments, motionless; cotton threads; confervoid cells; pieces of carbonate of lime.
24th Regt. N.I. do.	Brownish, not very abundant. Bits of carbonate of lime, vegetable <i>débris</i> ; confervoid cells, all motionless.
3rd Light Cavalry do.	Grey, not abundant, flocculent; vegetable <i>débris</i> , spores and cells, naviculæ.

As the rainfall has only been about 20 inches this year, it follows that in all likelihood most of these wells will run dry by next hot season, and the nullah on the south-west will be the only source for drinking-water. It is bunded near the bazaar every year, so as to form a tank. This nullah has an affluent from beyond camp limits, at Sew Ghat, in foreign territory, where all the bathing and washing outside such camp limits is done. I have in consequence recommended that a light earth bund be made across, through which the water from this one filthy affluent can be, as it were, filtered before it reaches the bazaar. The regimental wells, which will probably run dry, will either be supplemented by others dug in the bed of, or near, the banks of the north-east nullah, or the troops will have to move out of camp to the banks of some river. All washing in nullahs in camp above bunds is strictly forbidden. The two rivulets (north and south) are thus clean enough, with the exception of the affluent above mentioned.

5. Food grains, &c., almost approached famine prices—eight seers the rupee. This Food. only lasted for a few days.

Duties, exercise, and amusements: their effects on health.

6. Horse-riding, single-stick, riding-school, and drill combine amusement with exercise, and favour health.

7. The hospital is only Hospital and its immediate surroundings: present condition, hygienic and otherwise.

- temporarily occupied. We are at present located in a part of the old Artillery Hospital, so often described. The new hospital is a fine substantial building, and has been only a few months in use; its ventilation is good.

8. This has deteriorated General health and physique.

- since recruiting from Hindoostan has been prohibited. The Deccanees we now get are not the higher class of Mahrattas, nor indeed of that class which furnished soldiers formerly.

9. The climate of Neemuch gives a predominance to lung diseases generally, Influence of climate or local circumstances on health.

- does not seem to obtain further south. Fevers are, I believe, neither so severe nor so common as in many other stations, though a tendency to pneumonia is often observed in them. Typhoid fever appeared last year amongst the Europeans.

10. Including the figures of the squadron at Nusseerabad there were 461 admissions as compared with 589 in the preceding year. The cases of fever (144) are less numerous, as the rainfall was small in amount, and the subsoil water further from the surface. There were 47 cases of rheumatism, and 5 of syphilis.

- Details of treated.

Mortality and its causes.

11. There was no death in the regiment this year.

Epidemics.

12. Cholera visited the station, but spared the regiment.

13. Since 1873 the whole regiment has been re-vaccinated; all recruits are vaccinated or re-vaccinated, unless the lads have marks of small-pox, or can prove recent vaccination. Some operations, as usual amongst re-vaccinations, utterly failed. There are no failures among children, for they are operated on again and again till protected. The number of children vaccinated is 36, and the number of recruits and men re-vaccinated 51.

- Vaccination.

14. Almost all the cases of invaliding were from causes of debility; some lumbago Invaliding and its causes. cases were gouty, and therefore not likely to get well enough for cavalry duty; a case of hemiplegia (getting well) and an old asthmatic case complete the list.

14. Almost all the cases of invaliding were from causes of debility; some lumbago cases were gouty, and therefore not likely to get well enough for cavalry duty; a case of hemiplegia (getting well) and an old asthmatic case complete the list.

15. The total abolition of all secret cesspools in the courtyards of the huts; good saucer stone gutters are required instead of the earthen ones running down in front of the huts; also a new masonry latrine, neither too close to the lines, nor so far as the present one. Requirements and recommendations. Low parapets round the draw-holes of flat covered wells are needed. I have had this done in the case of the hospital well, as the washings ran in.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 8th December. Health to date very satisfactory. The present hospital, occupied in April last, was formerly that of the Royal Artillery. It has sufficient and suitable room, and there are ample subsidiary buildings; but the situation is inconvenient by distance, and open to some objection as lying between the regimental bazaar and grass-cutters' lines. For these reasons one of the vacated Artillery barracks near to the Cavalry lines is being got in readiness as an hospital, and it will afford superior accommodation, with all needful out-offices.

I found the lines fairly clean and in tolerable repair, but noticed the existence of cess-pools in some of the family enclosures. These, I understand, will now be removed.

**H. M.'s 10th Regiment N. L. I.**

NEEMUCH.—In medical charge of Surgeon-Major F. R. O'KEARNEY, M.D.

Average Strength.....	703	Deaths in Hospital .....	1
Do. Present.....	637·7	Do. out of do. ....	3
Admissions .....	1,211	Invalided .....	22
Daily Sick .....	38·7	Sick Leave .....	33

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Mehidpur and Agar .....	223·7	7·1	.....
1875 .....	Do. do. ....	213·9	6·7	4·2
1876 .....	Do. do. ....	230·9	7·7	0·8
	Average...	222·8	7·2	1·7
1877 .....	Neemuch.....	189·9	6·1	0·1

The head-quarters were stationed at Neemuch throughout the year. The left wing from January till its return on the 19th February was located at Nusseerabad, during the temporary absence of the 16th Regiment N. I. at Delhi. Besides these movements several escort parties have had to be sent on the Mhow and Nusserabad roads.

2. The lines and surroundings have already been described in former reports, and continue much in the same state as before. They are maintained, as usual, clean and in a tolerably good state of repair, but the main sanitary defects as to construction, space, light, and ventilation, total absence of plinths, &c., must, it is feared, remain as before; nothing will remedy this but the building of new lines on the standard plan.

3. The latrines are kept clean and in good order. The distance, which is nearly 500 yards from the lines, is felt as inconvenient; but, owing to the absence of other available sites, and danger of injury to the drinking water, this inconvenience seems at present irremediable. The line and latrine refuse is daily carted to a considerable distance, and buried in trenches away from all sources of water supply.

4. The same as previously described; owing to the slight rainfall the supply has been somewhat scarce, most of the wells having rapidly dried up.  
Water supply.
5. The food supplies, during the latter half of the year especially, have been not only dear, but scarce; the green food and vegetables, owing to the protracted hot weather, and insufficient rainfall, have also been very scarce.  
Food.
6. These are substantially as given in former reports, and have proved not otherwise than beneficial to the general health. One recruit of rather weakly frame and slender fibre, while going through his athletics in the gymnasium, met with an accident causing rupture of the tendo Achillis of the left leg, from which he had ultimately to be discharged the service, owing to permanent lameness.  
Duties, exercise, and amusements: their effects on health.
7. The hospital block previously occupied by the 3rd (Q. O.) Light Cavalry and staff and details having been vacated was taken over during the year; it is in good order, clean, and well ventilated; there has been no overcrowding. The subsidiary buildings are sufficient and conveniently situated. During the year efforts have been made, with good effect, to plant a few shady trees round the hospital. The hospital well ran dry in November last, when fortunately it was in part replenished by a propitious fall of rain.  
Hospital and its immediate surroundings: present condition, hygienic and otherwise.
8. The health of the regiment, though improving gradually, cannot be pronounced satisfactory, owing chiefly to persistent malarial cachexia contracted at Mehidpur, many sent on sick leave suffering severely, and being still liable to recurrences of fever on the least unusual exertion, change of weather, season, diet, clothing, &c. The physique of the men generally is satisfactory.  
General health and physique.
9. The change to Neemuch from Mehidpur has proved, on the whole, beneficial to the general health of the regiment.  
Influence of climate or local circumstances on health.
10. Of the total treated, 1,277, the largest proportion of admissions was due to malarious fevers, giving a ratio of 72·3 per cent. of fevers to all diseases treated, and 144·8 per cent. of fevers to the average strength. The general character of these fevers, though for the most part quotidian or tertian, was marked by frequent recurrences, and occasional complications of the internal organs, followed in many cases by general debility and more or less anæmia. Of the several cases of malarious fever recorded, many (33) had to be sent away for change of air, owing to extreme general debility engendered by protracted illness and convalescence. Most of the cases invalided were also, directly or otherwise, due to malarial fevers or secondary influences contracted at Mehidpur. Large doses of quinine—not less than from 20 to 30 grains—daily were found effectual, and when ineffectual were at once withheld, in preference for the neutral sulphate given hypodermically; this latter, however, had ultimately to be abandoned, owing to the danger of troublesome ulceration supervening on cases suffering from general debility. The largest monthly number of admissions occurred in April and May, and was due no doubt to malarial poison, contracted at Mehidpur. The remaining diseases included 23 cases of chronic rheumatism and 9 of lumbago; there were 11 cases of primary and 4 of secondary syphilis; in most if not all of these latter the disease was contracted either at Mehidpur, Mundisoor, or Jowra, on escort duty. There were also 19 cases of bronchitis, 9 of dysentery, and 10 of gonorrhœa.  
Details of treated.
11. One European officer died of malignant cholera on the 19th November, after a short illness. A sepoy died of hepatitis in hospital on the 5th November. Private Hoosain Khan died suddenly out of hospital on parade, on the morning of the 10th September, from rupture of the right ventricle of the heart. The *post-mortem* examination revealed atheroma and thickening of valves with some fatty degeneration of the right ventricle, and hypertrophy of the left. This man had never complained of any cardiac affection whatever. Private Baji Goolgoolay, sent on sick leave for paraplegia, was attacked by cholera *en route*, and died before reaching home, and another sepoy sent on sick leave for malarial fever and general debility died at Dapoolee.  
Mortality and its causes.
12. In the regiment there were none. In the Sadar bazaar there were six cases of small-pox, which disappeared within a month or two.  
Epidemics.
13. Forty-eight primary and twenty-four re-vaccinations were successfully performed. Those remaining unprotected are yet too young and delicate to undergo the operation. Lymph good.  
Vaccination and re-vaccination.

14. There were in all 22 invalided, of whom 19 were Hindus and 3 Musalmans. For Invaliding and its causes. malarious fever 6, lung diseases 3, hernia 1, old age and debility 10, secondary syphilis 1, and injury to tendo Achillis 1.

15. A contagious diseases ward and dead-house are much required. The present Requirements and recommendations. lines should be abolished, and new lines built on standard plans, with adequate space, plinths, drainage, &c. The wells should be deepened, and reservoirs to retain water constructed, and the adjoining nullahs so banded as to raise the water level.

*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 8th and 9th December. Health unsatisfactory, but materially better than in the previous year, when the regiment was at Mehidpur. During the past eleven months, in an average daily strength of 598, there have been 1,051 admissions into hospital, of which 815 were due to malarious fevers. In April the number of such cases received was 124, and in May as high as 227. It is noteworthy that the same exceptional result happened in the case of the 25th Regiment after removal to Mhow in 1874, of an excess of ague in the summer months as the outcome of malarious saturation acquired during two years' residence at Mehidpur. Apart from this exceptional feature the admissions have been relatively few, and mortality very small.

Hospital consists of two old barracks, and has ample and fairly suitable accommodation, with sufficient subsidiary buildings, excepting a dead-house. I found all well ordered. Lines clean and in tolerable repair; huts more defective than average. Two urinals have lately been constructed: a hollow perforated stone slab raised some 18 inches and adequately screened with an iron receptacle below, removable from outside, is the arrangement; it is more troublesome than that at Nusseerabad, but sand is not procurable. Permanent latrines are constantly in use, but here, as elsewhere in the Mhow command, inconveniently distant from the lines.

**H. M.'s 16th Regiment N. I.**

NUSSEERABAD.—In medical charge of Surgeon W. C. KIERNANDER.

Average Strength.....	719·3	Deaths in Hospital .....	3
Do. Present.....	668	Do. out of do. ....	1
Admissions .....	831	Invalided .....	29
Daily Sick .....	22·2	Sick Leave .....	6

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Mhow .....	.....	.....	.....
1875 .....	Do. ....	137·6	4·2	0·7
1876 .....	Nusseerabad .....	200·4	6·0	0·6
	Average...	.....	.....	.....
1877 .....	Nusseerabad .....	124·4	3·3	0·4

The regiment marched into Nusseerabad from Delhi on the 2nd February, having left Location and movements. the latter place on the 8th of January.

2. The lines are according to the standard plan, the roof is single-tiled, and the plinth is low. The huts are in good repair. During the year, however, they have been very much improved. The ground has been properly drained by surface trenches, so that it is now impossible for water to lodge. All cesspools have been abolished. A small open surface drain conducts from the bathroom all the water, &c. of the household to trees planted in front of the huts in the married quarters. Another vast improvement is the erection of urinals; this prevents a nuisance which has always hitherto existed, namely, the saturation of the ground in the vicinity of the huts by urine. These improvements have, in my opinion, made the lines as healthy as it is possible to make lines for native soldiers. The cantonment and lines are well drained, and the huts in the lines are clean and well ventilated. The bazaar attached to the lines is always kept clean and in good repair.
3. There are permanent latrines which are used by the women and children, but the men use trenches; these after being filled in are ploughed over, and a crop of grain is grown on them. The lines are swept daily.
4. Four large casks of water are brought in daily for the use of the regiment from Dilwara; this is enough for about two companies, and as a rule the men in the regiment do not use it. The favourite water with the men is that from the Mahadeo well, situated in a grove of trees near the railway station. The hospital well and another are also used by them. With the exception of Dilwara, the water in all the wells is more or less brackish. The wells do not run dry in the hot season.
5. Food is very dear, owing to the failure of the usual rains. Vegetables are always scarce in this station.
6. The regiment supplies several guards. Constant drill is their only exercise. They are encouraged in gymnastics, but very few take to it. Their duties are not excessive, and do not seem in any way to impair their health.
7. The hospital is placed in an open plain on high ground without a tree near it; the consequence is that in the hot season it is a perfect oven, while in the cold weather its wards are exceedingly cold. To remedy this I indented on the Barrack Department for *jhamps* for the front and back verandahs, which answer the purpose well, and I also obtained a grant from the Cantonment Committee which enabled me to plant trees in front of the wards. The hospital itself is well built and ventilated and in good repair.
8. There has been a great improvement in the health of the men as compared with the previous year; still there are a great number of men with a tendency to scurvy. The daily average of sick was <sup>22.7</sup>10.15, while in the previous year it was 39.24. As a body, I should say, the regiment is in a very fairly healthy condition, and contains a large number of men of good physique.
9. There are two influences which I cannot help thinking have greatly tended to produce these good results in the health of the men this year,—one climatic, and the other sanitary, viz., first, the drier season, and secondly the sanitary improvements in the lines. The following table will clearly show the difference:—
- | Total Monthly Admissions. |         |            |          |           |           |  |
|---------------------------|---------|------------|----------|-----------|-----------|--|
|                           | August. | September. | October. | November. | December. |  |
| 1876 .....                | 92      | 104        | 171      | 211       | 180       |  |
| 1877 .....                | 84      | 74         | 70       | 41        | 58        |  |
- and nearly all these admissions were from intermittent and remittent fevers.
10. The total number treated during the year was 914, and the following show the prevailing diseases:—chicken-pox 13, small-pox 3, intermittent fever 305, dysentery and diarrhoea 30, respiratory diseases 31, rheumatism 52, venereal diseases 13, eye diseases 39, and wounds and accidents 72.



11. There were three deaths in hospital—two from pneumonia and the third from beriberi. Private Lalla Sing was admitted on the 25th October with pneumonia. On the morning of the 29th he woke from sleep, gave a few gasps and died. The *post-mortem* showed a very large liver, his right lung was in a state of red hepatization, and the immediate cause of death was a large clot in the heart. The case of beriberi was the only one of its kind I have seen in this part of India. One case of fever died out of hospital; he was sent to the General Hospital at Delhi while we were there, and died soon after.
- Mortality and its causes.
12. There was an epidemic of small-pox in the bazaar, but only 3 cases occurred in the regiment. The disease was of a mild form, and the men made quick recoveries.
- Epidemics.
13. Vaccination was carried on throughout the year. The total number of vaccinations was 27, and all were successful. There were 49 re-vaccinations; of these 26 were successful and 23 unsuccessful.
- Vaccination and re-vaccination.
14. Twenty-nine men were invalided, fifteen of them after long service, five for chronic bronchitis, five for chronic rheumatism, and four for defective eye-sight. Two men who had only short service were discharged with a gratuity, being unfit for service—one for defective eye-sight, and the other for guinea-worm.
- Invaliding and its causes.
15. We have no special ward for contagious diseases, but the practice of building temporary huts is perhaps as good as anything that can be devised.
- Requirements and recommendations.
16. The sanitation of the regimental lines has been so much improved, and the climatic influences so favourable, that there has been very little sickness in the regiment during the year, and I have no observation to add to my remarks of last year on the subject.
- Special observations, new experiences in treatment, sanitation, &c.

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*Inspection by Deputy Surgeon-General WYLLIE.*

Inspected 29th November. Health so far very favourable, the usual autumnal ague showing far less than half its ordinary incidence. Hospital, on Bengal standard plan, is complained of as hot in summer, and cold and gusty in winter; is about to be provided with a ceiling, which will meet present objections; details of organization and conservancy all satisfactory.

I was particularly pleased with the improvements made in the lines since my last visit—the tidy, cleanly appearance of the huts, and the excellent arrangements in progress for drainage. Three urinals, two for men and one for women, have also been recently constructed by Colonel Pierce on his own plans. The urine is received on sand laid down in masonry beds, and renewed twice weekly. I could detect no smell outside the screen wall, and very little within, although the sand had been in use for three days. I regard this addition as very commendable, as it will certainly be a great convenience, and I anticipate that the arrangement will prove a success for imitation elsewhere.

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## SIND DIVISION.

Average Strength Present during the year	...	...	2291·7
Average Daily Sick per cent. to the Average Strength	...	...	4·2
Ratio of Mortality per cent. to the Average Strength	...	...	1·2

## H. M.'s 29th Regiment N. I.

KURRACHEE.—In medical charge of Surgeon-Major C. MORTON.

Average Strength.....	694·9	Deaths in Hospital .....	3
Do. Present.....	615·2	Do. out of do. ....	2
Admissions .....	411	Invalided .....	15
Daily Sick .....	17·1	Sick Leave .....	7

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Hyderabad .....	125·6	3·4	0·4
1875 .....	Kurrachee .....	85·7	3·3	0·6
1876 .....	Do. ....	95·1	2·8	0·7
		102·1	3·2	0·6
1877 .....	Kurrachee .....	66·8	2·7	0·5

The 2nd Belooch Regiment was quartered in the Dcpôt barracks, Kurrachee, from the 1st January to 21st October, on which date the corps left on field service to join the Mittri Field Force. The regiment proceeded by rail to Kotree, where it embarked on board the Indus Flotilla Steamer *Cranborne* on the evening of the 21st October, and disembarked at Sukkur on the morning of the 29th idem. Thence it marched to Mittri, *viâ* Jacobabad, arriving at the former place on the 12th November, where it was encamped to 31st December. The men enjoyed excellent health on the road, and, bearing in view the long marches over weary reaches of fine sand, did not suffer unduly from shoe-bite.

2. The lines occupied by the regiment in Kurrachee were originally designed for European troops, and are situated on an undulating, slightly irregular incline. They have a south-westerly aspect, and consist of nine blocks of buildings ranged in three rows. Each row has a central street 182 feet wide, running the entire length, and intersected by transverse streets thirty feet broad. The barracks are large, roomy, and thoroughly ventilated by means of continuous ridges and free lateral openings, and are kept in perfect repair. The hygienic condition of the lines and their surroundings received the most careful attention, and the sanitary state in which they were kept was highly conducive to health.

3. The system of conservancy is the standard plan, which in many respects is defective. The iron receptacles do not fit accurately into the stone compartments, and in consequence the urine and fœces fall between the stones and the pans. These receptacles are far from being sanitarily perfect. They have no partitions to separate the urine from the fœces, and are not sufficiently strong at the bottom to bear for any length of time the constant friction of pushing in and pulling out; the sides are equally weak, and become dented in all directions. A compartment for the urine might be made spittoon-fashion, to prevent the contents from being

jerked out, as is so noxiously apparent now; the dividing partition would strengthen the sides of the receptacles, and the addition of four small wheels to run in and out would be a great improvement, possessing the combined advantages of economy and of more perfect conservancy, in preventing the wearing away of the bottom, and in facilitating the withdrawal of the contents without spilling.

4. The water of Kurrachee is noted for its inferior quality, being largely charged with saline, and in a lesser degree with organic impurities. The supply is derived from wells, and for whatever length of time the scheme for bringing pure water into Kurrachee may be delayed, so long will the inhabitants be deprived of one of the greatest necessities of life.

5. An excellent and varied supply of meat, fish, grain, and vegetables is always to be found in the Kurrachee markets. Every description of food is procurable at moderate cost. The clothing with which the men provide themselves is only suited to the mild climate of Lower Sind. I have had occasion to represent the urgent necessity of supplying the Mittri Field Force with warm clothing, the general health of the force having considerably deteriorated from the want thereof, owing to sudden vicissitudes of temperature. The thermometric range varies considerably in a few hours, and in consequence the climate is much more trying than a colder and a more equable one. The clothing of the men is sufficient on still warm days, but wholly insufficient to preserve health when the temperature suddenly falls; and the cold is intensified by the occasional prevalence of a strong penetrating wind from the neighbouring snow-clad hills.

6. The duties were of the ordinary parade and guard nature, with occasional escort duty, and had no injurious effects on health. The exercises were those common only to natives of very active habits, and practised at weekly regimental sports and amusements, in which the men of all castes eagerly compete, and which give a tone and vigour to the men scarcely to be equalled in other regiments.

7. The hospital is a commodious stone building, well situated, and contains two large wards and four isolated rooms. The ventilation, both lateral and ridge, is good; and a broad verandah runs the whole length in front and rear. Its plan and structure are excellent, and it is kept in thorough repair. Its immediate surroundings, especially that portion which lies within civil limits, are not as satisfactory hygienically as I could wish; but no sanitary evil, calling urgently for remedy, exists.

8. The general health of the regiment compares favourably with that for 1876. The general physique, chest formation, and muscular development are such as constitute thoroughly efficient soldiers, with physical powers capable of bearing great and prolonged fatigue under privations which so often prove fatal on active field service.

9. I cannot say, from an experience of several years, that the climate of Kurrachee exercises an injurious effect on the health of soldiers. Extremes of heat and cold are very rare. The local circumstances are not as favourable, sanitarily speaking, as they should be, particularly in the Sadar bazaar, the native city, detached native quarters, and in the vicinity of tanks. It is to be regretted that the Sadar bazaar now lies within civil jurisdiction (though formerly embraced within camp limits), and that the Cantonment Committee should be powerless to mitigate the sanitary evils which everywhere abound therein. Situated as it is, so close to the Staff and 83rd Regimental Lines, I felt it my duty to call the attention of the civil authorities to the subject, through the Cantonment Magistrate, but with what result I am unable to state.

10. The total number treated in hospital was 436, against 616 in 1876, of which 25 remained from the previous year. The total discharged to duty was 413, and otherwise 7. The total number of deaths in hospital was 3, out of hospital 2; 7 men proceeded for change of air, and 15 were invalided and discharged. The average daily sick was 17.1, against 18.08 in 1876. The percentage of treated to strength was 70.8, against 98.4 in 1876; that of deaths to strength 0.4, against 0.8; and of deaths to treated 0.6 against 0.8. The percentage of daily average of sick to strength was 2.7 against 2.9. Paroxysmal fevers were, as usual, the prevailing diseases, but the decrease in admissions from the preceding year was most marked, standing in the proportion of 337 in 1876 to 200 in the year under review.

11. Two deaths from pneumonia occurred in January, and were the result of the cold prevalent throughout that month. One casualty arose from enteritis in February, and possibly was occasioned by the ingestion of an irritant. The deaths out of hospital were two; but, as the men were on leave, I am not in a position to state of what diseases they died.

12. There was no epidemic in the regiment, though small-pox was prevalent in the city and bazaars, yet only one case occurred in the regimental lines, and that in the person of a sepoy of the 1st Belooch Regiment, temporarily attached for duty. The usual precautions to stay the spread of the disease were taken, and were attended with perfect success.

13. Vaccination and re-vaccination received the most careful attention, with successful results.

14. Fifteen men were invalidated for the following diseases—rheumatic affections nine, syphilis four, and lung diseases two.

15. The great requirement of Kurrachee is an ample supply of good water. Quarters for hospital assistants, contiguous to the hospital, and a dead-house, are also much required.

16. The not unfrequent occurrence of typhoid fever and other preventible diseases among the troops quartered in Kurrachee calls for special observation, and I would reiterate what I have before urged, that in all matters affecting the sanitary state of military corps, whether European or native, it is impossible to overlook surrounding influences which act prejudicially on the public health. It should ever be borne in mind that the same local non-sanitary conditions which deteriorate the general standard of health affect alike the military as the civil population. When an epidemic breaks out in the locality of the one, it generally extends to the other. Attention, however, is so concentrated on the limited area occupied by regiments that pathogenic causes outside that area are unregarded, or passed over as lying beyond the limits of military supervision and control.

*Inspection by Deputy Surgeon-General Joynt.*

This corps was hurried off to Mittri (Sind frontier) on very short notice, and was not formally inspected. I had ample evidence, however, of the zeal and efficiency with which Surgeon-Major Morton discharged his duties, not only in daily routine, but also in his careful arrangements for the welfare of the regiment on the march.

**H. M.'s 27th Regiment N. I.**

HYDERABAD.—In medical charge of Surgeon S. B. HALIDAY.

Average Strength.....	699·6	Deaths in Hospital .....	4
Do. Present .....	636·2	Do. out of do. ....	1
Admissions .....	635	Invalided .....	49
Daily Sick .....	27	Sick Leave .....	12

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Kurrachee .....	75·1	1·8	0·3
1875 .....	Hyderabad .....	92·6	4·1	0·1
1876 .....	Do. ....	137·4	5·8	1·0
	Average...	101·7	3·9	0·5
1877 .....	Hyderabad .....	99·8	4·2	0·6

The head-quarters of the regiment were stationed in Hyderabad during the year 1877; but a detachment of 179 strong, consisting of two companies under a European officer, went to Kurrachee on the 18th October, where it remained until the 18th of November, when it returned to Hyderabad. On the 17th of November an escort party (62 strong) left to accompany the Governor of Bombay on tour, and on the 29th idem another escort party of 14 left to accompany the Commissioner of Sind on tour.

The Lines and their surroundings : present condition, hygienic and otherwise. 2. These have been exhaustively described in my annual report for 1875, and no alteration has been made since. They are in good repair, and their hygienic condition is fair.

3. The conservancy is the same as last year. It has been most carefully attended to, and the working of the establishment made as effective as possible.

4. This has already been fully described. The recommendation made last year to prevent the surface drainage (consisting of rainfall) from flowing into the tank which acts as a reservoir to supply Belooch wells, has not been carried out.

5. Food was good and abundant, but very expensive; grain compensation made up the increase in price in the case of unmarried men, but married men with large families felt it severely.

Duties. 6. Duties consisted of the usual parades, guards, and escorts.

Hospital and its immediate surroundings : present condition, hygienic and otherwise. 7. These were fully described in 1875, and no change has occurred since. The new hospital, which was reported as under consideration in 1875, has not been built, and is much required.

General health and physique. 8. Good: only 638 sick admitted this year, against 900 last year.

9. There were 696 cases treated during the year, against 932 in last year. The chief diseases admitted were the following, arranged in the order of their frequency:—malarious fever 263; contusions 80, of which 39 were shoe-bites; boils 45; venereal diseases 43, of which 20 were primary syphilis, 4 constitutional syphilis, and 19 gonorrhœa; bronchitis 25; conjunctivitis 25; dysentery 21; rheumatism 20; diarrhœa 13; scabies 12; measles 9; colic 10; ulcers 8; orchitis 7; and small-pox 1.

10. Four deaths occurred from confluent small-pox, malignant disease of the bladder, phthisis, and abscess of the liver, respectively.

11. The epidemic of small-pox which broke out towards the end of last year continued into the commencement of this. One sepoy and one sepoy's child suffered; these cases were treated in the temporary isolated small-pox hospital, which consisted of tents and a grass hut. Measles appeared in March, and continued through the spring; 11 sepoys, 1 woman, and 35 children suffered. The disease was of a mild type.

Vaccination and re-vaccination. 12. Number of vaccinations 16; these were all children. There were 241 re-vaccinations of recruits and sepoys.

13. Invalided 49, of whom 36 were pensioned, and 13 discharged with gratuity; 20 were invalided on account of debility, 13 from other diseases, 8 from rheumatic affections, 2 from bronchitis, 3 from ague, 1 from disease of the stomach, and 2 from skin disease.

14. The floor of each pendal should be raised on a level with, or slightly above, the footpath (six inches high) which surrounds it, the roofs raised a few feet, and the roof ventilation improved. As there is no Lock Hospital here, venereal diseases are unchecked, and I again strongly recommend that the prostitutes be placed under supervision. The quarter-guard is unsuitable, and the cells are much too small, especially in the hot weather; a new quarter-guard is urgently required.

*Inspection by Deputy Surgeon-General JOYNT.*

The lines are in good order and are kept clean. The sanitary state of the hospital is satisfactory; there has been no overcrowding. Vaccination has had careful attention.

## H. M.'s 1st Sind Horse.

JACOBABAD.—In medical charge of Surgeon S. O'B. BANKS.

Average Strength.....	363·3	Deaths in Hospital .....	2
Do. Present.....	229·2	Do. out of do. ....	5
Admissions .....	406	Invalided .....	10
Daily Sick .....	12·1	Sick Leave .....	18

Years.	Stations.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Jacobabad .....	195·3	3·8	2·0
1875 .....	Do. ....	187·2	3·3	1·9
1876 .....	Do. ....	211·2	4·3	1·5
	Average.....	199·2	3·8	1·8
1877 .....	Jacobabad .....	176·9	5·2	0·8

Head-quarters of the regiment not moved. The left wing, with an average of 253 sabres, Location and movements. has been absent in Beloochistan and on district outpost duty during the year.

2. The lines are excellent, and leave very little to be desired. The amount of cubic and superficial space allotted to each man has been described in former reports. Surroundings are unobjectionable, and their hygienic condition has been improved by knocking down old lines, &c., in the vicinity of the present ones, which somewhat obstructed the passage of air, and these were used as latrines.

The Lines and their surroundings: present condition, hygienic and otherwise.

3. In the hospital dry earth is used, but, owing to the defective construction of the latrines, which are enclosed by a roof, disinfectants have to be used. The line conservancy is very bad, the latrines being situated in the middle of the troop lines, and less than forty paces from the men's quarters. They are made of sun-dried bricks on earthen floors; the whole of the liquid excreta is disposed of by soakage and evaporation. There can be little doubt that if properly constructed latrines were made in suitable places the dry-earth system might be carried out to perfection in this dry climate. The difficulties, such as separating the fluid and solid excreta, caste prejudices, ablution, &c., are all matters of detail only involving a little trouble. If the hospital latrines were properly constructed there should be no necessity for the use of disinfectants; the powerful sun and free use of earth would suffice,—disinfectants being kept solely for purifying the building, and for disinfecting specific stools.

Water supply. 4. Unchanged as to source or impurities.

5. Food during the year has been abundant, but the prices were somewhat higher than usual—not, however, sufficiently so as to exercise an injurious influence on health. The scorbutic taint is less commonly observed in the troops than in the civil population of the district, which is owing to vegetables being fairly abundant in the cantonment.

Duties, exercise, and amusements: their effects on health. 6. Duties extremely arduous and trying to health, from exposure to the vicissitudes of climate, intense heat and cold. The men, as far as I am aware of, have no games or sports of any kind.

7. In the vicinity of the regimental hospital a new ward has been built, which will, under all ordinary circumstances, prevent overcrowding. The ward is built, I believe, on a standard pattern with domed roof; but however suitable such plans may be in other parts of India, there can be no doubt that they are utterly unsuited to this climate, being hotter than any other form of building. It has, besides, other defects—there is no approach to it, no fence round the building, and the ventilation is defective.

General health and physique. 8. Unsatisfactory.

9. The district is highly malarious. The effect on health is very marked, and is particularly apparent in foreigners. Debility and premature old age, as the annual Invaliding Committee testifies, is frequently seen; numbers of, comparatively speaking, young men have to be invalided yearly as "worn out" from premature old age—the effect of malaria. Strangers are always struck with the anæmic appearance of the troops.

10. The total number of treated during the year was 426. Of these the principal were—ague 195 cases, chronic rheumatism 18, pneumonia 6, dysentery 13, diseases of the eye 11, syphilitic affections 16, gonorrhœa 6, and injuries, chiefly contusions of the lower extremities, 61.

11. There were two deaths in hospital, from ague and remittent fever respectively; and five out of hospital, one of which was due to bronchitis,—the causes of the remaining four were unknown.

12. None. Small-pox, however, broke out several times during the year in the neighbouring villages.

13. There were 49 successful primary vaccinations during the year, and 168 successful re-vaccinations.

14. Five men were invalided for old age, and one each for disease of the spleen, deafness, and injury.

15. A good scheme for the filtration of the water might be introduced with advantage, particularly at some of the outposts where the water is notoriously impure. The roads are at present covered with tiger grass, to prevent their being cut up; this proceeding is objectionable, as the grass retains the excreta, and after rain offensive noxious vapours rise from it. They should be raised, and metalled either with burnt brick or *kunkur*. A large amount of low jungle exists in many places round the station, which might be removed with advantage. It extends for miles in every direction, and grows rapidly. Some very important points with reference to hospitals seem to have been overlooked in this station. In the event of another hospital being constructed here I would recommend that it should have a ten-foot plinth; the main walls protected throughout from the sun; verandahs broad and well ventilated at the top; roof flat and double, and sufficiently strong to allow of the patients sleeping on it during the hot weather; doors, windows, skylights, &c., large,—in fact, a system of ventilation which would admit of being graduated according to circumstances. Every ward should have a fire-place. I would call attention to the excellent results which follow treatment of the surgical cases in the open air. In all cases where there is much suppuration, ulceration, gangrene, &c., &c., the benefit derived from open-air treatment is sometimes astonishing; a few mats will, as a rule, keep off the wind, if there is any; care must be taken to keep the patients warmly covered.

H. M.'s 2nd Sind Horse.

JACOBABAD.—In medical charge of Surgeon M. L. BARTHOLOMEUSZ, M.B.

Average Strength.....	492	Deaths in Hospital .....	4
Do. Present.....	284	Do. out of do. ....	4
Admissions .....	276	Invalided .....	10
Daily Sick .....	11·5	Sick Leave .....	10

Years.	Station.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Jacobabad.....	112·2	2·6	4·8
1875 .....	Do. ....	116·0	3·4	1·0
1876 .....	Do. ....	117·3	3·4	0·5
	Average.....	115·2	3·1	2·1
1877 .....	Jacobabad.....	97·1	4·0	1·4

The head-quarters of the regiment remained at Jacobabad until the 27th October, on which date they marched upon Mittri, in Beloochistan, accomplishing the journey in six marches. Thirty-one sabres, under command of a European officer, proceeded to Quetta from Mittri in charge of treasure on the 4th of December, and returned on the 22nd.

2. The permanent lines at Jacobabad have been described in previous reports. The standing camp at Mittri is pitched on a level piece of ground on the right bank of the river Nara, and about three-quarters of a mile to the north of the village of Mittri. The surrounding country is almost a dead level, with very scanty vegetation, such as is usually met with in the frontier districts of Upper Sind. The troops are living under canvas. There are sixteen tents for the native officers,—each of these tents has a superficial area of 140 square feet; and there are 171 tents for the sowars, each of which has a superficial area of 108 square feet, and is occupied by two men. These tents afford ample accommodation, and protect them sufficiently on the line of march against the inclemency of the weather during the cold season. It is doubtful, however, whether men could live under canvas in the plains of Beloochistan during the hot months with impunity.

3. The trench system of conservancy is successfully carried out. There are seven trenches parallel to each other, situated about fifty yards on the right flank of camp. Each trench is subdivided into separate compartments by matting, so as to afford a certain amount of seclusion. There are twelve sweepers regimentally employed, of whom one is kept continually at work during the day at the trenches for the purpose of covering the excreta with dry earth. This system is found to answer admirably.

4. The water supply is obtained from the Nara, a mountain torrent which has its source in the Murree hills, and runs through Seehee in the borders of Beloochistan, and skirts the village of Mittri, and then, taking a south-westerly direction, is lost in the plains of Cutchee. This stream is generally very low, with a sluggish current, rendering it fordable for men and cattle except after heavy rains. The water of the Nara is usually muddy, especially so after rain, but clears on standing, and by means of an ordinary filter the water may be rendered clear and palatable.

5. Food is plentiful and of good quality, but almost every article comes from Bagh and Dadur, brought hither by Baniahs who have set up shops in camp. Food is consequently somewhat dearer in price than at Jacobabad. With reference to the clothing of the sowar on field service in Beloochistan, the following defects and deficiencies deserve immediate attention. The present kind of trowsers, made of cotton cloth (*doosootie*), is not suited for cold-weather wear. It is well suited for hot-weather use, when the temperature ranges between 80° and 104° in the shade, and it is hardly reasonable to suppose that the same material would answer in the cold weather on field service, when the temperature is frequently below freezing point, with a cold biting wind generally blowing during the night. I would recommend the adoption of trowsers made of some warm material for cold-weather use, and to be worn when the cloth tunic and *neemchas* are worn. I am also of opinion that woollen socks should be issued to the men for use in the cold weather, and warm gloves in addition when on picquet or guard duty. It is well known that the constitutions of the men in the Sind Frontier Force are so impregnated with *malaria*, from long exposure to this poison, that they are, as a rule, ill suited to withstand the rigour of intense cold, such as is experienced in the winter months in Beloochistan. This fact adds greater importance to the subject of suitable clothing during the cold weather, and in the absence of these it becomes a serious matter for reflection whether the maximum amount of efficiency would be attained by the men composing this force, in the event of a campaign during the winter months on and beyond this frontier. Nor is the present head-dress a suitable covering for the head: it affords neither sufficient protection against the sun in the hot weather, nor against the cold in the winter. Apart from this it has another disadvantage, inasmuch as it is not a sufficient safeguard against a sword-cut. In other words, the present head-dress is to a model pugree, such as that worn by Pathans, what a forage cap is to a helmet. For these reasons, I beg to recommend that the head-dress be so modified that, while it will afford sufficient protection against heat in summer and cold in winter, it will at the same time afford protection, to a certain extent, against sword-cuts.

Duties.

6. Duties consist of the usual amount of drills and parades these supply all the regular exercise which the men get.



7. The hospital at Mittri consists of the regulation number of tents, viz., one sepoy of two *páls* each, which at present affords sufficient accommodation, but another tent is wanted for the hospital establishment and stores; this has been indented for. If troops are to be permanently stationed at Mittri, it would be advisable to build a hospital for the accommodation of the more serious cases, as tents do not afford sufficient protection against the cold when a gale of wind blows, as it frequently does, from the north-west, in which direction lies the snow-capped range of the Murree hills.

8. The general health and physique of the men is fair. The climate of Mittri from November to March is comparatively well suited to improve the general health of the men, for malaria is not rife here as at Jacobabad, and the surrounding circumstances are favourable, provided the men are well clad. With this proviso, there is every reason to hope that a periodical change such as this to the troops at Jacobabad will be attended with benefit to their general health.

9. The influence of climate on health must be considered chiefly with reference to the extreme cold in the winter months, which is the only time of the year that troops could conveniently be stationed at Mittri. The intense cold of December gave rise to congestion and functional derangement of the abdominal organs, and this was a fruitful source of dysentery during that month. Of the escort party which proceeded to Quetta, referred to in para. 1, five men were admitted into hospital on their return on account of slight frost-bite of their feet, indicating the extreme cold they were exposed to on the march, and the necessity of providing the men with warm socks for the future. During the hot months, from April to October, the extreme heat, and probably the scarcity of water and its liability to contamination, will render Mittri uninhabitable for any large body of troops. It will be remembered that the epidemic of cholera last year amongst the troops in Beloochistan broke out in the beginning of the hot weather, and has been attributed by Surgeon MacRury, then in charge of the 3rd Sind Horse, to contamination of the drinking water obtained from the river Nara, which is the source of water supply at Mittri. Dr. MacRury states that all the villages on the river suffered from the disease, which must have been conveyed and communicated from one to another from Seehec downwards through Cntchee by means of the drinking water from the river bed, as there are no wells, as a rule, in or near the villages. The water supply in the hot weather being scanty becomes easily contaminated, and epidemics spread with extreme rapidity.

10. The total number treated was 290. Amongst these there were 105 cases of ague, 11 of rheumatism, 14 of syphilis, and 19 of dysentery; 31 cases of injury were treated.

11. Two deaths from pneumonia occurred in January, and one death from ague. The latter was a severe case of malarious poisoning accompanied with extreme anæmia, in the person of a non-commissioned officer who had recently joined the head-quarters at Mittri from the outpost at Tooj. The case was complicated latterly with diarrhœa, brought on by the severe cold of December. One other death occurred after fracture of the leg.

Epidemics. 12. None.

Vaccination and re-vaccination. 13. Primary vaccinations 41, and re-vaccinations 251,—all successful.

14. Ten men were invalided during the year for the following causes:—rheumatic affections three, syphilis one, and old age and general debility six.

15. With regard to treatment I have nothing new to record, except with reference to the so-called "Sind sore." I am now confirmed in the opinion that this form of boil or ulcer is merely a local indication of a constitution undermined by long and continued exposure to malarious poison, and that it can only be combated by the liberal administration of the alkaloids of cinchona bark, combined, if need be, with stimulants, and the local application of soothing poultices in the beginning, and latterly, when the ulcer has cleaned and healing action has begun, having judicious recourse to astringent lotion and strapping. I have also found that dry carbolized cotton wool, so applied as to exclude the action of light and air, is a clean and satisfactory dressing after the system has been sufficiently brought under the influence of quinine.

## H. M.'s 3rd Sind Horse.

JACOBABAD.—In medical charge of Surgeon ELTON BURROUGHS.

Average Strength.....	493	Deaths in Hospital .....	7
Do. Present.....	332·4	Do. out of do. ....	4
Admissions .....	551	Invalided .....	20
Daily Sick .....	12·1	Sick Leave .....	6

Years.	Station.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Jacobabad.....	170·7	3·2	4·1
1875 .....	Do. ....	197·4	3·0	1·1
1876 .....	Do. ....	218·8	4·5	5·6
	Average.....	195·6	3·6	3·6
1877.....	Jacobabad.....	165·9	3·6	2·1

The head-quarters returned on April 18th from Mittri, where they had been stationed for some months. Detachments have been on outpost duty at the various localities mentioned below—Sooie, Guoreanearee, Poolejee, Mittri, Lehra, and Tooj. A troop escorted H. E. the Governor from Sukkur to Jacobabad in December.

2. The lines have undergone no alteration since 1875. The married quarters are quite detached from those occupied by the single men, and they are far too close to the bazaar, of which one may say they form part. The available cubic space for each man is 870 feet. The drainage is carried out in the same manner as it is in the cantonment, viz., by surface drains. The roads are made of dry grass, which after a shower of rain emits a most offensive odour. The lines are kept clean.

3. There are three latrines, each containing twelve pans. The sewage is removed twice a day, and carried into the jungle about three miles out of camp. There are no latrines for the women.

4. The supply of water is plentiful, but, as all the wells are open, the water when delivered by the bhistees contains a great deal of vegetable matter.

5. Grain has considerably risen in price during the past year.

6. Outpost duty seems to have a very injurious effect on the men, as all the men who are sent in sick from outpost duty require a more stimulating kind of treatment than the others, besides which they remain longer in hospital. With the exception of tent-pegging there are no amusements for the men. A gymnasium would not only afford some amusement, but would improve the physique of the recruits.

7. At the present time the sick of the 1st Sind Horse, detachment of the 2nd Sind Horse, and those of the 3rd Sind Horse occupy the same hospital. The latrine is situated five yards from the building, directly under the window of the hospital assistant's dwelling: he is thus unable to use the window as a means of ventilation. The sick of the Rifles are in tents pitched outside the hospital. The new hospital for the 3rd Sind Horse will be ready for occupation at the commencement of the hot weather.

8. On first looking at the men who have been stationed here some time, one particularly remarks the anæmic appearance they present. Many patients who are admitted with various complaints have enlarged spleens; they seem to consider it a most trivial ailment, but all say this enlargement has happened since their arrival in Sind.

9. The admissions for the year numbered 551. The prevailing diseases were—ague 222 cases, dysentery 22, diarrhoea 38, rheumatism 15. There were 6 cases of hypertrophy of the spleen, and 2 of pneumonia. Details of treated. Contusions numbered 100. Three cases of sunstroke occurred.
10. There were 11 deaths—two from diarrhoea, and one each from concussion of the brain, sword-cut (murdered), capital punishment, sunstroke, Mortality and its causes. erysipelas, intermittent fever, shock, and bronchitis. The cause of one was unknown.
11. Primary vaccination has been successfully performed 63 times, and re-vaccination Vaccination and re-vaccination. 8 times.
12. Twenty men have been invalided during the past year, principally for old age and Invaliding and its causes. debility.
13. A slight alteration might be made in the men's boots and head-dress with advantage ; Requirements and recommen- the first are too large, and the latter too small. Latrines should be built for the women. Cross ventilation is required dations. in the lines. Filters are required in the hospital.

**H. M.'s 30th Regiment N. I.**

JACOBABAD.—In medical charge of Surgeon ELTON BURROUGHS.

Average Strength.....	764	Deaths in Hospital .....	13
Do. Present .....	610	Do. out of do. ....	0
Admissions .....	850	Invalided .....	20
Daily Sick .....	25.4	Sick Leave ..	14

Years.	Station.	Rate per cent. to Average Strength Present of		
		Admissions.	Daily Sick.	Deaths in Hospital.
1874 .....	Jacobabad.....	105.9	3.3	2.5
1875 .....	Do. ....	142.1	4.4	2.2
1876 .....	Do. ....	248.8	6.0	7.2
	Average...	165.6	4.6	3.9
1877 .....	Jacobabad .....	139.3	4.1	2.1

The right wing returned from Mittri, under the command of Major Humphrey, in Location and movements. April ; the head-quarters and left wing, under Colonel Mainwaring, marched for Mittri on the 26th October last.

2. The lines are situated to the east of camp ; they are capable of holding a thousand Lines and their surroundings : men ; each man is supposed to have 800 cubic feet of air present condition, hygienic and space. The dwellings are built on the ground. Ventilation otherwise. is good.
3. There is only one latrine, which is used by the prisoners also, but to each of the Conservancy. married quarters one is attached ; these are cleaned twice a day.
5. Grain of all descriptions has risen in price, but a good supply can easily be obtained Food. in the bazaars.
6. The guard duties are very heavy, especially now, when so few troops are in camp. Duties, exercise, and amuse- The favourite amusement is wrestling, but this is only practised ments ; their effects on health. by a few ; one or two admissions into hospital have been the result of falls. There is a gymnasium, and all the recruits have to go through a course.

- Hospital and its immediate surroundings. 7. The old hospital is closed; the sick are at present in tents to the east of the 3rd Sind Horse Hospital. A new hospital with out-buildings is nearly completed.
- General health and physique. 8. There seem to be two classes of men, those who are always coming to hospital and those who never come; the latter are very sturdy-looking men, and are capable, I should say, of standing any climate, whereas the former are anæmic and cachectic-looking; many of those who have been only a short time in the service belong to this class.
- Influence of climate or local circumstances on health. 9. The anæmia, which is common both in European and native, seems to be entirely due to the continual attacks of fever, the consequence of malarial poisoning.
10. The total treated numbered 905. The prevailing diseases were—ague 321 cases, diseases of the lungs 70, dysentery 35, diarrhœa 40, rheumatism 54, syphilis affections 12, and injuries of a trivial nature 127.
- Details of treated.
11. The deaths in hospital were 13—five from pneumonia, and two from diarrhœa, and one each from ague, dysentery, laryngitis, phthisis, meningitis, and debility.
- Mortality and its causes.
- Epidemics. 12. None during the year.
- Vaccination and re-vaccination. 13. Carefully attended to, with satisfactory results.
14. Nineteen men were invalidated for the following diseases—seven each for rheumatism and debility, two each for enlarged spleen and secondary syphilis, and one each for dysentery and curvature of the spine.
- Invaliding and its causes.
- Requirements and recommendations. 15. A latrine is wanted for the single men, as at present they are obliged to use the ground in the vicinity of the lines.

*Inspection of the Troops at Jacobabad by Deputy Surgeon-General JOYNT.*

The troops present at Jacobabad during my inspection (17th January 1878) were the 1st and 3rd Regiments Sind Horse, and Right Wing 30th N. I. (Jacob's Rifles), the remainder of the frontier force being at Mittri.

The general remarks made last year on the sanitary aspect of the station hold good still. The water supply continues of indifferent quality, and the buildings are without suitable plinths. A sufficient supply of good filters is much needed.

Some improvement, however, in the sanitary surroundings of the 1st Sind Horse has been effected by the removal of several decayed structures from the immediate vicinity of their lines; an additional ward (detached) has increased the hospital accommodation of the 3rd Sind Horse. This new building, with its appurtenances, recently completed, presents in many respects a pleasing contrast to earlier contrivances for the accommodation of the sick at this station. It has a good plinth—a point of paramount importance in such a damp and malarious soil, and appears carefully designed to meet, as far as practicable, the requirements of a climate which consists of two seasons—a fiercely hot and a severely cold.

## No. 2 Mountain Battery.

JACOBABAD AND KHELAT.—In medical charge of Surgeon M. L. BARTHOLOMEUSZ, M.B.  
Strength 155.

1. The head-quarters and right half of the battery (97 strong) remained at Jacobabad during the greater part of the year. On the 26th of November this half of the battery marched to Mittri, and is at present encamped there.
- Location and movements.

2. The permanent lines at Jacobabad have been described in previous reports. At  
 Lincs, &c. Mittri the men are living under canvas, like the other troops  
 composing the force at that place. For information on the  
 system of conservancy adopted in camp, the water supply, the quantity and quality of the  
 food, &c., I beg to refer to my report on the 2nd Sind Horse.
3. The total number of cases treated during the year in the right half of the battery  
 Details of treated. amounted to 228, the majority being cases of malarious fever,  
 and the next in order of frequency being cases of bowel com-  
 plaints, contusions, ulcers, and rheumatic affections.
- Mortality. 4. There was one casualty in hospital from pneumonia.
5. Thirty-three men were invalidated, chiefly on account of chronic rheumatism and  
 Invaliding. general debility in men who had been worn out by long service.
6. The remarks in my regimental report, 2nd Sind Horse, with reference to the inade-  
 Clothing. quacy of warm clothing when on service in Beloochistan during  
 the winter, apply equally to the men of this battery.
7. The left half of the battery, 60 strong, left Jacobabad on the 23rd March on escort  
 duty to Beloochistan, and arrived at Nall on the 19th April, where they encamped until the  
 12th of May. On the 13th May they left for Khelat, which place they reached on the  
 23rd May. They remained at Khelat until the 29th July, on which date they marched to Quetta,  
 where they remained until the 6th of November. They left Quetta on the 7th November, and  
 returned to Khelat on the 23rd November. Having remained at Khelat about six days they  
 marched to Mittri, and rejoined the head-quarters on the 10th December.
8. The health of the men suffered considerably at Quetta from attacks of fever and bowel  
 General health and physique. complaints, so much so that a great number of them still  
 remain in hospital.
9. The admissions into hospital during the year amounted to 291, of which 144 were  
 from ague, and 61 from dysentery and diarrhoea, the other most prevalent diseases having  
 been ulcers, chronic rheumatism, and contusions.
10. There was one casualty during the year, from ague.

### Left Wing H. M.'s 1st Sind Horse.

KHELAT.—In medical charge of Surgeon J. McCLOGHRY :—Strength 129·7.

The left wing, consisting of 200 sabres, left Jacobabad on the 17th of March for the  
 Location and movements. purpose of forming part of an escort to the Governor-General's  
 Agent in Beloochistan. Having marched across Cutchi, it  
 proceeded through the Mulla Pass to Nall, where it remained for 23 days. From Nall it  
 left for Khelat, which was reached on the 23rd May. We remained in the Khelat valley,  
 with the exception of a march to Bhagwana and back, until the 25th of November, when we  
 started for Kurrachee, where we are at present under canvas. While at Khelat we occupied  
 three different positions in the valley, one about a mile to the south-east of the city, the  
 second two miles to its north, and the third halfway between the city and the second.

The valley of Khelat is situated in about 29° 2' N. Lat., and 66° 40' E. Long., with a  
 height above sea-level of 7,000 feet. Its approximate dimensions are—16 miles from the  
 Lagani Pass on the north to Teyri hill on the south, the width varying from two to five  
 miles. It is completely shut in by mountains, all of limestone formation, excepting where  
 it communicates by means of "nalas" with neighbouring valleys. It is most open to the  
 west, the direction in which the surplus water makes its way, though the Girani and Leyaret  
 valleys, to the Lora river. The town and citadel, which are situated in the southern extremity  
 of the valley, are in an extremely dirty state, the filth of ages being allowed to remain  
 undisturbed in the thoroughfares, and no attempt whatever at drainage being made. The  
 population is about 12,000 people, consisting of Brahuis, Dehwars (of Persian origin), Pathans,  
 and Hindu traders. The soil of the greater portion of the valley is exceedingly fertile, and  
 contains large quantities of carbonate of lime; it is highly cultivated, chiefly by Dehwars.  
 Almost all the tilled portion of the land is irrigated, it being divided into terraces for that  
 purpose. Wheat, barley, Lucerne grass, potatoes, carrots, cucumber, beet root, and tobacco  
 are largely grown; while the principal fruits are mulberries, apricots, melons, pears, apples,  
 quinces, and grapes. The cultivators do not bestow the same care and attention on their  
 fruit gardens that they do on their field crops, the trees being utterly neglected and allowed  
 to crowd so much together that the fruits never attain their proper size.

2. The water both for drinking and irrigating purposes is exclusively derived from two sources—springs issuing superficially from the foot of the surrounding hills, and from “karazes.” The “karazes” are peculiar in their construction. A shaft is sunk sometimes as deep as thirty or forty feet, generally at the foot of a hill; when water is thus found another is sunk at a distance varying from five to twenty yards from the first, and both are connected by a tunnel; another and another are sunk in like manner, till at length an underground aqueduct three or four miles long is formed, and water brought in the proper direction, till it is raised to a level with the surrounding ground. The water of the “karazes” is not as sparkling as that in the springs, but is, I think, softer; it was preferred to the latter by the men. Both waters contain large quantities of lime salts.

3. Most articles of food were plentiful, and some exceedingly cheap. Wheaten flour was to be had at the rate of from forty to fifty pounds for a rupee; meat one anna per pound, ghee four pounds for a rupee. But condiments, milk, and firewood were expensive; sometimes milk was not even obtainable.

4. The want of stockings amongst a few of the men was felt extremely while on guard duty at night, but the majority possessed them. Stockings and gloves of a thick woollen material are absolutely necessary for men serving at Khelat during the colder months. The trowsers, being made of coarse cotton material, are not at all sufficiently warm for the climate in which the men have served during the last nine months, the cloth ones they formerly wore being preferable. The men who had brought the latter with them on the march were allowed to wear them on night duty.

5. Some of the men joined the officers in games got up in Khelat by the latter, but these were the exception, as there seems to be a prejudice in the regiment against foot games of any sort. Though the duties on the march were sometimes severe, I cannot say that any ill effect was caused thereby. The average number of consecutive nights in bed was six.

6. One tent is utterly insufficient for the use of the wing of a cavalry regiment, especially on the march, and had not the officer commanding the escort lent me a tent from the lines I should have been obliged to treat some of the men in their own tents, which would have been unsatisfactory. For the use of dhooly-bearers a tent of some description ought to be always provided when they accompany troops into Beloochistan. In a standing camp they are generally able to construct huts for themselves, but while marching they have no protection during the night. Several of those who accompanied us on our last march were attacked with fever, bronchitis, &c., on account of being exposed to the intense cold at night.

7. Taking into consideration the facts that the men have been in tents for nine months and a half, that during that time they have been subjected to sudden and great changes of climate, that they have marched about twelve hundred miles, and that now only four men out of one hundred and ninety are in hospital, I can come to no other conclusion but that their general health is excellent. The men are almost all Hindustanis, so that they are characterized more by length of limb and activity than by large chest capacity or size of muscle.

8. The climate of Khelat is peculiarly antagonistic to life under canvas, both on account of the great variation between the daily and nightly temperature, and the power of the direct rays of the sun. The amount of moisture in the air is almost always very small. This excessive dryness, and the presence of a strong wind from the north-west (its prevailing direction), rendered the men very liable to chills, when they returned heated from parade and took off their warm clothing. The following are the averages of monthly temperature and rainfall from June to November:—

	June.	July.	August.	September.	October.	November.*
Average maximum .....	84·5	97·8	94·5	89·6	80·0	67·8
„ minimum .....	53·1	49·8	44·2	42·3	32·2	38·0
„ Dry bulb (9. A.M.)	68·1	80·8	79·6	75·7	65·3	59·5
„ Wet bulb „	53·3	55·6	55·7	53·6	48·5	49·2
Maximum temperature registered during the month ....	98·0	103·9	99·8	96·8	94·2	81·8
Minimum temperature registered during the month ....	45	46·8	38·5	32·5	20·2	29·5
Rainfall .....	None.	None.	None.	None.	66 cents.	1 inch 16 cents.

\* Observations were taken in November up to the 23rd, but not afterwards.

9. There were altogether 303 admissions since the 17th of March, to which ague contributed 151. A great number of those suffering from this

Details of treated.

disease were attacked by bronchitis and congestion of the lungs, and three by pneumonia. This was most particularly the case in the months of October and November, when the cold at nights was intense. The uncomplicated cases yielded readily to cinchonidine or quinine; so mild were some of them, that I am of opinion that they were brought on rather by chills acting on men who had previously suffered from ague, than from any particular malarial poison. A peculiar fact about the attacks of ague is that, with few exceptions, the type amongst the men of this wing was of the quotidian variety, while the Panjab troops almost always were attacked by the tertian or quartan. For diseases of the alimentary canal 57 were admitted into hospital, and a great number of others treated in the lines; in fact I believe that there was not a man in the wing who did not suffer more or less from diarrhœa. It was of the same description as what is known as hill diarrhœa, and was caused by congestion of the liver and bowels. All European Officers in the camp suffered from it also—some very frequently. The treatment I found answer best was two grains of grey powder and three grains of compound rhubarb pill, given once or twice a day, and followed by an iron tonic. The cases of dysentery, with one or two exceptions, were mild, and cured generally by one or two large doses of ipecacuanha. Three cases of pneumonia, six of bronchitis, and one of pleuritis were admitted. In the cases of pneumonia only one lung was attacked, and in all instances they recovered. Injuries of the lower extremities caused thirty-four admissions, the majority of them being slight bruises caused by their horses. The only other case calling for any remark is that of frost-bite. This case occurred while on the march from Khelat to Kurrachee and at a place two marches from the former. The man had been on guard duty during the night without any guard tent, and I suppose that while asleep his foot was exposed without his knowledge. The case was not severe.

10. One case proved fatal. It occurred in an old man who had asked to be sent before the Invaliding Committee. He was admitted for ague, and a few days after was attacked by pneumonia, which rapidly

Mortality and its causes.

proved fatal.

11. None of the men have been sent before an Invaliding Committee this year, owing to their being at such a distance from head-quarters.

Invaliding.

12. The sick carriage of the wing was entirely defective, owing to the want of “kajavas,” and to the weight of the dhooly. In Beloochistan, where

Sick carriage.

the marches are chiefly over the beds of mountain-torrents, the

dhooly-bearers, no matter how good they are, cannot well keep up with a cavalry regiment, when they have to carry the unwieldy dhooly at present used. In addition to the dhooly, wooden camel “kajavas” are also necessary; and when properly made they are quite as comfortable as the dhooly, two or even four men being accommodated in each. Iron “kajavas,” one of which we had with us, are generally useless, on account of their liability to get out of repair, the iron bending when any great strain is put on it. Instead of the dhooly some lighter article should be provided. This is a matter which should certainly be looked after; as, had our sick carriage been severely tested, it would have broken down and thus impeded the movement of the troops.





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STATEMENT.

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STATEMENT showing the SICKNESS and MORTALITY among the NATIVE

N.B.—The regiments are placed as they stood

Regiment.	Station.	Movement during the year.	Average daily sick.	Average daily strength present during the year.	Remained on 1st January 1877.	Admitted during the year.	Total treated.	Discharged cured.	Discharged otherwise.	Died in hospital.	Died out of hospital.	Remaining.	Average daily sick per cent. to average strength.	Ratio per cent. of admissions to average strength.	RATIO PER CENT. OF DEATHS.				Invalided.	
															To treated.	To average strength.	To treated.	To average strength.		
<b>PRESIDENCY DIVISION, ADEN,</b>																				
Detachment, 4th Regiment N. I.	Bombay ...	None.	5.7	134.0	4	128	132	127	3	2	2	...	4.2	95.5	1.5	1.5	1.5	1.5	13	3
20th Regiment N. I.	Do. ...	Proceeded to Baroda on 30th November 1877.	23.1	579.4	28	550	578	450	77	5	7	16	3.9	94.9	0.8	0.8	1.2	1.2	44	32
21st do.	Do. ...	None.	11.5	563.0	10	285	295	262	11	6	5	16	2.0	50.6	2.0	1.1	1.7	0.8	15	9
Details attached to 21st Regiment N. I.	Do. ...	None.	1.8	30.7	3	29	32	16	9	7	...	...	0.6	94.4	21.8	22.8	...	...	...	6
Wing 7th Regiment N. I.	Tanna ...	None.	6.3	293.0	6	218	224	200	9	5	...	10	2.2	74.4	2.2	1.7	...	...	20	4
17th Regiment N. I.	Surat ...	None.	29.8	635.9	14	1,501	1,515	1,468	25	6	4	16	4.7	236.0	0.4	0.9	0.3	0.6	31	25
Detachment, 20th Regiment N. I.	Janjira ...	None.	0.4	17.0	...	18	18	18	...	...	...	...	2.3	105.9	...	...	...	...	...	...
Detachment, 21st Regiment N. I.	Bushire ...	None.	0.6	15.8	1	7	8	7	...	1	...	...	3.8	44.3	12.5	6.0	...	...	...	...
Do.	Bassadore ...	None.	3.0	12.0	1	200	201	199	...	...	...	2	25.0	166.6	...	...	...	...	...	...
Do.	Bagdad ...	None.	0.4	10.0	...	8	8	8	...	...	...	...	4.0	80.0	...	...	...	...	...	...
Do.	On board the steamship "Dal-housie"	None.	0.2	8.0	...	17	17	16	1	...	...	...	2.5	212.5	...	...	...	...	...	...
Do.	Do. "Magdala".	None.	...	8.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do.	Do. "Abyssinia".	None.	...	8.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do.	Do. "Quangtung".	None.	0.2	7.8	...	7	7	5	1	1	...	...	2.6	89.7	14.3	12.8	...	...	...	...
Total...			83.0	2,322.6	67	2,968	3,035	2,896	130	33	18	60	3.6	127.8	1.1	1.4	0.6	0.8	123	79
<b>PRESIDENCY DIVISION, ADEN, (continued)</b>																				
6th Regiment N. I.	Aden ...	Proceeded to Mhow in December.	14.6	644.4	7	346	353	324	12	7	4	10	2.3	53.7	1.9	1.1	1.1	0.6	62	6
4th and 1st Company, Sappers and Miners	Do. ...	4th Co. joined the Head Quarters, and 1st Co. came here in Nov.	1.4	95.1	2	41	43	41	1	...	1	1	1.5	43.1	...	...	2.3	1.1	4	...
Aden Troop	Kharmaksar ...	None.	4.3	87.7	3	159	162	153	7	...	...	2	4.9	181.3	...	...	...	...	3	4
Detachment, 6th Regiment N. I.	Peria ...	Relieved by Detachment 25th Regiment N. I. on 7th December.	0.9	46.6	...	33	33	21	12	...	...	...	1.9	70.8	...	...	...	...	...	...
Total...			21.2	873.8	12	579	591	539	32	7	5	13	2.4	66.2	1.1	0.8	0.8	0.6	69	10
Total Presy., Divn., Aden, and Bombay Marine ...			104.2	3,196.4	79	3,547	3,626	3,345	168	40	23	73	3.2	107.8	1.1	1.2	0.6	0.7	192	89
<b>POONA</b>																				
1st Regiment, L. C.	Poona ...	1st Squadron arrived from Baroda and joined the Head Quarters in December.	12.9	299.0	4	410	414	366	12	2	1	34	4.3	137.1	0.4	0.7	0.2	0.3	16	12
5th Regiment N. I.	Do. ...	None.	18.8	606.0	13	847	860	806	27	5	...	22	3.1	139.7	0.6	0.8	...	...	39	17
8th do.	Do. ...	None.	24.3	631.6	10	951	961	911	12	6	...	32	3.8	152.1	0.6	0.9	...	...	30	11
26th do.	Do. ...	None.	23.5	581.0	26	730	806	773	14	4	1	15	4.0	134.2	0.5	0.7	0.1	0.1	48	12
Sappers and Miners	Kirkkee ...	None.	15.3	375.0	14	411	425	377	13	5	1	30	4.1	109.6	1.1	1.3	0.2	0.2	23	2
Detachment, Poona Horse	Dhulia ...	None.	2.3	105.0	2	52	54	43	2	2	...	7	2.2	49.5	3.5	0.2	...	...	...	...
15th Regiment N. I.	Ahmednagar ...	None.	17.3	585.0	12	593	605	561	15	7	...	22	2.9	101.3	1.1	1.2	...	...	18	6
13th do.	Malegaon ...	Left Wing arrived from Ahmedabad and joined Head Quarters in September.	15.7	618.0	12	662	674	660	39	4	3	31	2.5	107.1	0.6	0.6	0.4	0.4	30	17
4th Rifles	Satara ...	None.	11.4	371.4	3	489	492	463	7	2	...	15	3.0	130.4	0.4	0.5	...	...	47	6
2nd Grenadier Regiment N. I.	Belgaum ...	None.	19.3	631.0	19	356	375	323	23	9	1	15	3.1	56.4	2.4	1.4	0.2	0.1	20	18
14th Regiment N. I.	Do. ...	None.	20.9	593.1	14	439	453	396	36	4	9	17	3.5	73.4	0.8	0.6	1.9	1.5	17	14
Poona Horse	Sirur ...	None.	7.9	319.1	12	174	186	172	8	2	...	4	2.4	54.9	1.1	0.6	...	...	18	8
3rd Regiment N. I.	Kolhapur ...	Left Wing marched to Sholapur in November.	14.4	526.2	13	555	593	548	24	1	...	25	2.7	111.1	0.1	0.2	...	...	17	11
Detachment, 3rd Regt. N. I.	Kaladgi ...	Joined the Head Quarters in December.	3.7	111.2	1	128	129	116	10	3	...	...	3.3	115.1	2.3	2.6	...	...	...	...
19th Regiment N. I.	Sholapur ...	Left Wing marched to Sholapur.	32.1	613.1	6	1,043	1,049	973	26	9	...	36	5.2	170.1	0.8	1.4	...	...	6	7
12th do.	Dharwar ...	A det. at Kaladgi joined the Head Quarters in March.	14.1	648.7	10	521	531	494	11	6	...	20	2.2	80.3	1.1	0.9	...	...	10	3
Detachment, 4th Regiment N. I.	Assirghur ...	None.	7.3	149.2	3	230	233	210	5	1	1	17	4.9	154.9	0.4	0.7	0.4	0.7	6	1
Total Poona Division...			261.2	7,771.6	174	8,671	8,845	8,142	239	72	17	242	3.3	111.5	0.8	0.9	0.2	0.2	345	151

TROOPS serving in the BOMBAY PRESIDENCY during the Year 1877.

in the Army List on the 1st of July 1877.

Hindus.				Mahomedans.				Strength present on 31st December 1877.	Regiment.	Average number of consecutive nights in bed.	Number of Recruits joined during the Year.	CASTES.												Remarks.				
Strength.		Died per cent. to strength in and out of hospital, and on leave.		Strength.		Died per cent. to strength in and out of hospital, and on leave.						Europeans.			Eurasians.			Natives.			Hindus.		Mahomedans.		Others.			
Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.					Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.		Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.
<b>AND BOMBAY MARINE.</b>																												
112	1.8	16	13.5	130	Detachment, 4th Regiment N.I.	3.3	1	1.0	...	...	...	1.0	...	114.0	1	1	17.0	1	1	2.0	...	...	...					
541	1.3	74	4.0	634	20th Regiment N. I. ...	4.7	164	6.6	...	...	...	17.9	1	487.7	3	4	73.8	1	2	...	...	...	...					
390	1.8	161	1.9	576	21st do. ...	5.2	44	7.0	...	...	...	17.0	1	402.0	4	3	141.0	2	1	3.0	...	...	...					
90	7.7	7	...	106	Details attached to 21st Regiment N. I.	...	...	...	...	...	...	1.8	...	25.3	7	...	3.0	...	...	0.6	...	...	...					
281	1.4	21	4.1	311	Wing, 7th Regiment N. I. ...	4.7	...	1.5	...	...	...	2.0	...	269.0	4	...	22.0	1	...	3.0	...	...	...					
677	1.7	63	...	659	17th Regiment N. I. ...	4.1	48	6.0	...	...	...	10.0	...	562.4	6	4	55.0	...	...	8.5	...	...	...					
17	...	...	...	17	Detachment, 20th Regiment N.I.	...	...	...	...	...	...	...	...	16.8	...	...	0.2	...	...	...	...	...	...					
12	8.1	4	...	16	Detachment, 21st Regiment N.I.	0.4	...	...	...	...	...	...	...	11.1	1	...	3.5	...	...	1.2	...	...	...					
10	...	2	...	12	Do. ...	...	...	...	...	...	...	...	...	9.7	...	...	2.3	...	...	...	...	...	...					
5	...	5	...	10	Do. ...	...	3.0	...	...	...	...	...	...	5.0	...	...	5.0	...	...	...	...	...	...					
6	...	2	...	8	Do. ...	...	Every 2nd night.	...	...	...	...	...	...	6.0	...	...	2.0	...	...	...	...	...	...					
8	...	...	...	8	Do. ...	...	...	...	...	...	...	...	...	5.3	...	...	2.2	...	...	...	...	...	...					
5	...	3	...	8	Do. ...	...	...	...	...	...	...	...	...	4.6	...	...	3.4	...	...	...	...	...	...					
6	16.6	2	...	8	Do. ...	...	...	...	...	...	...	...	...	6.5	1	...	1.3	...	...	...	...	...	...					
2,060	1.9	366	2.4	2,593		...	257	22.1	...	...	...	49.7	1	1922.9	27	12	331.7	5	4	18.3	...	...	...					
604	1.7	61	...	631	6th Regiment N. I. ...	4.0	14	6.4	...	...	...	9.8	...	549.0	7	4	79.3	...	...	6.3	...	...	...					
88	1.1	9	...	99	4th and 1st Co., Sappers and Miners	7.8	...	1.0	...	...	...	0.2	...	73.1	...	1	16.6	...	...	0.2	...	...	...					
29	...	63	...	92	Aden Troop	5.0	4	0.8	...	...	...	...	...	23.0	...	...	59.7	...	...	...	...	...	...					
...	...	...	...	...	Detachment, 6th Regiment N.I.	4.0	...	1.0	...	...	...	...	...	41.6	...	...	5.0	...	...	...	...	...	...					
721	1.6	132	...	872		...	18	9.2	...	...	...	19.0	...	636.7	7	5	160.6	...	...	6.5	...	...	...					
2,731	1.8	493	1.7	3,375		...	275	31.3	...	...	...	59.7	1	2619.6	34	17	492.3	5	4	24.8	...	...	...					
<b>DIVISION.</b>																												
231	0.7	159	0.6	431	1st Regiment, L. C. ...	5.3	23	6.0	...	...	...	8.0	...	175.0	2	...	116.0	...	1	...	...	...	...					
544	0.9	98	...	661	5th Regiment N. I. ...	4.7	72	7.0	...	...	...	7.0	...	492.0	5	...	95.0	...	...	12.0	...	...	...					
436	1.1	76	1.3	587	8th do. ...	4.2	68	5.5	...	...	...	17.3	...	476.8	5	...	80.5	1	...	37.0	...	...	...					
572	0.8	73	...	662	26th do. ...	3.7	80	6.0	...	0.4	...	11.4	...	490.2	4	1	73.4	...	...	3.6	...	...	...					
330	1.8	73	...	400	Sappers and Miners	3.0	27	6.0	...	...	...	0.8	...	313.0	5	1	58.0	...	...	3.2	...	...	...					
22	4.5	85	1.1	107	Detachment, Poona Horse	10.2	...	1.0	...	...	...	...	...	21.0	1	...	84.0	1	...	...	...	...	...					
563	1.2	76	...	658	15th Regiment N. I. ...	3.9	36	8.0	...	...	...	9.4	...	593.4	7	...	66.6	...	...	5.6	...	...	...					
536	0.7	73	2.5	623	13th do. ...	10.9	61	7.7	...	0.7	1	8.7	...	463.3	2	2	89.3	1	1	65.0	...	...	...					
129	1.5	22	...	357	4th Rifles	3.5	58	4.2	...	...	...	9.6	...	142.6	2	...	30.8	...	...	191.4	...	...	...					
568	1.4	87	2.3	691	2nd Grenadier Regiment N.I.	3.5	58	6.0	...	...	...	12.0	...	523.0	7	1	74.0	2	...	22.0	...	...	...					
449	1.7	73	2.5	674	14th Regiment N. I. ...	3.8	35	6.4	...	2.6	...	7.2	1	385.1	4	4	72.6	...	2	59.6	...	2	...					
66	...	284	1.5	351	Poona Horse	8.0	33	5.7	...	0.9	...	...	...	61.1	1	...	237.1	1	...	...	...	...	...					
595	0.2	114	...	669	3rd Regiment N. I. ...	3.0	39	5.4	...	...	...	2.2	...	369.1	1	...	101.3	...	...	50.0	...	...	...					
...	...	...	...	...	Detachment, do. ...	3.0	...	0.3	...	...	...	0.3	...	92.7	3	...	15.4	...	...	2.3	...	...	...					
555	1.4	82	1.2	647	19th Regiment N. I. ...	4.0	27	5.6	...	...	...	4.2	...	490.4	8	...	74.0	1	...	41.5	...	...	...					
536	1.1	118	...	697	12th do. ...	4.6	46	5.2	...	2.0	...	12.3	...	497.1	6	...	111.9	...	...	25.4	...	...	...					
198	0.9	21	0.4	165	Detachment, 4th Regiment N.I.	3.2	...	1.0	...	...	...	...	...	97.2	...	1	13.7	1	...	33.3	...	...	...					
6,203	1.1	1,523	0.7	8,446		...	667	57.0	...	6.6	1	133.4	...	15,393.6	63	10	2412.6	8	4	375.4	...	2	...					

STATEMENT showing the SICKNESS and MORTALITY among the NATIVE

Regiment.	Station.	Movement during the year.	Average daily sick.	Average daily strength present during the year.	Remained on 1st January 1877.	Admitted during the year.	Total treated.	Discharged cured.	Discharged otherwise.	Died in hospital.	Died out of hospital.	Remaining.	Average daily sick per cent. to average strength.	Ratio per cent. of admissions to average strength.	RATIO PER CENT. OF DEATHS.				Invalidated.		
															In Hospital.		Out of Hospital.			For discharge the service.	For change of climate.
															To treated.	To average strength.	To treated.	To average strength.			
<b>NORTHERN</b>																					
1st Grenadier Regiment N.I.	Ahmedabad	None.	22.1	666.9	17	629	646	610	17	6	6	13	3.3	94.3	0.9	0.8	0.8	0.8	50		
Squadron, 1st Regiment L.C.	Baroda	From Baroda to Poona in December.	3.1	133.7	...	114	114	111	3	...	...	...	2.2	85.0	...	...	...	...	3		
9th Regiment N. I.	Do.	Proceeded to Bombay in November.	15.2	671.3	8	478	486	433	18	13	5	22	2.2	71.2	2.6	1.9	1.0	0.7	27		
22nd do.	Do.	Left Baroda for Ahmedabad in November.	36.3	645.6	20	794	814	727	50	15	...	22	5.6	122.9	1.8	2.3	...	...	58		
Squadron, 2nd Regiment L.C.	Rajkot	None.	4.5	141.0	3	91	94	83	7	2	1	2	4.1	64.5	1.0	0.7	1.0	0.7	6		
No. 1 Mountain Battery	Do.	None.	2.8	117.0	3	72	75	64	7	1	...	3	2.6	63.1	1.3	0.8	...	...	12		
Head Quarters, 7th Regt. N. I.	Do.	None.	8.9	306.0	18	212	230	195	27	2	5	6	2.9	63.2	0.8	0.6	2.1	1.6	15		
28th Regiment N. I.	Do.	None.	15.0	622.6	15	377	392	349	34	4	1	14	2.4	60.5	1.0	0.6	0.8	0.1	25		
11th do.	Bhuj	None.	29.7	684.1	26	738	764	639	37	5	1	53	4.3	107.8	0.6	0.7	0.5	0	25		
2nd Regiment L. C.	Deesa	None.	7.4	318.0	1	210	214	210	3	1	...	...	2.2	66.0	0.4	0.3	...	...	13		
18th do.	Do.	None.	11.8	611.1	6	389	395	372	14	...	...	9	1.9	63.6	...	...	0.7	0.4	23		
23rd do.	Mhow	Left Wing left Indore and joined the Head Quarters in June.	23.1	651.4	13	804	817	774	23	1	2	16	3.5	123.5	0.4	0.6	0.2	0.4	23		
25th do.	Do.	Left for Aden in November, & a Wing marched to Indore in June.	24.5	633.5	17	844	861	814	33	2	1	12	3.7	133.2	0.2	0.3	0.1	0.1	10		
24th do.	Mehidpur	A Wing proceeded to Agar, and the Head Quarters arrived at Agar from Neemuch in March.	16.5	649.6	20	722	742	682	41	8	6	11	2.4	111.0	1.0	1.2	0.8	0.9	19		
3rd Regiment L. C.	Neemuch	None.	9.8	329.8	3	343	346	331	6	...	...	9	3.0	103.9	...	...	...	...	11		
10th Regiment N. I.	Do.	Left Wing joined the Head Quarters in February.	38.7	637.7	66	1211	1277	1215	43	1	3	18	6.1	189.9	0.1	0.1	...	0.4	22		
16th do.	Nusseerabad	None.	22.2	668.0	83	831	914	794	107	3	1	10	3.2	124.4	0.3	0.4	0.1	0.1	29		
Squadron, 3rd Regiment L.C.	Do.	None.	2.8	114.0	4	118	122	116	4	...	1	2	2.6	103.5	...	...	0.8	0.8	2		
Total, Northern Division...			204.4	8601.3	326	8977	9303	8540	474	67	30	222	3.4	104.3	0.7	0.7	0.7	0.4	363		
<b>SINDH</b>																					
29th Regiment N. I.	Kurrachee	None.	17.1	615.2	25	411	436	413	7	3	2	13	2.7	66.8	0.6	0.4	0.4	0	15		
27th do.	Hyderabad	None.	27.0	636.2	61	635	696	637	21	4	1	34	4.2	99.8	0.5	0.6	0.1	0.1	49		
30th do.	Jacobabad	Wing left Mitree and joined the Head Quarters in June.	25.4	610.0	55	850	905	854	15	13	...	23	4.1	139.3	1.4	2.1	...	...	29		
1st Sind Horse	Do.	Left Wing marched to Khehat in March.	19.2	358.9	20	709	729	695	17	3	5	14	5.2	197.5	0.4	0.8	0.6	1.3	10		
2nd do.	Do.	Proceeded to Mitree in October, leaving a part at Jacobabad.	11.5	284.0	14	276	290	246	16	4	4	24	4.0	97.1	1.3	1.4	1.3	1.4	10		
3rd do.	Do.	Marched from Mitree, and arrived at Jacobabad on 18th April.	12.1	332.4	20	551	571	534	16	7	4	14	3.6	165.9	1.2	2.1	0.7	1.1	20		
No. 2 Mountain Battery	Do.	Proceeded to Mitree on 26th October, keeping half Battery on escort duty from March.	16.2	155.0	16	503	519	480	16	2	...	21	10.3	324.5	0.3	1.2	...	...	33		
Total, Sind Division...			128.5	2991.7	211	3935	4146	3859	108	36	16	143	4.2	131.5	0.8	1.2	0.4	0.4	157		
Grand Total...			788.3	22561.0	790	25130	25920	23886	1039	215	95	780	3.4	111.3	0.8	0.9	0.3	0.4	1057		

ROOPS serving in the BOMBAY PRESIDENCY during the Year 1877.

Strength	Hindus.		Mahomedans.		Strength present on 31st December 1877.	Regiment.	Average number of consecutive nights in bed.	Number of Recruits joined during the year.	CASTES.												Remarks.				
	Used per cent. to strength in and out of hospital, and on leave.		Strength.						Used per cent. to strength in and out of hospital, and on leave.		Strength.		Christians.			Hindus.		Mahomedans.		Other.					
													Europeans.	Eurasians.	Natives.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.		Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.
													Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.	Average daily strength.	Died in hospital.		Died out of hospital.	Average daily strength.	Died in hospital.	Died out of hospital.
<b>DIVISION.</b>																									
552	1.8	76	1.2	646	1st Grenadier Regiment N. I. Squadron, 1st Regiment L. C.	5.3	83	5.1	1.0	17.2	574.6	4.6	74.1	2.0	1.0	...	...	...	...	...					
563	2.4	78	3.5	676	9th Regiment N. I.	6.0	50	6.5	2.0	11.7	577.9	9.5	77.7	3.0	2.0	...	...	...	...	...					
525	2.8	80	...	629	22nd do.	7.5	47	6.3	0.2	15.6	542.7	15.0	79.5	...	7.6	...	...	...	...	...					
61	4.9	48	...	130	Squadron, 2nd Regiment L.C.	9.3	...	1.0	...	2.0	61.0	2.1	57.0	...	21.0	...	...	...	...	...					
92	1.0	19	...	120	No. 1 Mountain Battery	4.0	13	2.0	...	1.0	89.0	1.0	19.0	...	8.0	...	...	...	...	...					
181	2.7	23	4.0	251	Head Quarters, 7th Regt. N.I.	6.0	52	5.0	...	13.0	239.0	2.3	50.0	...	4.0	...	...	...	...	...					
488	0.6	83	2.4	595	28th Regiment N. I.	11.1	35	6.5	...	10.7	513.2	3.0	83.1	1.1	10.6	...	...	...	...	...					
619	0.8	74	...	697	11th Regiment N. I.	7.9	21	6.4	...	...	609.5	5.4	70.0	...	4.6	...	...	...	...	...					
202	0.4	127	...	332	2nd Regiment L. C.	7.0	19	5.0	3.0	...	191.0	1.0	124.0	...	...	...	...	...	...	...					
556	0.5	83	...	647	18th Regiment N. I.	4.1	57	6.2	1.9	8.5	520.0	...	8.7	...	...	...	...	...	...	...					
637	0.7	116	1.7	687	23rd do.	5.5	56	8.7	3.8	19.8	511.3	3.1	106.2	1.1	10.3	...	...	...	...	...					
476	0.6	59	...	545	25th do.	10.1	48	6.0	...	4.6	532.7	2.1	89.8	...	6.4	...	...	...	...	...					
567	2.2	84	1.1	685	24th do.	11.5	52	8.3	...	16.9	540.2	8.5	78.4	...	14.1	...	...	...	...	...					
213	...	132	...	346	3rd Regiment L. C.	3.4	28	4.9	...	1.0	202.8	...	125.9	...	...	...	...	...	...	...					
525	0.5	106	0.9	656	10th Regiment N. I.	4.5	35	7.4	...	12.1	470.7	1.2	115.8	...	39.7	...	...	...	...	...					
559	0.7	102	...	685	16th Regiment N. I.	16.4	39	7.8	...	11.0	555.1	3.1	89.9	...	12.0	...	...	...	...	...					
95	...	40	2.5	138	Squadron, 3rd Regiment L. C.	5.3	1	1.7	...	2.7	76.9	...	34.4	...	...	...	...	...	...	...					
6,830	1.3	1,329	0.9	8,465		...	636	95.9	10.9	147.8	6,006.7	59.22	1,394.6	7.6	141.3	...	...	...	...	...					
<b>DIVISION.</b>																									
76	...	521	0.9	600	29th Regiment N. I.	5.7	43	6.1	...	2.0	82.9	...	527.3	3.2	3.0	...	...	...	...	...					
117	0.8	516	0.7	647	27th do.	4.0	51	5.1	...	2.5	129.4	1.0	502.3	3.1	2.0	...	...	...	...	...					
263	2.7	365	1.6	628	30th do.	8.3	63	3.1	...	...	264.9	7.0	345.1	6.0	...	...	...	...	...	...					
36	2.7	370	1.0	406	1st Sind Horse	5.3	20	6.6	...	...	35.7	1.0	323.2	2.5	...	...	...	...	...	...					
77	2.6	345	1.7	427	2nd do.	5.0	28	5.2	...	5.0	54.8	1.1	224.2	3.3	...	...	...	...	...	...					
67	4.4	210	3.3	282	3rd do.	4.1	33	4.5	...	5.0	54.9	...	272.5	7.1	...	...	...	...	...	...					
106	1.8	59	...	166	No. 2 Mountain Battery	5.8	55	2.0	...	...	110.0	2.0	44.0	...	1.0	...	...	...	...	...					
742	2.1	2,386	1.5	3,154		...	293	32.6	...	14.5	732.6	12.4	2,233.6	24.12	6.0	...	...	...	...	...					
6,516	1.4	5,736	1.2	23,440		...	1,561	246.8	17.5	405.4	15,852.5	168.63	5,538.1	44.26	747.5	...	...	...	...	...					

Includes the numbers of the Det. at Dwarka.

## Summary of the Statistics for the Year 1877 and seven previous years.

Years.	Average Daily Strength Present.	Admissions into Hospitals	Ratio per cent. of Admissions to Average Strength.	Average Daily Sick per cent. to Average Strength.	Deaths in Hospitals.	Ratio of Deaths in Hospitals to Average Strength.	Ratio of Deaths in Hospitals per cent. to Admissions.	Deaths out of Hospitals and on Leave.	Total Deaths in and out of Hospitals.	Ratio per cent. of Deaths to the Average Strength.	Ratio per cent. to Strength of Hindus who died in and out of Hospitals and on Leave.	Ratio per cent. to Strength of Mahomedans who died in and out of Hospitals and on Leave.	Ratio per cent. to Strength in-validated for discharge the Service.	Ratio per cent. to Strength in-validated for change of climate.
1877	22,561·0	25,130	111·38	3·49	215	0·95	0·85	95	310	1·37	1·39	1·22	4·51	2·03
1876	22,583·3	22,918	119·20	3·79	247	1·09	0·90	49	296	1·31	1·14	1·57	4·27	2·17
1875	22,819·0	25,475	111·63	3·88	213	0·93	0·83	66	279	1·22	1·30	1·18	4·27	1·83
1874	22,750·0	26,601	116·92	3·68	176	0·77	0·66	72	248	1·09	0·99	1·12	4·60	1·73
1873	22,967·0	29,035	126·86	3·82	165	0·71	0·56	81	246	1·07	.....	.....	4·35	2·11
1872	22,903·0	36,209	158·09	4·54	226	0·98	0·62	95	321	1·40	.....	.....	3·98	2·13
1871	22,959·0	29,733	129·50	4·31	236	1·03	0·79	97	333	1·45	.....	.....	3·12	2·10
1870	22,715·0	28,380	139·08	4·33	191	0·84	0·68	95	286	1·26	.....	.....	3·71	2·33







APPENDIX II.

RETURN showing the Admissions and Deaths, &c., amongst the Native Troops of the Bombay Presidency at the several Stations for the Year 1877 as compared with 1876.

Division.	1877.							1876.						
	Regiment.	Station.	Average Strength.	Average Daily Sick.	Admissions.	Deaths in Hospital.	Regiment.	Station.	Average Strength.	Average Daily Sick.	Admissions.	Deaths in Hospital.		
Presidency Division, Aden and Bombay Marine.	Detachment 4th Regt. N.I.	Bombay	134.0	5.7	128	2	Detachment, 4th Regt. N.I.	Bombay	136.0	5.6	100	2		
	20th Regiment N.I.	Do.	579.4	23.1	550	5	20th Regiment N.I.	Do.	594.5	42.7	722	13		
	21st do.	Do.	563.0	11.5	285	6	21st do.	Do.	568.5	12.5	283	3		
	Details attached to 21st Regiment N.I.	Do.	30.7	1.8	29	7	Details attached to 21st Regiment N.I.	Do.	28.0	1.9	16	5		
	Right Wing, 7th Regt. N.I.	Tanna	293.0	6.3	218	5	Right Wing, 7th Regt. N.I.	Tanna	276.0	4.2	171	2		
	17th Regiment N.I.	Surat	635.9	29.8	1,501	6	17th Regiment N.I.	Surat	631.6	35.0	1,194	15		
	Detachment, 20th Regt. N.I.	Janjira	17.0	0.4	18	...	Detachment, 20th Regt. N.I.	Janjira	17.0	0.1	6	...		
	Detachment, 21st Regt. N.I.	Bushire	15.8	0.6	7	1	Detachment, 21st Regt. N.I.	Bushire	16.0	0.7	18	...		
	Do.	Bassadore	12.0	3.0	200	...	Do.	Bassadore	12.0	2.7	198	...		
	Do.	Bagdad	10.0	0.4	8	...	Do.	On board the Steamship "Dalhousie."	8.0	0.2	10	...		
	Do.	On board the Steamship "Dalhousie."	8.0	0.2	17	...	Do.	On board the "Magdala."	8.0	.....	...	...		
	Do.	On board the "Magdala."	8.0	.....	...	...	Do.	On board the "Abyssinia."	8.0	.....	2	...		
	Do.	On board the "Abyssinia."	8.0	.....	...	...	Do.	On board the "Quangtung."	8.0	.....	...	...		
	Do.	On board the "Quangtung."	7.8	0.2	7	1	Do.	Aden	642.6	14.3	425	4		
	6th Regiment N.I.	Aden	644.4	14.6	346	7	6th Regiment N.I.	Aden	642.6	14.3	425	4		
	4th and 1st Co., Sappers and Miners.	Do.	95.1	1.4	41	...	4th and 5th Co., Sappers and Miners.	Do.	104.2	2.2	48	...		
	Aden Troop	Kharnaksar	87.7	4.3	159	...	Aden Troop	Kharnaksar	89.5	6.1	158	1		
	Detachment, 6th Regt. N.I.	Perim	46.6	0.9	33	...	Detachment, 6th Regt. N.I.	Perim	50.0	0.3	9	...		
							Do.	On board the Steamship "Hugh Rose"	9.1	0.2	5	...		
		Total...	3,196.4	104.2	3,547	40		Total	3,207.0	128.7	3,363	45		

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Division.	Regiment.	Station.	Average Strength.	Average Daily Sick.	Admissions.	Deaths in Hospital	Regiment.	Station.	Average Strength.	Average Daily Sick.	Admissions.	Deaths in Hospital	
Poona Division.	1st Regiment N. L. C.	Poona	299.0	12.9	410	2	1st Regiment N. L. C.	Poona	291.0	10.4	282	3	
	5th Regiment N. I.	Do.	606.0	18.8	847	5	5th Regiment N. I.	Do.	589.0	22.1	1,106	...	
	8th do.	Do.	631.6	24.3	951	6	8th do.	Do.	684.0	28.1	1,311	2	
	26th do.	Do.	581.0	23.5	780	4	26th do.	Do.	598.0	30.2	793	5	
	Sappers and Miners	Kirkee	375.0	15.3	411	5	Sappers and Miners	Kirkee	360.3	7.3	169	3	
	Detachment, Poona Horse.	Dhulia	105.0	2.3	52	2	Detachment, Poona Horse.	Dhulia	102.0	3.1	41	1	
	15th Regiment N. I.	Ahmednagar	585.0	17.3	593	7	15th Regiment N. I.	Ahmednagar	584.0	13.6	396	4	
	13th do.	Malegaon	618.0	15.7	662	4	Hd.-qrs., 13th Regt. N. I.	Malegaon	348.3	7.7	309	2	
	4th do.	Satara	374.4	11.4	489	2	4th Regiment N. I.	Satara	322.6	6.7	363	2	
	2nd Grenadier Regt. N. I.	Belgaum	631.0	19.3	356	9	2nd Grenadier Regt. N. I.	Belgaum	630.0	16.7	402	5	
	14th Regiment N. I.	Do.	598.1	20.9	439	4	14th Regiment N. I.	Do.	569.1	17.4	466	5	
	Poona Horse	Sirur	319.1	7.9	174	2	Poona Horse	Sirur	314.5	10.1	247	1	
	3rd Regiment N. I.	Kolhapur	526.2	14.4	585	1	3rd Regiment N. I.	Kolhapur	547.0	16.0	544	2	
	Detachment, 3rd Regt. N. I.	Kaladgi	111.2	3.7	128	3	Detachment, 3rd Regt. N. I.	Kaladgi	89.8	1.2	63	...	
	19th Regiment N. I.	Sholapur	613.1	32.1	1,043	9	19th Regiment N. I.	Sholapur	631.5	10.7	326	3	
	12th do.	Dharwar	648.7	14.1	521	6	12th do.	Dharwar	642.8	13.6	303	4	
	Detachment, 4th Regt. N. I.	Asirghur	149.2	7.3	230	1	Detachment, 4th Regt. N. I.	Asirghur	144.7	5.5	128	...	
		Total...		7,771.6	261.2	8,671	72	Total...		7,448.6	220.4	7,249	42
	Division.	1st Grenadier Regt. N. I.	Ahmedabad and Sadra.	666.9	22.1	629	6	1st Grenadier Regt. N. I.	Ahmedabad and Sadra.	693.0	29.3	861	11
		Squadron, 1st Regt. N. L. C.	Baroda	133.7	3.1	114	...	Wing, 13th Regt. N. I.	Ahmedabad	291.2	12.5	434	3
9th Regiment N. I.		Do.	671.3	15.2	478	13	Squadron, 1st Regt. N. L. C.	Baroda	144.8	6.6	205	...	
22nd do.		Do.	645.6	36.3	794	15	9th Regiment N. I.	Do.	662.0	11.9	452	2	
Squadron, 2nd Regt. N. L. C.		Rajkot	141.0	4.5	91	2	22nd do.	Do.	647.6	22.1	634	6	
No. 1 Mountain Battery		Do.	117.0	2.8	72	1	Squadron, 2nd Regt. N. L. C.	Rajkot	145.0	3.9	98	1	
Hd.-qrs., 7th Regt. N. I.		Do.	306.0	8.9	212	2	No. 1 Mountain Battery	Do.	120.0	3.0	84	1	
28th Regiment N. I.		Do. & Dwarka	622.6	15.0	377	4	7th Regiment N. I.	Do.	280.0	12.5	375	1	
11th do.		Bhuj	684.1	29.7	738	5	28th do.	Do. & Dwarka	612.6	23.3	677	13	
2nd Regiment N. L. C.		Deesa	318.0	7.4	210	1	11th do.	Bhuj	678.2	19.2	485	2	
18th Regiment N. I.		Do.	611.1	11.8	389	...	2nd Regiment N. L. C.	Deesa	315.4	7.4	246	1	
23rd do.		Mhow & Indore	651.4	23.1	804	4	18th Regiment N. I.	Do.	627.0	16.2	508	3	
		Total...		7,771.6	261.2	8,671	72	Total...		7,448.6	220.4	7,249	42

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Northern	25th do.	...	Mhow & Indore.	631.9	32.5	824	1	
	24th do.	...	Mehidpur	378.0	33.2	1,074	3	
	3rd Regiment N. L. C.	...	Neemuch	333.8	10.2	412	1	
	10th Regiment N. I.	...	Do.	651.6	18.6	787	7	
	16th do.	...	Nusseerabad	653.1	39.2	1,309	4	
	Squadron, 3rd Regt. N. L. C.	...	Do.	106.4	5.2	177	1	
		...	Sadra	16.0	0.3	16	...	
		...	Agar	243.0	14.9	360	2	
		...	Burdachoky	67.2	7.4	261	1	
		...	Total...	8,937.3	365.5	11,177	68	
	Sind District.	29th Regiment N. I.	...	Kurrachee	627.2	18.0	597	5
		27th do.	...	Hyderabad	655.0	33.0	900	7
		30th do.	...	Jacobabad	577.9	34.8	1,433	42
1st Sind Horse		...	Do.	325.2	14.3	687	5	
2nd do.		...	Do.	340.0	11.8	399	2	
3rd do.		...	Do.	369.7	17.7	809	21	
No. 2 Mountain Battery		...	Do.	95.4	7.6	299	10	
		...	Total...	2,990.4	142.2	5,129	92	
		...	Grand Total...	22,819.0	772.7	25,475	213	
		...		22,819.0	850.8	25,475	213	
		...		22,819.0	772.7	25,475	213	
		...	Grand Total...	22,819.0	772.7	25,475	213	

## APPENDIX III.

COMPARATIVE STATEMENT showing the Health of the Native Troops in the Four Divisions of the Bombay Presidency.

	1877.							1876.							
	Average Strength.	Admissions	Deaths.	Average Daily Sick.	Ratio per cent. of Admissions to Average Strength.	Ratio of Deaths per cent.		Average Daily Sick per cent. to Average Strength.	Average Strength.	Admissions.	Deaths.	Average Daily Sick.	Ratio per cent. of Admissions to Average Strength.	Ratio of Deaths per cent.	
						In Hospital.	To Admissions							In Hospital.	To Admissions
Presidency Division. {	2,322.6	2,968	33	83.0	127.8	1.1	1.4	3.6	2,320.7	2,723	40	105.8	117.3	1.4	1.6
Bombay Circle. ...															
Aden ...	873.8	579	7	21.2	66.2	1.2	0.8	2.4	886.3	640	5	22.9	72.2	0.7	0.5
Poona Division ...	7,771.6	8,671	72	261.2	111.5	0.8	0.9	3.3	7,448.6	7,249	42	220.4	97.3	0.5	0.5
Northern Division ...	8,601.3	8,977	67	294.4	104.3	0.7	0.7	3.4	8,937.3	11,177	68	365.5	125.1	0.6	0.7
Sind Division ...	2,991.7	3,935	36	128.5	131.5	0.9	1.2	4.2	2,990.4	5,129	92	142.2	171.5	1.7	3.1
Total...	22,561.0	25,130	215	788.3	111.3	0.8	0.9	3.4	22,533.3	26,918	247	856.8	119.2	0.9	1.0
															3.7



