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REPORT

ON

The Station, Barracks, and Hospitals of Bangalore,

By

ROBERT S ELLIS, C B,

President, Sanitary Commission

1 The inspection of this important station was commenced on the 7th September 1864, as detailed in the inspection report of the King's Dragoon Guards' Hospital. Subsequently to this, and previous to a complete examination of the

Date of Inspection.

Military buildings, I was obliged to proceed on duty to the Neilgherry Hills, and afterwards to Masulipatam, and the completion of the whole Report on the station has been in consequence much delayed

2 In this report, the Barracks, Hospitals, Family quarters and all Regimental buildings, &c, are first considered in detail—and at the end of the report for each Regiment, recommendations are submitted for the consideration and orders of Government.

Method to be adopted in this Report

Regimental accommodation detailed

3 In a summary, general observations are drawn up regarding the different items of accommodation (as Barracks, Hospitals, &c.) of the whole station, and rules regarding Barrack and Hospital accommodation, Water supply, Drainage, &c, are proposed for definite sanction by Government.

General recommendations regarding whole Station.

4 In submitting this report, I have been anxious to point out errors in existing buildings and arrangements not only that these defects may be as far as possible remedied, but with a view to general principles on these points being clearly laid down, to assist Medical Committees and Engineers in designing new buildings

5 I may here state for the information of Government that I have been privately placed in possession of the earliest published copy of the remarks, of the Royal Commissioners for Barrack and Hospital Improvement, on Dr Leith's report on the Sanitary condition of the Bombay Army, and that I have, as far as possible, framed my observations in accordance with the recommendations of that Commission.

Recommendations of the authorities in England have been complied with

6. The recommendations of the Commission are as follows :—

(1) That each station be carefully examined by competent Sanitary and Engineering officers, and that a careful survey be made, and a well-digested scheme for improving the station be prepared and submitted for sanction. The scheme to include—

(2.) Levelling, filling-up, paving, and otherwise improving the surface-drainage of the station.

(3.) Drainage and water supply, including sub-soil drainage, house drainage, filtration, and distribution of water over the station.

- (4) Improving existing Barracks and Hospitals, including raised floors, with ventilation beneath, or providing upper floors for sleeping rooms, in localities where it may be necessary to do so
- (5) Ventilation of Barrack-rooms and Hospital-wards, on the principles laid down in our "Suggestions" Improvements in lighting Barracks and Hospitals
- (6) Fixing, by regulation, the superficial and cubic feet to be allotted per bed in Barracks and Hospitals, the amount being regulated according to the healthiness or otherwise of the locality, on the principles laid down by the Royal Commission In doing this, rooms or wards unfit or doubtful for occupation should be excluded And the amount of additional Barrack and Hospital accommodation necessary to admit of the regulation being complied with, should be stated
- (7) Sub-dividing long Barrack-rooms and Sick Wards, so as to have no more than from 20 to 24 beds per room, and providing that each room is completely cut off from the others, and ventilated separately
- (8) Improved latrines, water-closets, and urinals for Barracks and Hospitals
- (9) Improved and extended ablution and bath accommodation for Barracks and Hospitals
- (10) Improvements in Cook-houses, Hospital kitchens, and cooking apparatus
- (11) The provision of sufficient accommodation for exercise, recreation, and instruction in the way of gymnasia, work-shops, reading and day rooms, soldiers' gardens, covered ball Courts, &c.

7 I believe that in few stations in the Presidency, except in Bangalore, has any complete scheme been prepared for "the improvement of the station," contemplated in para 1 of these recommendations But it may be not unreasonably expected that this subject will engage the early attention of Cantonment Committees, when these are instituted as proposed in the Military Cantonment Act I trust that the necessity of accurate surveys of Military and Civil stations may be speedily recognized, as they form the great basis upon which all schemes for conservancy, drainage and water supply and distribution must be planned

8 I am happy to be able, however, to state that Bangalore is in some respects far in advance of almost all towns in Southern India, and that both the Military and Civil Authorities have vied with one another in attempting to promote the improvement of the town and its proper conservancy. The improved condition of the Bangalore station is due to Mr Bowring, the Commissioner of Mysore, and Major-General the Hon'ble Augustus A. Spencer, C. B. These Officers have received the most cordial assistance and valuable co-operation from Dr. Mackenzie, C. B., the Deputy Inspector-General of the Division; and Captain Cole, in charge of the Civil portion of the station. I am much indebted to all these gentlemen for the valuable information afforded to this Commission and for the ready willingness with which they accepted all suggestions offered by us

9. Regarding the surface drainage and conservancy of the station as of extreme importance, I took the opportunity of my visit to examine in detail all that had been done by the Municipality as regards Drainage, Water supply, removal of Sewage, and the general conservancy of the town

10 The following Extracts from Reports by Dr Mackenzie, C. B., and Major Sankey, will satisfactorily show what has been done in respect to these matters I quote them here as bearing upon the question of the general conservancy of the station. The conservancy of the Barracks will receive special notice afterwards.

Extract from the Inspection Report by Deputy Inspector-General W. Mackenzie, C. B., M. D.

"In spite of the representations which have been made on the conservancy of this station, very few towns in India appear to have received the same amount of consideration in regard to Sanitary arrangements, and I cannot but think that the misconceptions, which have obtained publicity on this subject, arise from simple ignorance of facts In the first place the conservancy of the Cantonment and Bazaars is carried out with a large Establishment at an annual cost to the Mysore Government of Rs 14,400"

2nd "The jurisdiction of the Municipal Committee extends over an area, on a rough calculation, of about 14 square miles, which is divided into 5 Districts, each under charge of an European Overseer"

3rd "Manure pits have been established at a distance from Cantonment, to which the whole of the sweepings of the streets and side drains are removed daily"

4th "Five new double latrines—that is for both males and females—have been constructed within the past year, bringing up the total of these public conveniences to the number of 12, they are much used and are all daily thoroughly cleansed out and washed"

5th "About 400 yards of drains have been lately constructed or re-laid in the bazaars, and provision has been made in the Budget, just submitted, for the years 1864-65 for the complete repair, &c., of the whole of the drains throughout the town during the approaching official year."

6th. "New masonry built market places have been erected"

7th "A large portion of ground leading down the centre street of the principal bazaar has been set apart for gardens for the use of the sepoys, by which the bazaar is well opened out and free perfusion of air throughout the district secured."

8th. "Slaughter houses, on an approved model, exist at the North-west side and quite in the suburbs of the Town"

9th "A large portion of swampy, marshy ground underneath the Shoolay tank covering an area of 9 acres and 1,087 yards, lying in the close proximity of the Foot Artillery Barracks on the West side, and about 1/4 of a mile to the North of the new Barracks at the Race Course, has been re-claimed and converted into Soldiers' Gardens, in which several of the men of the Battery and 66th Regiment, find profitable and healthful recreation Vegetables of every variety, Native and European, are grown in great perfection, and portions are very tastefully laid out in flower plots of much beauty. All this, with the energetic supervision of the Municipal Committee, give good assurance of eventual effective working"

10th On the subject of the drainage, the present Officiating Chief Engineer of the Mysore Commission has been good enough, at my request, to draw up a short statement, copy of which I beg to append to my inspection Report"

11 The following is Major Sankey's Report alluded to in Dr Mackenzie's Remarks, and it shows briefly the accomplished and projected improvements in the Drainage of the station

1st "From the peculiar conformation of the ground in the neighbourhood of Bangalore, there are three distinct drainage areas, the first and most important being that, which includes the Cantonment Bazaar, the old Light Cavalry Lines, the present Dragoon and Infantry lines, and the village of Ulsoor, the second, the district of Shoolay, and the third the Fort and Pettah of Bangalore"

2nd "In addition to the obvious advantage of providing in a systematic manner for the drainage of the first named area, it was sufficiently apparent that the scheme, whatever it should be, must in the first place cut off the sewage of the Cantonment Bazaar before reaching the Ulsoor tank, the water of which being used by both the troops and the inhabitants of the bazaar had hitherto been contaminated by its reception."

3rd. "Very great difficulties attended the consideration of the question, as in the first place it was clear that to cut off completely the whole of the storm waters flowing down the

"bazaar channel would simply deprive the tank of half its supply, and in the second place that there was no possible means of securing any addition to the water supply of the station. Years of investigation having in vain been devoted to the subject by such men as Sir A. Cotton, Colonel Green, and other experienced Officers."

4th. "It is needless to show in detail, how these difficulties were got over, or rather promised. Suffice it to say, that a large oviform sewer has been constructed for upwards of $\frac{1}{2}$ of a mile in length, and passing under the bed of the Ulsoor tank, delivers the sewage into an open masonry channel, which again is succeeded by another one delivering the filth eventually into a tank $3\frac{1}{2}$ miles away from the Cantonment."

5th. "Though the flushing arrangements are of necessity imperfect, they are the very best, I believe, which could be devised, and as the flow of the sewage is assisted by the great slope of the ground, the slightest fall of rain effectually sweeps the sewer and open drain perfectly clean. So clear indeed is the channel at all times, that hardly any trace of offensive smell can be detected even on the edge of the open channel, and none whatever a few yards off."

6th. "It is true the upper drains of the bazaar itself and some other ducts connected with the Barracks, are not affected directly by these large drainage works, and from the impossibility of procuring a supply of water for flushing, it will probably be always difficult to put them on a thoroughly satisfactory footing, yet as the first consist of stone, with a good slope, and are being improved, and as the second are proposed to be dealt with by the introduction of the Dry System, I have every reason to think that before long, the whole arrangements will be as complete, as is possible, under the circumstances."

7th. "With reference to the drainage of the second area, viz., the district of Shoolay as estimate is entered in the Budget of 1864-65 for introducing such improvements as at present appear to be required. Here again the same difficulties occur with reference to water supply, and hence the arrangements must, of necessity, consist of a species of compromise, but like the others above described, they will be as effective as possible. Large sums have already been expended in improving this quarter of Bangalore, in other respects directly affecting its Sanitation."

8th. "Regarding the drainage of the Fort and Pettah, a very complete scheme of drainage, and very costly, I may add—has already been submitted for the consideration of the Government of India, and will probably be ere long sanctioned for execution."

12. The several places alluded to in Major Sankey's Report are shown in the accompanying map from which also may be gathered the relative position of many of the public buildings both Civil and Military.

13. It is desirable before entering into the details of inspection briefly to notice certain subjects which directly affect the health of all classes, such as the climate and the Water supply of Bangalore.

14. I do not deem it necessary here to allude to the topography of the place as ample information on this subject is in the possession of Government. But I may allude to the great importance of Bangalore as a Station, owing to the large Military force constantly stationed there (1,800 to 2,000 men) and as the Head Quarters of the Mysore Commission, and a most popular Sanitarium for the greater part of Southern India.

15. From its position and elevation, Bangalore is exposed to the beneficial influence of both the N. E. and S. W. Monsoons. It is situated in Latitude $12^{\circ}57'$ North, Longitude $77^{\circ}38'$ East, and is 3,000 feet above the level of the Sea. The distance from Madras is about 200 miles, though both Road and Rail are somewhat longer, but the direct connection with the seat of Government and the possibility of accomplishing the journey in twelve hours render Bangalore deservedly popular, not only with invalids, but with all persons able to leave the oppressive climate of the Presidency Town for the bracing air of the Mysore Plateau. The surface of the Mysore country is studded with Hills of various sizes, and in these many of the Rivers irrigating the low country take their origin. Some of these Hills rise to an altitude of 4,000 to 4,500 feet, and might possibly afford sites for Sanitaria were such required.



Geervanahully

Light Cavalry Parade Ground

2600 FT

Kilhully

Ulsoor Tank

Solitary Hills
Ice House

INFANTRY BARRACK

OLD DRAGOON BARRACKS

Horse Lines

RIDING SCHOOL

Hospital

TRINITY CHURCH

ROYAL ARTILLERY BARRACK

Dumloor Tank

Shoolay Tank

Parcherry

Parade
NEW DRAGOON BARRACKS

BRIGADE GROUND

Riding School

MAP A
SHOWING RELATIVE POSITIONS
OF
MILITARY BUILDINGS
AT
BANGALORE.

SCALE
100 200 300 400 500 600 FT

Office of Sanitary Commission H B Montgomery M D Secy
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16. Although generally temperate and pleasant, and with a climate somewhat resembling that of England, there are portions of the Mysore country which are undoubtedly feverish, and the Yelwall Range (as noted in my Report on the Mysore Native Lines,) possesses an unenviable pre-eminence in this respect

17. The Eastern and Western Hill Ranges distant 60 to 80 miles, tend to break the force of the Monsoons, and although heavy showers are frequent, rain is rarely of long continuance and by no means equal either in duration or intensity, to the monsoon rains of the adjoining low lying country of the Eastern or Western Coasts

18. The rainfall at Bangalore is so fairly distributed over the months from March to October inclusive, that even at the height of the hot weather season (May to July) the Cantonment continues to preserve its verdure little impaired. The air is usually cool at night and sometimes in the morning is exceedingly cold, the thermometer being registered at 69° as an average in the month of December, and occasionally as low as 52° in the morning Gneiss Granite and Hornblende Gneiss are abundant.

Water is naturally plentiful both in tanks and wells, but the well water is often brackish

19. The Meteorological tables in Appendix A. will sufficiently indicate the leading features of the climate and their probable influence upon public health.

20. The climate of the year 1863 was seasonable and calculated to conduce to the public health. The rainfall was somewhat in excess of that shown in 1859, and amounted to 32 inches and it fell during 91 days.

Dr Mackenzie thus reports — "The highest reading of the Barometer was 26.75 in January, November, and December, and the lowest 26.45 in June, July, September, and October. The highest reading of the Thermometer in the Sun was 117° in April, the lowest 32°. The mean temperature was 79°. The mean deduced dew point was 67°, and the mean degree of humidity 82°."

21. During the prevalence of the S. W. Monsoon (May to September) the wind was from that quarter. Similarly during the N. W. Monsoon the wind was from that direction becoming E. in January and February and then variable until May.

22. In this cool and agreeable climate the health of the Troops was good and they "enjoyed a remarkable immunity from serious disease"

23. Individual cases of unhealthiness arose in connection with particular causes, but these were fortunately of a remediable character and of trivial importance, and in one of the Regiments the death-rate was as low as 14 per thousand and effect of climate was equally evidenced by the eventual improvement in health of the 66th Regiment who had previously become much debilitated by prolonged residence in the enervating climate of the Western Coast.

24. Perhaps one of the best tests of the salubrity of this climate is the appearance of children of all ages who present the same ruddy appearance that characterises them in England, and the men of the European Regiments much more resemble their comrades at home than the pale and debilitated Soldiers stationed in the plains of India.

25. The water supply of Bangalore is chiefly dependent upon wells in public and private compounds and upon the Ulsoor and Shoolay tanks.

An analysis of these waters has been made, and it shows results which are on the whole satisfactory. Any of the waters reported on would, if boiled previous to use, be freed from much of the suspended matter to which their opacity is to be referred.

Chemical Analysis of Water used for drinking, &c.

red, and ordinary filtration if carefully conducted would remove the suspended impurities. The low degree of temporary and permanent hardness is satisfactory and may be accepted as a proof of the suitability of the water for cooking and drinking.

26 It is believed that much of the alleged impurity of the water of the Ulsoor tank was formerly due to its receiving both surface and sewage drainage from the adjacent Barracks and Horse Lines of the King's Dragoon Guards, but the measures adopted for the drainage of these places by Major Sankey seem to have been eminently successful in removing this great source of impurity, and the water is now of good quality.

27 During the progress of my inspection of this station I visited the reservoirs in the course of erection on the Ulsoor Rock situated in the middle of the tank of the same name. Large Chambers of solid masonry are here built into which water will be lifted

Public Water Works
from the Tank by steam power, and thence passed through filtering beds into large iron pipes by which it will be conveyed to the new Barracks in course of erection on the Race Course

28. This method of filtration is much to be recommended, but it does not, in the opinion of this Commission, obviate the necessity of providing suitable filters in all Barracks and Hospitals. An analysis of various waters at Bangalore has been submitted by Dr Wyndowe, the Chemical Examiner to Government, and if filtration of the water when raised from the Ulsoor tank is efficiently performed, and if this process is repeated immediately before its use, the water of this tank will be fit for human consumption.

This Analysis is printed *in extenso* as Appendix B of this Report

29. At one part of the Bazaar much inhabited and largely resorted to by cattle, the water of one well became so offensive that it ceased to be drinkable. A very ingenious method of obviating

Filtering strata round well
the entrance of impurities clearly due to surface drainage was adopted. The well was dug round to a considerable depth, and a deposit of sand and charcoal was laid down so as to cut off the immediate contact of the earth from the walls of the well. Any percolation which now occurs passes through a purifying medium, and the result of this has been very remarkable. The well has once more become sweet and is freely and by choice resorted to by natives who, above all other people, are exceedingly fastidious in regard to the water they use, and who possess great powers of discrimination in detecting impurities and ill flavor in water.

30. Although a good deal of ornamental planting in private grounds and in road avenues has been carried out, yet there is little or no jungle; and large trees are exceptional outside the Station.

Vegetation of station.
English flowers and vegetables are produced here in great perfection, as will be seen in subsequent portions of this Report; the Soldiers both European and Native have been induced to cultivate land in this way with manifest advantage to their own health and the salubrity of the neighbourhood adjoining their Barracks and Lines.

31. The vicinity of the station may now be said to be free from swamps or low jungle likely to generate miasmata, but a portion of the Ulsoor tank was formerly, and some of the Shoolay tank is still, somewhat offensive in the months of February and March, owing to the exposure of decaying vegetable matter resulting from the low and shallow water becoming evaporated, and from the absence of rain.

32 Surface drainage must continue to run into these sheets of water, but it may be perhaps found that by restricting their area and deepening the water bed not only can the annual storage of water be increased, but also its loss by evaporation be diminished. This has been done to a certain extent in one part of the Ulsoor tank where a good space of ground has been reclaimed and converted into a nursery of trees for the Department of Public Works.

33. I have entered thus fully into the question of water supply and climate as in both respects Bangalore is exceptional to almost all Military stations in Southern India. And, as regards climate, a full consideration of its peculiarities induces this Commission to sanction some variation from the standard of accommodation (for other than Hill stations in India) in Barracks and Hospitals.

34. I now proceed to notice in detail the various buildings occupied by the several Corps at Bangalore. Before doing so, however, I may explain that owing to the non-completion of the new Barracks on the Race Course, and in consequence of other circumstances there was at the time of my visit a good deal of confusion as regards the occupation of different public buildings. Thus some of the 66th Regiment of Europeans were located in the Dragoon Barracks. The Artillery were under treatment in an hospital that has been condemned, some of the Foot Artillery were on the Race Course and some in their own Barracks.

35. The Barracks of the 66th have been condemned and are therefore less minutely described than they would otherwise have been. The new family quarters for the Cavalry and Artillery on the Race Course are not completed; and several of the more important buildings here are unfinished and some of them can only be remarked upon from the designs submitted to this Commission by His Excellency the Commander-in-Chief.

36. It may therefore be well to consider the different groups of buildings as nominally occupied and to indicate any future changes either already sanctioned or now proposed by this Commission. The accompanying plan of the Cantonment shows the relative position of all localities and buildings alluded to in this Report. (Map A.)

MILITARY BUILDINGS ON THE RACE COURSE.

37. On a high lying piece of ground situated to the South of the Ulsoor Tank a number of Military buildings are now being erected which will when completed form one of the finest Barracks in India.

The buildings are one-storied but with good basements, the floors being 2½ feet above the ground.

38. The accompanying Plan B. will explain the relative positions of all the buildings either completed, in process of erection, or merely designed. The Barrack Rooms are eight in number and occupy two sides of a square, being, however, well separated and having a free current of air in all directions. These Barracks are intended for occupation by the European Cavalry Regiment, and a portion of the Artillery—and it was proposed to erect an hospital in the several wings of which the men of these two arms of the service were to be accommodated. It therefore becomes necessary to fix authoritatively what number of men can be placed in the Barracks and how far the proposed hospital is calculated to meet the requirements of both Cavalry and Artillery.

39. Before this can be done it must be decided by Government what superficial area is required per man in well-raised and well-ventilated Barracks in a mild and healthy climate such as I have before described at this Station.

According to the decision of the Supreme Government 90 feet of superficial space is required in the Plains and 77 in Hill Stations.

40. In the Report of this Commission upon the Military Hill Station at Wellington I had before perusing Colonel Crommelin's Memoranda on Barracks recommended 75 feet of superficial space as sufficient on the Hills, and this Commission still considers this to be ample. But at Bangalore a greater allowance of space must be given both

in Barracks and Hospitals, and a medium rate of accommodation be fixed between Barracks on the Hills and on the Plains. After careful consideration this Commission is inclined to fix upon eighty-five square feet of superficial area as sufficient for Bangalore

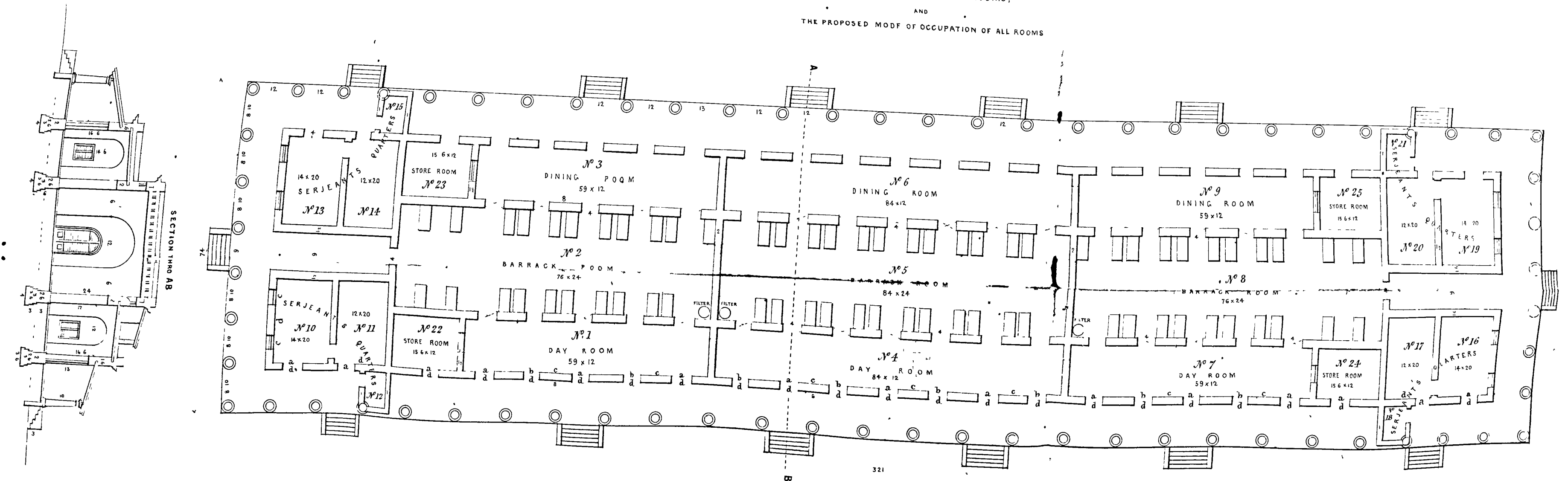
41. Another point to be considered in fixing an allotment of men to these Barracks is the recommendation of the Home authorities that long Barracks should be sub-divided so as not to contain more than 21 to 24 men in each apartment—(vide paras. 6 and 7 of recommendations, on page 2 of this Report)

42 The plan of the Race Course Barracks can fortunately easily be altered so to conform to these suggestions, and in accompanying Plan C the position of all cots is shown, giving to each man 85 square feet superficial and from 1,824 to 2,016 cubic contents.

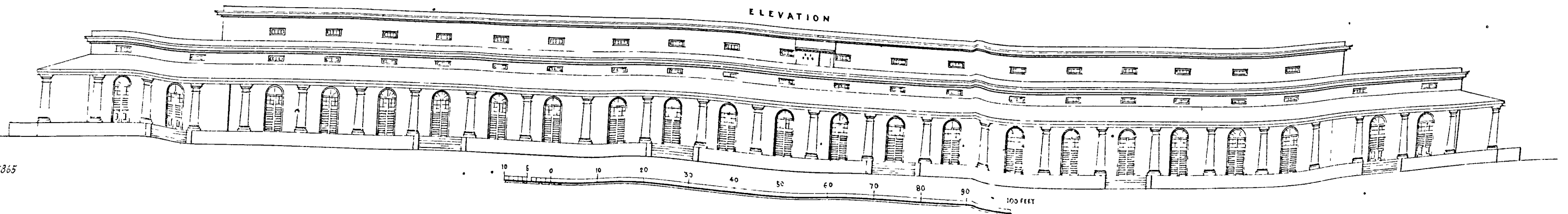
43. The following tabular statement will show the exact numbers now contained in these Barrack Rooms of which 6 are now completed, from which it will be seen that there is no serious overcrowding, so far as the men are concerned; but the families and the Band occupy the verandahs of some of these Barracks as a temporary measure, until their own quarters are constructed.

The sixth Barrack shown as not occupied as such in the following return was at the time of our inspection used as an Hospital.

PLAN C
 SHEWING RELATIVE POSITION OF 66 COTS
 IN
 NEW RACECOURSE BARRACK BLOCK AT BANGALORE
 SUB DIVIDED INTO BARRACK ROOMS,
 AND
 THE PROPOSED MODE OF OCCUPATION OF ALL ROOMS



REFERENCE
 a OPEN DOORS
 b FIXED DOORS
 c FLOOR VENTILATORS
 d SWINGING WINDOWS



15

Total No to be accommodated at 85 square feet.	528
--	-----

66 Men and 4 Serjeants can be comfortably accommodated with the approved allowance of room in a single block 3 Day-rooms, one in front of each small Barrack room, and three Dining rooms can also be allotted to one troop of Cavalry

By this arrangement the views of the Home authorities will be as fully as possible carried out and all sanitary requirements sufficiently met

45 For purposes of reference in this and other Reports, I submit (in Appendix C) a detailed statement of the numbers of men of all ranks to be provided with Barrack accommodation. It will be seen that 66 cots will eventually be somewhat in excess of the total requirements of a troop of Cavalry. But as the 18th Hussars have only recently landed in India, it will probably be some time before the full percentage of married men will be reached

46 It was proposed, I was informed, to provide in the 8 Barrack blocks, for the accommodation of one Regiment of Cavalry and two Batteries of Artillery. But this cannot be done if the standard of space which has been authoritatively laid down is observed, or even according to the reduced standard which is, in the opinion of this Commission, sufficient in such a climate as Bangalore

47 When the Cavalry is accommodated, only one remaining block will be available for the Artillery. It will therefore be necessary to construct three new blocks of a similar size to those finished or under construction, in order to afford the required accommodation for the Artillery consisting of two Batteries

48 Each Battery has of Corporals, Gunners, and Drivers 137 men, and of these 12 per cent. may be roughly estimated as married. As each block will contain 66 unmarried men, the addition above described will be necessary to complete the four blocks to be occupied by Artillery

49 If in the new blocks the orders of the Supreme Government were followed out regarding upper storied Barracks capable of containing a Troop or Company, then three upstairs rooms should be provided, and the lower apartments be used as Day and Dining rooms only

* As shown in Appendices C and D, the strength of one Battery amounts to 137 men, and this reduced by 12 per cent of married men would leave 121 men to be placed in the unmarried Barrack or 242 in all, in addition to the necessary increase that must be made to the married quarters. Of these 242, 60 (one quarter) could be accommodated in the 8th block remaining unoccupied after the Cavalry were accommodated, and it will be necessary to erect 3 new blocks of corresponding dimensions. But in this computation it is assumed that 12 per cent of the Corporals and Rank and File are married, while practically it has been found that of the Cavalry only 8.9 per cent and of the Infantry only 8.6 per cent avail themselves of the privilege afforded them of marrying up to 12 per cent. The more correct plan therefore of estimating the actual average proportion likely to be married would be to obtain a return for several years showing the same details as are here afforded by a return dated 1st May 1864

	Staff Serjeants	Serjeants	Rank and File
Engineers	20	85	0
Artillery	91	0	145
Cavalry	64	7	89
Infantry	69	4	86

The following statement will therefore show the method of computation of Barrack room requirement of each troop of Cavalry and Battery of Artillery

Arm.	Total strength	Deduct Serjts. with separate accommodation	Remaining	Deduct for married at say	In Barrack Block
Troop of Cavalry	72	4	68	9 per cent = 6	62 in 3 rooms in 1 block.
Battery of Artillery	145	8	137	12 " " = 16	121 in 6 rooms in 2 blocks

50 At Bangalore, however, and more particularly on the Race Course, if additional Troop Barracks are erected, this Commission see no objection to the repetition of the present Barrack Block subdivided as described above. The total lengths of the wards might, however, admit of a slight reduction if only 60 unmarried men have to be provided for

51 Hospital accommodation will also be required for these men, and this Commission has examined with great care the site and plan proposed for the European Cavalry and Artillery Hospitals. The site is well chosen, but there are many and serious objections to the plan of the Hospitals. The purport of our remarks on it (Vide Appendix E) have been already submitted to His Excellency the Commander-in-Chief, who has been pleased to order the discontinuance of the works until a final decision is arrived at regarding the principles of Hospital construction for European Troops

52 This Commission had not, when drawing up the letter alluded to in last paragraph, considered in detail Colonel Crommelin's papers on the subject of Hospitals for Europeans

53 The views of this Commission on Colonel Crommelin's reports were laid before Government in my letter No. 605A, dated 31st March (Appendix F)

54 Although deferring to Colonel Crommelin's great experience in this matter, this Commission believe that their suggestions on Colonel Crommelin's plan contain important improvements and are deserving of consideration before a final decision is passed on the Bangalore Hospital

55 Although the Government in their order dated 24th November on the Report submitted by this Commission on the Old Dragoon Hospital at Bangalore were not prepared at that time to accept the suggestion made by this Commission as to the advantage of substituting, at a large station like Bangalore, a General European Military Hospital in lieu of several District Regimental Hospitals, I would venture (as the construction of the New Hospitals on the Race Course for the Artillery and Cavalry has been stayed) again to press on His Excellency the Commander-in-Chief the advantages of a single Military Hospital for the whole of the European troops at Bangalore

56. These are briefly—

(I) That the Executive Staff of one Hospital is comparatively much less in number and expense than that of several Hospitals widely separated

The advantages of it

(II) That by providing distinct pavilions for different corps all interference with Regimental discipline could be avoided

(III) That a single set of Administrative rooms, as Surgery, Committee room, Operating room, &c, would suffice, and that, at Bangalore, an admirable site would be afforded for instituting a General European Hospital

(IV) That the site occupied by the present Dragoon Hospital is highly objectionable, and the proposed site on the Race Course is within a reasonable distance of these Barracks

(V) That as the present old Dragoon Hospital requires to be considerably enlarged so as to make it sufficient for a full Infantry Regiment, and as this will be a source of considerable expense it would be much better that this should be incurred in completing one large Hospital, constructed on scientific principles, than in making additions to the old Dragoon Hospital; for

if these additions are designed on the principles now recommended by Colonel Crommelin they could not be made to agree in style with the Hospital which it is proposed to assign to the Infantry Regiment who will soon occupy the old Dragoon Barracks

57 The decision of Government on the views expressed by this Commission on Colonel Crommelin's plans and recommendations must regulate any conclusion to be arrived on the subject of the proposed Hospital on the Race Course whether it be a General Military European Hospital or one for Artillery and Cavalry only

Views of this Commission regarding Hospital construction

58 The various subsidiary buildings on the Race Course, Cook-house, Wash-houses, Workshops and Quarters for Non-Commissioned Officers, &c., were all carefully examined by us, and the plans of them fully discussed by the whole Commission after our return to Madras

Subsidiary Buildings

59 The following observations with reference to them were submitted in great part to His Excellency the Commander-in-Chief through the department of the Quarter Master General

59 The Canteen will be well situated in the centre of the Race Course Plateau, nearly equidistant from the several Barracks and Sergeants' Mess and Library.

Proposed Canteen

60 The general arrangement and proportions of this building seem well calculated for its intended use. The size of the chief room seems also sufficient for the probable number of men who will resort to it. But as a whole Cavalry Regiment and a large number of Artillery will have to be accommodated, and as they generally resort to the place about the same time in the day, I would suggest that in lieu of (as is apparently intended) permitting the men to go for their supply of Liquor to the three small arched windows, opening from the Serve-out room into the main apartment and the adjoining Verandahs, a large arch should be thrown between the two rooms and a counter (say 4 feet high, 20 feet long and 2 in depth) be erected under this arch. If men could have access to a long counter like this, much of the struggling and confusion usually witnessed in Canteens might be avoided and no liquor need be taken into the Verandahs. Thus interchange of liquor, &c., could be avoided, and the men who get liquor would be more easily kept under observation

Proposed slight alteration

61 A hinged iron grating to turn up when the Canteen is open, and afterwards to be folded down, could, of course, be easily constructed, and the additional air thus admitted to the Serve-out room would tend to prevent the heavy and disagreeable smell usually observed in these places. The centre of the Counter should be made to open when required to the width of the length of a large Cask, as according to the present plan (if correctly drawn) all casks have to be introduced into the Serve-out room through windows

Improvement in Ventilation

62 At the time of our inspection the Provost yard was only partially erected, and on examination of the plan of it this Commission found it necessary to remark "that no indication was given of any means of admitting fresh air into the cells other than by openings 16 feet from the ground," and it was added, "possibly barred non-cell doors are intended, but these would somewhat prevent that entire seclusion which is contemplated in strictly solitary confinement, and as all the doors, facing inwards, are exactly opposite to one another, this difficulty of securing strict seclusion is rendered greater." But I have since learned with pleasure that although not shown

in the plan due precautions had been taken to ensure ventilation and on examination at a later date, and when the building was nearly completed, the cells were found to be good and well-ventilated rooms.

63 There is, however, one fault in the design for them that should be avoided in places of this kind, namely, that only one privy was provided for the 20 prisoners

Latrine arrangement not approved

64 This Commission is of opinion that separate and distinct Latrine accommodation should be provided for each cell, so as to prevent the necessity of the men having to be marched to and from the Privy room to meet the calls of nature. There are some difficulties in effecting this but it should be done if possible.

65 The apartments for Library and Recreation Rooms are situated very centrally and in a convenient position for all men in Barracks. The rooms are well ventilated and airy, and well suited to their intended use. But as quiet is essential to the perfectly comfortable use of a Library and as a Recreation room may be more or less noisy, I think that the connecting door-way should be closed up. As the two rooms are well supplied with doors, I believe this closing up of one door-way would in no degree interfere with its ventilation.

Library and Recreation room

66 The adjoining Sergeant's Mess is very neatly and tastefully fitted up, and is calculated to promote the comfort of this class of Non-Commissioned Officers.

Sergeant's Mess

67. A small Cook-room and Privy are to be attached to the Sergeant's Mess. The Cooking Range is after the native fashion, but as the use of this room will probably be confined to the preparation of tea, coffee, soup, &c., it would not be advisable to recommend any more extensive building or more costly apparatus

Out-buildings, Cook-Rooms

68. The plan of the Privy showed a small building of brick and chuam, with masonry partitions between the seats. This Commission would prefer to see this building composed in great part of corrugated zinc and iron worked on the dry earth system. A modification of the design forwarded with my letter No 403 dated 12th December 1864, would at small cost meet the end in view

Privy.

69 The same observations apply to the plan of the Privy proposed for the Library. In these as in all Privies a Urinal should be provided and worked with sifted earth. A recess as for an ordinary closet seat should hold a vessel of sheet iron containing a sufficient quantity of dry sifted earth, and into this vessel directly, the men should pass the urine. To prevent the surrounding ground being wetted through carelessness, the urine tub should stand on a paved surface covered with a layer of dry sifted earth.

Privy for Library

Urinal required

70 In the morning—at midday—on each evening, the vessel should be removed and carried to a distance where its contents should be buried or otherwise disposed of; it should be replaced by another clean vessel $\frac{1}{2}$ filled with fresh earth. These vessels should be well painted inside and outside with coal tar once or twice a week, and as occasion offered should be exposed to sun heat when they are perfectly empty.

Conservancy of Urinals.

71 A double Privy—each side to be provided with a urinal, would occupy less space be more sightly and be more easily worked than the two separate buildings designed, for the Serjeant's mess and library which are close together

72 The Guard room Privy proposed is open to much objection both as to the materials of which it is composed and the heavy masonry screen wall behind it Here, again, a urinal is provided at the end of the passage formed between this wall and the Privy itself This is an objectionable arrangement The Privy and Urinal should be in one apartment and the passage in rear of the seats should be covered and provided with receptacles for deodorized excreta and vessels for storing fresh earth This alteration would convert it from a Privy on the Punjaub system to one on the principle recommended by this Commission A very small shed attached to the Privy would afford sufficient room for storing a few days' supply of Earth and Poudrette

73 It is proposed to erect Married quarters for the Cavalry and Artillery in five blocks. Three of these blocks are designed to accommodate 15 families, and two to accommodate 7 families, each Each of these quarters consists of two rooms, one 16 x 14, and the other 12 x 8 This latter room is in reality the back verandah enclosed. This plan for family quarters does not appear as good as that suggested by Colonel Crommelin, which would give two rooms measuring 16 x 14, and 14 x 10, with verandahs both in front and at the back At Bangalore the married quarters on the present plan will have verandahs in front only The subsidiary buildings of these quarters are also open to the objection of being too close to the sleeping room

74 The close proximity of Cook-house and Privy ought to be avoided if possible; and this might be easily done by building them at opposite sides of the small compound in rear of the houses The Privy and Cook-houses, respectively, of adjoining houses might be contiguous, and thus the distance from the main buildings to these out-houses could be somewhat increased

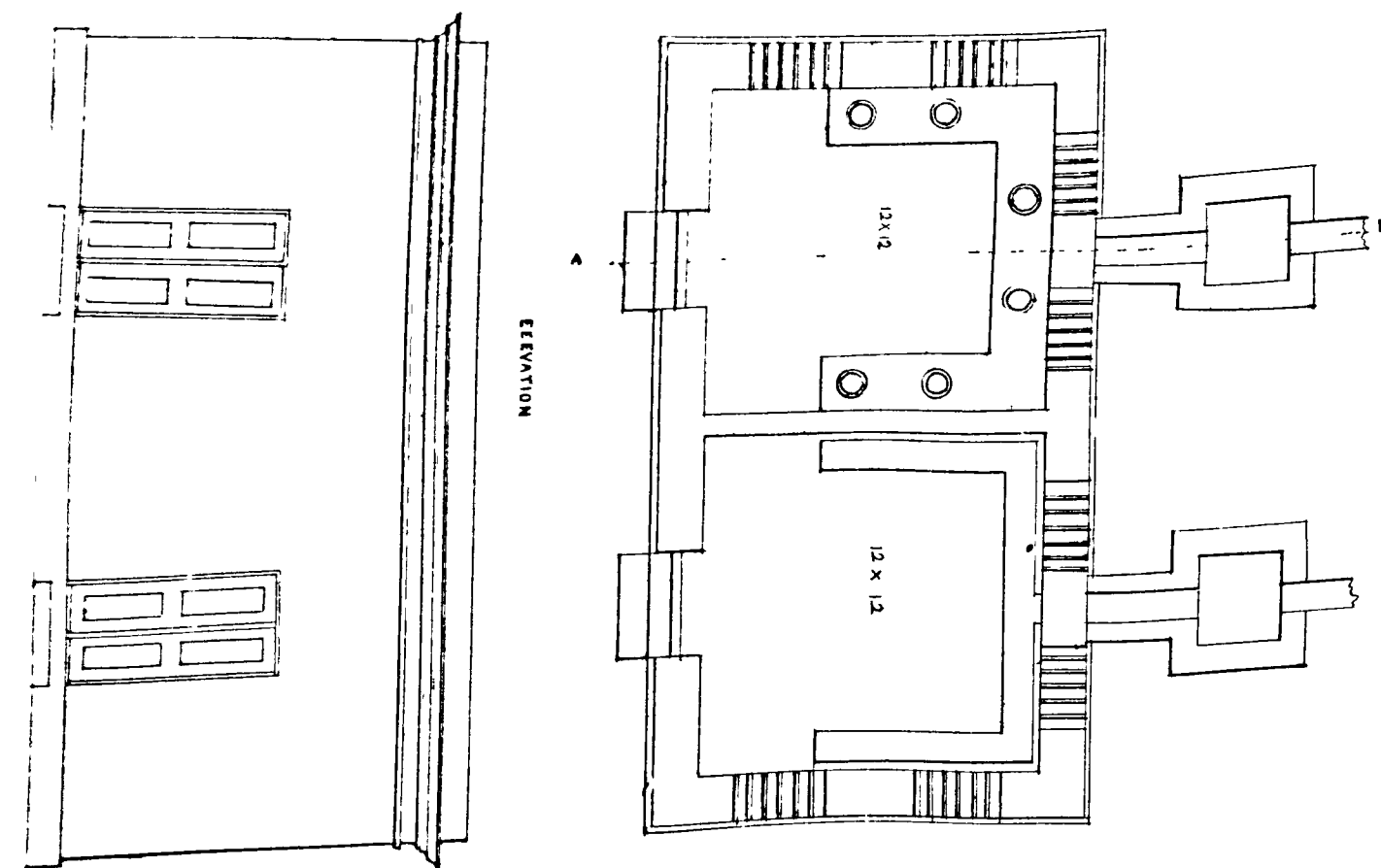
75 If the Privies are suitably built they might be worked on the dry earth system, with rear openings—or a receptacle for Poudrette might be made adjacent to the Privy, which could be emptied by the Scavenger's carts. Similarly a receptacle for kitchen waste stuff, &c., might be erected outside and all refuse from the Cook-room might be discharged into it from a "shoot" or sloped opening in the rear wall of the Cook-room

76 If possible the compound should be enlarged so as to remove these out-offices from close proximity to the sleeping room; and the door in the rear wall of the compound, now shown in the plan, might be dispensed with altogether, or if considered necessary it might open directly into the Cook-room. A space of only 6 feet now exists between this latter building and the only window of the one sleeping apartment of some of these quarters as now erected

77 The observations contained in last para regarding the unnecessary proximity of Cook-rooms applies to the Troop Serjeants' quarters and I have to submit similar recommendations regarding them

Here however there would be no difficulty in introducing the door in the rear wall

PLAN
OF A
WASH HOUSE FOR A BLOCK OF 7 MARKED QUARTERS
FOR ARTILLERY
AT THE NEW DRAGOON BARRACKS ON THE RACE COURSE
AT BANGALORE



15
between the out-buildings. It is to be regretted that in these plans the back room and passage are only 10 feet in height at some parts. The back bed room 12 x 8 is (with its average height of 11½) scarcely more than sufficient for occupation by one adult.

78 The plan for the Urinary and Wash-house attached to these quarters showed a combination of out-buildings that is highly undesirable. A Urinary to be inodorous must be strictly dry, and thus it can never be if it is either flushed out by, or in close proximity to, a Wash-house.

79 In my previous remarks on this subject (vide para 69) I have dwelt upon what appear to this Commission should be the principles and materials of construction of these places. The design sent to the Commission was the usual standard plan of the Punjab system, and the urine vessels were merely the air tight receptacles first designed by Dr Hathaway; they simply retain the urine until the vessel is removed in the evening. Urine thus kept is always more or less offensive, and I would suggest the substitution of non receptacles partially filled with sifted earth which will continue inodorous until thoroughly saturated with urine.

80. Due care should be taken to remove the foul water from the Wash-houses to a considerable distance from the vicinity of the Barracks.

Wash houses

Water with soap and organic matters in it is known to prove highly offensive if allowed to remain stagnant in chinam receptacles. The pit shown in the proposed plan might be entirely dispensed with and an open channel would effectually remove all water flowing from the Bath rooms. The V shaped granite channels so common in Bangalore would be well suited for this purpose.

81. The condition of the Wash-houses in use at the time of our inspection generally was not satisfactory. They were large apartments with tubs and a granite ledge for basins (portable). I think these large rooms might with great advantage be sub-divided into a Basin-room and a Bath-room. In the latter two reclining tubs, a shower bath and a small urinal should be erected, the latter to be cleaned out twice daily, and only to be used by persons bathing.

82 A plan of some other proposed wash-houses was laid before this Commission, and they reported to His Excellency the Commandant-in-Chief regarding them that—

“The tile work ventilation openings 3 x 2 in the wash-houses, four in a block, are placed in a line 4½ to 6½ feet from the ground, and not only unnecessarily expose the persons washing to partial observation from outside, but also expose in face, neck, and chest to draughts of air. The openings should not in any place fall below a line 6½ feet from the ground.

“The basins are to be put on ledges of wood, only 2 feet from the ground. These should be so raised that the bottom of the basins should be not less than 3 feet from the ground line for adults, and 2 feet for children. The basin openings are only 12 inches in diameter. A larger sized basin would be better, and if granite slabs could be substituted for wood, they might be found little more costly and much more durable.

“The pit for receiving foul water has no channel of exit except on the level of the top of it, and for this pit an open channel should be substituted, allowing water to flow off to a considerable distance” (Vide Plan.)

83. The question regarding the erection of stables for the Cavalry and Artillery, has not been finally determined, or whether stables for sick horses only are to be provided.

Cavalry Lines and Stables

This Commission has, in a letter dated 10th April, strongly recommended that on account of the health of men and horses stabling should be built. A copy of this letter will be found in Appendix G.

84. The schoolrooms will be airy and well ventilated, and the only suggestion regarding them that I would make is, that some Latrine accommodation should be supplied in their vicinity for boys and guls (separately) and a urinal for boys. These buildings need not be expensive, and they are required to prevent the prolonged absence of pupils from the class rooms which must result if they are compelled to go home for these purposes.

85. The industrial employment of Soldiers in India has recently excited so much attention that I think sufficient accommodation in the way of workshops should be erected to give the men a fair opportunity of occupying themselves in this way, more especially at Bangalore, where the climate is temperate.

Only three buildings on the Race Course have been designed for this purpose, and they are to consist each of only 1 room 30 x 15'. If these are the only buildings to be devoted to this use on the Race Course, where some 800 men may be in Barracks, they are in the opinion of this Commission, insufficient.

Some of the workshops intended for noisy occupation should be well removed from Barracks, Hospitals, and family quarters.

86. The double Cook-rooms intended for 2 Troops and already erected are found to answer then intended use satisfactorily. They are airy and well ventilated, and they will when fitted with "Ranges" be quite fit for proper superintendence by European cooks as contemplated in the order of His Excellency Sir Hugh Rose. It is however essentially necessary that the Cook-rooms should be provided with Kitchen Cooking Ranges, if the Soldier's food is to be properly cooked.

These Cook-rooms should be provided with a good supply of cooking utensils and with tables suitable for dressing and preparing food. If this is done and if Grant's or Duff's Cooking Ranges are erected, then supervision by Europeans would be quite practicable and the Soldier would probably be supplied with more varied diet. The lighting of the room is not as ample as it should be.

87. One very prominent want in these Barracks is a good Plunge Bath. This should certainly be erected when the new Tank on the Ulsoor Rock is completed. In all Barracks water should be readily available for this purpose, and in a climate like Bangalore the men would probably resort freely to a Plunge Bath which need not be very expensive, as very light roofing would be a sufficient protection from sun heat.

88. Out-of-door recreations, Skittle Alley, Fives Court, &c, are to be erected, and a Gymnasium might with advantage be added to these. At this Station and at Wellington the climate would probably induce the men to take exercise as an amusement, but in warmer Stations it is in our opinion somewhat questionable how far men would willingly use a Gymnasium, unless it is made a part of their drill.

89. I cannot conclude this portion of this Report without directing attention to the defective mode of conservancy adopted and the very great want of a system of drainage for these splendid Barracks.

90. The Lavatories are placed close to the Urinals, and the foul water used in washing passes out to flush the channel of the adjacent Urinal. This arrangement should be at once discontinued and both the Urinals and Latrines should be worked exclusively on the Dry Earth System. The water from Lavatories, Cook-rooms, Family quarters and Barracks, should be carried off by open granite drains to a considerable distance to leeward of the Barracks and Hospitals—and the present underground drains which collect all these fluids into a cistern close to the Barracks should be closed up.

91. Without proper drainage these Barracks will become exceedingly foul and no time should be lost in preparing a complete scheme for efficient drainage. In a climate like Bangalore where light rain is of frequent occurrence the open drains would if properly constructed remain without smell and they could be easily flushed when rain does not fall. Under-ground drainage is so liable to get choked up and then to prove at once a source of nuisance and expense for repairs, that in the opinion of this Commission a system of open drains similar to those so frequently seen at Bangalore should be adopted. The natural drainage of the site of these Barracks is so good and the moisture caused by the rains is so quickly absorbed, that sub-soil drainage does not seem necessary.

92. Close to the Solitary cells of the New Artillery Barracks, the inhabitants of a neighbouring Horsekeepers' village manufacture biatties or cakes of dried manure used for fuel, in large quantities, and the ground is rendered highly offensive by the absorption of the fluid portion of these when exposed to dry. This practice should be interdicted in the close vicinity of these Barracks. The adjacent native village is gradually being extended so as to encroach on the Northern angle of the Barrack square. This should be prevented and the conservancy of this place (occupied chiefly by followers of the Regiments) should be put under Military control. Horsekeepers will be required for the Hussars and these men will require houses but it would seem highly desirable that regular lines should be laid out for them on a suitable site, and probably one could be found towards the North East, closer to the proposed site of the Lines or Stabling for Horses (vide Block Plan of Race Course Barracks).

93. The village under notice is chiefly occupied by the Horsekeepers of the Royal Artillery, and its conservancy and drainage have been entirely neglected. In places it is one huge Latrine. There are no made drains—no level road—the whole place is cut up with nullahs and other water courses. Choleia has been known frequently to break out in this very spot, and it might be thus introduced among the Troops with the most serious results. If a line be drawn from the corner of the enclosure of the Horse Artillery Barracks to the "1 mile post" on the Race Course it will indicate how much of this village should be removed. All huts to the South of this line should be at once demolished, and on some convenient adjacent site regular lines for Horsekeepers should be built and public Latrines erected. The importance of due attention being paid to this village should not be overlooked, —to be improved for from its close proximity to the Barracks, and from the unavoidable intercourse between the inhabitants of it and the Soldiers, it would probably be found that Choleia or Small Pox prevailing in the village would find its way rapidly to the Barracks, and an extension of the disease might occur.

But even under ordinary circumstances the village would probably be a nuisance from its defective conservancy, and it should be strictly supervised, and all extension of it prevented.

94 I next proceed to notice the recommendations in the foregoing remarks, which
Recommendations of the Commission require the orders of Government —

- (1) That 85 square feet superficial area should be adopted as the fixed regulation standard for Europeans in Barracks at Bangalore
- (2) That three new Barrack Blocks be constructed or such number as may be required to accommodate at this standard, one Regiment of European Cavalry and two Batteries of Artillery if it is finally decided that this force should be placed on the Race Course
- (3) That a system of Drainage by open V shaped Granite channels should be constructed for these Barracks
- (4) That all Latrines and Urinals should be worked exclusively on the Dry Earth system as proposed by this Commission
- (5) That in all Barracks the men occupying any sleeping room should employ the adjacent closed Verandahs as Day and Dining rooms and that the lighting of Barracks be improved
- (6) That the Canteen should be improved as suggested in paras 59 to 61
- (7) That in the construction of all future Latrines and Urinals the style of building proposed by this Commission should be adopted.
- (8) That all Cook-rooms should be provided with Duff's or Giant's cooking ranges, a suitable supply of culinary articles, tables for cutting and preparing meat
- (9) That additional workshops should be built
- (10) That permanent Stabling should be provided for all horses
- (11) That future family quarters should be made to measure 16 x 14—and 14 x 10 in two rooms with verandahs front and rear
- (12) That family quarters should have the Cook-room and Privy separated.
- (13) That suitable Latrine and Urinal accommodation should be attached to all schools
- (14) That a General Hospital should be erected on the Race Course for all European Soldiers in Bangalore
- (15) That a Plunge Bath be erected on the Race Course
- (16) That the native village close to the Northern Corner of the Race Course should be removed, and that the making of bratties, &c, and all other offensive occupations, as those of Butchers, Tanners, &c, should be interdicted in the vicinity of these Barracks

OLD DRAGOON BARRACKS

95 The Old Dragoon Barracks consist, as shown in the accompanying plan (marked D) of eight Barrack Blocks, an Hospital, Family quarters for 90 men, and the usual out-buildings of an European Regiment.

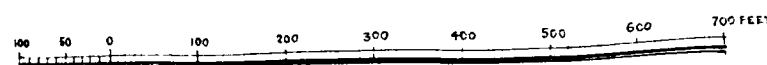
Old Dragoon Barracks—

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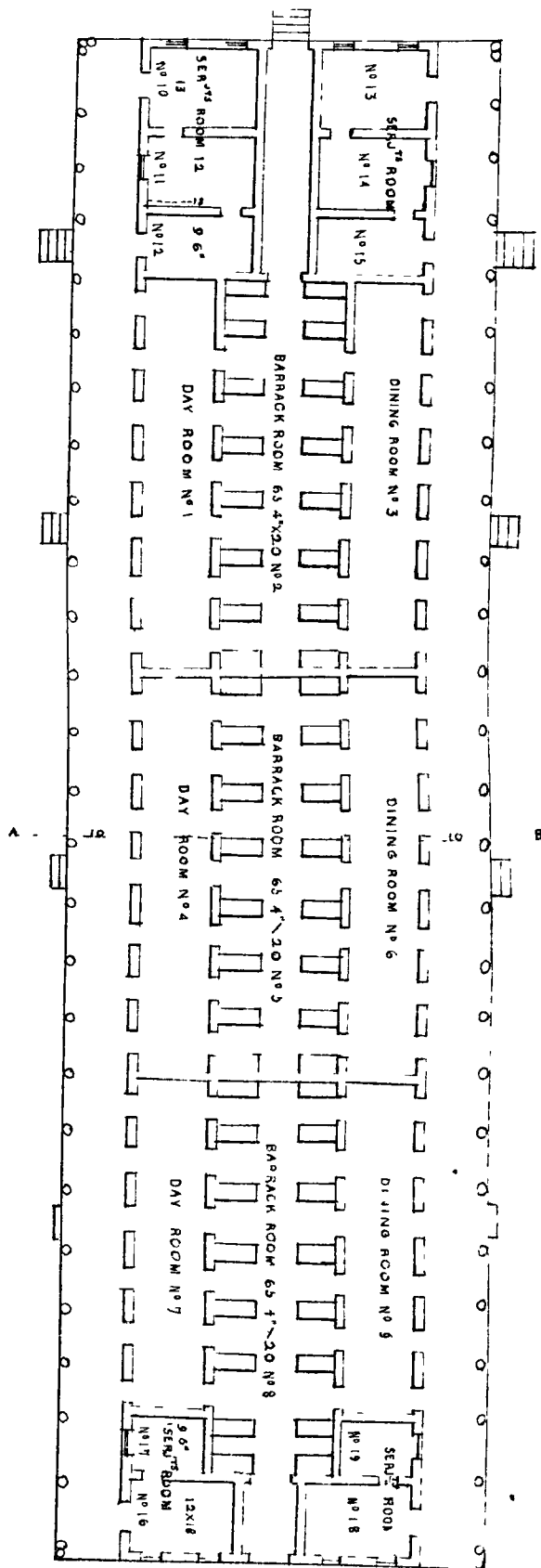
RIDING SCHOOL

HOSPITAL SQUARE

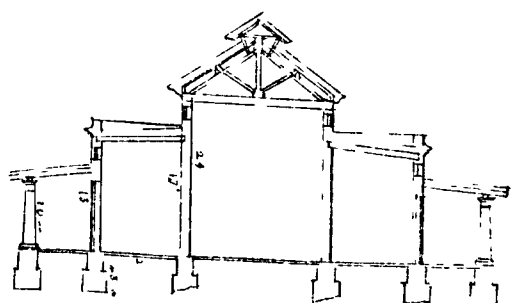
HOSPITAL SQUARE



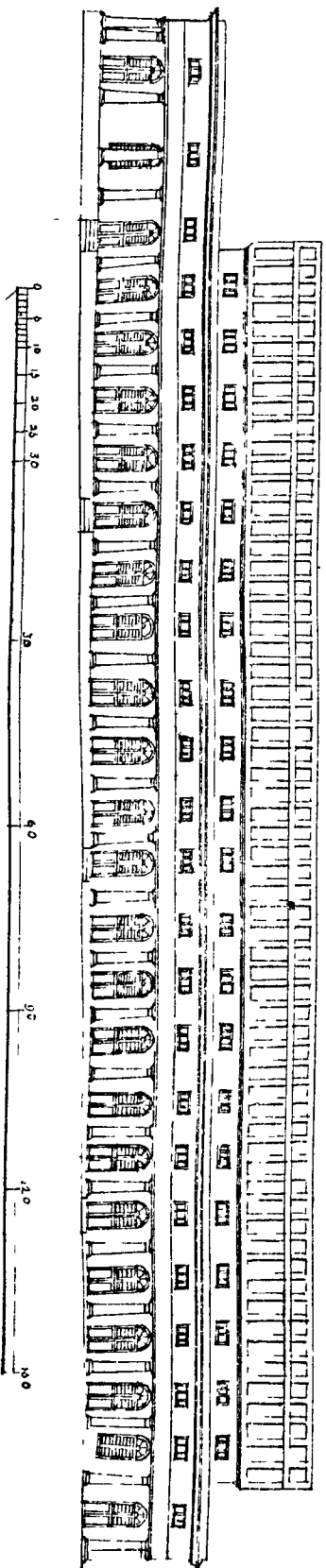
PLAN E
 SHEWING RELATIVE POSITION OF 48 COTS
 IN THREE SUB-DIVISIONS
 OF THE
 OLD DRAGON BARRACK BLOCK AT BANGALORE



SECTION THRO A-B



FRONT ELEVATION



Office of Sanitary Commission
 H. B. Henderson, M.D. Secy
 Drawn by J. W. S. S. S.
 Inspected by J. B. S. S. S.

Detailed Statement of accommodation in one Block of the Old Dragoon Barracks at Bangalore

Block.	Rooms	HOW OCCUPIED	DIMENSIONS			Superficial area of each room	Cubic contents of each room	Regulation No. at 1,000 cubic feet	Superficial area then afforded	No of cots at present	No at 85 superficial in each room	Cubic contents thus afforded.	Openings for Ventilation	WINDOWS §			DOORS		Open arches to adjoining rooms	REMARKS
			Length	Breadth	Height									Number	Height.	Width	Number	Height	Width	
No.1	1	Enclosed Front Verandah	65	0 12	0 16 9	784	13,132	36	36	36	16,208†	7 Attics.		...	...	...	7	7	4	6 Day Room.
	2	Barrack Room No I*	65	0 20	0 28 0	1306	36,586	...	...	...	...	14 "		...	...	...	12	12	6	Barrack do
	3	Enclosed Back Verandah	65	0 12	0 16 9	784	13,132	...	...	...	...	7 "		...	...	...	7	7	4	Dining do
	4	Enclosed Front Verandah	65	0 12	0 16 9	784	13,132	...	...	...	...	7 "		...	...	...	7	7	4	Day do
	5	Barrack Room No. II*	65	0 20	0 28 0	1306	46,586	36	36	36	16,206	14 "		...	...	...	...	...	14	Barrack do
	6	Enclosed Back Verandah	65	0 12	0 16 9	784	13,132	...	...	...	...	7 "		...	...	...	7	7	4	Dining do
	7	Enclosed Front Verandah	65	0 12	0 16 9	784	13,132	...	...	...	...	6 "		...	...	...	6	6	4	Day do
	8	Barrack Room No. III*	65	0 20	0 28 0	1306	36,586	36	36	36	16,2084	14 "		...	...	...	12	12	6	Barrack do
	9	Enclosed Back Verandah	65	0 12	0 16 9	660	11,055	...	...	...	...	6 "		...	...	...	6	6	4	Dining do
No.2	10-12	2 Married Sergeants' Quarters, each containing	18	0 13	0 16 9	234	3919	...	...	104	48	3 "		...	...	...	2	7	4	* The three Barrack rooms now open into one by communicating archways they will require to be sub-divided by the closing of these openings
	13-15	Room I	18	0 12	0 16 9	216	3618	...	...	...	...	1 "		...	...	...	2	7	4	† Vide para 104
		Room II	18	0 12	0 16 9	171	2864	...	...	...	...	1 "		...	...	...	2	7	4	
No.3	16-17	2 Single Sergeants' Quarters, each containing	18	0 12	0 16 9	216	3618	...	...	...	...	3 "		...	...	...	2	7	4	
	18-19	Room I	12	0 9	6 16 9	114	1909	...	...	...	...	1 "		...	...	...	2	7	4	
		Room II	12	0 9	6 16 9	114	1909	...	...	...	...	1 "		...	...	...	2	7	4	
No.4	19	Dimensions exactly as in No. I Block																		
No.5	19																			
No.6	19																			
No.7	19																			
No.8	19																			
Total No. to be accommodated at 85 square feet												384								

§ In the Verandahs fixed, and open Doors supply the place of Windows

† used as Recreation room

96 It is intended that on the completion of the Race Course Barracks these buildings shall be given over to the European Infantry Regiment stationed at Bangalore and that the Infantry Barracks are insufficient for a full Infantry Regiment. The Commission therefore considers that the Barracks and Hospital lately occupied by the 66th Regiment shall be utilized for other Military purposes. As the strength of European Infantry Regiments considerably exceeds that of Cavalry Regiments it is at once apparent that in point of Barrack and Hospital accommodation these buildings will prove insufficient for a full Infantry Regiment. This Commission therefore carefully examined into the amount of accommodation now afforded, and the extent to which it should be increased with a view to rendering it adequate for its intended use.

97 The dimensions of each of the Barrack Blocks are given in the following table, and it will be seen from the plan accompanying this table that in point of construction these Blocks greatly resemble those on the Race Course. Thus, they each consist of a long verandah (open) at front and rear of the building, inside this is a closed verandah well ventilated by closed and open venetian doors, by ground ventilation and by swinging windows. In each Barrack the central room is partially divided into three parts of almost equal size, and by building up these arched openings these Barrack Blocks can, like those on the Race Course, be divided into three rooms.

98 In the Report of the Royal Commission each Barrack is said to be able to accommodate 88½ men, giving to each 1,000 cubic feet of breathing room. The fallacy of this calculation arises from overlooking the fact that to secure any given cubic space by simple loftiness of a room does not by any means imply that adequate superficial area is also given. The latter point is really of much greater importance, for if sleeping rooms are 15 feet high and they are seldom lower, and if adequate superficial area (75 to 100 square feet) is afforded, the cubic contents must be from 1,120 to 1,500 square feet, and this is ample.

These observations apply with much force to the Buildings now under notice as they are 25 feet high.

99 In the Barracks now under report each Barrack room would contain 16 cots with very nearly 85 square feet of superficial space per cot.

Although the allowance made here is slightly less than that proposed for the Race Course Barracks, yet it is considered sufficient because only 16 men sleep in one apartment and that apartment has ridge ventilation throughout. The advantages of this mode of ventilation are so fully alluded to in Appendices F and G of this Report, that I need not here repeat the arguments there urged.

100. Assuming that Government will acquiesce in the propriety of fixing a regulation standard number of occupants for this Barrack—and that they will sanction its sub-division into three rooms, then, if 16 cots are placed in each room, 48 of the unmarried men may be accommodated in each Block as at present built. This would give 384 men to be accommodated in the whole of the Blocks now erected as shown in accompanying Table and Plan.

101. I have with reference to the Race Course Barracks stated that this Commission is of opinion that 85 square feet is sufficient superficial area per cot at Bangalore, and it is at this standard that the Barracks now under notice can accommodate 384 men.

102. From Appendix C and D of this Report it will be seen that a full European Infantry Regiment has in India 10 Companies each, comprising 4 Corporals, 2 Trumpeters, and 81 Privates. This gives 870 men to be provided with Barrack accommodation. But of these say 10 per cent. will be married (vide note on page 10), so that 783 men remain in the Barracks for unmarried men. As an example, the extent of 384 is now a little less than the full complement.

Eight additional blocks will therefore be required, each to contain 50 men. If the present buildings are made the model for these—as for uniformity they would probably be—then I would suggest that, instead of the sub-division into 3 compartments, each to contain 16, each Barrack should be divided into 2 rooms, each to hold 25.

It will be seen from Plan D, that abundant space is available in the enclosure of the Barracks for 8 additional Blocks.

103 At the time of our inspection of these Barracks, seven of them were occupied by the King's Dragoon Guards then on the eve of their departure from Bangalore, and one was occupied by a portion of 2 Companies of H. M. 66th Regiment.

Overcrowding witnessed

104 This Barrack Block was much overcrowded, 58 men occupied the Central Room, and 23 men were placed in each of the two enclosed Verandahs or 104 men in all. In the other Blocks the numbers contained were 50 in three instances, 49, 51, 46 and 43.

Of No 5 Block ½ was given up as a Recreation Room, and the front enclosed Verandah was occupied by 14 men, who, with 35 in the Central Ward, made up 49 as noted above, and in this Block there was some overcrowding.

105 If the plan of utilizing the Barrack accommodation recommended in the foregoing Report be adopted, then very suitable Sleeping, Day and Dining rooms will be provided for the Soldiers in these Barracks. But in one respect considerable

Deficient light in Barracks.

improvement is needed. The lighting of these rooms at night is exceedingly defective. The oil lamps do not enable the men to read comfortably, and as they go into their Barrack rooms at 8 o'clock they are obliged to waste a good deal of time in a half lighted room. I would suggest that suitable lights should be supplied from dusk until 10 P. M. in the Day rooms, and that the men should be permitted to remain in these apartments until that hour. The cost to Government would probably be very slight, but this Commission believes that the comfort of the men would be greatly promoted and that this indulgence would be much prized by them.

106 Throughout the Barracks which are large and well ventilated, the saddlery is placed over the men's beds. This is a very defective arrangement in a Cavalry Barrack, which this was at the time of our inspection. It is destined to become an Infantry Barrack. A separate Saddle and, in the case of Artillery, a Harness room should be provided for all mounted Soldiers. On sanitary grounds it is objectionable that saddles should be placed in the Barrack room, and the cleaning of the saddles prevents the verandahs of the Barrack being kept clean. (Vide Appendix G.)

Saddlery should not be kept or cleaned in Barracks

107 I have before remarked upon the fact that these Barracks are in many instances used for purposes for which they were not intended, and of this an example is seen in the present situation of the room devoted to the Recreation room.

It is formed out of a portion of the Barrack. It is more comfortably furnished than usual and is well frequented by the men. This and the Reading rooms might with advantage be located in the present Hospital which could be vacated if Hospital accommodation for this Barrack is completed on the Race Course, where this Commission has proposed to construct a General Military Hospital for the whole of the European Troops stationed at Bangalore, or if another Hospital which is much required is built in the Barrack enclosure. A place also could be afforded in the present Hospital for School rooms.

108. In this as in the other Barracks hitherto visited, the married quarters of the Staff Sergeants which form a part of the Barrack rooms are defective in the means of washing, and in any means by which the water used in the married quarters can be disposed of by drainage.

Sergeants' Quarters in Barracks.

At present small screens and tatties have been used to make bathing places and kitchens. Deficiencies in means of bathing and cooking. and all the water has to be removed by hand.

No necessary of any kind has been provided for these married quarters, and what is evidently intended as a Store room is used as a night closet and hence the screens erected in the verandah.

Bathing.

In future plans some provision should be made for a small dry Earth closet for the use of married Serjeants and their families and all bathing and cooking in verandahs should be strictly interdicted.

109. The Lavatories and Urinals are placed between the several Barrack blocks which is perhaps the most convenient situation for the men, but the Lavatories are open to the same objections.

Lavatories and Urinals found offensive.

that I have made to those on the Race Course. The Urine channel of the urinals is imperfectly washed out by the water from the Lavatory and the Urine lodging at the point of conjunction of two urine channels gives out a most offensive smell.

The same remedial measures should be adopted here as have been recommended for similar buildings on the Race Course, namely, the discharge of foul water from the Lavatory through some

Remedy proposed.

other channel and the working of the Urinal by the Dry Earth system of conservancy.

110. The Wash-houses are very defective both in design and accommodation. No privacy is

Proposed improvement in Wash-houses.

afforded to men anxious to have a thorough wash—no Foot baths are provided nor any special appliances for washing the feet.

111. In the opinion of this Commission it is necessary that close to all Barrack blocks should be attached two apartments, one simply for fixed basins

They should be close to Barracks.

fed by bib cocks—and the other fitted with two or three tubs and one or two reclining baths, with screens or curtains. Thus men would have placed at their disposal the means of effectual bathing and this without unnecessary exposure.

One of the most prominent wants in this respect of these Barracks is a good Plunge Bath. This Commission would strongly recommend that one should be erected and the men encouraged to use it freely. At a considerable distance from the Barracks there are Bath rooms for the use of the men, but to be of practical utility such apartments should be close to the men; so that they could readily resort to them at all times of the day and in all weathers. The Bathing rooms now in use were part of the Cook-room, but were devoted to their present use in consequence of the want of Bathing rooms being recognized. They are fitted with tubs, and the only objection to them is their distance from the Barracks.

112. Close to them are the Cook-rooms, and these are on the old native plan of Cook-houses. Sanction has been given for the introduction of good cooking stoves. The cooking is at present conducted in kitchens upon the old native system, which causes the building to be unnecessarily dirty, and leads also to an unnecessary consumption of fuel.

113. From the accompanying Plan will be seen that there are two small blocks of Family

Family Quarters.

quarters between the ends of the Barracks and the public road. The quarters themselves are small, close, and ill-ventilated, owing to the close proximity of the Barrack room. They are reported to be unhealthy and they interfere somewhat with the ventilation of the Barrack room. These quarters are also impede the passage along the end of the Barracks. In the opinion of the Commission these 16 quarters, and the out-houses attached to them, should be removed, and the Barrack square wall be made only 4½ to 5 feet high, so as to allow free circulation of air. The wall has already been lowered in some parts with great advantage. These quarters of which the removal is proposed are shown in red in accompanying plan.

Of the buildings intervening between the Barracks and Road, all except the gateway and Guard room, and room for the Officer on guard, should come down, and provision should be made in the Barrack enclosure for the buildings thus removed.

These buildings of which the removal is proposed are not well constructed, are not raised on any sufficient basement, and under any circumstances are objectionable. Their removal is strongly insisted upon by experienced Medical Officers and I think with sufficient reason.

While these alterations are being made—the adjacent Infantry Barracks which have hitherto been occupied by the 66th Regiment will afford accommodation for such portions of the Regiment as cannot be provided for until the additions to the Dragoon Barracks have been made.

114. There are 4 blocks of Married Quarters surrounding a Garden square as shown in Plan. They accommodate 24, 24, 14, and 20 families respectively.

Married Quarters.

They are neat in design but are open to the same objections as before urged against the plan of construction adopted in the Family quarters on the Race Course, although not identical with them as regards their dimensions. Two rooms measuring 16×14 and 14×10 accommodate one family.

115. The Guard House comprises a Main Guard room, Cells for defaulters, and a verandah.

Main Guard.

The Guard room is 26 feet high, 50 feet long, and 20 wide, with arched doorways. The Cell (or Ward) is 20×20 feet and of the same height, and there are 3 separate Cells 9-6 by 10 but only 11-6 in height. The verandah in front is really a part of the Main Guard which opens into it by doorways.

These buildings call for no special remark except as to the wooden trestle bedsteads used by the men on guard. The mattresses to them are inferior and should be improved. As I have already addressed Government on this subject, I need only refer to Appendix H of this Report as giving all suggestions on this subject in detail. In these, however, as in all other Guard rooms, a few chairs should form part of the Barrack furniture.

Furniture required.

It is desirable on the score of health that the men should not be reduced to the alternative of standing or lying in their beds; a few chairs would be a great comfort afforded to the guard at a comparatively insignificant cost.

116. The Privy of the Guard room was offensive in smell. It is now worked on the Punjaub system, but this does not prevent evil odours. The necessary alterations required to ensure the introduction of the dry earth system of conservancy should be made without delay.

Privy defective.

117. The Solitary cells were formerly five in number, but of these two, at the South East angle of the Barrack enclosure, have been removed, so as to provide a site for a water cistern. The three remaining Cells are small separate buildings 8×8 and 11½ in height. The cubic contents thus afforded is only 736 feet. These Cells are seldom used and are only suitable for use during the cold weather. New Cells are in course of erection.

Solitary cells.

118. I may here allude to the desirability of erecting a Military prison at this Station in lieu of the various detached places of confinement scattered over the Station. This proposal has, I believe, already engaged the attention of His Excellency the Commander-in-Chief, and I trust that it will receive early attention.

Military prison recommended.

119. The other subsidiary buildings attached to these Barracks do not require special notice. The dimensions of these several buildings are shewn in the accompanying tabular statement of Barrack accommodation. They are generally in good order, recent in construction and well suited to

Subsidiary buildings generally approved.

the purposes to which they are applied. They were examined in detail by this Commission, who have no suggestions to make for their improvement except as regards the following particulars

120. The Latrines for Non-Commissioned Officers and Privates, and containing 12 seats in two buildings for the former and 42 seats in 8 buildings for the latter, were clean, but though Coal tar was freely used they were decidedly objectionable in odour. A raised foot-path to these houses has been recently made.

It will be observed from Plan D that these buildings have their rear wall on the line of the public road, and doubtless this is the reason why, although constructed on the Punjab plans, they have never been adapted to that system, and the rear openings have not been made which are essential to its being carried out. This Commission would recommend that these Privies should be re-constructed and that they be adapted to the Dry Earth system of conservancy. Scavengers' carts should have free access to the building through which doors should be pierced and the nuisance would be avoided, of which complaint is made as arising from the wooden tubs for excreta which have to be carried from the Latrine to the gateway with a view to the removal of their contents.

121. There are two Wash-houses intended for the use of women, but one of these is temporarily employed as a School-room. These Wash-houses for women are closed daily at 4 P. M., an arrangement which is objectionable when it is borne in mind that there are no arrangements for bathing in the Family quarters. The internal fittings of these Wash-houses are so arranged as to furnish each with 8 separate compartments. The buildings are lofty, well-ventilated, and of recent construction, and the only objection to be urged against them is that they are far removed from the married quarters. Indeed, one of them temporarily used as a School is most inappropriately placed close to the Canteen and in the vicinity of Latrines for men.

The neighbourhood of these places renders it very desirable that this building should not be used hereafter either as a Wash-house or School, but a suitable Wash-house for women should be built close to each block of family quarters.

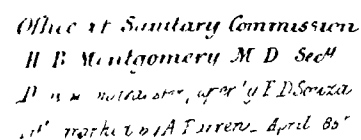
122. I have in the earlier portions of this Report alluded to the character of the water in Bangalore generally (vide paras. 25 to 28). I again refer to it with reference to these Barracks as there has been a good deal of complaint as to the character of water supplied to the Troops placed here. Should the system of water-supply for the whole Station be carried out as proposed, then a Cistern in the Barrack yard here will contain a sufficient supply. At present the water is derived from wells close to the Ulsoor Tank, and the knowledge of this fact renders it of the utmost importance that the conservancy of this sheet of water should be strictly attended to.

It has been found that in dry weather the water in these wells is exceedingly scanty and indifferent in quality, and this to such an extent as occasionally to necessitate the use of water drawn from the wells usually used for watering horses who are then sent to the Ulsoor Tank to be watered.

It is scarcely necessary to add that there is considerable objection to these means of meeting the present deficient water-supply.

123. Dr Jephson reports as regards food, "The diet of the men is furnished by the Commissariat Department, and consists of 1 lb meat, 1 lb bread, 1 lb vegetables, 4 oz rice, 1 oz salt, 2½ oz. sugar, 1½ oz. coffee, or ½ of tea, to each man. The rations are good, and the native Cooks cook the rations according to the fancy of the men, some have the meat curried, others will have it fried, while others have it boiled. Considering that there are no cooking ranges, the rations are very well cooked."

CONVALESCENT WARD 80 X 18
Nº 5



“ 3 Annas 4 Pie is the Government deduction for each man's rations. Half the vegetables consist of potatoes, and the other half are mixed, such as carrots, onions, turneps, &c. and are very good and conducive to health. The Porter, Beer and Arniack are furnished by Government, but the Porter and Beer are at times rather acid.”

124 With reference to Dr Jephson's concluding observation, this Commission desire to record that wherever they have had an opportunity of examining the Commissariat supplies of Beer and Porter, they have been invariably struck with the remarkably sound condition in which these liquors were found. And without desiring to impugn in the slightest degree Dr Jephson's statement, we are inclined to refer to accident any occasional failure as regards the quality of these articles.

125 The Canteen is a large building 60 by 32 feet and 17 feet in height. The apartment is well ventilated now, its deficiency in this respect having been brought to notice by the Surgeon of the Dragoon Guards.

126 The clothing provided for the men is well adapted to the climate, but warm clothing is much more used here than at almost any other Station in the Presidency, except Wellington

As I have recently addressed Government on the subject of bedding to be provided for European Soldiers generally, and as the whole subject is awaiting the orders of the Supreme Government, it is unnecessary that I should do more than refer to the opinions expressed by this Commission and which are re-printed in Appendix H.

127 In conclusion, I beg to direct attention to the fact that several of the present buildings, as Line Guard Room, Slingshed, Steam Boiler, Sick Horse Stable, Grain Godown, &c., will be no longer required when an Infantry Corps is placed in these Barracks, and in all probability the health of the men in Barracks will be improved by the removal of the present Horse Lines, the proximity of which to Barracks is objectionable.

128. I have already addressed the Government on the subject of the Hospital in this Barrack, and have strongly urged the necessity of its discontinuance.

The Government in their Order dated 28th November 1864, were not prepared to consider the arguments then used as conclusive in respect of the unhealthiness of the building as an Hospital, and it was intimated that alterations would be made to the building with a view to its continuance as a Military Hospital.

I am unwilling again to advance my own opinion, but I venture to submit the following extract from a recent Inspection Report by Dr. Mackenzie, the Deputy Inspector General of Hospitals—who is an Officer of acknowledged talent and experience—and to submit that there is ground for a re-consideration of the decision of the Government. Dr. Mackenzie writes as follows—

"The Hospital, in all the conditions under this head, remains in precisely the same state as noted in my Inspection Report of last year.

"If the definition of an unhealthy Hospital given by Mr. Simon, the Medical Officer of the Privy Council, London, be accepted as correct,—'that by reason of some fault of its own, disease cannot be treated successfully in it,' then is this building a very unsuitable one, and with reference to the Proceedings of Government, on the Inspection Report submitted by the President, Sanitary Commission, on the 30th September 1864, I would beg permission most respectfully to observe that after upwards of two years' experience and constant inspection, I am persuaded that it is so radically defective and faulty as to be incapable of improvement without absolute re-construction. The Quarter Master General of the Army has shown that all that could be suggested to remove its defects has been already carried out. I am therefore of opinion that any further temporary alterations will be fruitless waste of money."

"Captain Tulloch, the Executive Engineer here, was good enough to go over the buildings with me yesterday morning, and I have his authority for stating that he does not think that the most careful drainage will in the least, or at all events, but to a very slight degree, rectify the dampness of the wards. 'There are errors in their construction,' he says, 'which cannot be remedied except at so heavy a cost as would be unadvisable for Government to incur'—and he adds, 'I formed this opinion in 1862, and have no reason whatever to alter it in 1865'."

"I am not at present in a position to show by figures how much the ailments of the patients have been aggravated, and their recovery opposed by this Hospital atmosphere, but that this has been, and will continue to be the case to a large amount, especially in the rainy and cold seasons, I can assure the Principal Inspector General. Since, then, an entire re-construction and further accommodation to nearly double the extent of the present wards will be required when the Infantry Regiment is moved into the Hussars Barracks, my belief is, that it will be a saving to Government, in money and men, to abandon the present site altogether, and have a new Hospital built in the close vicinity of those now in course of erection for the Artillery and Cavalry. Here it would occupy an open, isolated, and elevated position, having a free and unobstructed exposure to the prevailing winds, whereas the present locality is comparatively low, and shut in on three sides by the Barracks and dwelling houses."

"I am quite sure that this arrangement would prove greatly to the comfort and benefit of the sick, and I may add that I believe Deputy Inspector General Inglis is entirely of the same opinion."

In the Report of the Royal Commission appointed to enquire into the sanitary condition of the Army in India, the evidence regarding this Hospital was unanimous in condemning it, and this Commission ventures again to suggest that this building should only continue to be used as an Hospital until a new one can be built."

As proposed in my former letter, the Men's Hospital could be readily converted into a Workshop, or Recreation rooms, and the Female Hospital could be used as a Regimental school."

Description of Hospital Out-houses	Length.	Breadth.	Height
Serjeants' Quarters	34	12	14½
Office and Store room.	42	15	15
Commissary's store	28	15	15
Guard room	20	15	15
Bath houses	31	15	11
Latines	51	23	14
Sheds for sick carts	20	20	10
Cook houses	43	20	16
Lamp Lighter's godown	0	0	0
Native Hospital Ward.	43	25	16
Dead house	18	18	0

These out-buildings would afford ample space for workshops of various kinds, and the building itself could be thoroughly utilized."

The accompanying plan and statement of dimensions of the Hospital sufficiently prove how entirely inadequate it is to meet the requirements of an European Infantry Regiment."

Wards	Length		Breadth		Height		Superficial area	Cubic contents	Regulation number of Patients	For each patient		Number at 100 sq. ft. superficial area	Height of bed from floor		Windows and ventilating attics			Distance from foot of one bed to foot of opposite bed	Distance between adjacent beds
	Ft.	In.	Ft.	In.	Ft.	In.				Superficial area	Cubic contents		Ft.	In.	Number	Height	Width		
No 1	101	0	18	0	15	6	1818	1817	23	64.93	1006.76	18	1	6	20	1	3	3	0
" 2	61	0	18	0	15	6	1098	1701.9	12	91.50	1418.25	11	1	6	16	1	3	3	0
" 3	34	0	18	0	15	6	612	948.6	9	68.00	1054.00	6	1	6	8	1	3	3	0
" 4	25	0	18	0	15	6	450	697.5	5	90.00	1395.00	4	1	6	8	1	3	3	0
" 5	80	0	18	0	15	6	1440	2304.0	23	62.60	1001.73	14	1	6	20	1	3	3	0

Regulation number of beds at 1000 feet cubic space

77

Number at 100 superficial area

53

129. This Commission desire to submit the following recommendations regarding the occupation of the Old Diagon Barracks and the improvements required to promote the health and comfort of the troops occupying them

(1) That at the standard of 85 square feet only 48 men exclusive of Serjeants be accommodated in each of the old Diagon Barracks.

(2) That the additional barrack accommodation needed for a full Infantry Regiment be provided by the erection of additional Barracks

(3) That each Barrack be subdivided into 3 compartments as shown in plan, and that the better lighting of the Barracks be enforced.

(4) That suitable Latrine accommodation be provided for the families of married Serjeants in Barracks.

(5) That the latrines and urinals for men be cleaned separately, and that dry earth conservancy be adopted in both urinals and latrines

(6) That the wash-houses be improved so as to secure more privacy to persons bathing

(7) That the two blocks of family quarters now existing between the end of the Barracks and the public road be removed, and a low wall be erected as a Barrack enclosure.

(8) That the furniture of the Guard Room be improved so as to promote the comfort of the men on duty and that the Privy attached to the Guard Room be adapted to the Dry Earth System

(9) That a General Military Prison be built at Bangalore

(10) That wash-houses be built for women close to each block of family quarters.

(11) That the proposed new water supply for these Barracks should be as soon as possible effected

12. That the Beds and Bedding be improved as recommended by this Commission.

13. That the Hospitals for Males and Females be no longer used for this purpose and that they be converted into Recreation and School Rooms for the European Infantry Regiment.

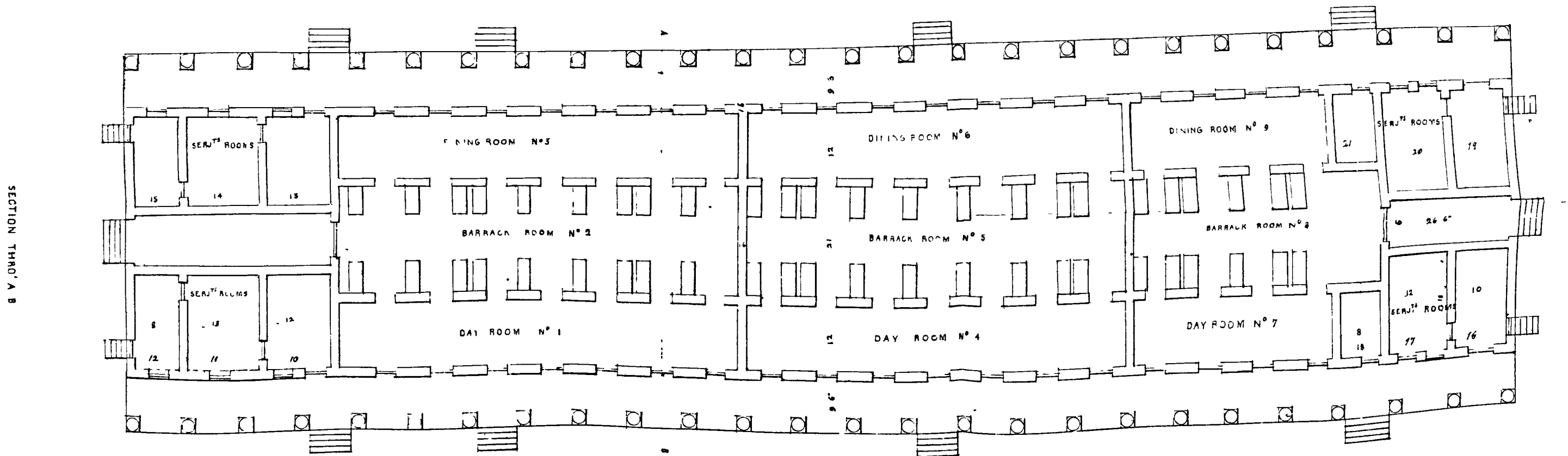
14. That the sick be treated in one General European Hospital to be erected on the Race Course.

Detailed Statement of accommodation in one Block of the Horse Artillery Barracks at Bangalore.

Block.	Rooms.	Description of room.	DIMENSIONS.			Superficial area of each room.	Cubic contents of each room.	Regulation No. at 1,000 cubic	Superficial area then afforded	No of Cots at present in the block	No at 85 superficial area	Cubic contents thus afforded	Openings for ventilation	WINDOWS			DOORS			Open arches to adjoining rooms	Remarks as to proposed use of each apartment
			Length	Breadth	Height									Number	Height	Width	Number	Height	Width		
No.1	1	Enclosed Front Verandah	75	12	16 9	900	13,075	34	46	26	18	1,923	7 attics	..	..	..	7	8	4	7	Day Room
	2	Barrack Room No I.	75	21	22 0	1,373	34,650	..	..	..	..	..	14 "	..	..	..	14	8	6	14	Barrack Room
	3	Enclosed Back Verandah	75	12	16 9	900	13,075	..	..	..	..	..	7 "	..	..	..	7	8	4	7	Dining Room.
	4	Enclosed Front Verandah.	72 1/2	12	16 9	870	14,572	..	..	..	..	..	7 "	..	..	..	7	8	4	7	Day Room
	5	Barrack Room No II.	72 1/2	21	22 0	1,522	33,495	33	46	26	18	1,860	14 "	..	..	..	..	..	..	14	Barrack Room
	6	Enclosed Back Verandah	72 1/2	12	16 9	870	14,572	..	..	..	..	..	7 "	..	..	..	7	8	4	7	Dining Room.
	7	Enclosed Front Verandah	48	12	16 9	576	9,648	..	..	..	..	..	4 "	..	..	..	4	8	4	4	Day Room
	8	Barrack Room No. III.	48	21	22 0	1,908	22,176	22	45	..	12	1,848	8 "	..	..	..	1	8	6	8	Barrack Room
	9	Enclosed Back Verandah	48	12	16 9	576	9,648	..	..	..	..	..	4 "	..	..	..	4	8	4	7	Dining Room
								89	..	..	48	..	2 "	1	5	4	2	8	4	..	* Used as a Recreation Room
No.2	10	Serjeants' Quarters.	18	12	17 0	216	3,672	1+	..	..	..	..	1 "	1	5	4	2	8	4	..	..
	11	Room I.	13	12	17 0	156	2,562	..	..	..	1+	..	1 "	1	5	4	2	8	4	..	..
	12	Bath room	12	8	17 0	96	1,632	..	..	..	..	..	1 "	1	5	4	2	8	4	..	..
	13 to 15	Do (Same as 10 to 12)	..	..	..	..	..	1+	..	..	..	..	..	..	..	..	..	..	..	..	..
	16	Serjeants' Quarters.	18	10	17 0	180	3,060	..	..	..	..	..	1 "	..	..	..	3	8	..	..	+ One married Serjeant
	17	Room I.	18	12	17 0	216	3,672	2+	..	..	..	..	1 "	1	5	4	2	8	4	..	..
	18	Room II.	12	8	17 0	96	1,632	..	..	..	..	..	1 "	..	..	..	1	8	4	..	..
	19 to 21	Do (Same as 16 to 18)	..	..	..	..	..	2+	..	..	..	..	..	..	..	..	..	..	..	..	+ 2 single Serjeants.
	21	Dimension exactly as No. I.	..	..	..	..	..	..	..	70	48	..	..	..	..	..	..	..	..	..	..
		Total No. to be accommodated at 850 sq feet.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

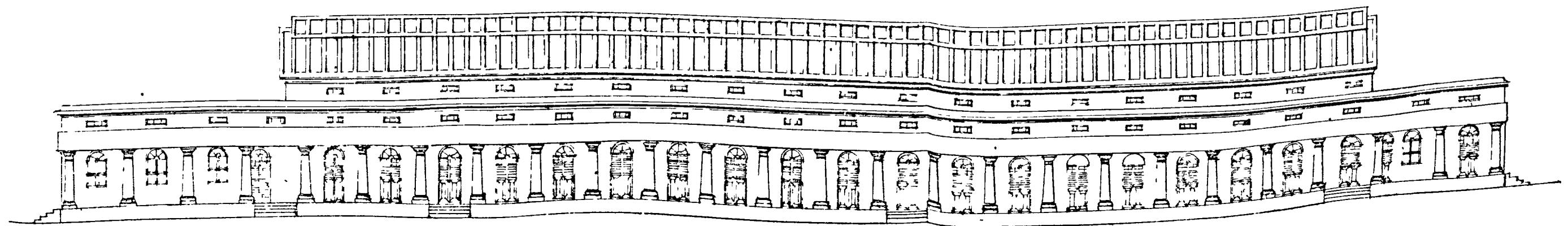
*Office of Staff
H. B. Montgomerie
Drawn on variety
Isographied by A.*

PLAN F
 SHEWING RELATIVE POSITION OF 48 COTS
 IN THREE SUBDIVISIONS
 OF
 ONE HORSE ARTILLERY BARRACK BLOCK AT BANGALORE



SECTION THRO' A B

FRONT ELEVATION



Office of Sanitary Commission
 H. B. Montgomery, M. D., Sec'y
 Drawn on transfer paper by F. D. Smith
 Engraved by A. Barron, 1895

ROYAL HORSE ARTILLERY BARRACKS.

130 In style of general construction these Barracks are identical with those now in course of completion on the Race Course—and those of the old Diagoon Barracks. The rooms are lofty, well-ventilated and airy, although they are not as capacious as those of the Diagoon Barracks.

131 The same standard of superficial space should be here adopted as that recommended for the other buildings, and these rooms should be similarly sub-divided. As the information required to indicate the views of the Commission is contained in the accompanying statements and plan, it is not necessary to enter again upon these several topics which have been sufficiently discussed with reference to the other Barracks.

132 The following brief remarks are therefore simply intended to direct attention to the several points in which it is necessary that improvements should be made in order to render these Barracks equally healthful and comfortable to the Soldier as the other Barracks will be, should the recommendations of this Commission be carried out.

133. From the accompanying plan F it will be at once seen that only 48 men can be accommodated in one Barrack building sub-divided as shown therein, and as the two Barracks are of equal dimensions only 96 men, unmarried, can be accommodated in them.

134 The Corporals, Rank and File of one Brigade of Royal Horse Artillery will amount to some 150 men, and if 12 per cent be deducted as the probable number married, then 132 men will require Barrack room. Of these 132 men only 96 can occupy the two existing Blocks and the remaining 36 must be accommodated in a new block which, for the sake of uniformity, should be made on the same plan as those now in existence, but in the designs for this additional block such improvements as are suggested in the present buildings should be planned.

135 Saddlery and Harness should be removed from these Barracks and placed in separate Harness rooms, (as has been done at Kamptee) or should be provided for in the stables recommended by this Commission.

136 The beds in this Barrack are open to the same objections as have been made to those elsewhere in this station, and should be re-placed by iron trundles with wooden planking, and a good coil mattress be supplied to each cot.

137. These large Barracks are only provided with 6 hanging lamps which yield a very indifferent light. This want should be rectified.

138 The Serjeant Major's quarters at the end of the Barracks require additional ventilation, which could be effected by tubular shafts through the terraced roof. The drainage of the same places requires to be improved as noted in the old Dragoon Barracks (para. 108 of this Report) for there is not sufficient provision made for the removal of dirty water, slops, &c. from these apartments.

139 The Lavatory assigned to each of the Barrack blocks is much too small, and no decency can be observed by the men in washing. New lavatories should be built.

Cook rooms deficient in cooking apparatus. 140 The Cook-rooms are too small, and they should be furnished with proper stoves.

141 The Privies are small and ill-ventilated, and should be re-built on some convenient site. At the west end of the block on the side of the road there is a good site for a Privy. The present Privy of the A Troop is too near the family quarters. I propose the removal of the present Privy of the west end Barrack. It is, as stated before, too near the married quarters, not sufficiently ventilated, and being an old building it should be removed. More privacy should be secured by having light iron screens between the seats. Neither in Regimental Bath rooms nor Privies is any attempt made to secure decency.

Proposed site for other out buildings.

142 Supposing this to be done, the new lavatories, Cook-rooms and Privy for the other block would face the Barracks and render them complete.

143 The present hospitals, for males and females, have been condemned, and the sick of the Horse Artillery are to be transferred to the new Race Course Barracks. These hospitals would, with a few minor improvements, serve for Recreation, Reading room, and Work-shops.

Reading rooms

144 For the Reading room seats with backs have been promised. tables should also be given.

The drain which is in front of the Barrack is too far from the Barrack itself, and no means have been afforded for rain water from the roof being carried away. The present stone drain should be shifted nearer to the Barrack. Spouts and gutters constructed, so that the rain-water should not make the ground immediately in the front of the Barrack verandah muddy and wet are much required.

145 The rooms occupied in the Eastern end of the Barrack by the married Sergeants require to be protected from the morning Sun. This might be done by a light verandah with corrugated iron roofing.

NATIVE HORSE ARTILLERY LINES.

146 The lines of the Native Artillery, which will before very long cease to form part of the Artillery were visited. They are kept clean, but have no regularly paved drains. A side drain is under construction on one side of these lines—but the drainage of these lines should be thoroughly attended to, for a considerable portion of these lines will remain useful for the horsekeepers and grass cutters, &c, &c, attached to the Horse Artillery.

HOSPITAL FOR ALL ARTILLERY.

147 The Hospital in which the sick of the Artillery were treated at the time of our visit was a building totally unsuited to an Hospital and has been long condemned. The appended statement shewing the dimensions of the Wards sufficiently indicates the propriety of this decision. It will be seen that in the Male Wards, only 17 patients can possibly be accommodated. In the female 15, and in the Native Wards only 6. At the time of our visit to Bangalore 16 patients were in Hospital, so that a very few additional admissions would have caused over-crowding. But independent of the insufficient space afforded by the Hospital, it is entirely unfitted for its present use by the style of its construction, which is that of an ordinary Bungalow with enclosed Verandahs, and by its position, which is close to the Cook-rooms, Privies and Lavatory of the Horse Artillery Barracks which lie in front of it, and by the proximity of the Sick Horse Lines which lie immediately behind it.

148 Instead of having a suitable basement it is raised only about 18 inches above the level of the ground, from which unhealthy exhalations and moisture find their way into the Hospital. From its peculiar construction there is no possibility of securing separation for cases of epidemic disease, and the divisions between the several Wards are incomplete as they either open into one another or into enclosed Verandahs, these latter being on the level of the ground.

149 I need scarcely add that in the opinion of this Commission it is highly desirable that the erection of the new Hospital on the Race Course should be expedited as much as possible so as to render unnecessary the continued use of this building which might then be converted into Recreation rooms and Workshops.

Detailed Statement of accommodation in the Hospitals of the Royal Artillery.

Block	Rooms	How Occupied	Dimensions.			Superficial area of each room	Cubic contents of each room	Regulation No at 1,000 cubic	Superficial area then afforded	No of cots at present in each room	No. at 100 superficial area	Cubic contents thus afforded	Openings for Ventilation	Windows.			Doors.			Remarks.
			Length.	Breadth	Height									Number	Height	Width.	Number	Height	Width.	
No. 1	1	Ward	63 0	20 9	15	1037	19,608	20	51	...	10	1,960	6	10	5 2	30	5	7 0	40	Verandahs on both sides [closed by wooden Jalousies For cases requiring seclusion.
	2	Opthalmic Ward.	20 9	11 10 15	15	245	3,682	4	61	...	2	1,841	1	...	...	...	2	7 0	40	
	3	Spare room (enclosed Verandah)	26 0	12 0	8	312	2,496	2	156	...	3	832	...	1	3 6	21	2	6 6	51	
	4	Store room (Verandah)	20 9	12 0	8	249	1,992	...	...	...	...	...	...	2	20 3 6	30	1	6 6	37	
	5	Surgery (Verandah)	20 10 12 0	8	8	250	2,000	2	125	...	...	...	...	1	5 2	30	2	6 6	30	
	6	Spare room (Verandah)	20 10 12 0	8	8	250	2,000	2	125	...	2	1,000	...	1	5 2	30	1	6 6	30	
No. 2	1	Ward	29 7	19 8	22 0	551	12,799	13	44	...	6	2,133	10	...	...	...	2	8 2	40	[sides, 3 Jalousies in each Closed Verandahs on both
	2	Female Ward, 1	23 0	11 10 16 0	27 2	4,354	4,354	4	68	...	3	1,451	...	...	...	...	2	8 2	40	3 Jalousies
	3	Female Ward, 2	23 0	11 10 16 0	27 2	4,354	4,354	4	68	...	3	1,451	...	...	...	...	2	8 2	40	Do
	4	Office	23 0	11 10 16 0	27 2	4,354	4,354	4	68	...	3	1,451	...	...	...	...	2	8 2	40	Do
	5	Spare room.	23 0	11 10 16 0	27 2	4,354	4,354	4	68	...	3	1,451	...	...	...	...	2	8 2	40	Do
Out-houses	1	Cookroom	15 0	8 0	10 6	120	1,260	...	...	...	...	...	3	...	...	...	1	6 4	30	Five openings on floor
	2	Latrine.	15 0	8 2	10 6	122	1,286	...	...	...	...	...	2	...	...	...	1	6 0	30	
	3	Lavatory	25 10	7 0	10 0	180	1,808	...	...	...	...	...	...	2	1 1	33	2	6 0	30	
Near Sick House	1	Ward 1	19 10	16 9	11 6	332	3,820	4	83	...	3	1,273	2	3	5 0	30	2	7 0	41	{ For Native sick-open Ve-
	2	Ward 2	16 9	9 10	11 6	164	1,894	2	82	...	2	947	2	2	5 0	30	1	7 0	41	randahs on both sides.
	3	Spare room (detached)	14 9	7 11	8 0	116	934	1	116	...	1	934	2	2	13	210	1	6 0	30	
	4	Latrine (detached)	11 10	6 10	10 6	80	849	...	...	...	...	...	2	...	...	...	...	...	...	
		Dead room	16 8	12 8	10 0	211	2,111	...	...	...	...	...	...	4	4 0	30	1	7 0	3 6	

BANGALORE.
8th November 1864.

150 The quarters of the Hospital Serjeant are much spoiled and rendered dark and close by the enclosing of the front verandah. As owing to the delay in completing the new Hospital on the Race Course the present Horse Artillery Hospital will probably continue in use for some time, I think it would be well if ridge ventilation were at once introduced into this building

151 At the conclusion of this Report I will comment on the number of men of all branches of the Artillery under treatment in this and other Hospitals.

152 A small Native Hospital for the Native Horse Artillery is situated close to the European Artillery Hospital. It is small but usually the number of sick is very limited, and on the occasion of our inspection only 1 native Artilleryman was under treatment

153 The Canteen is well arranged, it was under repair with a view to the introduction of ridge ventilation. The Serjeants' Mess House is neatly furnished and reflects great credit on the Non-Commissioned Officers.

154 Part of one of the Barrack rooms is used as a Game and Recreation room. No tables are given by Government to this Institution, but benches with backs have been indented for.

155. The Hospital having been condemned will eventually be available for employment as a Recreation room. When it is so, this part of the Regimental establishment should be removed into it, and the Barrack space thus liberated should be devoted to its proper use

156 The present Horse lines are well situated, all that is required is that a sufficient number of stables for the protection of the Artillery horses should be constructed on this site on the plan recommended by this Commission

157. The Officers of the Horse Artillery are unanimous in their opinion that there would be a real economy in the health of the men and horses if they are placed under cover

A small harness room in a detached building is used by the native Troops of Artillery who cannot keep harness in their own huts.

Attached to these Barracks are schools for adult Soldiers and for boys and girls. The Boys' school has an average attendance of 25 boys, who study from 9 to 12, and from 2 to 4 o'clock daily. The room is small but well ventilated, and is neatly furnished. One apartment is used by adults. The Girls' school has an average attendance of 56 children who are educated by a trained School Mistress

158. The Boys' school had not, when we were at Bangalore, a trained Teacher. It appears probable that, if a competent person were appointed, the number of adult pupils would probably increase, and this is very desirable.

159. A small dark room is allotted to the use of the Moonshiee who is educating these men in Hindoostanee.

- 160 This Commission would strongly urge upon His Excellency the Commander-in-Chief the desirability of erecting a good school room in closer proximity to the Barracks and married quarters, and they trust that an efficient teacher may soon be made available for the Boys' school.
- New school and competent teachers required.
- A good skittle alley is provided for the men and a quoit ground.
- Out of door recreation.
- A good Plunge Bath should be provided for the men of the Royal Horse Artillery.
- Plunge Bath required.
- Workshops are in course of erection from the debris of an old Gymnasium which fell down a short time ago.

161. The accompanying tabular statement will shew the accommodation of the Regimental Serjeants' Quarters in the Horse and Foot Artillery at Bangalore.

Detailed Statement of Accommodation in the Regimental Serjeants' Quarters of the Horse Artillery at Bangalore.

Block and Rooms	How Occupied	DIMENSIONS			Superficial area of each room	Cubic contents of each room	WINDOWS			REMARKS
		Length.	Breadth.	Height.			Number.	Height	Width.	
2 Serjeants' Quarters between the ranges										
	Room I. } for each {	18 0	12 0	10 4	216	2232	2	5 0	4 6	
	Room II. }	16 4	12 0	7 6	196	1470	1	5 0	4 6	
1 Schoolmaster Serjeant's room.		12 0	18 0	12 0	216	2592	1	5 0		
1 Hospital Serjeant's Quarters										
	Room I. }	10 10	14 10	14 4	160	2303	1	4 0	3 6	
	Room II. }	12 10	14 10	14 4	190	2728	1	4 0	3 6	
Apothecary's Quarters		11 10	14 10	14 4	175	2516	1	4 0	3 6	
1 Regimental Serjeant Major's Qrs										
	Room I. }	13 10	16 10	12 6	233	2910	1	5 0	4 0	
	Room II. }	13 10	16 10	12 6	233	2910	2	5 0	4 0	
	Room III. }	14 0	8 0	7 8	112	858	1	4 0	3 6	
	Room IV. }	8 0	8 0	7 8	64	490	1	4 0	3 6	
1 Regimental Qr Master Serjeants' Quarters										
	Room I. }	24 0	17 0	9 10	408	4012	4	5 0	4 0	
	Room II. }	13 10	17 0	9 10	235	2312	3	5 0	4 0	
	Room III. }	38 3	12 0	9 7	459	4398	2	5 0	4 0	
8 Serjeants' Quarters in one Range										
	Room I. } for each {	14 0	17 0	12 0	238	2856	8	5 6	5 0	
	Room II. }	14 0	12 0	11 3	168	1890				
Standard Guard-room.		35 0	16 0	14 0	560	7840	4	5 0	4 0	
2 Prisoner rooms, each.		16 0	16 0	14 0	256	3584				
2 Solitary cells, each.		8 0	8 0	10 0	64	640				

Detailed Statement of accommodation in the Regimental Serjeants' Quarters of the Foot Artillery at Bangalore.

2 Serjeant's rooms in centre of the two Ranges, each.	17 6	17 9	13 7	310	4219					
1 Staff Serjeant's Quarters.										
	Room I.	16 0	14 11	11 6	238	2744	2	5 6	4 6	
	Room II.	10 0	14 11	11 6	149	1715	2	5 6	4 6	
1 Guard room.	25 0	14 4	11 3	358	4021	3	5 6	4 6		
1 Prisoner room.	16 6	14 0	11 3	231	2598	1	5 6	4 6		
1 do. do.	27 0	8 0	7 3	216	1566	2	2 0	3 0		
1 Solitary cell.	8 0	8 0	10 0	64	640					
1 Conjee house.	14 0	8 0	10 0	112	1120					

FOOT ARTILLERY BARRACKS

162. The Foot Artillery Barracks are situated to the N W of the Race Course, on which stand the new Diagoon Barracks. The health of the Troops in these Barracks has always been remarkably satisfactory, and probably may be expected to improve on the completion of some alterations now being carried out—and some others which I now suggest for consideration.

The measurements of the Barracks given in the following table show that they are capable of containing 52 men exclusive of Serjeants, with an average of 85 superficial area and 1,456 cubic contents

Detailed Statement of accommodation in the Rooms and Verandahs of A Battery, 23rd Brigade, Royal Artillery

Block	Rooms	How occupied	DIMENSIONS,			Superficial area of each room	Cubic contents of each room	Regulation No at 1,000 cubic feet	Superficial area then afforded	Number of cots at present in each room	Number at 85 superficial area	Cubic contents thus afforded	Openings for ventilation	WINDOWS		DOORS		REMARKS		
			Length	Breadth	Height									Number.	Height	Width	Number		Height	Width
No 1.	{	1 Barrack Room	119	19	16	92261	37,872	37	61	33	26	1456		12	2	3	6	8	4	
		1 Serjeant's Room	17	19	16	9323	5,410	5	64	3	3	1803		2	2	3	3	8	4	
		1 Serjeant's Room	17	19	16	9323	5,410	5	64	3	3	1803		2	2	3	3	8	4	
		1 Barrack Room	119	19	16	92261	37,872	37	61	32	26	1456		12	2	3	6	8	4	
		1 Guard Room	25	15	15	6375	5,812	5	75	..	4	1453		3	5	4	1	8	4	
" 2	{	1 Prison Room	16 1/2	14	15	6231	3,580	3	75	..	2	1790		1	5	4	1	8	4	
		1 Office Room	15	22 1/2	16	0337	5,400	..	77	..	..	..		2	5	4	1	8	4	
		1 Store Room	12	8	10	096	960	..	..	..	..	..		1	5	4	1	8	4	
		1 Serjeant's Mess	27	14	16	0378	2,268	..	..	..	..	..		3	1	6	1	6	3	
		2 Prison Room	15	8	10	0120	1,200	1	120	..	1	1200		5	5	4	2	8	4	
" 3 Canteen	{	1 Cook Room	30	11	14	0330	4,620	..	..	..	..	..		2	2	3	1	7	4	
		1 Cook's Store Room	10	10	14	0100	1,400	..	..	..	..	..		1	4	3	2	7	4	
		2 Cook Room	15	9	10	0135	1,350	..	..	..	..	..		..	..	..	1	6	4	
		1 N. C Officer's Room	13	10	14	0130	1,820	..	..	..	..	..		2	4	3 1/2	1	6	4	
		1 Canteen Serjeant's Room ..	13	10	14	0130	1,820	..	..	..	..	..		1	4	3 1/2	1	6	4	
" 4 Library	{	1 Rank and File Room	37	21	17	0777	13,209	..	..	..	..	..		2	4	3 1/2	2	6	4	
		1 Store Room	13	10	14	0130	1,820	..	..	..	..	..		..	..	..	..	6	4	
		1 Reading Room	56	20	16	91120	18,760	..	..	..	..	..		8	5	4 1/2	6	8	4	
		1 Librarian's Room	9	10	14	090	1,260	..	..	..	..	..		1	5	4 1/2	1	8	4	
		1 Store Room	9	10	14	090	1,260	..	..	..	..	..		1	5	4 1/2	1	8	4	
" 5	{	2 Store Room	9	10	14	090	1,260	..	..	..	..	..		1	5	4 1/2	1	8	4	
		1 Tailor's Shop	9	10	14	090	1,260	..	..	..	..	..		1	5	4 1/2	1	8	4	

163 The long rooms have been recently much improved by the introduction of ridge ventilation through their whole length, and though not of good design they are comfortable, and, with the out-offices, allow of the unmarried Soldiers being fairly housed

164 The churchyard in close proximity is, however, decidedly objectionable, and should be closed as soon as possible for the sake both of these and the new Dragoon Barracks as well as on account of the families of the Foot Artillery who reside in close proximity to it

165 Two verandahs run at the front and rear of these Barracks, of these one towards the public road is closed and used as a Saddle room, and the other towards the Barrack yard is open.

166 I am decidedly of opinion that the close proximity of this Saddlery is objectionable both as necessitating the constant closing of all the doors and windows in this verandah (and thus preventing thorough ventilation of the Barrack room) but also as tending to attract insects and to pollute the air, as harness is always more or less saturated with oil and perspiration.

167 In this as in other Barracks I would strongly recommend that separate and distinct Saddle rooms should be provided as close as convenient to the Barrack rooms or in the Horse stables In the present case the opening of the doors and windows of the verandah thus used would greatly improve the ventilation of the Barrack room.

168 The Guard room is small but well ventilated by 3 windows and 1 door But as those modes of ventilation are under control by the men, and it is but too likely that they might be closed by them, I think complete ridge ventilation should be given as in the Barrack—and the same recommendation applies to the Prison room which is smaller and less thoroughly ventilated, having only 1 door and 1 window and no thorough draft.

169. The Cook-room, a narrow badly ventilated apartment, is in bad repair. At the time of our visit (during the preparation of breakfast) the smoke and heat were intolerable and such as would prevent any European superintending the cooking The flooring was flagged and uneven, and cannot possibly be kept clean.

170. A new Cook-room should be built—airy and well ventilated, with Giant or Duff's Cooking range, and suitable tables for cutting and preparing food in a cleanly manner.

The Privies in this Barrack were small and somewhat offensive, although coal tar had been freely used in them Earth had been imperfectly used in them, but much greater care should be taken in its use and a suitable shed for storing it should be provided.

171. The Latrine intended for the Punjaub system of conservancy but with wooden seats and wooden tubs is situated near the Barracks. This ought to be altered so as to suit the dry earth system, and then the full advantage of this plan of conservancy would be more apparent than it now is in this and other parts of this Cantonment where it has been very imperfectly tried.

Wash house.

172 The Wash-house is a small octagonal building which is too small and allows no possibility of bathing with any regard to decency.

173 Solitary cells are used for Prisoners. They are both small and ill-ventilated apartments and one of them is without any Latrine accommodation. The other which has this accommodation has been condemned. One good Military Prison would be preferable to these places of confinement (vide also para 118). Confinement in close ill-ventilated cells, such as those under notice, can scarcely fail to act injuriously on the health of Prisoners.

174 A small building formerly known as the Foot Artillery Hospital is now used as a Reading room. Suitable lights were being provided for it. In this as in the other Reading rooms the furniture is deficient, and not calculated to promote the comfort of the men resorting to this place.

175 The Canteen is the only part of these Barracks which was dirty and uncomfortable. I have so frequently brought before the notice of Government the views of this Commission regarding the management of Canteens, that I need not here repeat my observations, but I trust the recent orders of the late Commander-in-Chief in India will be strictly carried out, and an improvement in this branch of Barrack management be thus effected.

176 The married men of this branch of the Artillery are accommodated in small cottages in close proximity to these Barracks. These buildings are small, ill-ventilated, and very insufficient in point of accommodation. They are rented by the men who usually pay two to three Rupees per month, the rent being defrayed by Government.

177 I have before adverted to the desirability of removing all saddlery from Barracks and made the requisite suggestions as to the disposal of these articles, but it is, I believe, uncertain whether or not these Barracks are to be abandoned, on the completion of those at the Race Course. They have recently been much improved and, so far as their capacity allows, are suitable for occupation, but if they are continued in use by European Troops, Workshops should be provided for the men.

178 The Soldiers' Gardens of the whole force of the Artillery and European Infantry Regiment are situated close to the Barracks now under report, they are very neatly kept. It is in the opinion of this Commission highly desirable that a Plunge Bath should be erected in these Gardens to be supplied from the Shoolay tank. This Bath should be screened off, so as not to be visible from the public road which runs between the Shoolay tank and the Soldiers' Gardens. The water used for the bath could be afterwards employed to fertilize the Gardens.

179 The Shoolay tank, like the larger one of Ulsoor, is liable to become rather low during the hot weather, and possibly might then be unequal to supply the Plunge Bath with an abundance of water. It will be necessary therefore to adopt measures to increase the storage of water in this tank and to lessen its area—while all rain-fall drainage should be conducted into it, and the present tributary of it (a channel conveying surface drainage from the village of Shoolay) should be protected from contamination by natives.

180 The necessity for this precaution being taken, will be more apparent when it is mentioned that two large public Latrines are situated in its close vicinity, and from the known habits of the native population it is not improbable that this stream is resorted to for the purposes of bathing after these places had been visited.

181. The following recommendations are made regarding the Barracks and Hospitals of the Horse and Foot Artillery at Bangalore.

Recommendations

(1) That the standard of 85 square feet superficial area should be adopted for all men, exclusive of Sergeants, to be accommodated in the Barracks.

(2) That additional Barrack accommodation should be provided at the same rate for such men as may require it—the number to be thus provided for to be fixed by the Military authorities.

(3) That the drainage of the Barrack Blocks and especially of the Sergeants' quarters therein, should be at once improved.

(4) That all saddlery and harness should be as soon as possible removed from Barrack-rooms or Verandahs, and that suitable apartments for the safe custody of these should be provided either in detached buildings or in the stables recommended by this Commission, should these latter be approved by Government.

(5) That the beds and bedding should be improved as recommended in Appendix H of this Report.

(6) That the present Lavatories be removed and suitable ones erected, each to contain, in separate rooms, fixed baths and basins respectively.

(7) That new Cook-rooms and Privies be erected, that they both be well ventilated, and that the latter be so constructed as to be worked strictly on the Dry Earth principle.

(8) That the present Hospitals for Artillery when no longer required for their present use, be converted into Recreation rooms and Workshops.

(9) That suitable stabling be erected for all Horses.

(10) That new and improved School rooms be erected in closer proximity to the married quarters of the Horse Artillery.

(11) That a good Plunge Bath be constructed in the Soldier's Gardens.

MAIN GUARD

Main Guard

shut by the European Guard on duty.

182 The Main Guard situated on the edge of the Parade Ground was visited early in the morning, and all the doors and windows were found tightly shut by the European Guard on duty.

183 The Officer's room is an indifferent apartment barely furnished and extremely uncomfortable.

184 Behind the Main Guard building two privies were found, one of these, intended to be worked on the Punjab system and for use by Europeans, was found in an exceedingly filthy condition and the proposed Conservancy system had never been carried out in this privy.

185 A small privy intended for use by the Natives on duty was found greatly slopped with water and smelling most offensively. The necessity of preventing Natives bathing within the limits of any privy used by them has been so frequently pointed out by this Commission, that it is scarcely necessary that I should do more than record our opinion that positive orders should be issued on the subject, and that here, the comfort, and perhaps the health, of the men on guard should not continue to be endangered by this practice.

Privy for Natives.

Recommendations.

186 These two privies should be re-constructed and worked carefully on the "Dry Earth" system.

BARRACKS OF INFANTRY REGIMENT

Barracks of Infantry Regiment.

187. These Barracks were occupied till very recently by Her Majesty's 66th Regiment

188. As soon as the New Cavalry Barracks on the Old Race Course are completed, it is proposed to abandon these Barracks, the Infantry Regiment being transferred to the present Cavalry Barracks.

189. The buildings have recently been put in repair and improved. I would suggest that they might be utilized for Commissariat Stores and for the Arsenal.

190. At present the Arsenal is located in the Bangalore Fort separated from the Cantonment by the pettah, a distance of nearly two miles. I believe the distance of the present Arsenal from the Troops has been pronounced objectionable by competent Military authorities

The Arsenal and Commissariat could be accommodated here.

191. 5,000 Rupees are, I learn, to be expended in alterations to the Arsenal in the Fort, and it seems very desirable that no expenditure should be incurred on an Arsenal in the Fort which will be hereafter abandoned.

192. There is ample space in the enclosure of the 66th Barracks for the necessary buildings required for the Arsenal, and the Barrack rooms would afford admirable accommodation for the Commissariat Serjeants, &c &c, who are not admissible in Regimental Barracks and who could here be accommodated close to their place of duty.

Commissariat Stores.

193. The only portion of this Barracks which was examined in detail by this Commission, was the Hospital for the treatment of the Regimental sick, and this will no longer be required on the transfer of the Regiment to the Old Dragoon Barracks

Hospital

194. A general plan of this Hospital is appended hereto, and it will be seen that it affords accommodation in Wards which are now well-ventilated and airy for some sixty patients.

Capacity of Hospital.

195. It is proposed that this building should be employed as a Garrison Hospital, and for this purpose, it is, in the opinion of this Commission, well suited.

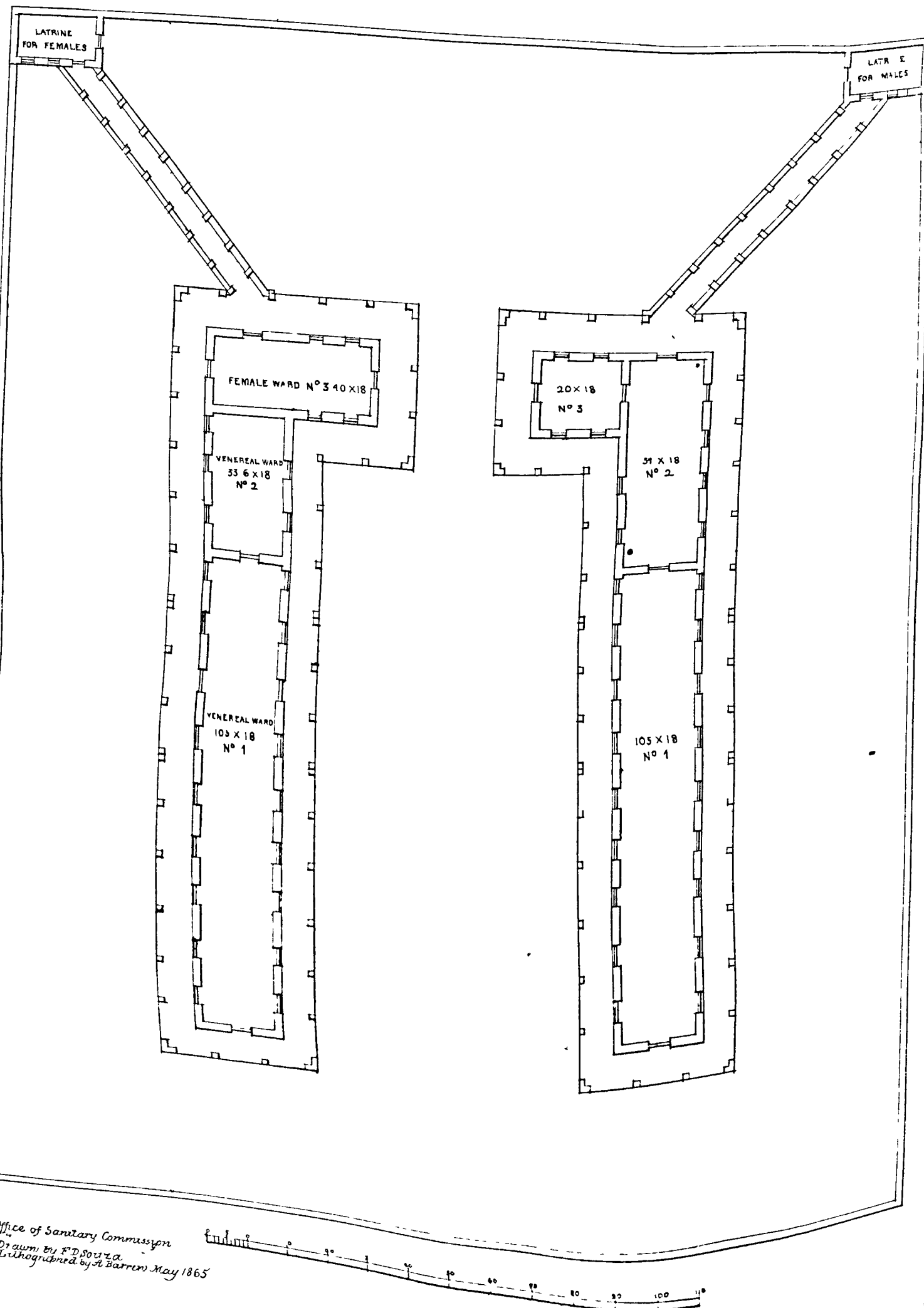
196. Some minor alterations may be required to fit it for this use, but they will be neither numerous nor expensive, for almost all that could be done, has been already effected to improve the condition of the Hospital. During the earlier part of the year 1863, there was much unhealthiness in the 66th Regiment. The conservancy of the Hospital was indifferent, and it was surrounded by a high wall which prevented thorough ventilation. This wall has been since removed and with a most beneficial effect.

Recent alterations and improvements.

197. At the period of our inspection one Ward was considerably over-crowded, having 33 patients where only 19 should have been, if each was allowed 100 square feet superficial area. This overcrowding, however, was only temporary and resulted from the fact of one of the large Wards being under repair. The Hospital, generally, was exceedingly neatly kept, but the condition of the roof was unsatisfactory, as in some places it leaked a little.

Over crowding.

PLAN
OF HOSPITAL OF 66TH REGIMENT OF FOOT AT BANGALORE
PROPOSED TO BE CONVERTED INTO A GARRISON HOSPITAL



- 198 The Latrines are worked on the Dry Earth System and with great success, but coal tar was also used as an accessory deodorizer.
199. The Bath rooms in this, as indeed in all old European Hospitals, were exceedingly faulty. The rooms were small, insufficient in size and number, and there were no pegs to hang clothes or towels upon
- 200 The Female Wards have been recently much improved, and the unpleasant smell arising from the Latrines has been cut off by a partition wall
- 201 The accompanying statement of Accommodation and Plan shows the capacity and arrangement of the different parts of this Hospital.
- 202 This Commission recommends to Government that this Hospital, when no longer required for the Infantry, be converted into a Garrison Hospital.

GARRISON HOSPITAL.

203 This Hospital consists of one large Native Ward and one Ward for European and East Indian patients.

Style of construction

204. There are also separate Wards for female patients. These were unoccupied at the time of our inspection

205. The accompanying Plan and Statement of accommodation show that the Native Ward is only capable of containing nine patients, the European Ward for males only seven, and that only two females can be accommodated in the detached building

Capacity of Hospital.

Unfit for continued occupation

The Hospital is so essentially bad, that it should be abandoned as soon as possible, and the patients transferred to the present Infantry Regimental Hospital when it becomes available for this purpose.

Latrines

206 The Latrines of this Hospital are very ill constructed and should, if the Hospital be maintained, which seems doubtful, be reconstructed

Separate Ward.

207 The separate Ward, if the small room 8 x 6 feet deserves the name of a Ward, is quite useless from its small size.

No Dead room.

208 There is no Dead room in this Hospital.

Water supply

The Water cart for the Lock Hospital and the Hospital servants procure water for the Garrison Hospital have been disallowed, and the Hospital servants procure water from an adjacent well.

209. A nurse is only entertained if there are female patients in Hospital, and the result is the attendant who is hurriedly entertained is found frequently to be inefficient

Female attendants

210. At the period of our visit there were no women under treatment, and had there been, the accommodation provided for them was so exceedingly indifferent, that in all probability the patients would have been subjected to much discomfort.

211 I am induced thus forcibly to direct attention to the many faults in this Hospital as under certain circumstances the access to it of a large number of patients might occur

212. All European recruits passing through the Station, drafts of Regiments, whether of Cavalry, Artillery or Infantry, European pensioners and their families, Invalid Soldiers of all classes, including men sent to this Station as a Sanatorium, Medical and Veterinary Pupils, Dhooly Bearers and all Garrison public servants, as well as all classes of followers, permanently or temporarily receiving pay from Government, are entitled to advice and treatment in this Hospital.

Persons entitled to treatment in Hospital

213 It will be seen by the tabular statement of accommodation that there is only superficial space sufficient for 7 European and 9 Native males, and that on the occasion of our visit 25 cots were placed in the two Wards affording this accommodation. If these cots were all occupied, the most dangerous over-crowding would necessarily have taken place.

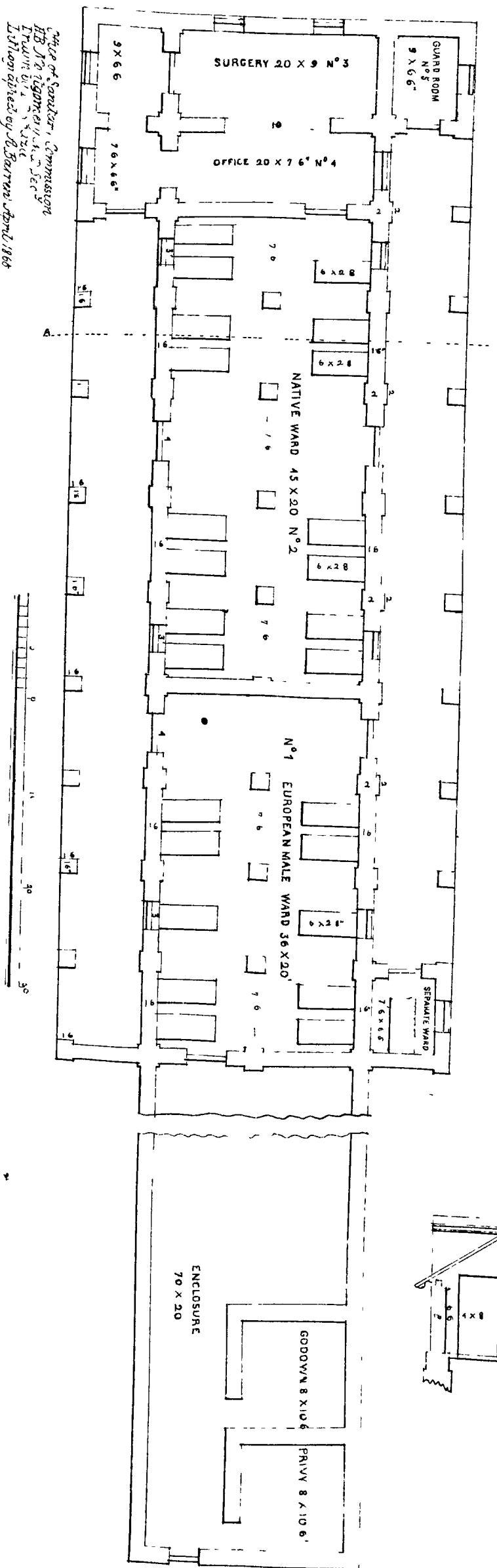
214. Under such circumstances, this Commission recommend to Government that the continued use of this Hospital should be abandoned.

215. The statement of accommodation of this Hospital shows that it comprises 3 Wards for European and Eurasian females. These apartments are lofty and well ventilated.

LOCK HOSPITAL.

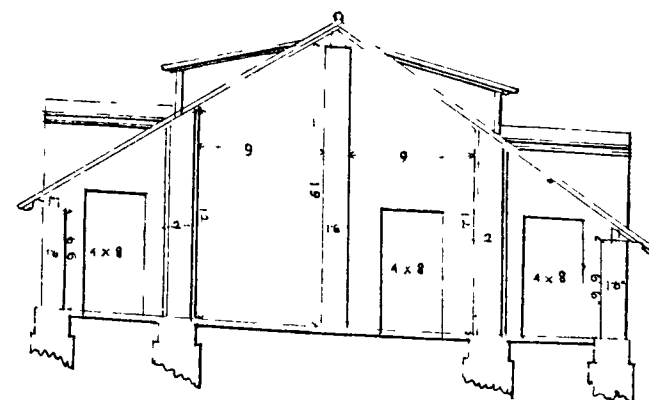
The statement of accommodation of this Hospital shows that it comprises 3 Wards for European and Eurasian females. These apartments are lofty and well ventilated.

Plan of Garrison Hospital
at Bangalore
Drawing by J. S. S. S.
18th Nov 1886



PLAN AND SECTION
OF
GARRISON HOSPITAL
AT
BANGALORE

SECTION THRO A B



216. There are at the entrance to the building a small Office and Examination room and behind the Female European and Eurasian Wards, 4 Wards for Natives

217. There is sufficient accommodation for 9 of the former class and for 19 of the latter, allowing 100 superficial square feet per patient. At the time of our inspection there was a good deal of over-crowding, there being in the Hospital 46 Native patients or more than twice the number which the wards should contain.

218. Two European women were also under treatment and the cots allotted to this class are never occupied fully

219. The number of cots shown in the tabular statement is the number actually in the Wards and not the number occupied at the time of our inspection

220. Beds are provided for the European and East Indian women and straw mats for the Native women except in severe cases when the native females are supplied with mattresses

Cleanliness of Hospital The Lock Hospital was throughout scrupulously clean

221. The ground opposite the Latrine in the Hospital requires levelling and the drainage of the Hospital should, without delay, be attended to

222. The women were wearing their own clothes, but I understand from Dr. Rogers, that Hospital clothing will shortly be issued to the inmates of the Lock Hospital.

223. I regret that my enquiry into the system observed for the registration and inspection of the Prostitutes who are frequented by the European soldiery, leads me to think that the Police, although there is a local regulation which gives them power to act, have failed in this portion of their duties.

224. The real number of Prostitutes frequented by European Soldiers is not entered in the Registers and those who are registered evade inspection.

This matter has been brought by me to the notice of the Chief Commissioner and of the officer who is at present at the head of the Town Police. I have little doubt that progress will soon be made in checking Venereal disease which is "the disease" of the Bangalore garrison.

225. This Commission trust that the Rules, prepared in connection with the new Military Cantonment Act, which relate to the prevention of venereal disease, will be applied in their entirety to the Bangalore Station.

LINES OF MADRAS SAPPERS AND MINERS

226. These lines were formerly occupied by a Regiment of Native Cavalry, and are situated North West of the Ulsoor tank which is distant from the North East angle of the lines 200 yards and 350 from South East angle

227. The low level of this tank which is intended to supply drinking water to the European Barracks, and the importance of keeping the water free from impurities, render the drainage of these lines of considerable importance. The whole of the ground allotted to these lines forms a parallelogram lying N. E. and S. W. and N. W. and S. E. of the central point.

228. The lines lie along the S. W. side and are thus exposed to the Monsoon from this direction. The ground slopes gently down towards the Western Bay of the Ulsoor tank, and the Storm Water drainage must, like that of the surrounding lands, be directed towards this point.

229. As hereinafter noticed, the place selected for lines is bounded on one side by a public road (S. E.) and on the adjoining sides by public buildings and a bazaar, separated from it by a narrow road. To the first two of these boundaries there is no objection, but the lower portion of the lines

might be, with great advantage, relieved from the probable ill effects of the close proximity of a cluster of Native huts, which are crowded together at the Southern angle of the lines, and which must be a source of nuisance from their filthy condition and want of drainage and ventilation.

230 I would therefore recommend that these huts be at once removed.

231 As the bazaar of which these huts form a part is to the S. W. and close to the lower portion of the site chosen for the lines, the drainage of it was carefully examined and found to be defective.

The drains are ill made and empty themselves on the eastern side into the Storm Water Drain, skirting the S. E. side of the whole lines. This drain empties itself ultimately in the water channels leading to the canals in the reclaimed land occupying the Western Bay of the Ulsoor tank. I would strongly recommend that all sewage drains should be diverted from it and that they should be directed if possible so as to join the main drain.

232 I believe that owing to the comparative levels of the bazaar and the bottom of the main drain, there will be no difficulty in doing this—and that the storm water channel of the latter may be crossed below under its bed by a masonry sewer which could join the main drain at right angles, but not to run into it. The junction of the two would, with the channel and side of the present sewage drain (parallel to the water channel), form a square cesspool which might be trapped with advantage—means being as now taken to flush out the main drain on the occasion of heavy rain. The storm water would continue as at present to be received in the larger channel and from it pass to the Ulsoor tank.

233 Before noticing the leading points requiring attention in housing the Sappers and Miners, I desire to draw attention to the block of buildings lying to the West of the hutting ground.

234 Here a large and confused assemblage of native houses exists between the lines and a public road (Pensioner's Hill). Like most Native bazaars the houses are irregularly placed and ill-drained and offensive house water and refuse are allowed to trickle from wide openings in the walls next the lines into hardly formed drains so ill-made that stagnant pools of most offensive filth lying along this side of the Lines render the air impure and offensive. Unless a strict and complete system of conservancy is enforced among these people, it will be necessary for the health of the Sappers and Miners, that these huts should be removed, such compensation as may be necessary being paid to the owners.

235 I think that it is very desirable that advantage should be taken of the present opportunity to construct for the Sappers and Miners permanent Lines, in lieu of the indifferent huts usually occupied by Native Soldiers in this Presidency. It is unnecessary that I should dwell upon the vast superiority of the former in promoting and securing the health and comfort of the Soldier; and the Permanent Lines at Perambore (Madras) show satisfactorily that Cholera and other Epidemics fail to affect them as injuriously as they do other Native Lines in the vicinity of Native bazaars. Perfect conservancy is literally impossible in the Native Lines hitherto constructed. I believe this question of substituting Permanent Lines for the Native Troops' Excellency the Commander-in-Chief.

236 It is a subject of great importance as affecting the health and comfort of the Native Army. Owing to the increased price of all articles of consumption, the pay of the Native Troops is not more than is absolutely necessary for their maintenance, and the expense which they incur whenever they change stations in paying for their lines far exceeds their Hutting money and falls very heavily upon them.

237 Moreover, they are obliged to incur a considerable annual expense in keeping their wretchedly constructed dwellings in repair.

238 The Corps of Sappers and Miners could themselves build the houses and construct the drains required for their lines and in a comparatively short time a model would be furnished upon which other similar Lines for Native Troops could be constructed, should it seem desirable to accommodate similarly other Regiments at such stations of this Presidency, as Madras, Secunderabad, Bellary, &c.

239 Inspector General Shaw, late Officiating Principal Inspector General, and indeed all Medical Officers of experience in this country, are of opinion that a material improvement in general health, a diminution of sickness and mortality—and a lessening of the spread of epidemic disease in the Native Army would result from the general adoption of permanent well built residences for Native Soldiers.

240 I now proceed to notice briefly the proposed method of utilizing the existing buildings on the proposed site of the Sappers' Lines for special purposes.

241 The Old Horse Lines are to be eventually made into European and Native Gardens, for this purpose they are from their previous use especially suitable.

The Sheds formerly used as Sick Lines and for boiling gram are to be made into Artificers' Sheds, for which they are well suited. The old gram boiling Shed will make a good forge. Some of the Sheds will require to be closed in, but these and other minor details are necessarily omitted from this report, which is merely intended to embrace such remarks as may have direct influence upon the health of the men, both European and Native, belonging to the Corps.

242 One block of buildings to the North of the N. E. angle of the Lines, contains quarters for 2 Staff Sergeants (Quarter Master and Sergeant Major), and affords very sufficient accommodation. A good verandah in front gives protection from sun and rain, and a good Sitting room, Bed room, Bathing room and Pantry are allotted to each man. The front Verandah is divided and a good compound adjoins the outer side of each house. Should it be desired, a small portion in front might be neatly enclosed, so as to bring the compound up to the same frontage as the present Hospital building.

243 In noticing these quarters, I would call attention to the overcrowding which not unfrequently takes place in the married quarters assigned to Non-Commissioned officers, by their receiving into the rooms intended for one soldier and his family, numerous other relations such as brothers, sisters, aunts, and uncles. This is detrimental to the health of the inmates for whom these quarters are intended by Government, and an order limiting the occupancy of such quarters should be issued by the Military authorities and strictly enforced.

244 The rooms themselves in the quarters inspected, were all perfectly clean and neatly furnished and if devoted to their proper use would have afforded a most complete and comfortable home for a married Staff Sergeant. In the main building there was ridge ventilation and thorough ventilation from front to rear by opposite doors and windows.

245 Almost identical in point of design 4 pairs of semi-detached cottages are about to be erected for 8 married families. They are intended to face the road on the east of the upper ground and have the same accommodation as is found in the Staff Sergeants' Quarters, except that no Pantry is provided. The design of these buildings is good and suitable to the

class for whom they are intended They are superior to the plan of Family Quarters in the Diagoon and new Race Course Barracks, but would, from the arrangement of the chief rooms along the frontage, occupy nearly double the same extent of front space as is required in the other Barracks, and as the same width must be carried in front for Gardens and behind to hold Cook-room and Privy a very considerable space of ground would be required for any number of them In point of ventilation, however, they are decidedly superior (vide Plan)

246. As previously noted in my remarks on the other Barracks, the small compound in the rear was practically diminished in size by placing the Cook-room and Privy in a line running from front to rear along the party wall dividing the compounds of adjoining houses

247. It is suggested that if possible the Privy and Cook-room should be placed in opposite angles of the back of this little piece of ground. By this slight alteration, the distance between the main building and out-houses is increased and this is highly desirable, as in the new Race Course Barracks not only is the Compound in the rear too small, but the outhouses are within 6 or 7 feet of the only Bed room window

248. In the family quarters built in continuous blocks, the same arrangement should, I think, be adopted

249. If no doors are provided in the rear wall of these compounds, I think a "shoot" might with advantage be placed adjoining each Cook-room to discharge house sweepings and kitchen refuse into an iron vessel placed outside, and which could be emptied once or twice a day by the scavengers' carts for whose easy access a good road in rear of all the houses is to be constructed

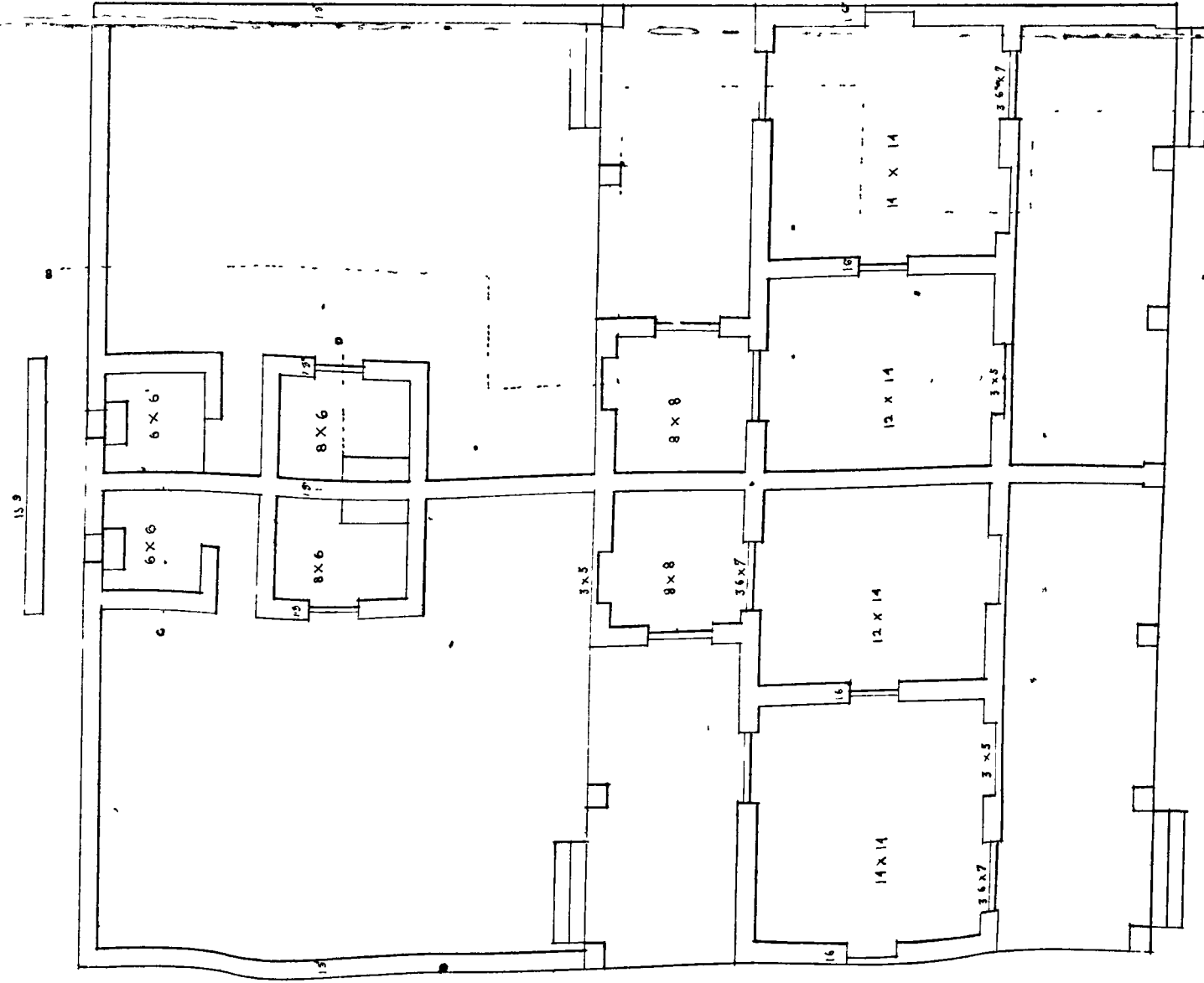
250. Of the buildings devoted to general purposes, the Barrack Block requires notice as it is intended to convert it into quarters for unmarried Europeans and School rooms Of the subsidiary buildings used as places of Arms, Main Guard, &c, &c, nothing need be said They only require ordinary repairs and white-washing The Guard room is on the standard plan and well ventilated (Vide Plan)

251. The Barrack block forms the rear of a quadrangle the left side of which it is proposed to convert into quarters for unmarried soldiers To effect this the roof must be removed, the walls raised, the windows enlarged and the whole building improved as regards ventilation.

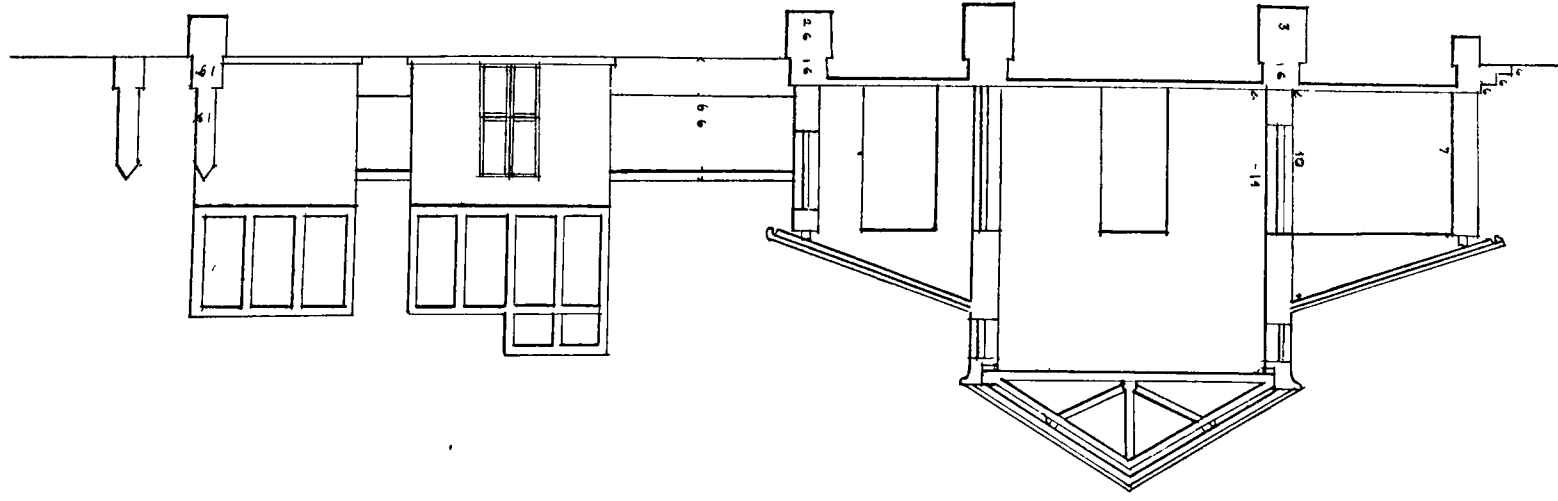
252. The corresponding building on the other side is to be used as a School house If devoted to this purpose, it is certainly desirable that similar measures to those recommended for the family quarters should be adopted

253. These two buildings are not large and should it appear to Government that it is desirable to provide for the Europeans of the Sappers who are all Non-commissioned Officers, a superior class of accommodation to that provided for common soldiers, it may perhaps seem advisable that both these buildings should be divided into quarters and allotted to these men There are 24 Europeans in this Corps and not improbably others may arrive from England If any considerable number of these are married, the 8 quarters now provided for married men will be insufficient

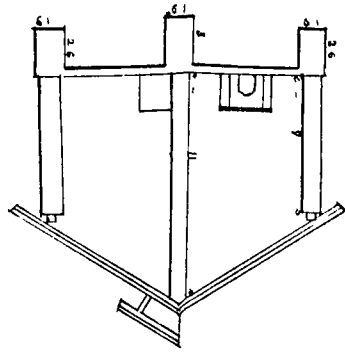
PLAN
OF 2 NON COMD OFFICERS' QUARTERS
FOR THE SAPPERS AND MINERS
PROPOSED TO BE BUILT AT BANGALORE



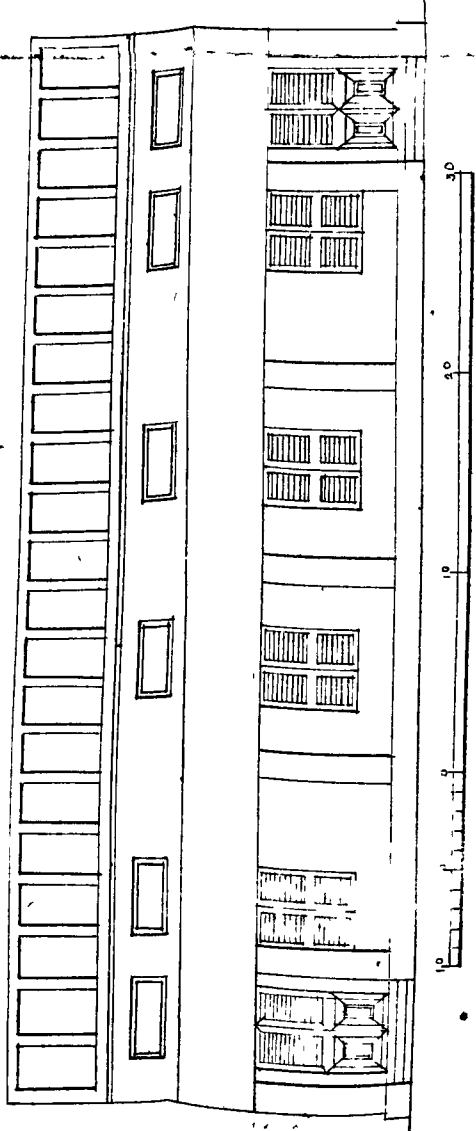
SECTION THRO A B



SECTION THRO C D

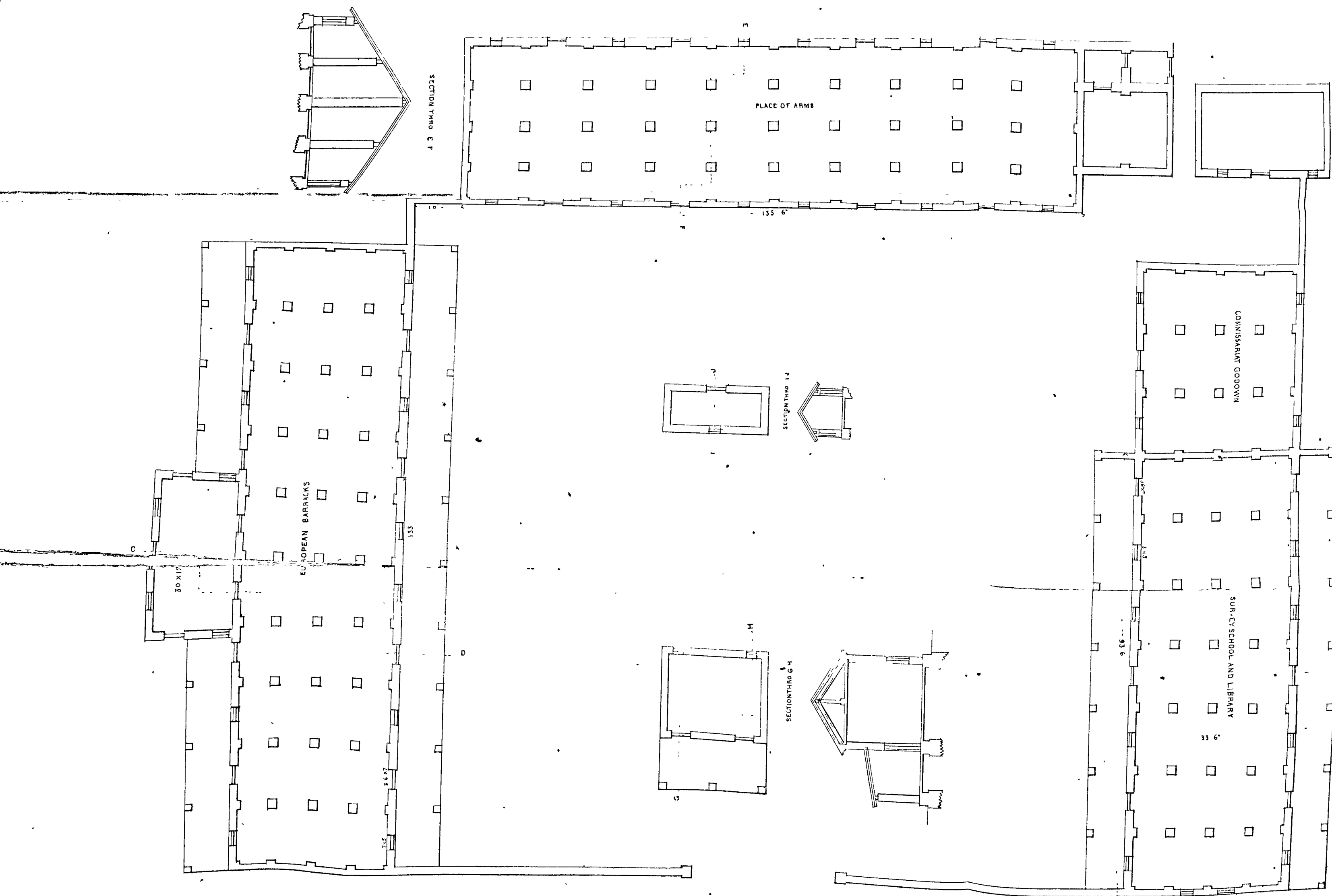


ELEVATION

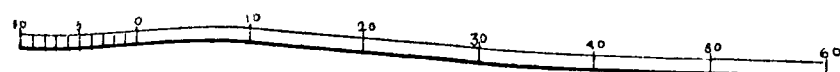
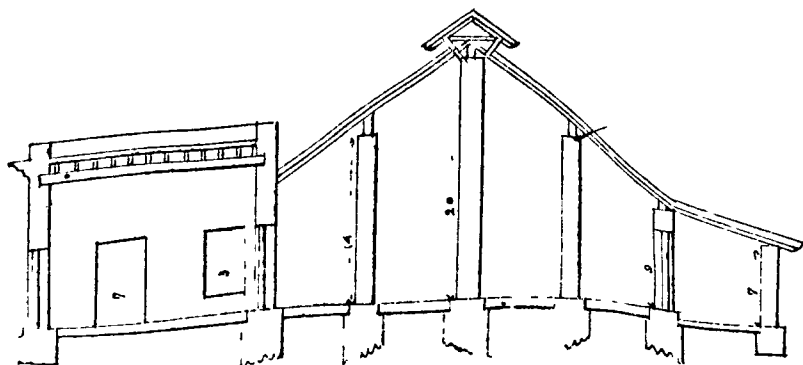


Office of Standard Commission
Drawn by the Corporation of Bangalore
and the Ministry of Defence, 1965

PLAN
OF THE LIGHT CAVALRY BARRACKS
FOR THE SAPPERS AND MINERS AT
BANGALORE
SHOWING PROPOSED ALTERATIONS AND IMPROVEMENTS

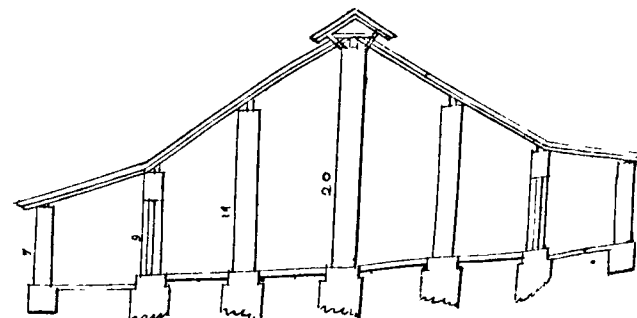


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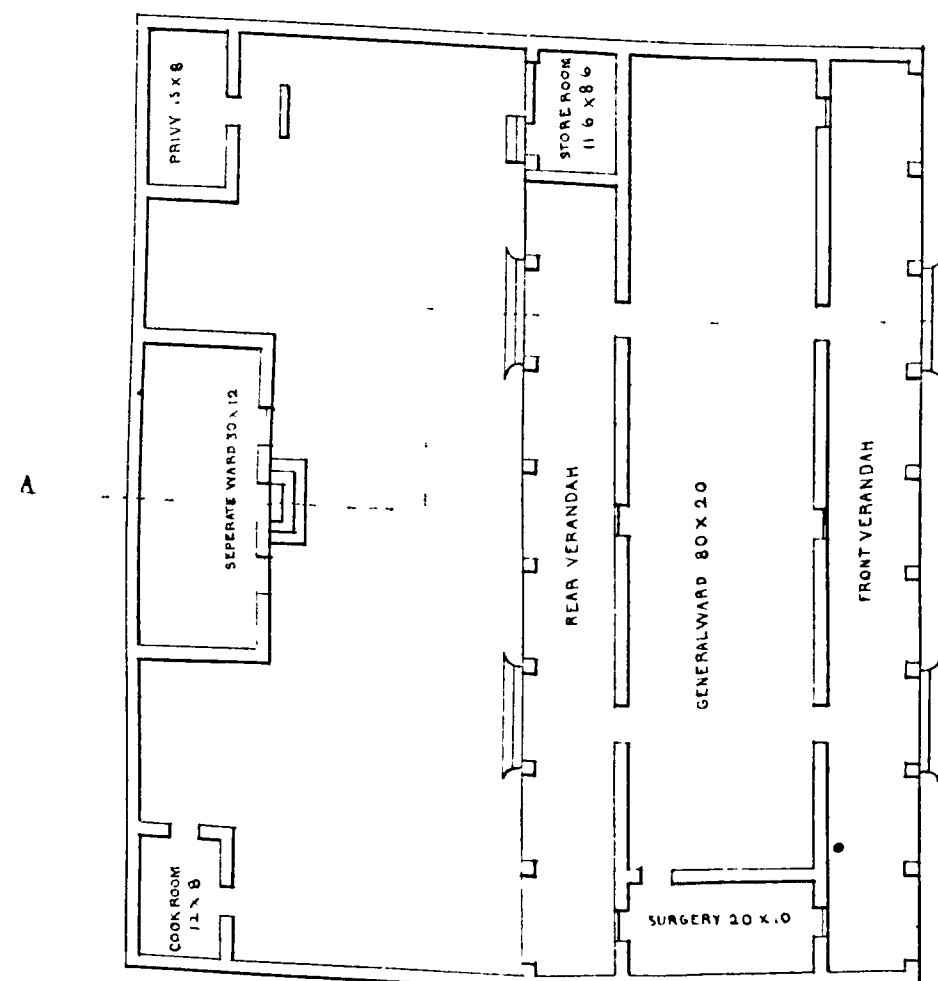


Office of Sanitary Commission
Drawn by E. D. Jones
Lithographed by A. Burner May 1865

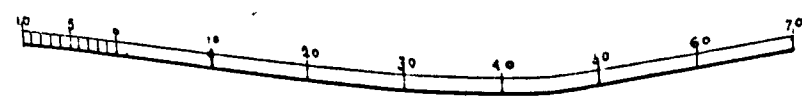
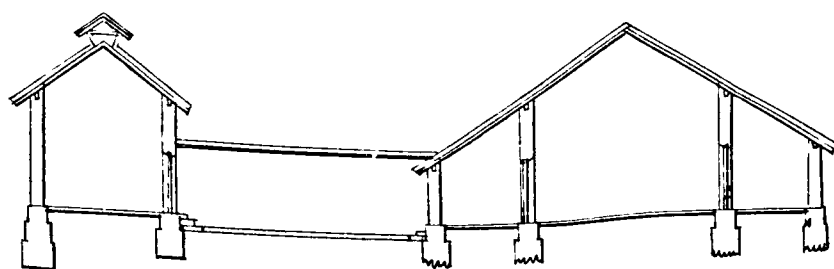
SECTION THRO A B



PLAN
OF THE HOSPITAL OCCUPIED BY THE MADRAS SAPPERS AND MINERS



SECTION THRO AB



Office of Sanitary Commission
Drawn by F. D. Souza
Lithographed by J. B. Barmen May 1865

Site for Detached School Room if required

254 If this should necessitate the erection of separate School rooms, there is abundant space for them on the ground to the North of the Barrack Block. I urge these recommendations for consideration as it is now proposed to have the Hospital for Natives close to the quarters to be allotted to unmarried men and to build between these places a Recreation room for the latter.

255 The Hospital is in a very good situation so far as pure air and good position are concerned and in point of arrangement is fairly suited to the wants of a small Native Regiment. It consists of a long Ward 80 x 20 and with a small adjoining room intended as a Surgery. It has a verandah in front and rear. Part of the latter has been walled in as a Bath-room. A good separate Ward 12 x 30 is to the rear of it, and two out-buildings, suited for a Cook-room and Privy.

256 To secure fully the proper segregation of patients, the European Ward should be entirely distinct from the Native Hospital, and should be provided with Latines and Washhouses of a special construction.

257 The only ground upon which such buildings could be erected is a space of ground between the present Native Hospital and the Quarters of the Staff Sergeants, and I do not consider that it is at all desirable that Hospital Buildings should be increased in this direction. The present separate Ward is hardly suitable for Europeans, as it lies between the Lines and (in the same enclosure with) the Native Hospital. Having considered carefully the relative position of all the foregoing buildings, I am of opinion that the requirements of the Regiment would be best met by (1) the conversion of the "Barrack Block" side buildings into sets of Quarters for 2 Europeans each, and (2) by the transfer of the Europeans of the Sappers and Miners to a General Military Hospital on the Race Course, if such an institution is sanctioned.

258. The Hospital, as it now stands, is provided with ridge ventilation which has however been blocked up with wooden weather boards. This is supposed to have been intentionally done as it was temporarily employed as a Brewery, but these obstructions can be easily removed. The separate ward is furnished with ridge ventilation and is well suited to this purpose for Natives. All the Hospital premises are exceedingly dirty and will require thorough cleansing before they can be used.

259 Should it be considered that a new Native Hospital should be built in conformity with the views of Col Crommelyn, (as modified by the Commission) then a good site is available for this purpose at the end of the old Horse Lines on high ground.

260 An Hospital constructed in this site would be well removed from all houses—would be to leeward during the S W Monsoon and would further allow that to windward of it and to the North of proposed School and Staff Sergeants' Quarters, additional accommodation could be provided for married Europeans, if they should be required. This could certainly not be done if the present Hospital is continued in its present use.

261. I should mention that a very indifferent private residence has been erected between the Hospital and the Sergeants' Quarters. It is in a dilapidated condition and should be at once removed; the site would be available for one pair of family quarters.

262 I understand that a Plunge Bath has been sanctioned for the use of the Europeans. I can only suggest that this should be placed in or close to the proposed Gardens where (as at a distance from all houses) the water could be utilized without any probability of harm.

263 In conclusion I desire to submit the following recommendations of this Commission

- (1) That the huts at the Southern angle be removed
- (2) That the Drainage of this place should be diverted from its present course.
- (3) That the conservancy of the hutting ground be promoted by enforcing a complete system of conservancy in the Native Houses lying to the West of it
- (4) That permanent lines be erected by the Corps of Sappers and Miners
- (5) That here and elsewhere overcrowding of public quarters by private families should be strictly prevented
- (6) That the out-houses of the proposed family quarters should be thrown to the back of the enclosed compound and not be built contiguous
- (7) That the school-rooms should be improved as it is suggested the Barrack quarters are to be.
- (8) That the Europeans of the Sappers and Miners be treated in a General Military Hospital at Bangalore if such an Institution is sanctioned
- (9) That the private dwelling house existing in these Lines should be at once removed

Lines of Native Infantry Regiment

264 The Lines of the three Native Infantry Regiments stationed at Bangalore are situated on the N W part of the Cantonment as shown in Map A. At the eastern extremity of this portion of ground the 14th Regt. N I is huted, the 22nd Regiment was placed in the centre, and the 33rd at the western end. The lines of the latter Regiment are separated into two wings or divisions, between which a broad road leads down to the Railway Terminus

265 The same style of huts is used by all the men, namely the ordinary mud hut with thatch roof. These huts are usually arranged in double rows back to back, and facing streets of different widths. The huts of the Native Officers are generally larger and better finished than those of the men; but in other respects closely resemble them. These huts vary in size from 15 to 12 feet square, according to the rank of the occupants and generally have from 5 to 6 persons living in each hut. This space is entirely insufficient for the number of persons who occupy the dwelling which has the further disadvantage of being generally very badly ventilated. Permanent lines of suitable design would greatly conduce to the health and comfort of the Sepoy, and this Commission is desirous to press this topic upon the notice of Government being aware that their views on this subject meet with the full concurrence of His Excellency the Commander-in-Chief

266 As will be seen from the remarks resulting from our detailed inspection of these places, the conservancy of them is very defective although the position of the ground occupied by the lines at Bangalore is singularly favorable to the introduction of a regular system of drainage while the erection of Latrines to be kept strictly under Regimental supervision would promote the health and comfort of the Sepoys and their families.

Lines of 33rd
Position and Drainage

267. These lines are extremely well situated on the slope of the hill which affords a natural fall for the surface drainage

Conservancy neglected

268 This position is so far fortunate, for there is no attempt made to secure cleanliness by any thing deserving the name of a made drain

269 There are imperfectly dug ditches on the side of the lines. For these should be substituted the granite slab drains common in Bangalore, where this stone is abundant and easily worked

270 The Sepoys' huts are thatched instead of being tiled as they should be

Faults in the huts

271 They are constructed according to the Quarter Master General's standard. The huts present the usual defects of being dark, and the yard attached to each hut is much too small for huts inhabited by the Sepoys who have generally large families

272 The Lines were clean, but this cleanliness is obtained at the expense of the Sepoys who employ Scavengers to clean their lines, each Sepoy paying at the rate of one anna for each inmate of his hut, a further sum of 3 pie per house is paid for keeping the roads swept

273 I do not think this charge should fall on the Sepoys, who at the present high prices prevailing are certainly not overpaid, but should be conserved by Government

274 The public Latrine of the 33rd Regiment was most offensive and dirty. I was unable clearly to ascertain who was responsible for the only part of the conservancy which is not paid by the Sepoys themselves. The Commissariat are supposed to supply the carts, and I conclude the Quarter Master of the Regiment is responsible that the work is done. The Latrine is liable to be flooded, and this Commission would recommend that a proper Latrine should be constructed for these Regimental Lines, and that Dry Earth Conservancy should be enforced. As the Sepoys already use the sewage of their houses in the Regimental gardens, there will be no difficulty in getting earth, and in employing the poudrette.

275. 223 of the Sepoys have small gardens remarkably well cultivated with vegetables. With assistance from their Officers they have sunk wells and take much pleasure in the cultivation of their gardens. These gardens are very creditable to the officers who have aided—and the men who work in them. Special credit is due to Dr. Henderson, for the active share he has taken in promoting this useful and healthy occupation of the Sepoys

School house

276 The School house which is nothing more than a rudely constructed shed—is not sufficiently large and is badly lighted.

277 There are on an average between 50 and 60 pupils, and at a slight expense, a decent school house might be constructed

278 The education in the Telugu and Hindustani languages is elementary and is eagerly sought after

279. The Quarters of the Regimental Sergeants of the 33rd Regiment are situated in close proximity to the Lines, and are surrounded by a wall which should be removed. If a light fence was substituted for this and the enclosure laid out as a garden, the comfort of these men and their families would be much promoted

280. The Quarters themselves situated on the flank of the right wing are small in dimensions and badly constructed. If not capable of improvement, this Commission is of opinion that new and suitable quarters should be built for these men whose social position demands that they should be suitably housed

281 The Guard-room is formed of two portions of the Verandah of the Barracks for Stand of Arms. It measures 20 x 9, and 30 x 9 or in all 450 square feet superficial area. It has one door, 3 windows on one side and two on the other, and seems sufficient for its intended use

Guard room

282 There are two Prison Cells on S W side of the General Parade Ground. Each Cell has 64 feet superficial area and 672 cubic space of air, and is ventilated by a barred opening 7 feet from the ground and measuring 6 feet long by 1 high. A sun shade protects the inmate from sun and rain. Running along the Cell and under the same roof is a passage 3 feet wide with a closet seat for the use of the Sepoy in confinement.

Prison Cells

283 From a large bowry close to the Lines, from two wells adjoining them, and from the

Water supply of 33rd Regt

"Dhobies' Tank" about quarter mile distant, abundance of good water is procurable throughout the greater part of the year, but in the hot weather the supply from these places frequently fails to a very considerable extent. The sinking of additional wells would therefore seem to be highly desirable.

284 It is understood that the Lines of the 14th when vacated by that Regiment, will not

Lines of 14th Regiment

be stationed at Bangalore

again be occupied by a Native Regiment, as two Regiments of Native Troops only will in future

285 The site of these Lines has on several occasions proved unhealthy, probably on account of the ground being saturated with the accumulated dirt of the Sepoys for many years. It will therefore be of decided advantage to clear this ground and leave it vacant for a period.

286 Hereafter when the ground has been 'purified' by having the site of these Lines used as gardens—the site may be found valuable for building purposes.

287 The remarks recorded above regarding the Lines of the 33rd apply generally to the

Lines of 14th Regiment

Latrine accommodation defective

Lines of the 14th, the drainage is defective, the huts dark and the cost of conservancy falls entirely on the Sepoys of the Regiment. No regimental Latrine has been provided for these lines, the Sepoys make use of a drain situated where the Regimental bazaar meets the Bilah Halli (commonly called Blackpillay) bazaar as a Latrine or else have recourse to the Billah Halli Latrine one of the most offensive buildings of the kind I have yet seen.

288 Much has been recently done by the energetic Municipal Committee to improve this

Public conservancy of the neighbourhood

part of the station by piercing broad streets, more improvements are in contemplation and are most urgently required.

289 In the lines of this Regiment a good deal of Fever was formerly prevalent and was

Sanitary condition

referred by the Medical authorities to the presence of a number of dry wells which had become receptacles of dirt and offal. These wells were filled up and the disease disappeared. In all respects as connected with drainage, construction of huts, &c, these Lines

Construction and drainage of the lines

closely resemble those of the 33rd Regiment.

290 There are 2 Solitary Cells situated at the South western end of the general Parade

Solitary Cells

Ground used by this Regiment. In dimensions and ventilation these are identical with those noticed in the 33rd Regiment.

Guard room

291 The Guard room of this Regiment is in every respect identical with the Regiment last noticed.

292 A mud building with tiled roof and divided into 2 rooms for Hindoos and Mussul-

School room

men, and with a court yard in front of sufficient size affords accommodation for the children of the Reg-

ment. The average attendance is said to be about 35 of Hindoos and about 30 of the Mussulmen children.

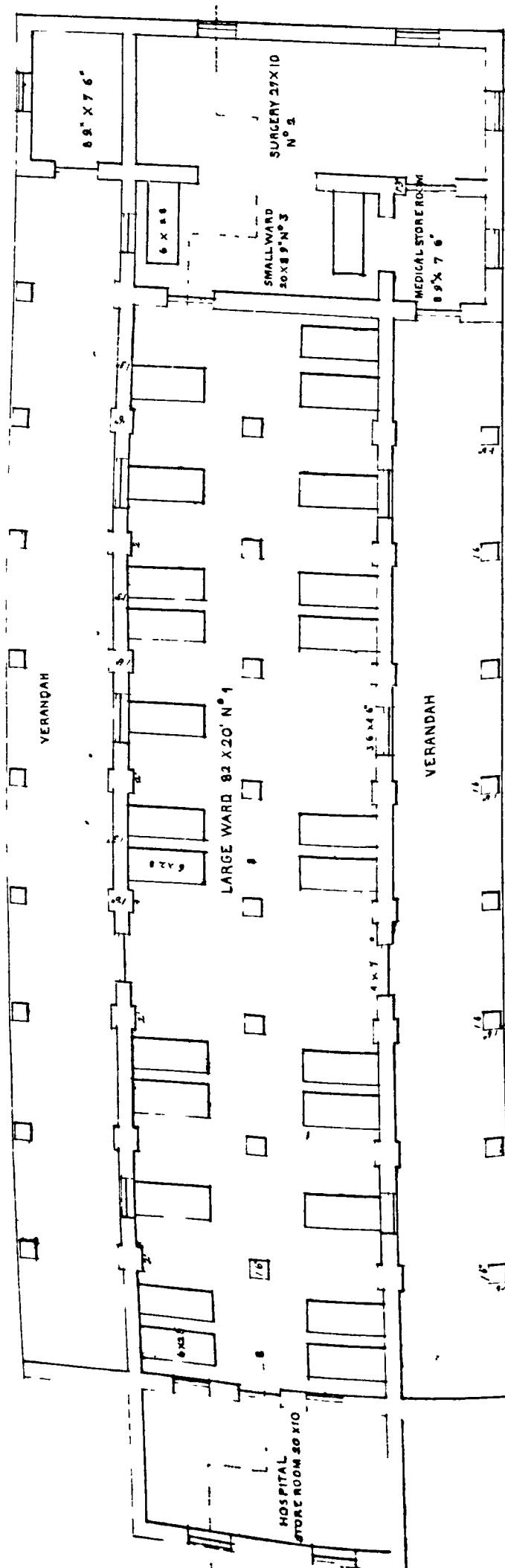
293 Drinking water is furnished from a large bowry close to the Lines. It is good and

Water supply

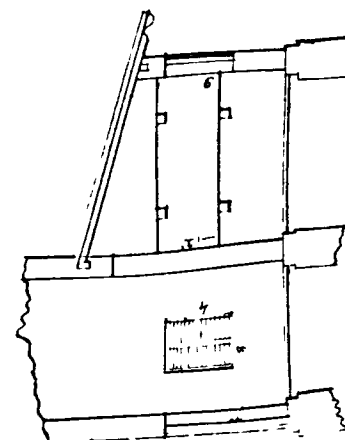
plentiful throughout the whole year, water for bathing purposes is derived from 4 bowries within the limits of the Lines themselves. This Commis-

sion is of opinion that the water used for drinking should be analyzed, and if this be found not

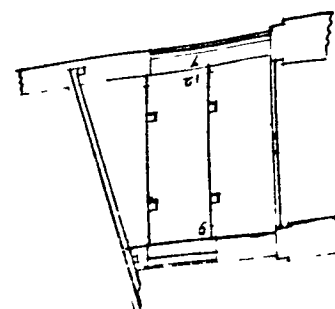
PLAN AND SECTIONS
OF HOSPITAL OF 33RD REGIMENT NATIVE INFANTRY
AT BANGALORE



SECTION THRO' C D



SECTION THRO' A B



Office of Sanitary Commission
H. B. Montgomery M.D. Secy.
Drawn on transfer paper by F.D. Smith
Lithographed by A. Baird April 1868

satisfactory, filtering beds should be placed round these wells as has been done with such marked good effect at the well close to the Old Diagoon Barracks.

294 On the East of the Lines, a ground measuring about six cawnies has been given up as Sepoys' gardens and about 16 per cent of the men cultivate vegetables in them. They were neat, well laid out, and men of different castes are found not only willing but anxious to employ their leisure time in this healthful amusement.

295 The same observations apply to the Lines occupied by the 22nd Regiment. In these, however, the ventilation is much impeded by cross blocks of houses opposite some of the main streets. These ought to be removed and regular drains should be constructed in all these lines.

296 Having before advocated the erection of permanent Lines for the Sappers and Miners at this Station, this Commission would urge a similar recommendation as regards the two Native Infantry Regiments who will continue to be stationed at Bangalore.

Guard Room and Solitary cells of 22nd Regt. 297 The Guard rooms and Solitary Cells of this Regiment are strictly identical with those of the 14th and 33rd Regiments.

298 A large bowry on the neighbourhood yields drinking water of satisfactory quality and 2 wells within the limits of the Lines themselves supply additional water for other domestic purposes.

299 Much less interest appears to be taken in this Regiment in the places allotted as Sepoys' gardens. A smaller number of men work in them and the gardens themselves are not as neat or well kept as those of other Regiments.

300. There are certain subsidiary buildings connected with these Native Regiments which require passing notice.

331 The Bells of Arms of the 14th and 33rd Regiments call for no remark, except as regards the privies, which are faultily constructed and badly kept.

302. The outside of the powder magazine of the 22nd Regiment is used as a Urinal and is very offensive. As Bells of Arms are necessarily almost in a public highway, immediate attention is required to this defect which has been brought to the notice of the Deputy Inspector General and will be speedily remedied. Owing to some mis-apprehension of orders on the subject, the Sepoys resort to a nullah in the middle of the Parade Ground at a considerable distance from the Bells of Arms and use it as a Latrine. They were evidently under the impression that they were obeying orders and seemed rather proud of their readiness to comply with the supposed wishes of the Military authorities, though they complained of the distance of the nullah.

HOSPITALS OF NATIVE INFANTRY REGIMENTS

303 The accompanying Plan of the Hospital of the 33rd Regiment and the statement of Hospital accommodation of the three Regiments will give all necessary information regarding these buildings.

Style of construction of Hospital of Native Infantry. 304 These Hospitals consist of a number of rooms, the larger being a general Ward for sick, and the other rooms being devoted to the purposes indicated in the second column of the tabular statement appended.

Uniform style in the three Hospitals. 305. The general design of all the Native Regimental Hospitals at this station is identical with that of all the older public buildings erected for this purpose, and has on the whole been found to answer satisfactorily owing to the small numbers usually in Hospital.

Block and Rooms	How Occupied	DIMENSIONS.			Superficial area of each room	Cubic contents of each room	Regulation No. at 1,000 cubic feet	Superficial area then afforded	No of cots at present in each room.	No at 100 superficial area	Cubic contents thus afforded	Openings for Ventilation	WINDOWS			DOORS			REMARKS	
		Length	Breadth	Height									Number	Height	Width.	Number	Height	Width		
1	General Ward	85	20½	14	1742	24395	24	72	20	17	1435	4	8	5½	4	2	6½	4½	*Wall enclosing the Court yard	
	Surgery	19	20	14	380	5320	..	..	..	..	882	..	5	5½	4½	1	6½	4	†The Cook room and latrine are situated on the North East end of the Court yard, the latrine has 3 divisions or compartments, the cook room is divided from it by a wall.	
	Special Ward	9	7	14	63	882	..	..	1	..	..	..	1	5½	4½	1	6½	4		
	Special Ward	18	12	14	216	3024	3	72	4	2	1512	..	2	5½	4½	2	6½	4		
	Store Room	17	11½	14	195	2737	..	..	..	..	..	..	1	5½	4½	1	6	3½		
	Court Yard*	54	18½	9½	999	9240	..	..	..	..	..	..	..	..	..	..	..	..		
	Cook Room†	8½	6½	9	53	482	..	..	..	..	..	1	1	2½	2	1	5	3		
	Latrine	8	6½	9½	50	462	..	..	..	..	..	..	1	2½	2	1	5	3		
	1	General Ward	85	10½	10½	1616	25864	25	64	22	16	1616	3	7	4½	3½	5	6½	3½	Open Verandahs on both sides with pillars
		Surgery	8	18	10½	150	2410	..	..	..	..	..	..	2	4½	3½	1	6½	3½	
Cook Room		8	2	10	89	87	784	..	..	..	..	1	1	2½	2	1	5½	4		
Latrine		8	2	10	89	87	784	..	..	..	..	1	1	2½	2	1	5½	4		
Court Yard		70	4	18	66	1301	8891	..	..	..	..	..	..	..	..	1	6	3		
1	General Ward	88	10	19	711	9	1739	20440	20	87	24	17	1202	6	4½	3	2	6	3	8 ft. 1 ft.
	Surgery and Store Room	27	10	11	6	270	3105	..	..	..	..	3	5	4½	3	2	6	2	3	(Of irregular shape, and partially divided into two, by a wall
	Small Ward	19	6	10	10	6	195	2047	2	97½	2	97½	2	4½	3	1	5	0	2	8
	Cook House	14	9	7	117	9	116	905	..	..	..	1	1	2½	2	1	5	0	2	8
	Privy	14	9	7	117	9	116	905	..	..	..	1	1	2½	2	1	5	0	2	8
	Verandahs (2) open	68	10	8	2	9	725	6329	..	..	..	..	..	..	..	..	..	..	Closed in the day time by Pardahs.	

306 A long Ward capable of containing from 14 to 20 patients constitutes the main building, and at the end of this are one or more rooms devoted to reception of special cases, Bathing rooms, Surgery, &c.

307. The chief Ward is usually sufficiently wide to allow of free passage between the ends of the beds and, as dining tables are not required, any width from 18 to 20 feet is ample—although wider rooms would perhaps be preferable, yet the increase of cost arising from any serious enlargement of this kind prevents me from recommending any greater change in this respect in any Hospitals to be hereafter designed, than that the Wards be made 22 feet wide, (vide Appendix F)

308 But in all these Hospitals at Bangalore much space is lost and complete supervision is prevented by the existence of a large number of heavy masonry pillars supporting the ridge pole of the roof and impeding the centre of the Wards very materially

309 I think these pillars ought to be removed and either that iron pillars should be substituted for them, or that cross beams should be placed at the height of the side walls, and these made a means of support for the ridge pole according to the plan to be seen in so many churches and other lofty apartments, &c.

310 The Medical Officers of the several Regiments all urged strongly the desirability of these pillars being removed, as they impede light and ventilation, and reduce the ground space which would otherwise be available In this recommendation Acting Inspector General Mackenzie and Deputy Inspector General Balfour concur.

311. I need scarcely say that these Hospitals are entirely at variance with the recommendations contained in Colonel Crommelin's Memorandum, but until the decision of Government is received as to whether or not an improved style of construction is to be adopted and an increased amount of accommodation afforded, it would be premature to do more than to direct attention that they do not afford sufficient accommodation at the standard of space considered necessary for native patients.

312. As will be seen from the foregoing remarks and from the tabular statements appended, all these Hospitals held, at the time of our inspection, a number of patients considerably in excess of that which would be allowed when 100 square feet is definitely fixed as the minimum of superficial area to be allowed to sick Sepoys at Bangalore If therefore the recommendation to this effect made by this Commission receives the sanction of Government, then it would become necessary very considerably to enlarge these buildings, even if their entire re-construction is not considered essentially necessary

313. These Hospitals although constructed on the old principle of Native Regimental Hospitals, have been improved by the introduction of roof ventilation not continuous, and they have further ventilation by doors and windows.

314 In the Hospital of the 33rd Regiment there is a small separate Ward at one end of the long Ward, this is likely to be noisy as a much frequented road runs by this end of the Hospital

315. At the other extremity of the Ward is a well lighted Dispensary and office room.

316. The cots in the Hospital are the old wooden cots which the Sepoys prefer as they use their own bedding to the cleaner and more sanitary iron cots The objection of the Sepoys would be met by providing mattresses as well as cots to Native Regimental Hospitals.

Requirements of the Hospital

317. The deficiencies in this Hospital are—that there are no quarters for the Apothecary, and no Bath room for sick men who require special ablution. There is also no Dead house.

318 The privy though clean was offensive in odour from its construction. The Dry Earth conservancy could at any time be introduced into this Hospital and this reform should not be delayed.

319 The provision of quarters for the Medical Subordinate is an urgent necessity, for a severe case of Cholera may seriously suffer from the loss of time required to give notice thereof to the Medical Subordinate whose house is at some distance from the Hospital. This deficiency is general in all Native Regimental Hospitals, and should be remedied throughout the Military Stations of this Presidency.

320 Supposing the Lines of the 14th Regiment to be removed, the present Hospital of the 14th should be made over to the 22nd Regiment, and the Hospital of that Regiment be converted into quarters for the subordinate Medical officers of the 22nd and 33rd Regiments N. I.

321 The Hospital of the 22nd Regiment is so deficient in the essentials of a good Hospital, that I am sure it is only necessary to point these out to the Government to secure the carrying out of the arrangement mentioned in last paragraph.

322 The Main Ward is barely 19 feet wide and is not only obstructed by central pillars, but a good deal of it is given as an office room, there being no office in the building. This is the only Ward for the treatment of sick. No separate or special Wards are to be found, and of both of these there is considerable want, and, the Dispensary Room is so dark that the issue of medicines is positively attended with considerable risk.

223 On the occasion of our visit a case of Varicella was under treatment in this Ward. Cases of this description should invariably be treated outside the body of the Hospital.

224 The Hospital of the 14th Madras Native Infantry very much resembles in point of construction that of the 33rd Regiment; but is superior to it with respect to accommodation. There is no doubt that the transfer of the sick of the 22nd to this superior building will be decidedly conducive to the more effectual treatment of their diseases and to the prevention of those serious results which might follow if epidemic disease be introduced into an Hospital totally unprovided with separate accommodation for this class of cases. This Hospital can in one special Ward accommodate 2 patients, while the other is scarcely sufficient for occupation by even one person. The use of this latter special Ward and the Store room might be exchanged, as the Store room is sufficiently large for one person. In the Hospital of the 14th, the cots were all of wood and of a most inferior description. The legs of these cots were rickety and insecure. Close to the Hospital of the 14th is a dangerous nullah, likely to cause accidents at night and convenient for the commission of nuisances. This nullah should be filled up and the diam at its head prolonged.

225 In conclusion I have to submit the following recommendations by this Commission —
 (1) That permanent Lines be erected for 2 Corps of Native Infantry at Bangalore.
 (2) That all charges of conservancy in the Lines should be defrayed by Government.
 (3) That the Regimental or public Latrines used by Sepoys should be re-constructed and worked on the dry earth principle.
 (4) That the quarters of the Regimental Serjeant of the 33rd Native Infantry should be improved or that new quarters should be erected.
 (5) That additional wells should be sunk for the use of the 33rd and 14th Regiments.
 (6) That the present Lines of the 22nd Regiment should be put under cultivation.

- 7) That the present Hospital of the 14th Regiment should be handed over to the 22nd.
- (8) That the ventilation of the Lines of the 22nd should be improved by the removal of all cross blocks opposite the main streets.
- (9) That the Latrines attached to the Bells of Arms of the 33rd and 14th Regiments, be improved.
- (10) That Government should decide whether new Hospitals should be built for these Regiments in accordance with the views of Colonel Crommelin as modified by this Commission.
- (11) That if the present Hospitals are to be retained, the heavy masonry pillars be removed from the centre of the Wards and that sufficient accommodation be provided for 40 men in general and special Wards to afford for each man 100 square feet superficial area.
- (12) That the Hospital of the 22nd Regiment be converted into quarters for the Medical Subordinates of the 33rd and 14th Regiments.
- (13) That for each of the Hospitals of these two Regiments, a Dead House and strictly separate Ward be erected, detached from the body of the Hospital.
- (14) That the nullah close to the Hospital of the 14th Regiment should be filled up or a covered water channel substituted for it.

HEALTH OF THE TROOPS IN GARRISON

326 I cannot conclude this report without directing the attention of Government to the state of health of the Troops in Garrison, both Europeans and Natives. An examination as to the number in each force in Hospital showed that preventable disease was present to an alarming extent. Venereal disease may be said almost to fill the European Hospitals of this Cantonment as may be seen from the following brief statement. In the Regiment of the 18th Hussars only just arrived, there were 8 cases of this kind out of 34 sick in Hospital. In the 66th Regiment which has been in the station for some time 35 cases were in Hospital out of a total of 66 sick, and several of these had been in Hospital for periods varying from 1 day to 4 months, but of all cases longest in Hospital 9 were due to the same disease. In the A Battery 14th Brigade of Royal Artillery of a total of 9 sick, 5 were suffering under Venereal disease. In the D Brigade Royal Artillery of 16 sick, 7 were being treated for same disease. And, in the Inspection report of the Hospital of the King's Dragoon Guards, I have already reported to Government, that of the 25 cases in Hospital in the month of September, no less than 12 were attributable to the same cause. I alluded in my remarks on the Lock Hospital at this station to the very imperfect supervision exercised over public women in Bangalore—not one-third of the public prostitutes being registered, but even under this imperfect system, 48 women were under treatment and throughout the year 1864, an average of 45½ women were constantly under treatment for this disease.

327 Subsequent to the inspection of the Lock Hospital, a Meeting was convened by me to discuss the subject of the control of Prostitutes. At this meeting the Deputy Inspector General, Mysore Division, the Deputy Inspector General Her Majesty's British Troops, and the several Medical Officers of the different European Corps in Garrison were present. Dr Rogers the Surgeon of the Lock Hospital, and Captain Cole, Superintendent of Police, also attended. I discussed with these Gentlemen, very fully the best measures to be adopted to control prostitution, and to render the working of Lock Hospitals efficient, and it was the unanimous opinion of those present that, if the Rules proposed to be adopted when the Military Cantonment Act comes into force can be introduced in the Bangalore Station, they would probably be found sufficient to effect a considerable diminution in the prevalence of Venereal disease.

328 I may further state on this subject that the following tables will shew that of the women summoned by the Police, little more than one-half usually attended for examination at the Hospital.

Imperfections of the present system.

329 The following returns compiled by Dr. Farquhar are of interest on this point

They indicate the extreme prevalence of disease among the prostitutes brought for Examination, only a small proportion of them, about 25 per cent as will be observed, being found "free from disease"

1864	Total No re- quired from Po- lice Register	Number Examined			Total examined	Found Diseased	Clean or free from Disease
		A	B	C			
		Total No sent up	Came of their own accord	Sent up from for- mer lists			
January	78	33	5	18	56	41	15
February	79	35	2	12	49	39	10
March	82	43	2	11	56	48	8
April	92	44	0	16	60	47	13
May	70	39	2	11	52	41	11
June	65	23	0	16	39	28	11
July	58	41	2	21	64	48	16
August	74	46	1	14	61	38	23
September	60	35	2	7	44	34	10
October	48	18	3	67	88	49	39
November	32	20	4	10	34	25	9
December	41	27	3	0	30	27	3
Total	779	404	26	203	633	465	168

330 Nothing can more clearly than the foregoing show the necessity of frequent examinations at stated intervals and of compulsory attendance of all public women at the Hospital for this purpose, for it has been shown above that of all the women examined at the Hospital, 75 per cent were found to be diseased

331 I trust that the facts detailed above may induce the early adoption of active measures in this respect. Although this disease is so prevalent among Europeans, yet the accompanying returns will shew that it is comparatively rare among Natives. In 3 Regiments, numbering altogether 2,173 men who would be treated in Hospital, only one case of Syphilis was under treatment at the time of my visit. It must be remembered that the majority of the Native Soldiers are married.

Sick Report of Regiments of Native Infantry at Bangalore, 31st October 1865

Names	Rank	Diseases	Date of Admission	REMARKS
14th Regiment M N. I				
Shah Homed	Private	Febris Intermit	26th October 1864	
Davood	do.	Rheumat. act	21st do do	
Fakeer Homed	do.	Febris Intermit	26th do do	
Koomah	do.	Ulcer	27th do do	
Shah Hoossam	do.	Ophthalmia	28th do do	
Yenkadoo	do.	Febris Intermit	29th do do	
Abdul Curreem	do.	do	29th do do	
Syed Moodeen	Nagae	Hepatitis	30th do do	
Chinsawmy	Havildar	Phlegmon	31st do do	

Names	Rank	Diseases	Date of Admission	REMARKS
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22nd Regiment.

J Johnson	Drummer	Rheumat chron	10th October 1864	
Sunnasee	do	do	12th do do	
Rungasawmy	Havildar	Febris Intermit	20th do do	
Coomarasawmy	Private	Rheumat chron	23rd do do	
Nizamooddeen	do	Ulcer	23rd do do	
Byragee	do	Vesiculæ—pedis	25th do do	
Venketsawmy	do	Febris Intermit	25th do do	
J Manuel	Drummer	Vulnus Incisum	25th do do	
Hyder Khan	Private	Phlegmon	26th do do	
Shah Cawder	do	Rheumat chron	26th do do	
Veerunnah	do	do	27th do do	
Paupiah	do	Ulcer	27th do do	
Yenkiah	do	Rheumat chron	27th do do	
Kistnamah	do	Febris Intermit	28th do do	
Ibrahim	do	Scabies	29th do do	
Syed Yacob	do	Febris Intermit	29th do do	
Mahomed Kaja	do	do	31st do do	
Syed Sillar	do	Ulcer	31st do do	

33rd Regiment N. I

Jaffer Khan	Private	Syph Second	30th August 1864	
Ramasawmy	do	Rheumat chron	12th Sept do	
Sawmy	do	Rheumat	17th do do	
Poolah	do	do	18th October do	
Ramasawmy	do	Ulcer	19th do do	
Gopalsawmy	do	Abscessus	25th do do	
Mahomed Cassim	do	Febris Intermit	28th do do	

As regards the health of both European and Native Troops, generally, it was satisfactory. The following brief statement of the numbers in Hospital will show the percentage of sick in each arm of the service

FORCE	Strength of men who would be treated in Hospital	Actual Sick	Percentage of Sick to Strength
EUROPEANS			
D Brigade R H Artillery	165	5	3.03
A Battery 14th Brigade	148	8	5.40
A " 23rd "	114	10	8.77
18th Hussars	353	36	10.19
66th Regiment	752	61	8.11
NATIVE TROOPS			
14th Regiment M N I	726	11	1.37
22nd " "	741	21	2.83
23rd " "	707	8	1.13

332. The remarkably small number present in the Hospitals of the Native Infantry is no doubt chiefly due to the small amount of Syphilis witnessed among them.

CAMPING GROUNDS

333 It remains to notice the camping grounds of this station which have not yet been fixed upon

334 One camping ground is required for Regiments arriving by Railroad en route to other stations, and Cholera Camps should be selected for the removal of the Regiments either entirely or in divisions on the occasion of epidemic disease making its appearance in the station of Bangalore. The ground chosen is at a distance of about $\frac{1}{2}$ of a mile from the Railway station on what is known as the High ground. The spot is very well situated for this purpose, being free from jungle—on high ground with a gentle slope which will secure its being dry.

335 There is good water in close vicinity to the ground, there are no bazaars or native villages in the neighbourhood and it is connected with the Railway station by a good road.

336 If the exact spot pointed out to me by the Deputy Inspector General, Dr Mackenzie, be selected, I would suggest that the Mussulman burial ground which has been recently opened should be closed as its close neighbourhood to the camping ground might eventually prove objectionable.

337 It may perhaps be also an objection that this camping ground is close to the lands which have been laid out as building sites for the New Town which will shortly spring up near the Railway, and if the Commissioner should consider this objection of weight he might be requested to select for the camping ground another site somewhat further removed from the building sites. There will be no difficulty in doing this as there is an abundance of ground eligible for this purpose in this neighbourhood.

338 No time should, I think, be lost in selecting Cholera camps in the neighbourhood of the Bangalore station. There should, I think, be 4 in number and within a distance of five or six miles of the station.

339 The Deputy Inspector General, Dr Mackenzie, pointed several places well suited for this purpose and there will be no difficulty in arranging with the Commissioner to secure the necessary land.

340 I have mentioned 4 Cholera camps because in the case of any epidemic prevailing in the Cantonment, it will be well that each of the European Regiments, the Artillery Horse Brigade and Foot Artillery and the Native Infantry should have a place ready for Cholera camps.

341 I trust that the General Commanding the division will be pleased to have these points decided and the sites of the Camps marked out with as little delay as possible.

342 Before concluding these remarks on the Barracks and Hospitals of Europeans, this Commission is anxious to suggest the propriety of instituting some place of public recreation and amusement for the European Soldiers at this station.

EUROPEAN SOLDIERS' CLUB

343 It has been proposed to establish a Soldiers' Club at Bangalore. A similar Club has been already established at Secunderabad with the greatest possible good to the Soldiers.

344 A building at the Eastern extremity of the Parade Ground lately used as a Commissariat godown is available for this purpose and has been placed at the disposal of the Soldiers' Club Committee.

345 The alterations required to make this building in all respects complete, are estimated to cost about 13,000 Rs. Should the Madras Government approve of the establishment of the Soldiers' Club at Bangalore, and be prepared to contribute funds for this object, the Chief Commissioner has intimated that a grant of funds will also be made by the Mysore Government.

346. At Dum Dum the Government of India purchased the building known as the Onbram Institute for a Soldiers' Club, at a cost of 25,000 Rs., and at Home the Government aided a similar Institution at Chatham to the extent of £2,000.

347 There can be no doubt that a comfortable Soldiers' Club at Bangalore would have a most beneficial effect in replacing the dissipation indulged in by the Soldiers in the bazaars by healthy recreation, and in so far that it will greatly conduce to the preservation of the health of the British Troops stationed at Bangalore.

348 In conclusion I have to solicit that the Orders of Government may be passed regarding the following recommendations made by this Commission.

NEW BARRACKS ON THE RACE COURSE

(1) That 85 square feet superficial area should be adopted as the fixed regulation standard for Europeans in Barracks at Bangalore.

(2) That three new Barrack Blocks be constructed or such number as may be required to accommodate at this standard, one Regiment of European Cavalry and two Batteries of Artillery, if it is finally decided that this force should be placed on the Race Course.

(3) That a system of Drainage by open V shaped Granite channels should be constructed for these Barracks.

(4) That all Latrines and Urinals should be worked exclusively on the Dry Earth system as proposed by this Commission.

(5) That in all Barracks the men occupying any sleeping room should employ the adjacent closed Verandahs as Day and Dining Rooms and that the lighting of Barracks be improved.

(6) That the Canteen should be improved as suggested in paras 59 to 61.

(7) That in the construction of all future Latrines and Urinals the style of building proposed by this Commission should be adopted.

(8) That all Cook-rooms should be provided with Duff's or Grants cooking ranges, a suitable supply of culinary articles, tables for cutting and preparing meat.

(9) That additional workshops should be built.

(10) That permanent Stabling should be provided for all horses.

(11) That future family quarters should be made to measure 16 x 14 and 14 x 10 in two rooms with verandahs front and rear.

(12) That family quarters should have the Cook-room and Privy separated.

(13) That suitable Latrine and Urinal accommodation should be attached to all schools.

(14) That a General Hospital should be erected on the Race Course for all European soldiers in Bangalore.

(15) That a Plunge Bath be erected on the Race course.

(16) That the native village close to the Northern Corner of the Race Course should be removed, and that the making of Bratties, &c, and all other offensive occupations, as those of Butchers, Tanners, &c, should be interdicted in the vicinity of these Barracks.

OLD DRAGOON BARRACKS

(1) That at the standard of 85 square feet only 48 men exclusive of Sergeants be accommodated in each of the old Dragoon Barracks.

(2) That the additional Barrack accommodation needed for a full Infantry Regiment be provided by the erection of additional Barracks.

(3) That each Barrack be sub-divided into 3 compartments as shown in plan, and that the better lighting of the Barracks be enforced.

(4) That suitable Latrine accommodation be provided for the families of married Sergeants in Barracks.

(5) That the Lavatories and Urinals for men be cleaned separately, and that dry earth conservancy be adopted in both Urinals and Latrines.

- (6) That the Wash-houses be improved so as to secure more privacy to persons bathing
- (7) That the two blocks of family quarters now existing between the end of the Barracks and the public road be removed, and a low wall be erected as a Barrack enclosure
- (8) That the furniture of the Guard room be improved so as to promote the comfort of the men on duty, and that the Privy attached to the Guard room be adapted to the dry earth system
- (9) That a General Military Prison be built at Bangalore
- (10) That Wash-houses be built for women close to each block of family quarters
- (11) That the proposed new water-supply for these Barracks should be as soon as possible effected
- (12) That the Beds and Bedding be improved as recommended by this Commission
- (13) That the Hospitals for Males and Females be no longer used for this purpose, and that they be converted into Recreation and School rooms for the European Infantry Regiment
- (14) That the sick be treated in one General European Hospital to be erected on the Race Course.

BARRACKS AND HOSPITALS OF THE HORSE AND FOOT ARTILLERY

- (1) That the standard of 85 square feet superficial area should be adopted for all men, exclusive of Serjeants, to be accommodated in the Barracks
- (2) That additional Barrack accommodation should be provided at the same rate for such men as may require it—the number to be thus provided for to be fixed by the Military authorities
- (3) That the drainage of the Barrack Blocks and especially of the Serjeants' quarters therein, should be at once improved
- (4) That all saddlery and harness should be as soon as possible removed from Barrack-rooms or Verandahs, and that suitable apartments for the safe custody of these should be provided either in detached buildings or in the stables recommended by this Commission, should these latter be approved by Government
- (5) That the beds and bedding should be improved as recommended in Appendix H of this Report
- (6) That the present Lavatories be removed and suitable ones erected, each to contain, in separate rooms, fixed baths and basins respectively
- (7) That new Cook-rooms and Privies be erected, that they both be well ventilated, and that the latter be so constructed as to be worked strictly on the Dry Earth principle
- (8) That the present Hospitals for Artillery when no longer required for their present use, be converted into Recreation rooms and Workshops
- (9) That suitable stabling be erected for all Horses
- (10) That new and improved School rooms be erected in closer proximity to the married quarters
- (11) That a good Plunge Bath be constructed

MAIN GUARD

- 349 That two privies should be re-constructed and worked carefully on the dry earth system.

BARRACKS FORMERLY OCCUPIED BY INFANTRY REGIMENT.

- (1) That these Barracks be converted into Arsenal and Commissariat Stores
- (2) That the Hospital when no longer required by the Infantry Regiment be converted into a Garrison Hospital

GARRISON HOSPITAL

- 350 That this building be abandoned

LINE OF THE SAPPERS AND MINERS

- (1) That the huts at the Southern angle be removed
- (2) That the drainage of this place should be diverted from its present course
- (3) That the conservancy of the hutting ground be promoted by enforcing a complete system of conservancy in the native houses lying to the West of it
- (4) That permanent lines be erected by the Corps of Sappers and Miners
- (5) That here and elsewhere overcrowding of public quarters by private families should be strictly prevented
- (6) That the out-houses of the proposed family quarters should be thrown to the back of the enclosed compound and not be built contiguous.
- (7) That the school rooms should be improved, as it is suggested the Barrack quarters are to be
- (8) That the Europeans of the Sappers and Miners be treated in a General Military Hospital at Bangalore if such an Institution is sanctioned
- (9) That the private dwelling house existing in these Lines should be at once removed

LINE OF NATIVE INFANTRY REGIMENTS.

- (1) That permanent Lines be erected for 2 Corps of Native Infantry at Bangalore
- (2) That all charges of conservancy in the Lines be defrayed by Government
- (3) That the Regimental or public Latrines used by Sepoys should be re-constructed and worked on the dry earth principle
- (4) That the quarters of the Regimental Serjeant of the 33rd Native Infantry should be improved or that new quarters should be erected
- (5) That additional wells should be sunk for the use of the 33rd and 14th Regiments
- (6) That the present Lines of the 22nd Regiment should be put under cultivation.
- (7) That the present Hospital of the 14th Regiment should be handed over to the 22nd
- (8) That the ventilation of the Lines of the 22nd should be improved by the removal of all cross blocks opposite the main streets
- (9) That the Latrines attached to the Bells of Arms of the 33rd and 14th Regiments be improved.
- (10) That Government should decide whether new Hospitals should be built for these Regiments in accordance with the views of Colonel Crommelin as modified by this Commission.
- (11) That if the present Hospitals are to be retained, the heavy masonry pillars be removed from the centres of the Wards and that sufficient accommodation be provided for 40 men in general and special Wards, each man to be allowed 100 square feet superficial area

(12) That the Hospital of the 22nd Regiment be converted into quarters for the Medical subordinates of the 33rd and 14th Regiments.

(13) That for each of the Hospitals of these two Regiments a Dead House and strictly separate Ward be erected detached from the body of the Hospital

(14) That the Nullah close to the Hospital of the 14th Regiment should be filled up or a covered water channel substituted for it

HEALTH OF THE TROOPS

351 That preventive measures be adopted to check the spread of venereal disease

CAMPING GROUND

That 4 Cholera camps be selected from 5 to 6 miles from Bangalore, and in different directions.

That a good site for ordinary camp for marching Troops be selected well removed from bazaars and private dwellings.

EUROPEAN SOLDIERS' CLUB

That a Club for European Soldiers be founded at Bangalore

W. J. R. S. Ellis.

President, Sanitary Commission

APPENDIX A.

I—Table showing the Monthly and Yearly Mean Reading of the Barometer			II—Table showing the Average Maximum Temperature for every Month and Quarter as well as for the Periods, October to March, and April to September, with the difference between hottest and coldest Months and Seasons and Mean Maximum Temperature for the Year.				
Month	1 Year 1859		Month	1 Year 1859	Winter, Spring, Summer, Autumn	Oct to March April to Sept	
	Inches						
January	27 33		January	79	81	82	
February	27 28		February	83			
March	27 26		March	88		88	
April	27 22		April	86			
May	27 12		May	91	83	85	
June	27 06		June	84			
July	27 03		July	84		81	
August	27 07		August	81			
September	27 08		September	82	80		
October	27 13		October	82			
November	27 12		November	79		3	
December	27 17		December	80			
Means	27 15		Difference between				
			Hottest and Coldest Months	Hottest and Coldest Seasons	12	7	
			Mean for year		83		
			Highest in		May		
			Lowest in		January		

III—Table showing the Average Minimum Temperature for every Month and Quarter, as well as for the Periods, October to March, and April to September, with the difference between the hottest and coldest Months and Seasons and Minimum Temperature for the Year				IV—Table showing the Average Daily Range for every Month and Quarter, as well as the Periods, October to March, and April to Sept, with the difference between the greatest and least months, and the Mean Daily Range for the year			
Month	1 Year 1859	Winter, Spring, Summer, Autumn	Oct to March April to Sept	Month	1 Year 1859	Winter, Spring, Summer, Autumn	Oct to March April to Sept
January	59	61	65	January	20	19	17
February	63			February	20		
March	70		71	70	March		18
April	71	April			15		
May	72	69		May	19	14	15
June	69			June	15		
July	70		69		July		14
August	69	August			12		
September	70	69			September	12	12
October	69		October		13		
November	67		62		November	12	
December	62	December			18		
Difference between				Difference between			
Hottest and Coldest Months	Hottest and Coldest Seasons	13	10	Hottest and Coldest Months	Hottest and Coldest Seasons	8	7
Mean for year		67		Mean for year		16	
Highest in		May		Greatest in		January and February	
Lowest in		January		Least in		August, September and November	

V—Table showing the Average Temperature of the air for every Month and Quarter, as for the Periods, October to March, and April to September, and the difference between the hottest and coldest Months and Seasons, and Mean Temperature for the year				
Month		1 Year 1835	Winter, Spring, Summer, Autumn	Oct to March April to Sept
January		70	71	72
February		73		
March		79		
April		79	79	76
May		78		
June		75		
July		74	74	76
August		73		
September		74		
October		71	72	76
November		71		
December		69		
Difference between				
Hottest and Coldest Months	Hottest and Coldest Seasons	10	8	4
Mean for year		74		
Hottest in Coldest in		March and April December		

VI—Table showing the Average Temperature of the air for every Month and Quarter, as well as for the Periods, October to March, and April to September, and the difference between the hottest and coldest Months and Seasons, and Mean Temperature for the year				
Month		1 Year 1859	Winter, Spring, Summer, Autumn	Oct to March April to Sept
January		69	71	73
February		73		
March		79		
April		79	80	78
May		82		
June		77		
July		77	76	78
August		75		
September		76		
October		75	75	78
November		73		
December		71		
Difference between				
Hottest and Coldest Months	Hottest and Coldest Seasons	13	9	5
Mean for Year		76		
Hottest in Coldest in		May January		

VII.—Table showing the Monthly, Quarterly, Half yearly and Yearly falls of Ruin					
Month.	1 Year	Winter, Spring, Summer, Autumn	October to March	April to September	
	1859				
	Inches	Inches	Inches		
February	0 0	} 0 1	4 1		
March	0 0				
April	0 0				
May	1 3	} 5 1	20 9		
June	3 8				
July	1 6				
August	5 6	} 12 6			
September	5 4				
October	3 2				
November.. . . .	1 1	} 7 2			
December	2 9				
	0 1				
Year	25 0	..	..	..	

NOTE—These tables are extracted for easy reference from those contained in Mr Glaisher's "Report upon the Meteorology of India in relation to the health of the Troops there stationed," as contained in Vol 2 of the Report of the Royal Commission on the Sanitary State of the Army in India .

R S E.

APPENDIX B.

Tabular Statement of the results of the following Drinking Waters received from the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

No	Locality	Sensible properties		Chemical Properties.										REMARKS							
		Appearance	Odour	Taste.	Reaction to Test paper	Solid ingredients in one imperial gallon		Hardness to soap test		Chlorides determined as Chloride of Sodium in one imperial gallon	Bases in solution by Carbolic Acid.				In solution after boiling						
						Organic	Inorganic	Total	* Temporary		Permanent	Total	Iron.		Lime	Magnesia	Lime	Magnesia	In small quantity	Average.	In small quantity
1	Ulsoor Tank, Bangalore...	Opaque from suspended impurities		Slightly earthy	Faintly acid.	5	19.5	24.5	1°	4°	5°	Gs	5537	A good deal.	Traces	Average	In small quantity	Small quantity	Average	None detected	
2	Dragon Well, Bangalore	Clear ...		None .	Neutral ...	3.2	17	20.2	2.5°	10.5°	13°	Gs	9336	Traces .	Average.	In small quantity	A little above average	Average.	None detected		
3	Ulsoor Well, Bangalore	Opaque		None	Faintly acid	4.3	15.1	19.4	1°	5.5°	6.5°	Gs	5846	Above average	Average	Average	A little above average	Average.	None detected		
4	Gentlemen's Well, Bangalore ..	Clear, a few floating particles ..	Free from	None	Faintly acid	4.6	13.4	18	4°	9°	13°	Gs	122766	Traces.	Average.	In small quantity	A little above average	Average	None detected		

* Each degree of temporary hardness equals	0.727 grs	Carbonate of Lime	} in one gallon
Do permanent do	0.959 grs	Sulphate of Lime	

MADRAS,
28th September 1864

(Signed) S J WYNDOWE, M D,
• *Chemical Examiner*

APPENDIX C.

Statement shewing details of established strength of each Arm of Service of the Madras Army

	European Non-Commissioned Rank and File								Native Commissioned, Non-Commissioned Rank & File							
	Staff Sergeants	Sergeants	Corporals	Bombardiers	Farmers	Trumpeters or Drummers	Artificers	Gunners or Privates	Subadars	Jemadars	Havildars	Trumpeters or Drummers	Farmers	Naigues	Privates	Veterinary Pupils
Battery Royal Horse Artillery	2	6	6	6	1	2	4	76	145	3	1	2	8	2	3	7
Battery Native Horse Artillery	18	21	28	...	7	8	...	434	516	...	...	...	...	...	84	1
Regiment European Cavalry	...	...	...	...	...	...	...	...	2	6	631	7	13	24	300	2
Regiment Native Cavalry	2	6	6	6	1	2	4	76	145	...	...	...	...	...	...	...
Field Battery Royal Artillery	1	4	4	4	...	2	...	60	75	...	...	...	...	...	...	...
Garrison Battery Royal Artillery	...	...	...	...	...	...	...	...	2	2	8	2	...	8	92	...
Battery Native Artillery	2	20	40	...	...	...	...	...	62	10	10	43	20	...	84	1144
Corps of Sappers and Miners	9	40	40	...	...	21	...	810	920	...	...	...	...	...	...	...
Regiment European Infantry	2	...	...	...	...	...	...	...	2	8	8	16	...	40	600	713
Regiment Native Infantry	...	...	...	...	...	...	...	...	72	...	...	...	...	...	...	...
One Troop European Cavalry	4	4	...	...	1	1	...	62	...	...	5	1	2	4	50	62
One Troop Native Cavalry	...	...	...	...	...	...	...	...	6	...	4	2	...	8	105	119
One Company Sappers & Miners	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
One Company European Infantry	4	4	...	...	...	...	...	81	91	...	...	2	...	5	75	87
One Company Native Infantry	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

APPENDIX D.

Statement shewing the composition of strength of each Arm of the Service of the Madras Army

Description	Europeans	Natives	REMARKS
Battery Royal Horse Artillery	145	...	
Battery Native Horse Artillery	2	111	
Regiment European Cavalry	516	...	Has 7 Troops present in India
Regiment Native Cavalry	2	389	Has 6 Troops
Field Battery Royal Artillery	145	...	
Garrison Battery Royal Artillery	75	...	
Battery Native Artillery	...	...	
Corps of Sappers and Miners	...	114	
Regiment European Infantry	62	1311	Has 10 Companies
Regiment Native Infantry	920	...	Has 10 Companies present in India
One Troop European Cavalry	2	713	Has 8 Companies
One Troop Native Cavalry	72	...	
One Company Sappers and Miners	...	62	
One Company European Infantry	6	119	
One Company Native Infantry	91	...	
	...	87	

QUARTER MASTER GENERAL'S OFFICE,
FORT SAINT GEORGE,
30th March 1865.

(Signed) F. H. SCOTT, Lieut-Colonel,
Quarter Master General.

APPENDIX E.

OFFICE OF SANITARY COMMISSION,
MADRAS, 28th February, 1865.

No. 531.

From

HONORABLE R. S. ELLIS, C.B.,
President, Sanitary Commission,
Madras.

To

LIEUTENANT-COLONEL F. H. SCOTT,
Quarter Master General of the Army,
Fort Saint George.

SIR,

Enclosures 3
Design for a New Hospital at Bangalore.
Appendix A
Appendix B

Proposed Hospital at Bangalore

With reference to your letter, No. 474, dated 29th October last, and my reply thereto, No 420, dated 5th ultimo (paras 7 and 8) I have the honor to inform you that having obtained a ground block-plan of the proposed new Hospital at Bangalore, I am now in a position to report, in detail, upon the plans submitted with your letter above referred to.

2 I may premise that during my visit to Bangalore, I carefully inspected the site proposed to be occupied by the New Hospital and that it is suitable and of sufficient area to contain a large Hospital in Pavilions for European Cavalry and Artillery and their families. This site has been approved by His Excellency the Commander-in-Chief in lieu of one previously selected.

3 In the Report of the Committee on the proposed Hospital this site is alluded to as being "one of the most elevated plateaus at Bangalore and as affording that isolation which is so necessary for a Hospital."

4 Before commenting on the plans now under notice I may direct attention to the fact that there is considerable discrepancy between the recommendations of the Committee and the designs prepared by the Public Works Department, and I think it right to add, that the report alluded to was, as may be seen from its date (1863), drawn up at a time when the Members of the Committee could not have had access to the numerous authorities now available to guide them in their suggestion.

As before stated by me, the "general style of construction proposed is good and a great improvement upon any existing Hospital in the Presidency" I trust therefore that any suggestions afforded by the Commission may be considered as simply intended to make the Hospital more perfect and as in no way reflecting on the judgment of the Members of the Committee or the Public Works Department.

Separate blocks of wards.

5. I now proceed to notice in detail the several suggestions of the Committee and the plans designed more or less in accordance with them.

6. It was proposed that there should be two blocks or pavilions, each block to be well raised and to form a "separate and complete Hospital in itself" From an examination of the plans, I infer, that by the words just quoted is meant separate and distinct wards for the accommodation of the sick of the two Corps named, for the administrative apartments were proposed to be put in Supplementary buildings—(vide para. 12 of Report)

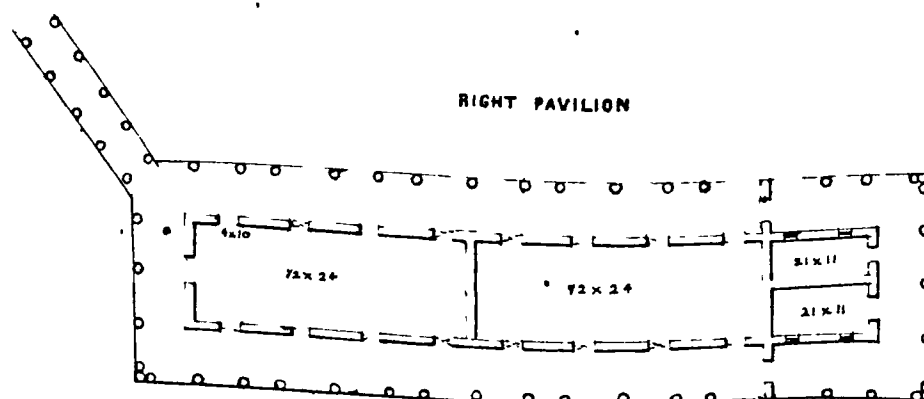
7. Each pavilion was to contain two wards on each floor, each ward to hold 16 patients—there would thus be accommodation for 128 patients in the two pavilions constituting the great body of the Hospital. To this proposition there can be no objection, but I would point out that each ward measuring 72×24 would only afford 108 square feet to each patient, and though this is amply sufficient, yet it is less than that proposed by the Committee, (viz., 112 square feet)

8. The plan drawn shows double verandahs which are objectionable both in consequence of their cost, and because the enclosed inner verandah must be expected to interfere with thorough ventilation. I would suggest in correction of this, which was not the intention of the Committee (vide P. S. of their 1st Report) that these divided minor verandahs should be altered into a single open verandah 10 feet in depth.

9. This would of course necessitate a re-arrangement of the end room now shown in the plan and intended to hold two patients each. These wards were designed for "cases requiring separation" from which I infer that both non-contagious and contagious special cases were intended, as no other provision is made for sick requiring isolation.

10 I may remark that to place a patient labouring under Cholera, Small-pox or other contagious fever in rooms opening out into a passage affording access to a common ward, would be highly undesirable and that all such cases as those referred to should be treated in buildings situated at some distance from the main wards of the Hospital I have therefore in a later portion of this Report (vide para. 33) to submit proposals for this class of sick and having done so have only here to suggest that the corner room now shown should be omitted at the inner end of each pavilion and at the outer end that they should be joined, the intervening passage being removed, and that they should be completely separated from the common wards as shown in the accompanying plan If distinct separate wards are erected, then two special wards on each floor affording accommodation for 8 sick in each pavilion, would be ample provision for the intended object, namely, special non-contagious cases

11. The relative position of the different apartments in each pavilion, the single verandahs and connecting colonnades are shewn below.—



12. A comparison of the plan above with the original design will show that I have thought it desirable to diminish very much the dimensions proposed in the latter, for I find on examining the plan that for each of the two separate cases proposed to be accommodated in each room 162 square feet superficial area was proposed to be given. I believe it will be found by experience that the use of these wards will be chiefly restricted to the accommodation of the superior Non-Commissioned Officers, cases of insanity, delirium tremens, or serious accidents or operations, and they will very seldom be fully occupied, but even if they were so 120 square feet superficial area would be abundant space for each of the two patients, while if one patient alone occupied the ward he would have double that space.

13 As shown in the original plan the "Special wards" had only a single verandah, although the rest of the Hospital is designed with double verandahs. This arrangement was of course necessitated by the large dimensions allotted to these special apartments; but if a single verandah is considered sufficient for the most important class of cases, it would surely be found equally suitable to wards intended for ordinary sick. I would suggest therefore that all the wards of the Hospital should be surrounded with a 10-foot verandah and that such portion of it as immediately surrounds the "special wards" should be devoted specially to the use of the patients inhabiting them.

14. In order also to prevent unnecessary disturbance from patients passing to the Latrines and wash-houses (who according to the plan would have to pass close outside the special wards) and also with the object of approximating the out-buildings and giving them a central position easy of access to all patients, the privies and wash-house should be placed directly in rear of, and much closer to, the centre of the back verandah. To the Lavatory direct access might be had from the verandah itself while the Latrine should be approached by a totally distinct passage. This arrangement is indicated in outline on the accompanying block plan by this Commission (vide para. 31).

15 If suitable arrangements are made for thoroughly draining the Lavatory and for speedily removing to a distance all water which is foul, and if the Latrine be worked by the Dry Earth system proposed by this Commission and not by the Punjaub system proposed in the plan, these out-offices need not be a source of the slightest inconvenience to the patients, while their comfort would be much more attended to than by the present plan where the most distant door of one of the general wards, from which a patient might enter the verandah is nearly 300 feet from the Privy.

16 I may also allude to the fact that for the upper stories no Latrine accommodation in the same floor is provided. As will be seen from the accompanying copy of letter relative to the General Hospital, Madras, there is not, in the opinion of this Commission, any objection either to the proximity of Latrines carefully worked with dry sifted earth, and if these be on both stories there would be less necessity for special utensils being provided in wards and verandahs for the use of patients laboring under bowel complaint or in a weakly condition.

17. Each Latrine for two wards should contain not less than 6 seats and should have a dry earth reservoir receptacle for poudrette and the other appliances noted in the letter above referred to from the Secretary to this Commission. A urinal should also be placed in the Latrine and another in the Bath-room.

18 The main wards should have the dividing wall closed entirely and there should be doors to close the openings from the wards to the verandahs in the main wards, and windows and doors in the special wards. Above each door a glazed swing attic should be placed to promote upper ventilation. The dimensions of the doors should be $8\frac{1}{2} \times 5$ feet, the doors to be of moveable venetians to 3 feet from the ground, the upper portion glazed, &c, with panes to open on hinges as recommended in paragraph 5 of the appended Report.

19 The doors and attics specified in the last paras will, from their sheltered position, afford free ingress of air in all states of the weather, for even if excessive rain or very strong winds prevailed the doors and attic windows on one side of the ward could be left open. Egress of heated air and products of respiration should be promoted by flue ventilators springing from the surface of the ceiling opposite to the centre of each of the three middle piers on either side of the main wards, and from thence passing up through the walls of the upper ward. The upper wards should be similarly ventilated by flues with cowl heads or the flues of both stories might be fitted with Muirs' Patent Ventilator described and delineated at page 70 of the Report of the Commissioners for the improvement of Barracks and Hospitals. I consider this mode of ventilation preferable to that proposed by the Committee for the upper floor, namely, sky-lights, as the patent ventilator is constant in action and is free from control by patients.

20 In the Report and Plans under examination provision is made for the following detached quarters. In one building (No. 6 F) on the upper floor there are a very large Operation room and three small apartments for Medical Officer. The ground floor of this consists of a Receiving room, Surgery and Dispensary for the Cavalry and Artillery respectively.

21 I am inclined to question the necessity of such very large accommodation as that afforded by this lower floor. No one corps of the ordinary strength of those proposed to be here accommodated would require more than a small Dispensary and small Receiving room. But the proposed rooms can be utilized as suitable for day use as Office and Committee Room, &c, for which no provision has been made.

22 If the question of the institution of a General Military Hospital for all European Soldiers at Bangalore had been favorably entertained, a considerable economy in these buildings might have been effected if one common Receiving room and Dispensary had been made for all corps.

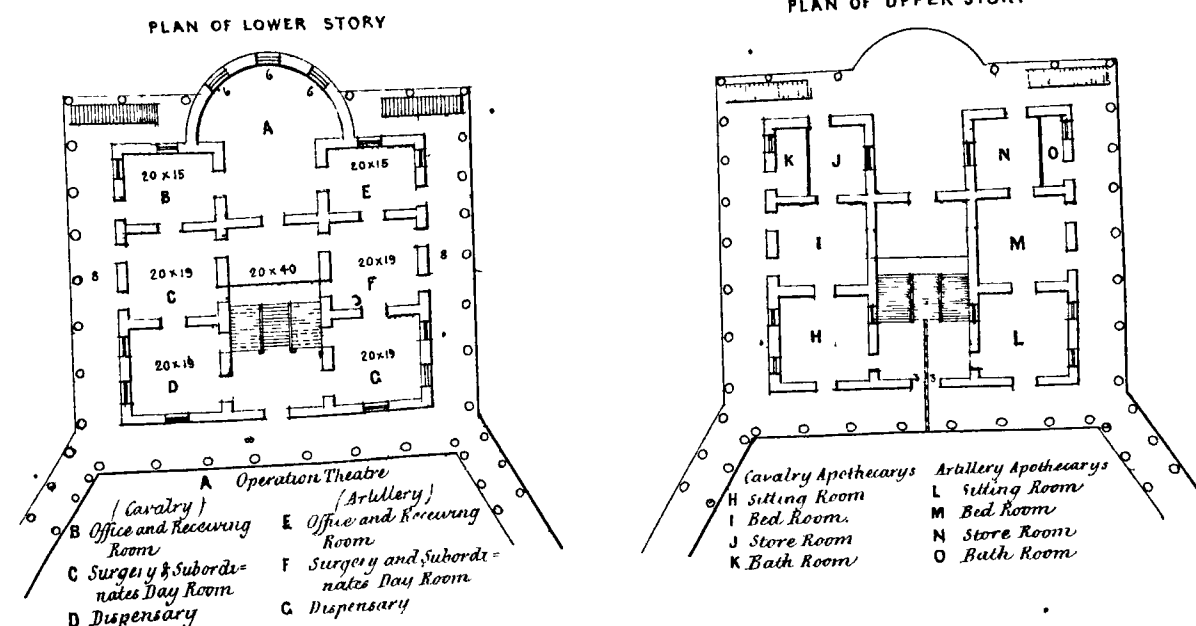
23 As however distinct accommodation for Regiments seems to be desired by His Excellency the Commander-in-Chief, I confine my suggestions to the best means of carrying out the necessary arrangements to secure the desired end, viz, separate accommodation for the sick of two corps.

24 In the plan now under examination there are, I think, several arrangements that could be amended with advantage. The Operation room is not suitably lighted; it is of quite unnecessary dimensions $55 \times 27\frac{1}{2} = 1512$ square feet. The windows are small and in the shade of a sloped verandah $10\frac{1}{2}$ feet deep and no light from above is provided.

25 The Operation room should not be on the upper floor but on the ground for obvious reasons, and the Apothecary should be resident in the same house in which is situated the Dispensary which is essentially under his charge.

26 The whole block should be connected with each of the pavilions, but this is not shown though the Committee recommended this arrangement. Indeed so far as the Block Plan of the buildings proposed to be erected on the Race Course shows the respective position and arrangement of the several buildings, the two pavilions for different Regiments are connected, which is neither necessary nor desirable; and the Administrative rooms are placed at a considerable distance and detached, which is objectionable.

27 In lieu therefore of Plan F as shown in accompanying drawing, a building might have been made to contain on the ground floor an Operation room, the projecting portion of which should not be built over and which should have a dome over the Operating table. The upper floor of this building would afford sufficient accommodation for two resident Apothecaries and two would be required if there are two different Regiments to be provided for separately, while the Surgery below stairs, might during the day, after the sick had been inspected, be used by the other Medical subordinates as a Day room. The arrangements proposed are shown below and one recommended in lieu of Plan F, of the Department Public Works.

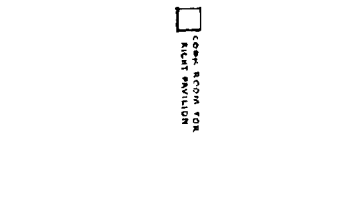
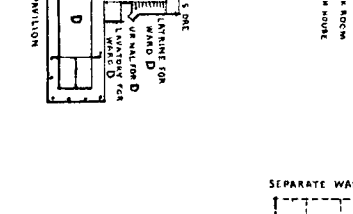
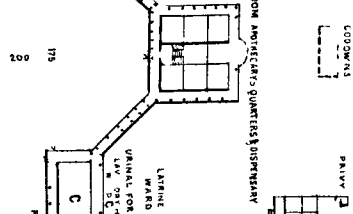
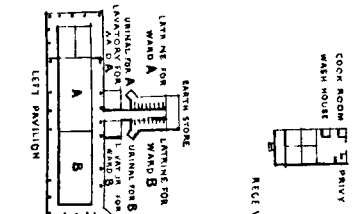
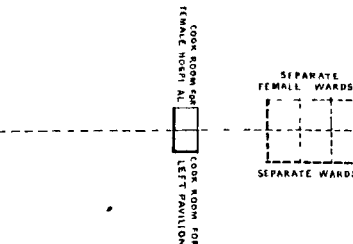
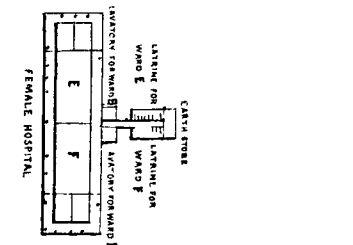


28. Each of the plans (No. 5) for Sergeants' and Medical subordinates' quarters might be then reduced to one-half its present size, and I think that the out-offices of the Hospital Sergeants' Quarters might be arranged as shown in Block Plan (vide para. 37). This design is recommended as separating the Cook-room and Privy and affording better ventilation for the last-named apartment; the removal of the walls at the end of the front verandah will promote the ventilation of the house itself.

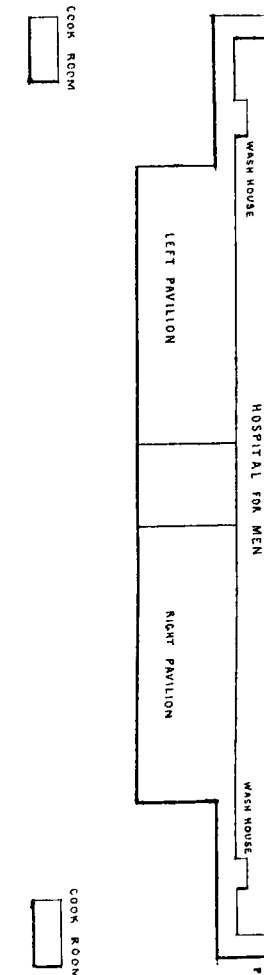
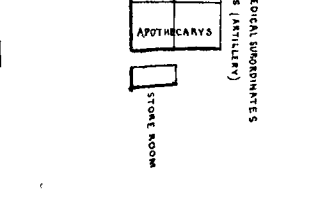
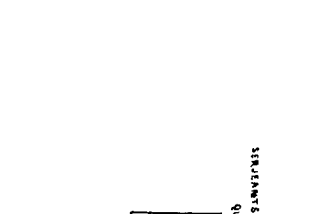
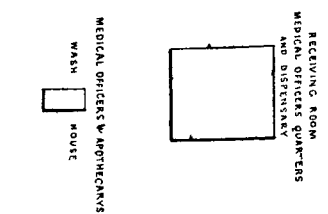
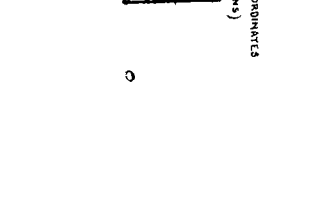
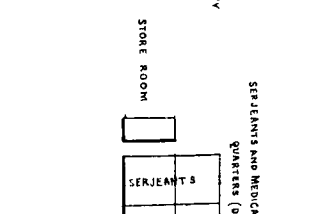
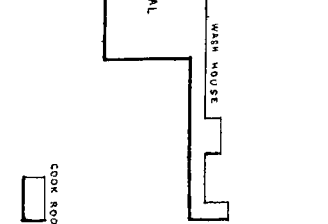
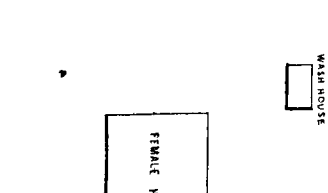
29. Plan No 3, Medical Officers' and Subordinates' wash-house, might be altogether got rid of as a distinct building. I am constrained to observe that the erection of this separate building would appear to be a perfectly unnecessary way of meeting the requirements of a Commissioned or even Warrant Officer, who should certainly be provided with a suitable bathing room on the premises where they reside.

30. If the suggestions now made were to be carried out, some economy in point of construction could be effected in most of the buildings hitherto examined, and the inadvisable grouping together of Officers' quarters with Operation room and Dispensaries could be entirely avoided. It

(Signed) H. B. Montgomery M.D.
Secretary Sanitary Commission



PUBLIC WORKS DEPARTMENT BLOCK PLAN



X

will be seen (para. 27) that I have suggested that provision should be made for two resident Apothecaries; similarly it may perhaps be found necessary to provide accommodation for 2 Hospital Sergeants and for 2 Medical Officers.

31. This should for Officers be done by a separate building to windward of the Hospital and not to lee ward as suggested in the Department Public Works plans

32. The Administrative apartments (Dispensary, Receiving room, &c) might also be placed between and behind the two pavilions. The buildings would then be relatively placed as shown in the accompanying plan of this Commission.

33. One very marked requirement of the proposed Hospital has been overlooked in the plans under consideration—no separate Wards have been provided for contagious or infectious cases requiring more complete separation than is possible under the same roof as that covering General Wards

34. I have therefore provided for two small buildings (marked in Block Plan by this Commission "Separate Wards") each to consist of 3 rooms and to be used for cases of Cholera, Small Pox, &c The necessity of this provision for contagious cases is recognized by all Medical authorities in India.

35. For the Female Hospital two similar Wards are provided.

36. The site for this building proposed by the Department Public Works is generally approved, but it is like the Male Wards open to objections as regards the double verandahs, ventilation, latrines and lavatories.

37. I would suggest that an Hospital be built as shown in Plan by this Commission, namely, one Ward and two small rooms for each Regiment with detached Cook-house and Matron's quarters. The latter to be built on the same plan as those for Hospital Sergeants.

38. I cannot forward this Report without again urging upon the notice of His Excellency the Commander-in-Chief the great desirability of adding a third pavilion for the Men's wards and thus the advantages of a good General Military Hospital be secured to this important Station

I have the honor to be,

Sir,

Your most obedient Servant;

(Signed) R. S. ELLIS,

President, Sanitary Commission

APPENDIX F.

OFFICE OF SANITARY COMMISSION,
MADRAS, 31st March 1865

No 603A

From THE HONORABLE R. S. ELLIS, C B,
President, Sanitary Commission, Madras

To COLONEL CHARLES A. ORR, R E,
Secretary to Government, Public Works Dept.,
Fort St George

SIR,

I have the honor to acknowledge the receipt of Proceedings of Government, dated 17th January, and Order Thereon, No 155

2. I beg to point out that the Circular letter by Colonel Strachey, is dated 25th November 1864, and also, that the Order of the Madras Government, 17th January, did not reach this office until one month and six days after its date.

3 The papers contained in these Proceedings have been carefully considered by this Commission, and I have to submit the following observations for the consideration of Government

Hospitals for Native Troops.

4. In accordance with orders of Government, the scale of accommodation to be provided for Native Troops has been fixed. But as the "full Regiment" of Bengal may not accord with the "full Regiment" of the Madras Presidency, I thought it advisable to place myself in communication with the Principal Inspector General, as regards the proportion of sick to the strength of the Cavalry and Infantry Regiments of the Native Army in this Presidency.

5 I have just received this return, and am therefore now able to submit the reply of this Commission to your requisition in a more complete form than I could otherwise have done.

6. There was some difficulty in fixing on the numbers of sick to be provided for, as there were up to this time no statistics available to give the requisite data upon which to base any conclusions. But the information afforded by the Principal Inspector General shows that—

(1) In four Native Cavalry Regiments the average annual daily sick of three years varied from 4 to 16, the mean average being 9. But the highest monthly average rose as high as 21, and 8 was the least number, the mean average of highest monthly sick being 14.6. But as there are a number of followers who might require treatment, and as some cases may require additional accommodation or seclusion, I think provision should be made for 25 beds, in four Wards, one for 17—one for 6—and 2 for one patient each. To these should be added a Surgery Receiving room, Bath room, Washing room, Latrine and Scullery, houses for Apothecary, Dresser, Hospital Servants, two separate Wards, Cook-room and Dead house, and Hospital Clothing Store. The principles of construction and general arrangement of such a building should be in accordance with the plans proposed by this Commission for a Native Infantry Hospital.

(2) Very great variations appear between the highest and lowest annual average daily sick in Native Infantry Regiments. The lowest being only 5 and the highest 64, the mean annual daily sick of one Regiment being $17\frac{1}{2}$. An equal variance is observable between the highest and lowest monthly average of daily sick, which are represented respectively by the figures 7 and 128: the mean highest monthly sick being $30\frac{2}{3}$.

On the whole, it is believed that 40 cots will be sufficient for ordinary sick, although in some instances this amount of accommodation may not be required. Colonel Crommelin assigns 48 cots and 2 special Wards for the same purpose; we think this somewhat in excess.

7. I may observe, however, that the general salubrity or otherwise of a station should be strictly borne in mind, for at stations where fever is frequently witnessed a much larger amount of accommodation would be required than at others where it is rarely prevalent.

8. In my present observations, therefore, I shall confine myself to the consideration of such principles of Hospital construction as are worthy of determination. In discussing these I purpose chiefly to submit the remarks of this Commission upon the "Plans" and "Recapitulation" of Colonel Crommelin.

9. This Commission entirely concurs with Colonel Crommelin, that upper stories are not required for Native Hospitals, except in situations where want of space may demand an upper floor to be added. A well-raised basement should, however, be invariably provided, and this recommendation applies especially to stations on the Western Coast in this Presidency.

10. The number (60) fixed by Colonel Crommelin to be contained in one building is larger than that ordinarily required by any Native Infantry Regiment in this Presidency. But I am inclined to think that the limit of sick to be aggregated in one building, under one roof, is as necessary to be defined in Native as in European Hospitals and for the same reasons.

11. As to the apartments required to constitute a good Hospital for Native Infantry or Cavalry, this Commission concurs generally in the observations under notice. But it is also our opinion that the precise use of individual apartments may be somewhat better arranged; and that the relative position of some of these might be altered with advantage.

12. Three general Wards will probably suffice for the treatment of ordinary Regimental sick. But as it is necessary to make suitable provision for cases of *contagious disease*, separated from the general Wards. These are shown in the annexed Plan as separate Wards.

13. This Commission concurs with Colonel Crommelin's suggestions regarding the arrangement of beds in the Wards.

14. The superficial space 97½ feet assigned by Colonel Crommelin is not so necessary with ridge ventilation as if flat roofs are designed, and this Commission is disposed to recommend 88 as amply sufficient with ridge ventilation. The width of Wards, however, General Hospital at Madras (occupied by Europeans) is only 20 feet and is found convenient (provided that for Europeans separate dining rooms are attached). The width of 22 feet gives 8 feet clear between the ends of the beds, and this is ample never seen in a Native Hospital. It has been found too, by experience, that the cost of buildings is greatly enhanced if the width of 22 feet is much exceeded.

15. Another argument in favor of the narrower Ward is the more perfect ventilation that can be ensured by ridge ventilation, and the cost of pointed roofing increases considerably in wider buildings.

16. Should the Government of Madras agree in the propriety of these views, then assuming 88 superficial feet to be fixed as a standard, each native patient would have 8 feet of wall space in lieu of 7½ allowed by Colonel Crommelin. I think these proportions

better than those suggested in his recommendations—because they give a wider space between adjoining beds.

17. As this Commission recommend one-storied buildings, they would prefer to see them with tiled roofs and ridge ventilated—the height of the Wards to wall-plate should be 15 feet and to ridge 22 feet. thus each patient would have 1,628 cubic feet of breathing room, with abundant ventilation by the ridge and attics. The doors of the Wards, I think, should be provided with panes of glass for their upper third, and one or two of these in each door might be fitted with hinges so as to open if required.

18. The verandah may, with a view to economy, be made by continuing the roof down at the same incline as over the Wards. If, however, the verandah is 8 feet wide, the roof would then be only 11 feet high at outside and no swing attics could be introduced with good effect. This Commission would prefer that the verandah should be made flat-roofed and level with the Ward walls, with swing ventilators under the verandah-roof and over each door and window. The verandahs need not be more than 8 feet deep.

19. In illustration of the foregoing and subsequent remarks of this Commission, I forward block sketch of an Hospital with all necessary out-offices and subsidiary buildings—this plan shows the size and arrangement of the different rooms in sufficient detail.

20. Colonel Crommelin's "recapitulation" contemplates single-storied buildings only. In this, this Commission concurs with him.

21. Colonel Crommelin considers that a single building will be sufficient for the whole Hospital. This Commission is somewhat inclined to question the propriety of this rule. We are of opinion that apartments for Executive offices, Apothecary's Quarters and separate Wards for contagious cases should be detached more or less from Wards to be occupied exclusively by sick persons, and the relative position of these latter rooms could, in our opinion, be better arranged.

22. The internal organization of a Native Infantry Regiment is doubtless somewhat different in Bengal from that prevailing in this Presidency, and this must be borne in mind in considering the "component parts" of which a Native Infantry Regimental Hospital should consist.

23. Provision should be made for (say 36) sick in General Wards, 3 in number to contain 20, 10 and 6 patients respectively. Two small Wards each for 2 "special cases" should also be provided in the same block but cut off from the other Wards.

24. There should also be one or two "Separate" Wards for contagious cases entirely apart from the main building, each to contain two beds.

25. Connected with the main building there should be a Surgery easily accessible to all Wards, but not necessarily under the same roof. Pavilion construction would meet this view, and we would recommend that this mode of building be adopted, and that next to the Surgery there should be a "Receiving Room" for men to be seen in when reporting sick or for the examination of convalescents attending daily during the Surgeon's visit.

26. As this room would be only required for an hour or so daily and chiefly during the Surgeon's visit or on the occurrence of accident or sudden illness, at both which times the Medical subordinates would be professionally engaged, this Commission is of opinion that the "Receiving Room" could be made to answer as a Day-room for the Apothecary, or Dresser, or Pupils on duty.

27. The usual allotment of Medical subordinates to a Native Infantry Regiment in the Madras Presidency is one Assistant Apothecary and one Dresser. These persons are, as a rule,

mained, and we think that suitable residences for them should be provided near to, but not forming an integral portion of, the Hospital.

28 I proceed to remark on the situations proposed by Colonel Crommelin for the subsidiary buildings required as Privies, Lavatories, Cook-rooms, Servants' apartments, &c

29 It is proposed in the papers under report to have two sets of privies. The necessity for this is very questionable. Assuming that 40 men are in Hospital, not more than 12 privy seats can possibly be required, and this is greatly in excess of the usual allotment to Hospitals; but we intentionally allow six compartments to be attached to each wing of the proposed Hospital. These compartments should be made as separate as possible from the adjoining ones and should be sufficiently removed from the Wards and not open directly into the verandahs as shown in Colonel Crommelin's plan

30 These apartments should be to the rear of the two wings of the Hospital occupied by the ordinary sick and should be approached by covered ways. The privies should be worked on the "Dry Earth" system

31. At either side of the passage leading from the Hospital verandah to the privy, and opening from the Hospital verandah, should be two Bathing rooms, one of them with fixed baths and one for ordinary bathing, and a small scullery should be placed at the side of the passage connecting the Executive rooms with the sick Wards and a small store for Hospital clothing

32. The accompanying plan will show the dimensions of all these buildings and their relative position.

33 A Cook-room might be provided, although this Commission somewhat questions the necessity for it. All cooking for men in Hospital in this Presidency is done by the families in the Lines and the food is brought to the men. But a Cook-room might prove useful for the preparation of soups and other articles of extra diet and for keeping the Surgery supplied with hot water, &c

34 A Guard room should be built in front of the Hospital in some central position overlooking the main building, and this with a surrounding dwarf wall with railing would prevent men leaving the Hospital at night or receiving supplies of food or liquor surreptitiously

35 A Dead house is an essential element of Hospital construction that has been too often overlooked. Although, as a result of native prejudice, *post mortem* examinations are rarely held, yet it is exceedingly desirable that dead bodies should not be allowed to remain in Wards occupied by sick patients

36. The servants of all Native Infantry Hospitals should be provided with quarters, as their absence at their houses for meals, &c., interferes very considerably with the efficient performance of their duties.

37 I have before recommended that the dry earth system of conservancy should be adopted, and this would necessitate the provision of two soil carts to each Hospital. The Cart shed shown in the design for the lavatories and privy

Hospitals for European Troops.

38 I intentionally defer to another opportunity entering upon the question of the desirability or otherwise of instituting General Hospitals at large stations for European troops, and for the reasons assigned by Colonel Crommelin confine my remarks to

the opinion of this Commission regarding the proposed plans submitted for, and the principles to be adopted in designing, Regimental and Detachment Hospitals for Europeans

39 This Commission agrees generally in Colonel Crommelin's calculation that accommodation at the rate of 12 per cent. will suffice for the sick of European Troops at ordinary stations. An examination of the Returns contained in the Proceedings of Government, dated 26th August 1864, with Order No. 2,972, and those dated 13th September 1864 with Order No. 3,226, gives the following results as regards European sick for the last five years.

Ratio per 1,000 daily sick to strength.		
1	Thyettmyoo	44.94
2	Kamptee	50.92
3	Wellington	51.70
4	Waltair	51.59
5	Bellary	57.09
6	Trinulgherry	58.47
7	Cannanore	60.57
8	Rangoon	60.96
9	Tonghoo	65.25
10	Secunderabad	67.46
11	Madras	67.62
12	Bangalore	68.73
13	Trichinopoly	82.96
14	Saint Thomas' Mount	88.08
15	Poonamallee	136.97

But it must be remembered that during epidemics a greatly increased number of sick would require to be provided for. On these grounds and in accordance with practical experience, I think that Colonel Crommelin's estimate should be accepted as the rule.

40 This Commission concurs in the proposal that sick should be treated in upstairs rooms, and the only argument against it is the cost of providing such accommodation. But if the sanction of the Supreme Government is accorded to this arrangement, it will then be only necessary to utilize to the greatest possible extent the lower or ground floor.

41. This Commission is, however, strongly opposed to third or fourth stories, as we believe that they would be found practically exceedingly inconvenient. Proper supervision of patients would be almost impossible without entailing extreme fatigue upon Medical subordinates, Orderlies, and attendants, and the transport to upper Wards of food, water, clothing and medicine, would be difficult.

42. In the case of General Hospitals, contemplated by Colonel Crommelin—even in General Hospitals—as possibly requiring these additional upper stories, an increased number of pavilions connected by arcades would, with much greater convenience, meet the required end, namely, increased accommodation.

43. It should also be remembered that, if the principle of fixing a limit to the number of sick to be aggregated under one roof be admitted, and if sick Wards are to be supplied with all necessary apartments shown in Colonel Crommelin's Plan II, the lower floor would not provide sufficient space for "day" "orderly" and "dining" rooms for three stories

44. The Commission for the improvement of Barracks and Hospitals recommend that in warm climates not more than 60 sick persons should be placed under one roof, and 2 Wards of 24 sick would, with a very few convalescents and special cases fully reach that number on the upper floor alone

45 Colonel Crommelin's argument in favor of the non-necessity of minute segregation of Military sick possesses considerable weight, but this Commission desires to point out that in many of the Hospitals in this Presidency, not only is the space per cot afforded to the sick below the standard of accommodation now recommended, but the cots are so few in number as to be almost constantly occupied. Colonel Crommelin's views, therefore, can only be upheld if all Military sick are treated in upstairs rooms and if cots are provided at the rate of 12 per cent.

46. As regards the number of Wards to be provided for the sick of a Regiment or other branch of the Service, this Commission is of opinion that Wards containing 24 patients each

should not be unnecessarily multiplied, and on this point would remark that Colonel Crommelin has selected the maximum number allowed by the Commissioners who reported on Barrack and Hospital improvement. The small Wards in his plan also only allow special accommodation for 4 persons out of a Regiment 920 strong

47 This arrangement seems open to improvement. There should, if possible, in every European Hospital be rooms sufficiently capacious for from 6 to 12 patients laboring under skin disease or other contagious affections not of a malignant character, and who might exceed in number the accommodation provided in distinctly separate and detached Wards

48 Cases of eye disease (non-contagious) might also require separate accommodation in apartments more airy than ordinary special Wards, and, above all things, it is desirable that one or two middle-sized Wards should be provided, into which the remaining patients of a large Ward could be shifted if, after continuous occupation, it required to be cleansed

49. For these reasons this Commission would be glad to see some alterations in the allotment of patients to the several Wards, and would therefore suggest that each European Infantry Hospital should contain,

2 at	24	Cots = 48	Cots (General Wards)
2 "	16	" = 32	" (Middle-sized "
2 "	6	" = 12	" (Small "
4 "	2	" = 8	" (Special "
1 "	12	" = 12	" (Convalescent "

112

50 Similarly for a Cavalry Regiment we would recommend -

European Cavalry	1 Ward at	24	= 24	Cots (General Ward)
	1 "	"	16	= 16 " (Middle sized "
	2 "	"	9	= 18 " (Small "
	2 "	"	2	= 4 " (Special "

62

51 For a Light Field Battery we would assign the same allotment as that recommended by Colonel Crommelin

52. For an Infantry Female Hospital we would allot,

Infantry Female	1 Ward at	10	= 10	(General Ward)
	1 "	"	6	= 6 (Small "
	2 "	"	2	= 4 (Special "

20

53 For a Cavalry Female Hospital we would fix the following numbers. —

Cavalry Female	2 Wards at	6	= 12	(Small Wards)
	1 "	"	2	= 2 (Special "

14

54. There is one element of Hospital construction somewhat hastily passed over by Colonel Crommelin and before alluded to in this Report I here refer to the desirability of affording small Wards to be used if required as Ophthalmic Wards. Another point requiring attention is the provision of distinctly separate and detached Wards for cases of epidemic disease.

55. This latter precaution should be invariably adopted, and in the Plan No. 2, submitted with this Report, I have shown the relative position they should occupy with reference to an Hospital chiefly in two pavilions and supposed to face the prevailing wind.

56 This Commission cannot concur in Colonel Crommelin's argument as to the necessary expense attendant upon the erection of these separate Wards, for beyond very limited Latrine and Bath-room accommodation, nothing but Wards would be required.

57. These Wards would, as a rule, be sparingly occupied, and often, it is to be hoped, closed altogether, and the patients in them would not usually need Day rooms, Dining rooms, or Attendants' rooms to be built. They would be attended by the general staff of servants, and would probably during their detention here be confined to their beds. Cholera patients, those suffering under small-pox, &c, should not be introduced within the buildings occupied by ordinary sick. If they are, disease originally sporadic may become epidemic and the most serious results ensue.

58 These separate Wards need not be numerous nor need they be calculated to hold very many patients; indeed, in them, minor sub-division is urgently required, so that the permanent cleansing of them after occupation can be rapidly effected at small cost. They should at all times be kept thoroughly clean and prepared for occupation on the shortest notice

59. As to the questions raised by Colonel Crommelin regarding the necessity of these separate Wards in small Hospitals, this Commission would observe that if the necessity of them be admitted, and we entertain no doubt of it, they must be an essential part of all Hospitals large or small, and herein consists one of the manifest advantages of "General" over "Regimental" Hospitals.

60. The erection of several sets of these Wards is avoided, and thus considerable expenditure is rendered unnecessary, while the attention of the Medical Staff is directed to the existence of infectious disease against which they can adopt the proper precautions

61 Colonel Crommelin's argument against too great sub-division of Wards is based on two considerations, the difficulty of ventilation and the increased cost of supervision and nursing

62 On the first point I may observe that if a building consist simply of single rooms with verandahs front and rear, no difficulty can be experienced if sufficient doors and windows be provided and if tubular shaft ventilation be insisted on. As to the second point, it yet remains to be seen how far the introduction of trained Nurses is practicable, and according to what system it is to be carried out before it is possible to calculate upon the effect of the slight sub-division of Hospital, recommended in the Remarks

63 The plan proposed by Colonel Crommelin of placing cots *along* instead of *across* the Wards appears to be a good one, and the provisions for altering the plan architecturally to meet this intention seem well calculated to allow of this arrangement of the cots.

64. For the reasons before stated, this Commission would prefer Wards only 24 feet wide.

65. 120 square feet is fully sufficient superficial area per bed in convalescent Wards. In large well-ventilated General Wards 126 feet would probably be sufficient—130 in medium Wards, and about 150 in special Wards.

66. The proposals regarding Ward Lavatories are identical with those long advocated by this Commission, and it is observed the recommendation submitted by us with reference to the General Hospital at Madras is here repeated, namely, that fixed tubs and basins

should be provided, and that a urinal should be erected in these rooms And when required a supply of hot and cold water should also be available.

67. I would recommend that Privies on the dry earth system should be provided, but not situated as shown in Colonel Crommelm's design, but placed directly behind each pavilion both on the upper and lower floors

68. This Commission does not believe that Water closets are desirable in India. Even in a temperate climate they are often a source of nuisance, and with the known careless habits of Soldiers they are almost certain to prove so in India. Besides at many stations water may not be easily laid on, and the dry earth system has proved so successful and is so easily managed, that I would prefer the introduction of it to that of Water closets, which are almost certain to get out of order.

69. The proportion between the Dining and Day rooms on the ground floor does not meet the approval of this Commission, as the dining room designed by Colonel Crommelm is too small, and the Day room is unnecessarily cut off from the Dining room.

70. This Commission is of opinion that quarters for the Apothecary should be detached from the body of the Hospital, but in close proximity to it. This Officer should, like the Hospital Sergeant, be accommodated in the administrative block, and upstairs.

71. The quarters of the Hospital Sergeant should similarly be adjacent to, but detached from the body of the Hospital (vide Plan by this Commission)

72. Good rooms for the reception and proper stowage of soldiers' kits are essential to a good Military Hospital, as are rooms for Hospital clothing, &c, &c

73. We think that the Surgery and Receiving room would be better in a detached building, the upper portion of which could be occupied by Hospital Sergeant and Apothecary.

74. The proposed kitchen should be, like the Dead house and separate Wards, to leeward of the Hospital

75. The Lavatory on lower floor of Hospital need only be very small but with one good hot, or cold bath, also a shower bath to be used only by Orderlies not by patients. The foregoing Remarks apply to the lower privy.

76. The Guard room should be at the entrance of the Hospital compound and not in the body of the Hospital.

77. Shed for ambulance cart and hearse should be behind the Hospital or to one side.

78. It only remains for this Commission to submit a plan for an European Infantry Regiment exhibiting our views of the alterations that might be made in Colonel Crommelm's designs. This plan will sufficiently explain our views regarding the relative position of the several buildings requisite for the accommodation of 112 sick. The number of Wards required for this purpose has been already detailed, and the accompanying block plan will sufficiently show the arrangements we propose

79. In submitting it for comparison with that of Colonel Crommelm, I beg first to direct attention to certain objections to his "block plan" (I)

80. Supposing the Hospital to face the direction from which the prevailing wind comes, we consider that the cook rooms and wash houses are badly placed and that the covered passages con-

necting these with the main building are calculated to prevent perfect ventilation between the two large blocks of buildings on either side

81. We further consider that the Hospital privies and Bath rooms are badly placed as regards the convenience of patients resorting to them, they being at the ends of the building.

82. We would prefer that administrative offices, Receiving room, Surgery, &c, Apothecary's quarters, and those of the Hospital Sergeant should, if possible, be detached from the buildings containing sick men, and we would desire to provide a good Office and Record room which is essential to the efficient working of an Hospital.

83. In explanation of these views I submit plan of a building which will contain Operation room, Surgery, Receiving room, Office and Record room, on the ground floor, and above, quarters for an Hospital Sergeant, Apothecary, and Committee Room.

84. The Operation Theatre is proposed to be lighted by 3 large windows at the end and (not being built upon) by a dome over the Operation Table.

85. The quarters for the Apothecary and those of the Hospital Sergeant are composed of sitting room 20 x 19, bed room 20 x 19, store room 13 x 15, and bath room 6 x 15.

86. The building containing the executive apartments should, in the opinion of this Commission, be placed behind and between the two pavilions constituting the main body of the Hospital, and thus be easily accessible to all persons engaged in the management of the Hospital.

87. In compliance with your wish I submit this Report in printed form and beg that it may be laid before Government with as little delay as possible with a view to its being considered and forwarded to the Supreme Government.

I have the honor to be,

Sir,

Your most obedient Servant,

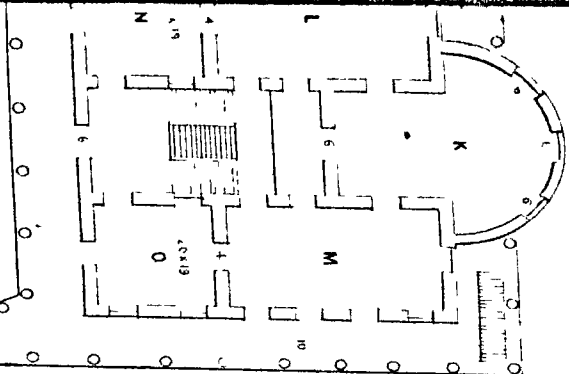
President, Sanitary Commission.

PLAN
L. L. R. AND V. J. P. FLOORS OF
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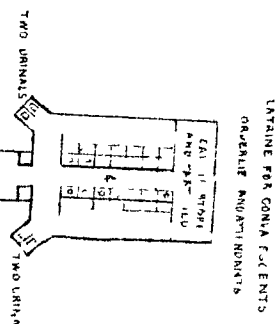
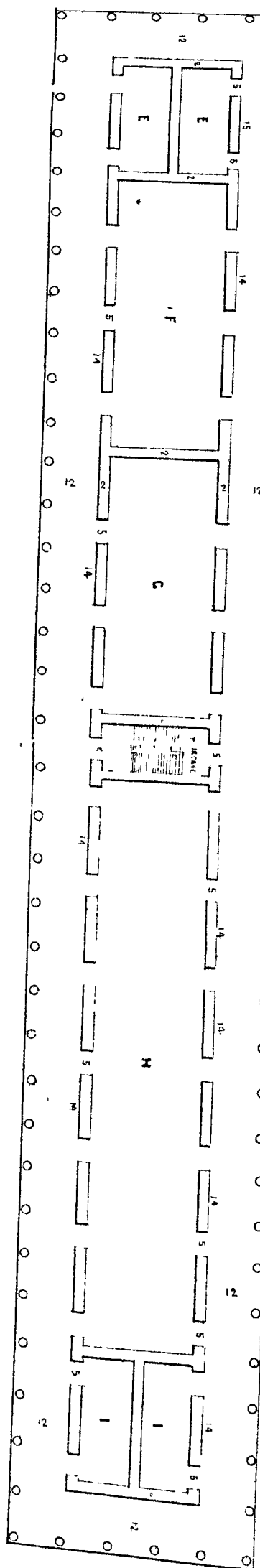
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HEALTH CENTER
UNITED STATES OF AMERICA

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GROUND PLAN
EXHIBITATIVE ROOMS



A. RECLINING BATH
B. SHOWER BATH
C. LAMIN
D. PORTABLE TUBS



1. GROUND FLOOR
2. FIRST FLOOR
3. SECOND FLOOR
4. THIRD FLOOR
5. FOURTH FLOOR
6. FIFTH FLOOR
7. SIXTH FLOOR
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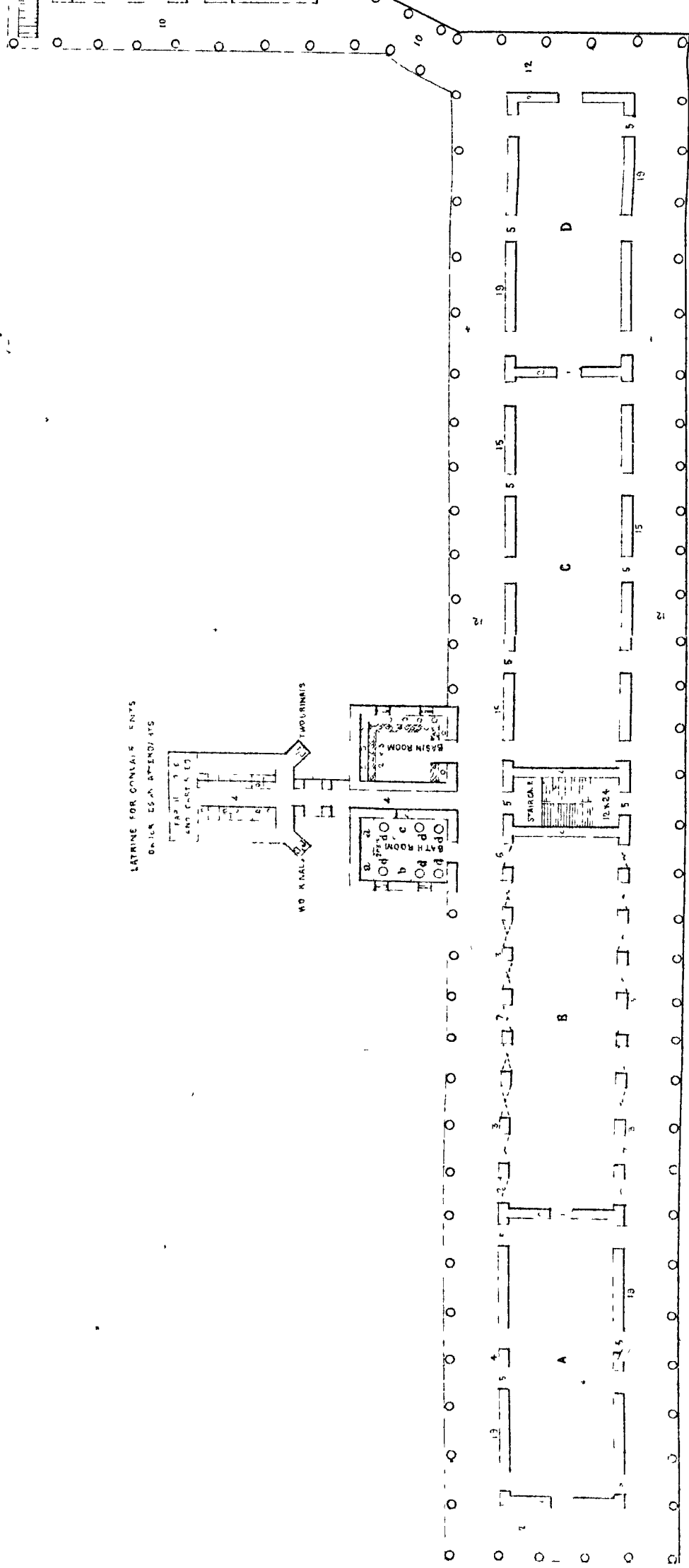
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1004
HOUSE

LAUNDRY FOR OFFICIALS
BATHS, SHOWER, DRESSING

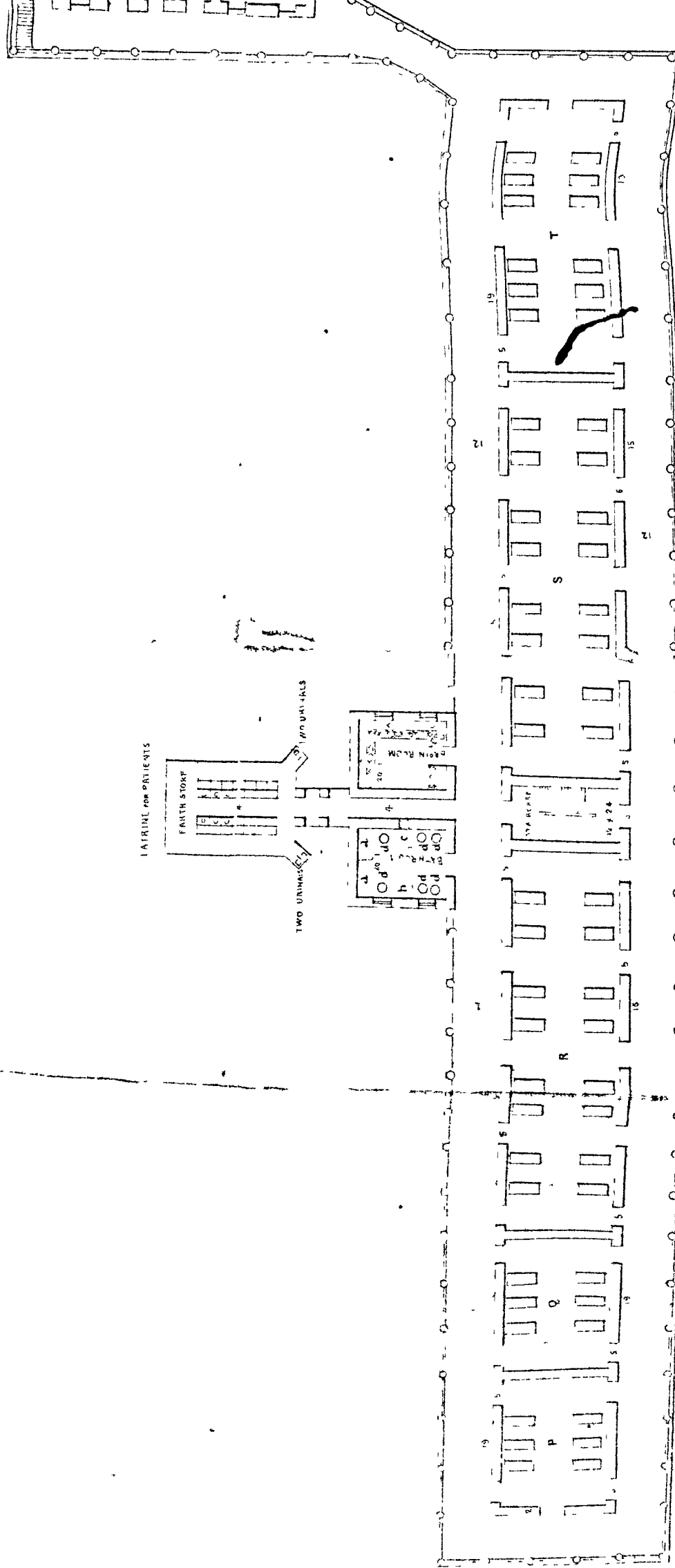
W.C. KITCHEN

SPRING FOR
OFFICIALS HOUSE



LAUNDRY FOR OFFICIALS

W.C. KITCHEN



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X - 12/4 x 24 ft
Y - 13/4 x 24 ft
Z - 14/4 x 24 ft

Office of Sunday Commission
H. B. Montgomery W. D. Berry
Designed by A. B. Burtin, 1905

DESIGN FOR AN HOSPITAL
FOR
NATIVE INFANTRY
PREPARED BY THE SANITARY COMMISSION FOR MADRAS

STAFFS LATTICE

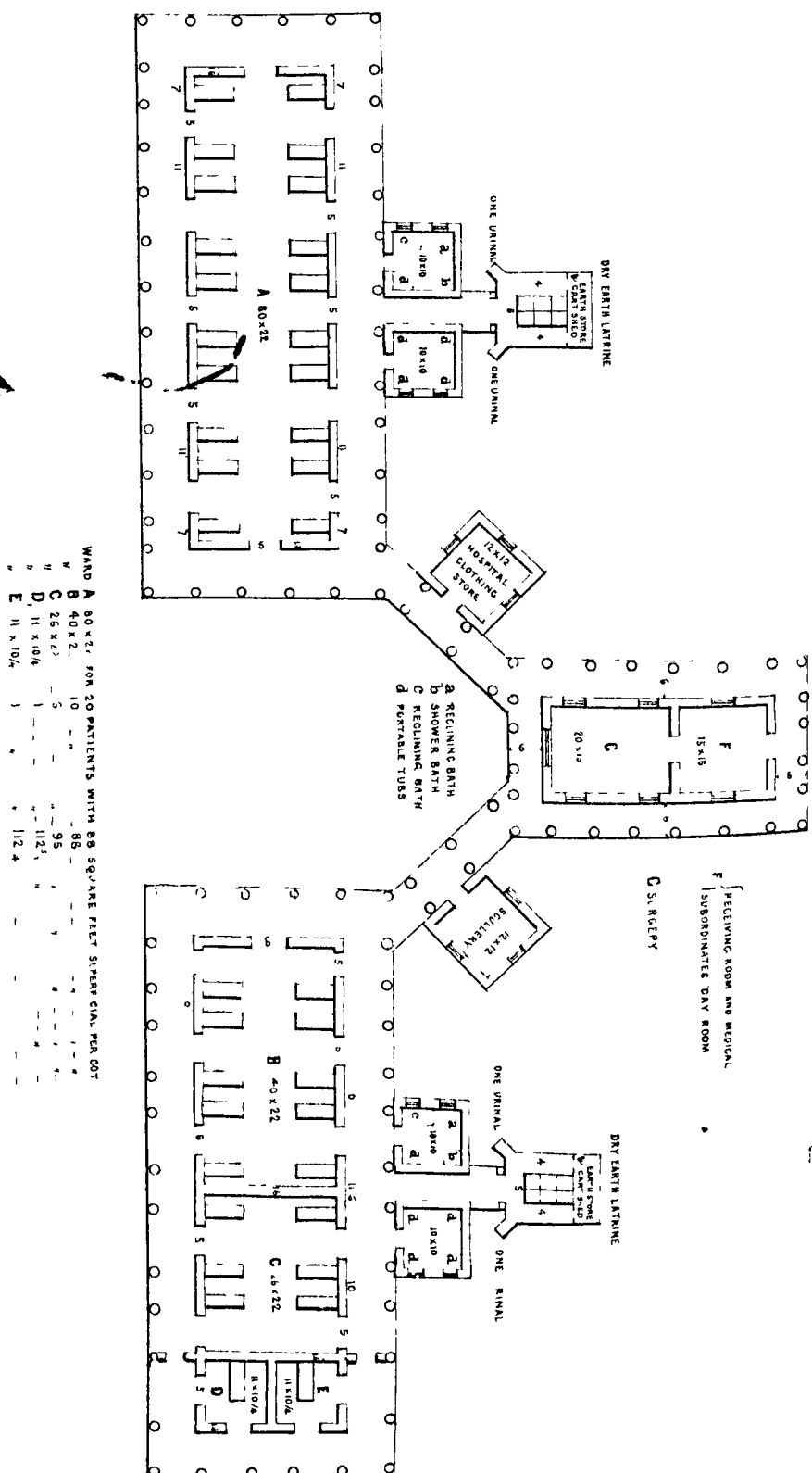
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STAFFS LATTICE

ENCLOSURE FOR
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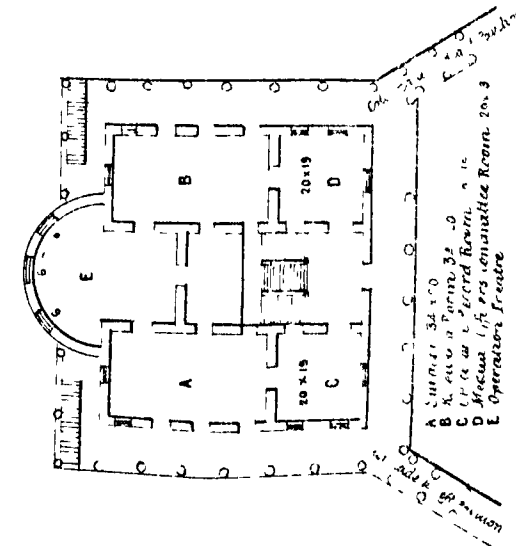
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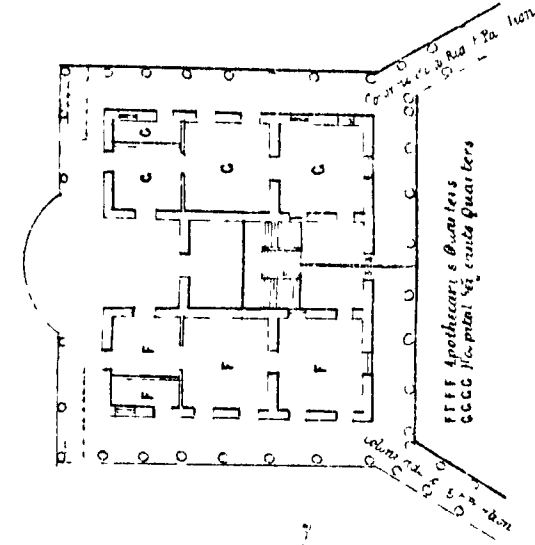
Office of Sanitary Commission
H. B. Montgomery M.D. Secy. Del.
1 designed by A. Barrett Esq. 1890

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PLAN OF LOWER STORY



PLAN OF UPPER STORY



APPENDIX G.

No. .

OFFICE OF SANITARY COMMISSION,
MADRAS, 19th April 1865

From

HONORABLE R S ELLIS, C B,
President, Sanitary Commission, Madras

To

COLONEL H MARSHALL,
*Secretary to Government, Military Department,
Fort Saint George*

SIR,

Proceedings of Government, Military Department,
No. 4,314, dated 2nd December 1864
Proceedings of Government, Military Department,
No. 3,338, dated 21st September 1864
Proceedings of Government, Military Department,
No. 403, dated 28th January 1865
Proceedings of Government, Public Works Department,
No. 648, dated 8th March 1865.

I have the honor to acknowledge the receipt
of the Proceedings and Orders of Government, No and
date as per margin, relative to the subject of the stabling
Cavalry and Artillery horses

2 I request that the following observations may be submitted to the Honorable the Governor in Council, with a view to a re-consideration of the dimensions of space to be allotted to each horse and of the style, generally, of construction to be adopted

3 The consideration of these subjects was brought before this Commission in consequence of the submission to us by His Excellency the Commander-in-Chief of a proposed set of stabling for sick horses at Bangalore (copy of this is appended to this letter) and marked Plan A

4 On it I submitted the following observations in my letter No 420, dated 5th January 1865 —

"This Commission is ~~anxious~~ to think that the flat roofed stalls without verandahs
" shown in this plan would not afford sufficient protection to sick horses Rain falling with
" wind blowing towards these open sheds would affect the horses nearly as much in these as in the
" open maidan "

" A building with side walls with proper openings for ventilation and leaving two feet
" open space above, with pointed roof (ridge ventilated), and with a central passage between the
" horses, (facing outwards) would at once afford admirable opportunity for careful supervision and
" for complete protection from the weather."

" In the same building a sweating room foot-bath stall with apparatus for swinging
" horses, &c, should be included, as also a Surgery, room for Line articles, &c "

5 A plan of sick stables constructed on this principle and capable of modification for ordinary stables is herewith submitted marked Plan B.

6 The erection of the separate " Line sheds" proposed for Bangalore can be avoided if they are made an integral portion of the stables for Cavalry and Artillery, which have been recently sanctioned by the Supreme Government

7. Of the necessity for such buildings there can be no doubt, but this Commission is anxious to bring to the notice of Government the desirability of providing ordinary stabling of a more complete kind than that hitherto proposed in the papers under consideration on this subject

8 There is no doubt that exposure and even change of weather is injurious to the horse, and of this a good example was brought to our notice by Colonel Thompson, the Remount Agent, who stated that in November last 140 horses were admitted into Hospital with coughs and colds during the few weeks next following a few days of heavy and continuous rain. The total strength of horses at the Dépôt was 550, so that nearly 25 per cent were made ill by change of weather alone. Colonel Thompson is also of opinion that horses properly housed would, especially in wet and cold weather, keep their condition better on less food than if they were picketed out.

9 The exposure is equally injurious to the men who have to clean the horses, and no doubt the admissions into Hospital are increased in number from men getting wet in attending to horses picketed out in rainy weather

10 The means of comparison between the health of mounted Soldiers whose horses are provided with stables with that of the same class of Soldiers whose horses are picketed without cover, are not available; but this Commission has no doubt that the Cavalry Soldier should be protected from heat and rain while attending upon his horse

11. This Commission is further of opinion that there would be a gain to the State, in the increased efficiency of horses protected from the inclemencies of the weather, more than compensating for the expense of building suitable stables

12 They most entirely concur in the opinion expressed by the Principal Veterinary Surgeon, Bombay Presidency, that horses are not more proof than other animals against attacks of disease resulting from continued exposure to heavy rain, and there can also be no doubt that exposure to a tropical sun and to land winds is very injurious to horses, especially Australians

13 As it has been now determined that the horses of the Artillery and Cavalry everywhere shall in future be stabled, this Commission would beg to call attention to a valuable report published on this subject by the Barrack and Hospital Improvement Commission under date 31st October 1863

14 It is of great importance that horses accustomed to live in the open air should not suffer from want of ventilation when transferred to the shelter of a stable, and although in this country the stabling required need not be of as elaborate a construction as is necessary in England, the remarks contained in the report above quoted will be found most useful in respect of ventilation, light—the cubical space allowed to each horse, and the drainage and conservancy of stables

15 The necessity for attention to these points in the construction of stables is as great in this as in any other country

16 It will also be desirable to guard horses from the direct action of the land wind which, as was found in the stables erected at Belgaum, is a fertile source of disease In this respect the “stables approved by His Excellency the Commander-in-Chief in India” (under date 19th April 1860) are defective, for there is no protection from land wind afforded by open sheds

17 It is probable that a pan-tile roofing will be found the most economical, but side walls are essential to prevent the access of land wind Iron roofing is very liable in this country to injury from high wind—and may not be easily or cheaply procurable at all stations

18 The pavement to be used in stables is also a matter deserving of attention—the requisites are that this pavement should wear well, not become slippery, be water-tight, and be easily cleansed

19 I may mention that asphalt has been lately employed in France for this purpose with great success, and if properly composed and really well laid, (to which sufficient attention is not paid in India), it would probably answer better than any other kind of pavement Another good flooring for stables can be made by fire-bricks laid in edge and tested with hydraulic cement or asphalt

20. It is also necessary to direct attention to the dimensions and mode of construction of ordinary stables as proposed by the Supreme Government. They fix the dimensions of stalls at $14 \times 7 = 98$ square feet with a 6-foot central passage This would give $17 \times 7 = 119$ to each horse, including the space of the central passage

21 Colonel Thompson recommends a larger area and a wider passage. he suggests 11×10 as necessary to allow Australian horses to turn, and he further suggests a central passage 12 feet wide. This would give in all 170 square feet per horse inclusive of the passage way. Colonel Thompson, however, would give a loose box to each horse This, though absolutely necessary in sick stables, may be considered unnecessary in the ordinary Cavalry and Artillery stables, but we are of opinion that a space of not less than 12×9 for ordinary and 12×12 for sick stables should be provided for each horse The horses in the latter to be in loose boxes.

22 Colonel Thompson says, of a stable at Oosoor—“The passage down the centre is 12 feet wide to enable it to be used for cleaning saddlery and harness, and for Officers and Non-Commissioned Officers to walk up and down when on duty at grooming hours A small box should be in the corner of each stall to hold the hay or grass, otherwise trampled under foot and wasted; the stable should be open at either end by a large arch which is closed by a door half way up at night or when the current of wind may set in too strongly at either end—the outside walls do not run up to the roof but stop about 18 inches short of it along both sides, the roof being supported on pillars at equal distances and projecting two feet outwards to prevent rain beating in Thus air is freely admitted all round and through both ends whilst none can blow upon the horses A brick and chunam drain 6 inches wide runs down under each row of horses with a small oval cistern in the centre of each stall covered with a strong wooden trap perforated with holes—outside the stable at the top of each drain is a chunam cistern into which a barrel of water is emptied twice weekly and thus rushes down the drain, washes thoroughly each cistern, and having cleansed all impurities is carried off at the lower end into a drain leading to a dung pit”

23 I beg to forward herewith a design for a sick stable constructed on these principles The cost of it need not be very much in excess of that approved by His Excellency the Commander-in-Chief in India, for the masonry pillars in each instance would be the same in point of numbers; but the height of them in the plan proposed by this Commission is of necessity greater and the roof more expensive, but the dividing walls shown in our plan can be made of mud or sun-burnt bricks, and the outer wall of the same material between the pillars

24 The same design would do equally well for ordinary stables with modification in respect to the space assigned to each horse

This plan appears to possess the following advantages—

- (a) The central passage allows of horses being brought into or out of the stable without risk, it also affords room for the cleaning of harness which should be done in the stable and not in Barrack verandahs as at present
- (b) All harness can be safely kept at night-time away from the Barracks but still well protected
- (c) Horses can be cleaned in all weathers without any exposure to the men
- (d) All horses will be in stalls of sufficient size
- and (e) Perfect protection from rain, damp and land wind, is ensured both to horses and men

25 For the foregoing reasons we would recommend each sick horse stable—and ordinary stable, should be thus constructed, and that a Troop stable should contain

72 Stalls

4 Harness rooms, and

4 Lane article rooms.

The sick horse stable should similarly contain

Veterinary Dispensary

Swinging Stalls

Foot Bath

Sweating Room

Boiler, &c, all under the same roof as the sick horses themselves, for whom stalls should be provided

26 Veterinary Surgeons and Officers Commanding Cavalry and Artillery will be in a position to report upon the probable number of sick stalls required

27 Soliciting that this communication may be submitted to Government

I have the honor to be,

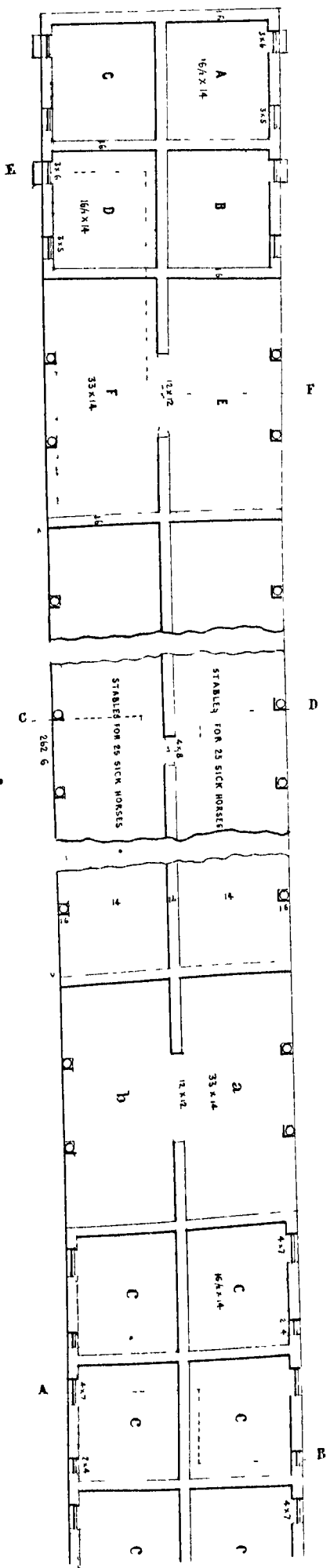
Sr,

Your most obedient Servant,

(Signed) R S ELLIS,

President, Sanitary Commission.

PLAN A
STABLES FOR 50 SICK HORSES
WITH ADJOINING ROOMS W. AS NOTED B.E.C.W.
FOR THE
NEW DRAGON BARRACKS AT
BANGALORE



SECTION THRO AB

SECTION THRO CD

SECTION THRO EF

- A Store Room
- B Lock up place for Tools
- C Line Guard
- D Veterinary Dispensary and Pharmacy
- E Barriers Room with finge
- F Shaving Room
- a. Boiling Room for heating water
- b. Washing and Ironing Room
- c. Loose Boxes

Office of Sanitary Commission
H. B. Montgomery W.D. Sec'y
Indorsed by A. Barren

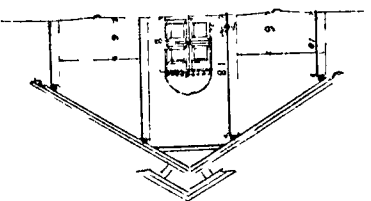
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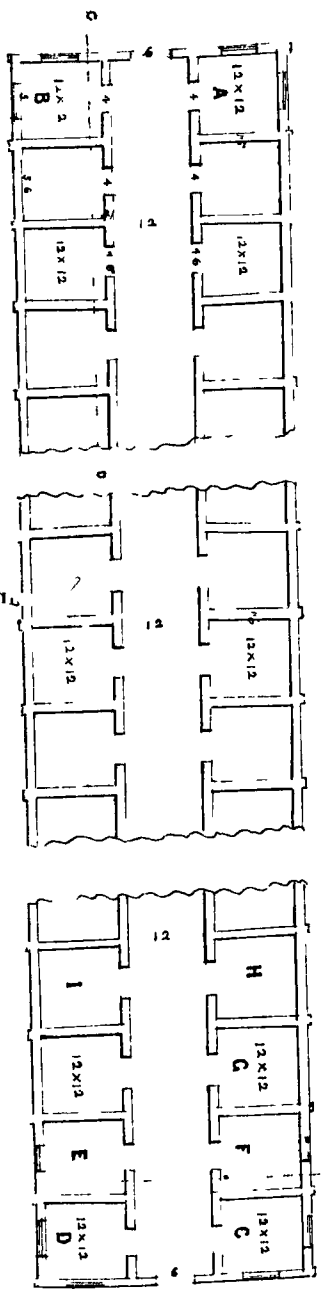
PLAN B

STABLES FOR SICK HORSES
WITH EXECUTIVE
APARTMENTS

PREPARED BY THE SANITARY COMMISSION FOR MADRAS



SECTION THRO A B

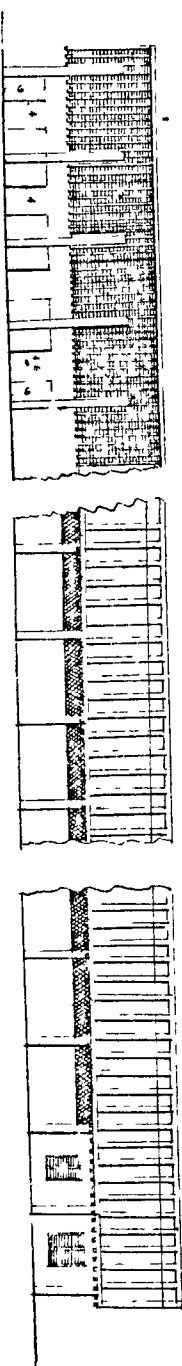


- A Veterinary Dispensary
- B Store Room for Surgical
- C Apparatus Room
- D Shaving Room
- E Forge and Barriers Room
- F Boiler Room
- G Sweating Room
- H Foot Bath
- I Swinging Stalls

END ELEVATION

SECTION THRO C D

FRONT ELEVATION



10 20 30 40 50 60 70 80 90 100 110 120

Office of Sanitary Commission,
H. B. Montgomery W.D. Sec'y

APPENDIX H.

No 678

OFFICE OF SANITARY COMMISSION,
MADRAS, 23th April 1865

From

HONORABLE R S ELLIS, C B,
President, Sanitary Commission

To

CORONEL H MARSHALL,
*Secretary to Government, Military Department,
Fort Saint George*

SIR,

1 I have the honor to submit, in compliance with the Order of Government, No 388, dated 27th January 1865, the following remarks of the Madras Sanitary Commission, on the subject of the Beds and Beddings of the European troops in India.

2 This subject has for a considerable time past occupied the attention of His Excellency the Commander-in-Chief of this Presidency, and the whole question has recently undergone elaborate enquiry by the Military authorities and the Sanitary Commission of Bengal

3 The President of the Sanitary Commission for Bengal addressed in September 1864, an exhaustive letter on this subject to the Secretary to the Government of India, Military Department. In the recommendations made by the Sanitary Commission for Bengal, this Commission agrees in all main points

Cots.

4 It is recommended by the Bengal Sanitary Commission as essential for the comfort and health of the troops that iron cots in all cases should be supplied. His Excellency Sir H Rose recommended an iron trestle cot which, with slight modifications, the Commission prefers to other cots examined by them. This cot consists of an iron frame work with two or three boards, removable, on which the mattress rests

5 Improved specimen cots are being prepared in Calcutta, and it would seem desirable to await the result of these experiments before determining upon ordering any further supply of iron cots for the Madras Presidency. The Madras Sanitary Commission entirely concurs with the Bengal Commission in thinking the cot devised by Sir H Rose, superior to Falconer's or any other form of iron cot in use in this Presidency. It affords the least possible harbour for vermin, and the fact that the wooden planks are easily moveable makes it possible thoroughly to clean every portion of the cot.

6 The Bengal Sanitary Commission has been requested to furnish this Commission with the result of the experiment made for the improvement of this Iron Trestle Cot, which seems the best suited for the use of the British Army throughout India

Bedding.

7 This Commission entirely concurs in the opinion expressed by the Bengal Sanitary Commission that much remains to be done for the improvement of the Soldier's Bedding. The only point upon which this Commission differs from that of Bengal is in the preference given in Bengal to Paillasses over Mattresses

8 This Commission is entirely opposed to the use of Paillasses, stuffed with straw, and without hesitation, recommend that Mattresses stuffed with good Coir be universally used in both Barracks and Hospitals.

9 The experiment of the cost, durability and comfort of Coir Mattresses has been most carefully made in this Presidency by Dr Jephson, the Medical Officer of the King's Dragoon Guards, lately stationed at Bangalore, and the result of this experiment has most conclusively shown that Coir Mattresses are admirably suited for Barracks and Hospitals in this part of India.

10 The Mattress recommended by Dr Jephson has been approved by His Excellency the Commander-in-Chief. It can be made at a cost ranging from four to five rupees. Such a Mattress will last for eight or ten years, it can be easily opened, the coir and ticking washed and the bed re-made. Such a Mattress is in all respects superior to a straw Pailasse which never makes a comfortable bed. The Coir is not in any way injured by washing, and if sufficiently often 'teased' this Mattress is as comfortable in all respects as a Horse hair mattress.

11. This Commission fully concurs in the necessity for Bolsters as recommended by the Bengal Sanitary Commission. These bolsters should be covered with canvass and be stuffed with the same material, Coir, as the Mattresses. Soft pillows should be provided to the extent of 25 per cent of the average sick in Hospital. These should be of silk cotton, feathers, or curled hair.

12 The objections mentioned by the Bengal Sanitary Commission to the cotton quilts or rezais, have frequently been brought to notice in this Presidency. They should be discontinued as a part of the Soldier's bedding. This Commission also concurs in the proposed substitution of English blankets for the country blankets. In this Presidency it will be of advantage to have two kinds of blankets, one thick for the colder stations of Bangalore, Wellington, Secunderabad and Bellary,—and another lighter, for such stations as Madras, the Mount and Trichinopoly. At these latter stations the lighter blanket would be more comfortable than a heavy English blanket, which would seldom be used.

13 His Excellency Sir Hugh Rose expressed as his opinion that "it is very desirable that the system of bedding being stationary at localities, instead of being moveable with the soldier, should be introduced into this country. This system prevails in England and throughout all other of Her Majesty's colonies, and it is especially applicable to India." The system recommended by Sir H. Rose will be a very great improvement upon that which at present prevails. When the Soldier's bedding becomes a part of the Barrack Store, it will be carefully looked after by a responsible Department, and increased comfort and cleanliness will be the result.

14 As above explained, the Soldier's bedding should consist of —

1 Mattress

1 Bolster

1 Setringee or small carpet

2 Sheets

2 English blankets—one of these blankets should, for the Madras Presidency, be of a light description, and in the Plains it would seldom be necessary to issue thick blankets.

1 Leather strap

15 This Commission concurs in the recommendation that these articles should be supplied by the Barrack department, and that a sufficient quantity be kept in store, so that they can be changed when necessary, and that clean articles of Bedding should be supplied to men in Barracks as follows —

Mattresses cleaned once in six months

Bolster cases once in four months

Setringees twice a year

Sheets once a week from March (in Bengal, April) to October, and during the rest of the year once a fortnight

Blankets twice a year

I have the honor to be,

Sir,

Your most obedient Servant,

R S ELLIS,

President, Sanitary Commission.

No. 36

OFFICE OF SANITARY COMMISSION,
MADRAS, 11 May 1865.

From

Surgeon J. B. Montgomery M. B.
Secretary Sanitary Commission, Madras.

To

Colonel Charles A. Barr M. B.
Secretary to Government P. W. D.
Fort Saint George.

Sir,

In the unavoidable absence of the officiating President of the Sanitary Commission, I have the honor to forward with reference to Proceedings of Government P. W. D. N^o 1276 dated 10th May 1865. 6 Copies of the Report on the Station Barracks and Hospitals of Bangalore lately submitted to Government in the Military Department.

Should additional copies of this Report be required by you they shall be furnished on intimation to that effect being received.

I have the honor to be
Sir

Your most ob^l servant

James B. Montgomery
Secretary Sanitary Commission

PW 1627/65

Recd Secy 12th May 65. N^o 27.

2^d 17 1865 Department
of War for May 27.

Adj. Secy. Landry Henry
to
Adj. Secy. Landry Henry
of the Department
of War.

Recd 11th May 1865
No. 11th

36
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Received with reference
to the 11th May 1865
the 11th May 1865
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