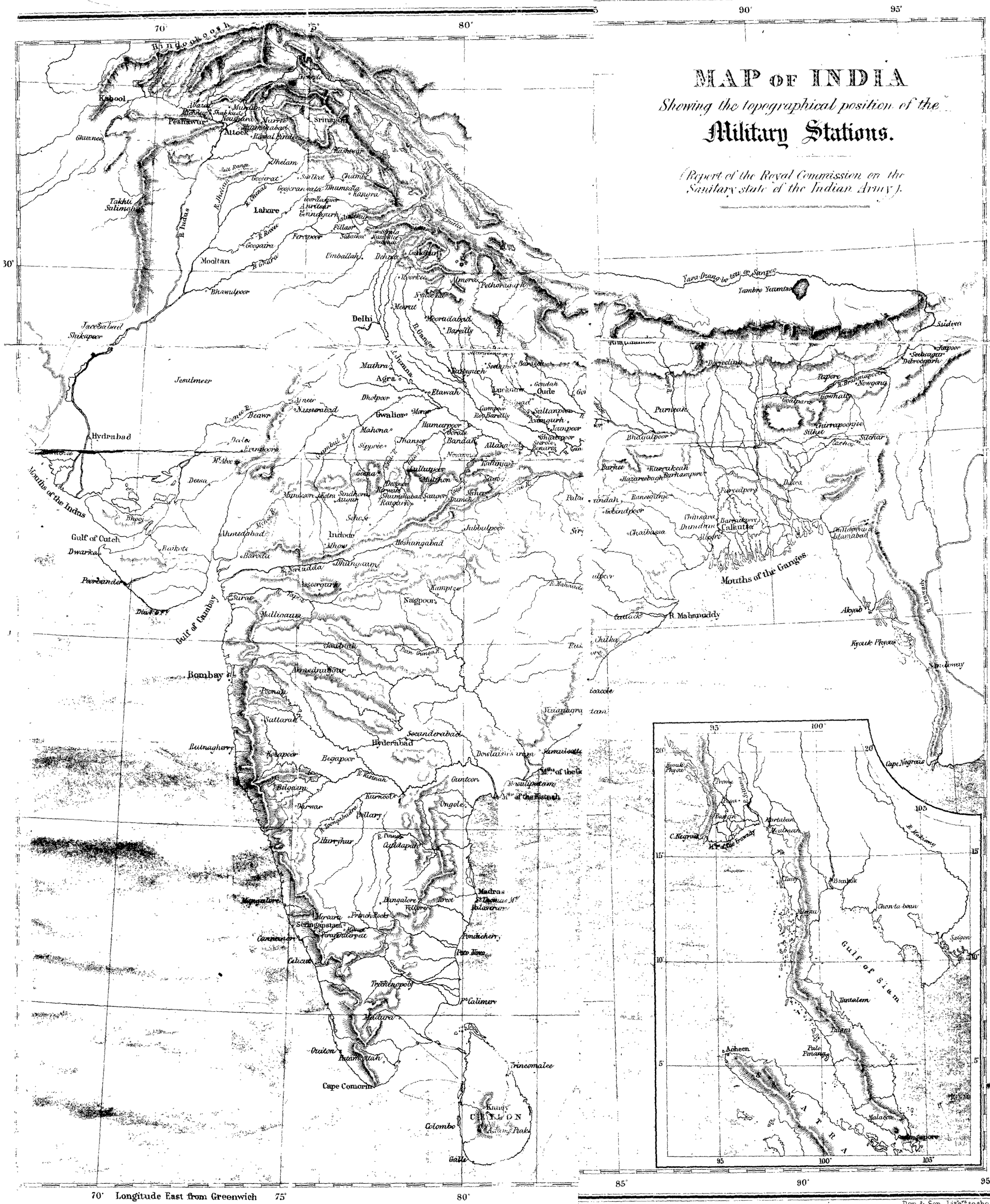
MAP OF INDIA

Showing the topographical position of the

Military Stations.

(Report of the Royal Commission on the Sanitary state of the Indian Army).

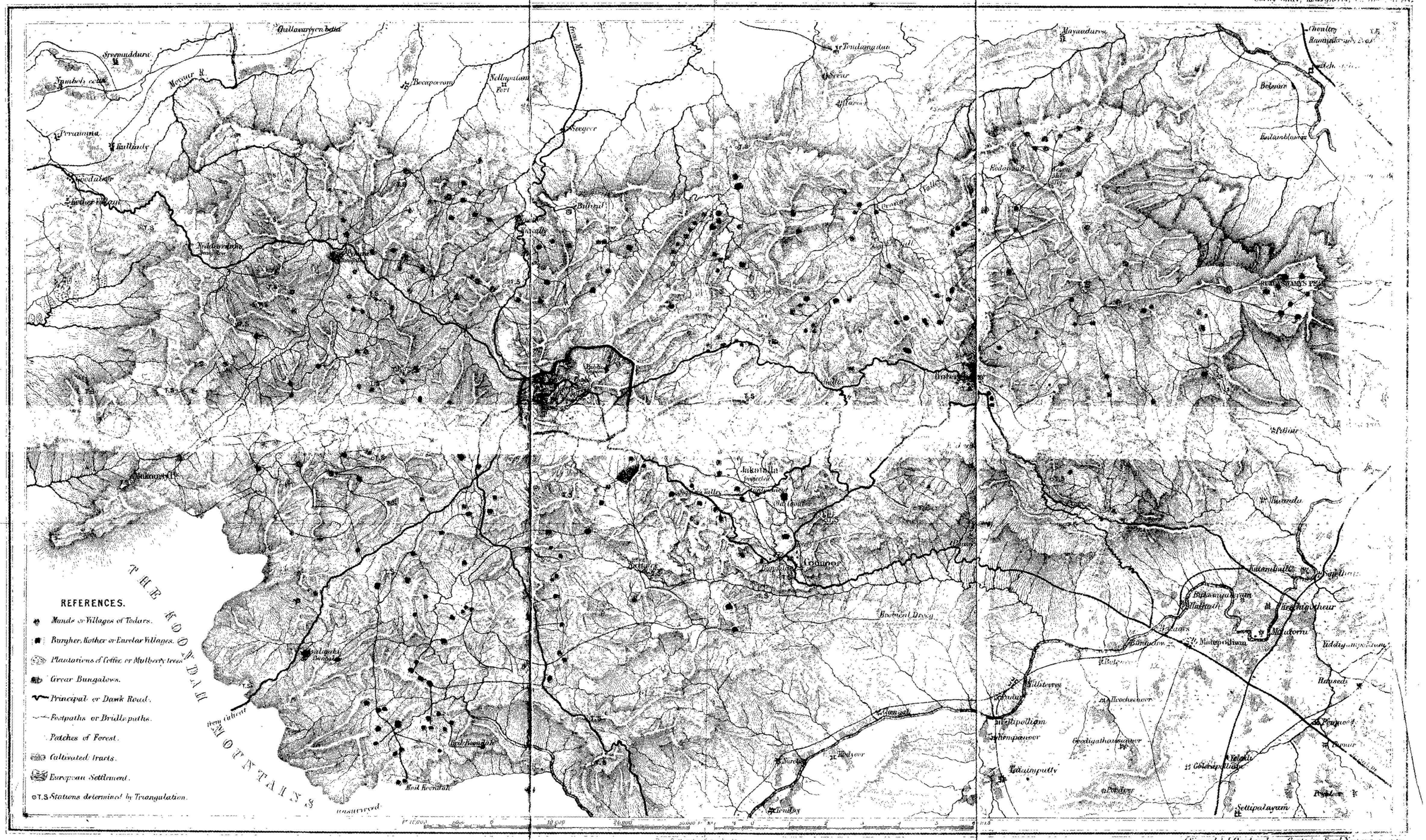


Day & Son. Lith^rs to the Queen.

MAP OF THE NEILGHERRY MOUNTAINS

REDUCED FROM THE RECENT SURVEY.

Survey Office, Ootacamund, [illegible]



(Signed) J. Ouchterlony, Captain, Supt. Survey

Map

EXHIBITING the ELEVATED MOUNTAIN RANGES & SOLITARY HILLS

CONTIGUOUS TO THE

Chief Military Stations in the Madras Presidency,

To illustrate

Inspector General Dr. Duncan Macpherson's Report

IN REPLY TO THE

Questions by the Royal Commission on the Sanitary State of the Indian Army

ALTITUDE POSITION AND APPROXIMATE ELEVATION OF THE CHIEF MOUNTAINS IN THE MADRAS PRESIDENCY

Names of Mountains	Approximate Elevation above Sea Level.	Names of Mountains.	Approximate Elevation above Sea Level.
Madras District.		**Coorg**	
Pulicat	4 to 2500	Bittatoor table land	4824
Shevary Range		Paupaugherry	5781
Green Hills	5080	Mercara	4506
Vercaund	4750	Fraserpett	3200
Neilgherry Range.		**Mysore**	
Neilgherry proper: Dodabetta	8760	Bababooden	6347
Ootacamund (Woodcock Cottage)	7416	Siva Gunga	4600
Wellington	5990	Nundidroog	4600
Coonoor	5886	Palamanair	2251
Kundah range: Golticaull	8685	**Bellary.**	
Mookoorte Peak	8408	Ramandroog	3600
Davebetta	6571	**Vizagapatam.**	
Sangthery range: Corbetta	6915	Galleykondah	5345
Kotagherry	6671	Grants range	5100
Dimhutty	6330	Harris Valley	4300
Malabar & Canara		**Gangam**	
Banasore Hill	7000	Mahendagherry	4909
Taking the range en masse	2 to 5000	Deodongar	4521
Roodramook	4200	**Cuttack District**	
Coimbatore Range		Meghassani	3821
The Anumallay Hills	7 to 8000	**Nizams Dominions.**	
Madura Range		Beeder	2000
The Pulney Hills	6 to 7000	Chicaldee	3600
Highest Peak of Do	8000.	Booldana	2700
Tinnevelly		**Nagpoor & Hossingabad**	
Cortallum	4160	Puchmurree	4000
		Mootoor	3400
		Chindwarra	2061

General Abstract of the Distribution of the Army in June 1860

Divisions of the Army.	Native Cavalry	Native Infantry	Horse Artillery: Europeans	Horse Artillery: Natives	Foot Artillery: Europeans	Foot Artillery: Eurasians	Foot Artillery: Natives	European Infantry	Native Infantry	Europe Veterans: Artillery	Europe Veterans: Infantry	Sappers & Miners	Total.
Centre Division	16	14.0	"	"	408	134	156	1383	5308	189	"	457	8185
Northern Division	"	"	"	"	40	22	40	202	6474	"	145	316	7239
Southern Division	"	366	"	"	60	"	31	1460	4521	"	"	84	6522
Mysore Division	369	384	125	162	34	"	27	867	6062	"	"	"	7430
Malabar & Canara	"	"	"	"	"	51	16	1068	3521	"	"	128	4804
Ceded Districts	"	384	99	"	117	"	32	832	3484	"	"	"	4948
Hydrabad Subsidiary Force	596	748	259	"	386	"	72	2120	4269	"	"	56	8606
Nagpore Force	"	753	74	"	189	"	66	774	3582	"	"	"	5438
Foreign Service	314	"	"	"	482	312	276	2132	12835	"	"	446	16797
Grand Total	1295	2775	557	162	1716	519	716	10858	49056	189	145	1481	69469

MOUNTAIN AND SEA COAST SANITARIA FOR EUROPEAN TROOPS, IN THE MADRAS PRESIDENCY.

Military Posts	Names of Mountains Contiguous
Madras	Shevaroy & Neilgherry Hills
Trichinopoly	Pulney & Neilgherry Hills
Cannanore	Anumallay & Neilgherry Hills
Bangalore	Neilgherry Hills
Bellary	Ramandroog
Vizagapatam	Galley kondah
Secunderabad	Ramandroog & Galley kondah
Jaulnah	Chicalda & Booldana
Nagpoor	Chindwarra & Puchamully Hills

Sea Coast Sanitaria.

Waltair near Vizagapatam.
Point Calimere near Negapatam.
" near Sedashegur.

Approximate Distances by Sea of the undermentioned Places

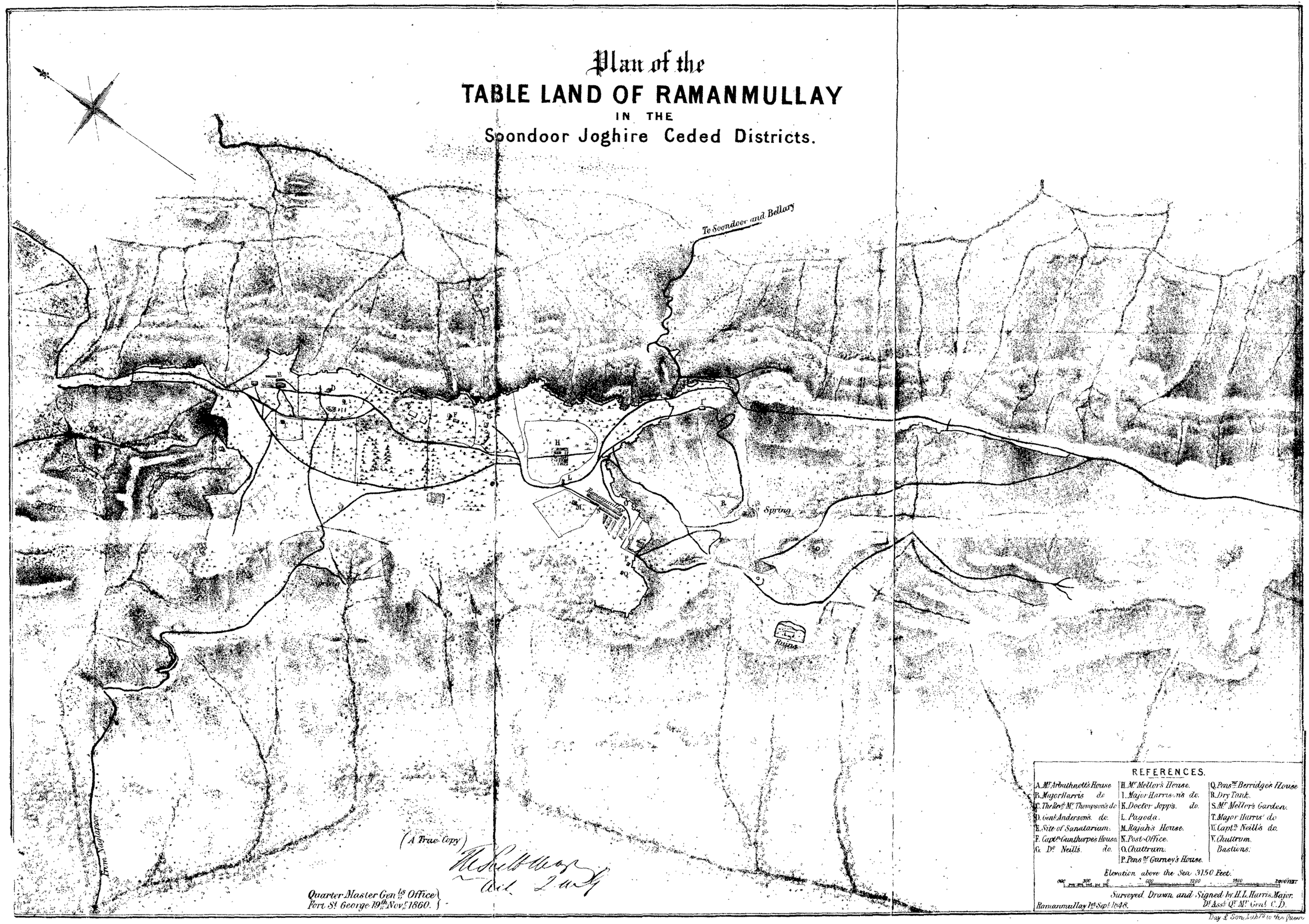
From Calcutta to Madras	870	miles
" Madras to Negapatam	170	"
" Negapatam to Tuticarin by Paumben Pass	200	"
" Do Do Round Ceylon	750	"
" Bombay to Beitkul Bay	300	"
" Beitkul Bay to Mangalore	150	"
" Mangalore to Beypoor	140	"

G. Murphy, Supt. Mang. Coy. (Litho Press)

Corry Mosley, Lieut. Col. Chief Engineer D.P.W.

Day & Son, Lith. to the Queen.

Plan of the
TABLE LAND OF RAMANMULLAY
IN THE
Spondoor Joghire Ceded Districts.



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VIZIANAGRUM.

Accommodation. Native troops, Infantry, 37th and 46th Reg., N. I.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station presents generally an undulating appearance, being hilly towards the north-west and north as far as Cheepropilly, a large village 16 miles north of Vizianagrum. The remaining portion or the country round the cantonment is flat, and generally open with much waste land. There are a number of tanks in the vicinity, many of which cover from 10 to 15 square chains. 2. There are no means of ascertaining the elevation of the station; but the ground about 2½ miles south of the cantonment is much higher, and better adapted in every way for a station than the present site. 3. There is a hill, lately occupied as a sanatarium, situated about 40 miles from the station, named Galleepareevatum, the level of which is about one mile above the sea. The level above the station is not known. 4. The nearest flowing water is a large river, about 200 feet in breadth, situated about 12 miles from the cantonment, near the town of Conadah. On the east side of the station, however, there is a large tank at a distance of 200 yards. The vicinity of the station is low and subject to inundations in heavy rains. There are many ravines near; but what their effect on health is, I am unable to say. 5. The station is situated on high ground unencumbered with trees, and the adjacent ground being principally open and uncultivated, the ventilation is free and good. The temperature is not raised by the buildings being exposed to reflected sun heat. The station is exposed to cold sea breezes and land winds; and when the latter prevails from the north-west, it is productive of colds, and a mild description of fever. 6. The surrounding country is principally cultivated. There are no works of irrigation of any great extent, and none nearer than 4 miles. Artificial irrigation is not generally thought to have any bad effect on the health of the station. Rice cultivation is not prohibited, it is grown in abundance to the north of the cantonment; but prohibited within the limits of the station. Indigo and hemp are cultivated throughout the district, but not sufficiently near to be of any nuisance. 7. The town of Vizianagrum is distant from the cantonment about one mile; and Bimlipatam, formerly a Dutch settlement, is situated about 16 miles distant to the south-east. 8. I am unable to give the geological structure, surface and subsoil of the district, but the station stands on ground which was never before occupied by a population. 9. Water is generally found during the dry season at a depth of 25 to 30 feet below the surface and about 15 feet below during the rainy season. 10. The station being on ground considerably higher than that adjacent to it, the whole of the rain-fall, or nearly so, as well as the drainage is carried off into the low land. 11. The water supplied is derived chiefly from wells during the hot season, at which time the supply is rather scanty; but an abundance of good water can be procured from the tanks during the rainy and cold season. There is a great deal of water stored in tanks, but not usually for drinking purposes, many of these tanks cover an area of from one quarter to one half a square mile when full. There are very few tanks within the limit of the cantonment. They are from a distance of one half to one mile. Tank water is used by the natives for drinking and all purposes, such as washing clothes, bathing, &c., and is of good quality. The tanks are almost all entirely dependent on the rain-fall for the water which they contain, as very few have springs. The nature of the plants and animals they contain is unknown; but, generally speaking, some little vegetation enters the tank. Many of them receive the drainage of the high ground, most of which is very foul, and the margins of the principal portion are used as public privies, consequently the water must be polluted, and no doubt causes many of the diseases which have prevailed. I am not of opinion that any malaria arises from any of the tanks adjacent to the station sufficient to be of any injury to the cantonment or lines; but I would suggest that public privies should be erected in or near the town of Vizianagrum, and properly flushed now and again,—say once, twice, or thrice a week. 12. The supply of water is good; but the quality is generally bad. Good clear palatable water, free from smell, has to be brought from some distance. Its chemical and microscopic conditions have not been ascertained, there being no means for that purpose at hand. Leathern buckets and ropes are generally used to raise the water; and I do not think any better water could be procured than that now used at the station. 13. I am not aware of any other topographical points bearing on the health of the station, not included in the foregoing replies. 14. I am unable to suggest anything in reference to the mode of selecting new stations.
II. Climate.	1. There are no means or instruments available at the station for conducting and registering meteorological observations. 2, 3, 4. No reply to these queries. 5. I have served at Jubbulpore, Kamptee, Jaulah, Secunderabad, Palaveram, Trichinopoly, Bangalore, Palamcottah, Quilon, Penang, Thyetmyo, and Tonghoo in Burmah, and should consider the climate of the stations in Burmah as salubrious and conducive to the health of Europeans as any I have been at; but not so for native troops, which I consider mainly owing to their diet, and the hospitals not being at all adapted to afford sufficient warmth for an invalid in the cold season, and from their having no blanket or any warm covering of their own to keep them warm; and I would strongly recommend that each sepoy serving in Burmah should be furnished with a thick Mysore cumbly, which I have no doubt would be found most conducive to health. I have come to this conclusion from the fact that the servants who go over to Burmah, and are moderately cared for and kept from sleeping on the ground, enjoy good health. Another cause of much sickness in the wet season is from guards, particularly those that mount at night, having to go a considerable distance in heavy rain, and consequently are thoroughly drenched before they reach their posts, and

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	and have to remain in their wet clothes all night. The only remedy I would suggest for this would be to allow such guards to march to their posts any time after 2 o'clock p.m., when there might be a break in the weather, and that each guard-house have bamboo sleeping places, raised about three feet from the ground, sufficient for the men to lie down on. The climate of Trichinopoly as a station, both for European and native troops, I consider to be as salubrious and conducive to health as any station I have served at. Secunderabad, for Europeans, I have considered the reverse of this, at least it was so during the 5 years, at two different periods, that I was there. This was many years ago and the unhealthiness was considered attributable to the sites that the European barracks were on. I do not recollect that any of the other stations I have been at were injurious to the health of Europeans or natives.
III. Sanitary Condition of Station.	1, 2. No reply to these queries. 3. A ground plan of the barracks occupied by the 37th regiment grenadiers and 46th regiment native infantry, is transmitted. 4. No reply to this question. 5. In the military hospitals there are windows all round, and they open from the inside. There is a verandah on all sides of each barrack with the exception of the west end, which is enclosed and used as a prison room. The verandahs are never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. There are no bedsteads or bedding in use in the barracks. 7. The native tent is constructed of three cloths, the two outer being white, and the inner one blue, supported by two upright poles, passing through a ridge pole. The height of the tent is from 10 to 12 feet; and it is 28 feet long by 15 feet broad. It is fastened down by 25 pegs, and has a fly door in front supported by four poles and two stays. 8. The ventilation of the barrack is very inferior, there being no windows, but doors only at an interval of every 12 feet, and when these are opened at early morning the heat of the interior is immense. The ventilation is insufficient to keep the air pure by night as well as day. No means are used for cooling barrack rooms of native corps. 9, 10. No reply to these queries. 11. All military public buildings in the cantonment are kept in repair by the engineers department; and the repairs are executed as speedily as possible. The general sanitary state of this cantonment is under the officer commanding. There is no fixed time for white-washing and cleansing the walls and ceilings of barrack rooms, but it is done whenever considered necessary. 12 to 15. No reply to these queries. 16. No part of any building used as a barrack or hospital is damp. There are no foul ditches near the station. 17. No reply. 18. The surface of the cantonment is kept free from vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station, &c. 19. No nuisance is experienced in barracks from wind blowing over native dwellings. 20 to 23. No reply to these queries.
Officers' Quarters.	No information under this head.
IV. Health of the Troops.	1. The station of Vizianagrum, and the district in which it is situated, are generally considered healthy. 2. Fevers, beriberi, and rheumatic affections are the most common complaints among the native population. Epidemic diseases are not prevalent. 3. My residence at this station being only of little more than 2 months' standing, I have not sufficient personal knowledge of the locality to speak of the unhealthiness or healthiness of the neighbouring native population. 4. The 46th and 37th regiments at present stationed here were previously on service in Pegu, and both corps were more or less affected in that province with the endemic diseases, prevalent there, viz., fevers, beriberi, burning sensation at the soles of the feet, rheumatism, anasarca, atrophy, and bowel complaints. The two regiments served about 3 years each in Pegu, and the 47th Native Infantry arrived here from that country in April 1858, and the 37th grenadiers in January last; many of the men of both corps being at the time of their arrival in a very debilitated and emaciated state, resulting from their having suffered from the prevailing diseases of that climate. 5. The 37th regiment grenadiers are temporarily encamped on the parade ground until their lines now in progress are completed, but no case of disease can be traced to this source. 6 to 16. Never having been in charge of troops at hill stations, I am unable to afford any information from personal experience regarding the sanitary state, &c., of troops at such stations. 17 to 24. No reply to these queries.
Diseases.	1. There are regular inspection parades once a week for the discovery of incipient diseases amongst the recruits of the 37th regiment of grenadiers at this station. 2, 3, 4. Neither scorbutic disease, hepatic disease, nor dracunculus have, as far as I am aware, been prevalent at this station. No case of either exists at present. 5. The proportion of venereal cases appears to be somewhat large, and I am inclined to recommend the re-establishing of lock hospitals as a precaution for lessening the liability of the soldier, European or Native, to this disease. 6. The troops at this station do not appear to suffer much from diseases in an epidemic form. The principal diseases are,— Fever of the intermittent type, this is the most prevalent form and is at times endemic. *Dysentery* occasionally occurs but not in an epidemic form. *Cholera* sporadic cases only generally occur. *Small Pox* has been lately somewhat prevalent in the town, but no fatal case has occurred among the troops. 7 to 10. No replies to any of these questions.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial ground is situated at the south end of the cantonment in the officers' lines, and the prevailing south and south-west winds pass right through the whole of the officers' lines. 2. Its area is 8,448 square feet and the soil is composed partly of dark and red earth and partly of gravel. There is no drainage, the surface being flat, but the ground is always kept with great care becoming its sacred purpose. 3. All burials take place at sun-rise or sun-set. The graves are dug five feet deep and three wide, the length being according to circumstances, they are two feet apart. When the surface of the ground shows by the external marks of graves and head stones, that there is no more space for interment, the ground is considered full. Graves are never re-opened for interment, except by mistake, when they are immediately closed up again, or by family request, the previous sanction of the chaplain having been obtained for so doing. Interment takes place, both at ordinary times, and during epidemics, within 24 hours. There are no burial grounds set apart for native troops by government, they are buried according to the usage of the several castes. 5. The grave yard is not offensive. The British soldier is interred according to the rites of the Church of which he is a member. Roman Catholics have their burial ground granted by Government, but Protestant dissenters have a small portion of ground (not consecrated) set apart for their use in the church of England burial ground by order of Government. 5. The dead of camp followers and bazar people are disposed of according to caste. 6. No injury at present accrues to the public health from the present practice. 7. Burial grounds should at all times be situated away and clear from cantonments. A room 12 yards by 6 should be built at the outer entry of the burial ground gate for the protection of funerals from inclement weather and also to afford a place of retirement for the chaplain.

(Signed) D. T. Morton, Surgeon,
In Medical charge of the Station Hospital.
J. Carter, Overseer,
Department Public Works.
A. Pinson, Colonel,
Commanding Vizianagrum.

26th May 1860.

FRENCH ROCKS.

Accommodation.—Native Infantry.—One regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is undulating, dry, and open, scattered with low ranges of hills. There is but little or no jungle; a large water tank is, however, in the neighbourhood. 2. The elevation of the station above the sea is 2,560 feet, but it is on a level with the adjacent country. There is no higher or healthier ground near the station. 3. The station is situated on the table-land of Mysore; there are no mountains or high hills in the immediate neighbourhood. 4. The nearest water is at the distance of a quarter of a mile, and consists of a large tank, one side of which is shallow and marshy, but not to any great extent. The vicinity is not liable to overflow. There are a few small ravines, which do not appear to have any effect on the health of the station. 5. The station is open and exposed to the wind. There are trees and hedges in the station, but there are very few around it. No old walls, thick hedges, &c. exist in the station, nor is it so encumbered by houses as to interfere with ventilation. The buildings are not exposed to reflected sun heat. The station is exposed to variable winds, but not to the sea breeze, being too far from the coast for it to have any perceptible influence on health. 6. The surrounding country is cultivated, but the only work of irrigation near the station is the lake or tank about a quarter of a mile distant. Artificial irrigation is not observed to affect the health of the station. The cultivation of rice is prohibited within about a mile from the station. There is no cultivation of indigo or preparation of hemp or flax carried on near the station. 7. There is no large city or town nearer the station than Seringapatam, which is six miles distant. 8. The surface soil of the district is light and sandy, with a rocky subsoil. The ground of the station has not been occupied by population before the formation of the station, but was, 40 years back, cultivated with grain. 9. Water is found during the dry season at about 20 feet below the surface, and during the rainy season at a depth of 12 or 15 feet, but not in all situations. 10. The rain-fall flows readily away and is easily drained off; it does not lie for any length of time on the surface. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is obtained from sunken wells and the tank. It is stored until required for irrigation in the tank, which is about a quarter of a square mile in extent. The tank generally pretty full, never dry. It contains various fish and the usual water plants, and the water in it is principally used for bathing. Neither the tank nor any of the wells are liable to pollution from any source. Slight malaria proceeds from the tank, especially after the rains, which could be prevented by drainage.

FRENCH ROCKS. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	12. There is an abundance of water, pretty clear and tasteless in quality. The well water is hard, but that from the tank is soft and good. There is a dam and sluice at the tank. The water from the wells is drawn by buckets. 13. There are no other topographical points bearing on health that we are aware of. 14. Cannot say what preliminary examinations or inquiries are made previous to the selection of new stations.
II. CLIMATE.	1. A weathercock, rain-gauge, barometer, and thermometer are the only instruments available at the station for conducting and registering meteorological observations. 2. There are no meteorological observations on record. 3. The climate is good, being dry during eight months in the year, and somewhat moist during the monsoon. It is not very variable, pretty free from fog and damp, and not affected by irrigation. There are occasional dust storms, which last but a short time. The usual diet only is required, but warm clothing is necessary during the cold weather. Drills and exercises take place in the mornings and evenings. The most unhealthy months are November and December, during which time intermittent fever is the prevailing disease. 4. There is no district near the station the climate of which is more conducive to health than that of the station. 5. I have served at many of the stations of the Madras Presidency garrisoned by native troops. None of them appeared to be positively injurious.
III. SANITARY CONDITION OF STATION.	1, 2. A plan of the station is forwarded. 3 to 6. No reply to these queries. 7. The tents used in camp are pitched on two uprights and a ridge pole; the fly sloping to the ground without a perpendicular part; the dimensions from pole to pole being 10 feet. They contain 25 men each, and the full length of each tent is 27 feet, the breadth being 11½ feet, and the height 9 feet. 8. The ventilation of the huts is effected entirely by the doors; that of the guard-rooms by windows. The latter are well ventilated, but the ventilation of the huts is (theoretically) insufficient. 9. The barracks are constructed of brick and mortar, the tents of cotton cloth, and huts of earth, with thatched or tiled roofs. 10. Not applicable to native barracks. 11. The materials and construction of the barracks, tents, and huts are all suitable to the climate. The barracks and cantonments are kept in repair by the Public Works Department, and the repairs are generally quickly executed. The commanding officer is responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed once a year. 12, 13. There are no lavatories, cook-houses, or conveniences for washing and drying linen. 14. There are at present no privies except those in the hospital. 15. The barracks do not require to be lighted at night. 16. There are no foul ditches. 17. Scavengers remove the refuse and night soil every morning by contract. It is used as manure by the neighbouring ryots. 18. The surface of the cantonment is kept free from vegetation, and there are no old walls, thick hedges, &c. to interfere with the ventilation of the station or bazaar. 19. The drainage of the bazaar is good; the ventilation free, and the water supply good. It is not crowded. The bazaar, being a native one, is under the immediate control of the adjutant, guided by the general regulations; these afford comfort and efficiency. There are no other native houses near the station. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The few animals required are slaughtered at a considerable distance from the station, and no nuisance is experienced from it. 21 to 23. These queries are not applicable to this station.
Officers' Quarters.	1. There are no public quarters for officers; they reside in private bungalows, which are in good condition in every respect. No improvement is required.
IV. HEALTH OF THE TROOPS.	1, 2, 3. Intermittent fever is common amongst the native population; otherwise the station and district are generally healthy, except during the months of November, December, and January, the cold season. The intermittent fever is attributed in the station to the close vicinity of the tank, and in Seringapatam to a broad shallow part of the river Cauvery. 4. The troops previous to coming to this station were at Rangoon for three years, and left there on the 24th March 1860. Their state of health there was not good, the chief diseases being beriberi, intermittents, and diarrhœa. The regiment arrived at this station on 29th April 1860 in good health, from the sickly men having been transferred to the general hospital, or to their villages. They have not suffered much from any disease since arrival, but the commonest have been rheumatism and intermittents. No part of the men's present accommodation is more or less healthy than the rest. 5. The troops at the station are not camped out. 6, 7, 8. I have had no experience with troops at hill stations, but I decidedly approve of their selection for troops. 9. On first arrival at hill stations, I believe troops are liable to be attacked with bowel complaints. 10. Every precaution is necessary in regard to diet, clothing, shelter, duties, &c., to enable the men to obtain the greatest benefit from such residence. 11. At most hill stations the rainy season is considered the healthiest. The shortest period to obtain the full benefit of residence in such stations must depend on the circumstances of each individual, but in general a year is required.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	12. There is no period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service on the plains. 13. The special precautions required on going to hill stations are,—to be careful in diet, and avoid exposure to the sun, night dew, and land winds. 14. It would be most conducive to the health of troops serving in India to locate them on hill stations, with short periods of service in the plains, provided the changes are not too frequent. If moved at the proper season, frequent change of station on plains is beneficial to the health and spirits of troops. 15. Cannot say if the barrack accommodation and sanitaria provided at hill stations be sufficient. 16. From 4,000 to 6,000 feet above the sea would be the most suitable elevation as sites for hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. A dry cultivated surface not surrounded by jungle is the most healthy for stations. 19. Soldiers proceeding to India should be from 20 to 25 years of age, and should land there at the beginning of the cold season. Recruits on landing should avoid indulgence in liquor and exposure to the sun, and should also be sparing in the use of fruit. 20. Troops should, if practicable, be sent to an intermediate station before being sent to India, and on landing should be sent to hill stations. 21. The present modes of transport of troops into the interior are by marching, rail, or water, when available, and bullock transit. When the mode is by marching, long marches and exposure to the night air or sun should be avoided, and great care should be taken in the selection of camp ground. Troops should have the best bedding available, and, above all things, avoid spirituous liquors. Coffee should be given on the march. 22. A British soldier should serve 20 years in India, but a good deal would depend on constitution. 23. Conflict of opinion sometimes exists in medical boards in reference to invaliding, but we are not prepared to offer any suggestion on the subject. 24. Invalids should leave India for home so as to arrive in England in the mild weather.
Diseases.	1. There are regular weekly inspection parades held at the station for the discovery of incipient diseases. 2. There has been no case of scorbutus among the troops at the station. 3. Usually there is no hepatic case under treatment, as such disease is rare among natives, and there are but few Europeans at the station. The principal cause of this disease is evidently the climate, though cold following continued heat, excess in eating or drinking, and want of exercise assist in its development. It is sometimes the consequence of dysentery, more commonly not. We know of no prophylactic measures other than the common and often ineffectual ones of avoiding the avoidable causes. 4. Dracunculus is still more rare than hepatic disease. 5. The proportion of venereal cases is one to five from all other diseases calculated for one month. The forcible removal of prostitutes to dispensaries has been found to diminish the number of venereal cases. The institution of Lock hospitals would, we believe, be advantageous to the army, though objectionable on other grounds. 6. The following table shows the diseases of epidemic or endemic class which the troops have suffered from, with the proportion of admissions and deaths from those diseases to the total admissions and deaths :—

Diseases.	Admissions for One Month.	Deaths for One Month.	Total Admissions for One Month.	Total Deaths for One Month.
Fevers { Intermittent	1	—	10	—
Fevers { Ephemeral	1	—	30	—
Dysentery, cholera. (No case has occurred since arrival)	—	—	—	—
Small Pox. (Two cases have occurred, both after vaccination)	1	1	15	1
Rheumatism (is very common)	1	—	5	—

	7. The only zymotic diseases that have occurred have been a few cases of small-pox, showing a large proportion of fatal cases, probably from the milder cases not being known of. I have been too short a time at the station to know what the seasons are at which such diseases are prevalent, or the climatic or atmospheric conditions which precede or accompany their appearance, nor can I speak as to the sanitary condition of the bazaar, where these diseases are most prevalent. Among the native population the circumstances most evidently predisposing to small-pox are their indifference to vaccination, which they view as an useless attempt at interfering with fate, and, more rarely, their positive objection to it as the mark of a Nazarene. 8. It is not known how far the nature of a soldier's duties or occupations predisposes him to epidemic disease. 9. Quinine has not been tried as a prophylactic against malarial disease. 10. No recommendations are offered on any of the preceding points, as my experience is so limited.
V. Intemperance.	1. The soldiers at the station are temperate, and no confirmed drunkards are found among them.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	2. There is scarcely ever an admission into hospital, directly or indirectly, from diseases caused by intemperance. Drunkenness *per se* is punished as an offence. 3. Distilled spirits (arrack) are sold in the bazaar, but the quantity consumed by each man *per diem* is not ascertainable among native troops. Spirit forms no part of the soldiers' ration either at the station, on march, or in the field, and the men do not take a dram before morning parade. It is occasionally given to convalescents; it is variable in quality and amount. No drinks injurious to health, other than intoxicating drinks, are sold in the bazaar. 4. The consumption of spirits in moderation is conducive to health. They have no effect on discipline unless taken in excess, and they are then injurious. 5. Restriction in the use of spirituous liquors would be beneficial, but not so their abolition. 6. As a general rule, malt liquors or wines are preferable to spirits. 7 to 10. Tea, coffee, lemonade, &c. are not used at the station. The questions under these numbers refer to European troops, but I would suggest that tea, coffee, beer, and lemonade should be more used than at present, to the comparative exclusion of spirituous liquors. 11. By the bazaar regulations every encouragement must be given to the connexions of the men to settle as shopkeepers in the regimental bazaar, which is under the immediate control of the adjutant, and individuals available as coolies are allowed to reside within the boundaries. All bazaar residents are subject to trial and punishment by military courts, and to expulsion at the pleasure of the commanding officer. The dookans are all registered, and no person is allowed to establish one or reside in the bazaar without previous sanction from the commanding officer.
VI. DIET.	No information under this head.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of cloth tunic and trousers,—the latter cotton in hot weather,—basket-work turban covered with oil skin, and native sandals. The accoutrements are musket, belts, and pouch. The dress is quite suitable for the climate and soldiers' duties at all seasons, with the exception of the turban. Warm clothing should be worn at hill stations, and light clothing on the plains, and the "solah" helmets at all stations. The soldiers should have flannel waistbands on the hills, and also on the plains, where there is a tendency to diarrhœa or cholera, and cloaks on night duty. At this station sepoys on guard are protected by sentry boxes and verandahs occasionally.
Duties.	1. Soldiers should be thoroughly drilled at home, or at some intermediate station before being sent to India. 2. At this station the duties are light, and consist of guard duty once in seven days, and drill one hour in the morning, and occasionally an hour in the evening. The men do not suffer in health from drill. The best hours for drills, parades, and marches are early morning. By general order there is route marching once a month. The men on an average have seven nights in bed during the week. 3. Guards are mounted close to the barracks. They mount at six in the morning and are relieved at six the next morning. Roll calls take place daily at sunset, and in the morning when there is no parade. Night guards are apt to be injurious, particularly in wet or damp weather; for this duty the men should be warmly clothed, and further protected if possible.
VIII. INSTRUCTION AND RECREATION.	1, 2. There is an English and vernacular school at the station, but no other means of instruction or recreation. No restriction is placed on natives in reference to exposure to the sun and rain out of barracks when off duty. No improvements are suggested. 3. The institution of soldiers' savings' banks would be decidedly advantageous. 4. There is plenty of shade from trees to enable the men to take exercise without injury, but there is none from sheds or verandahs.
IX. MILITARY PRISONS.	1. There are no defects in the construction of the solitary cells at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. The powers of the medical officers, in reference to the conduct of the line of march, &c., are limited to recommendations. 3. Camping grounds are selected on elevated and dry ground, at some distance from a village, and, if possible, on that which has never been previously occupied. Water is brought to the camps in water bags, carried by bullocks. 4. The number of tents required for the field hospital is supplied of the same kind as used by the force to which the sick belong. Sick and hospital supplies are transported by bearers and on bullock carts.
XII. HOSPITALS.	1, 2. The ground slopes slightly downwards from the hospital to the barrack buildings. It is a considerable distance from the bazaar, the sepahis lines and some open ground intervening between them. The site of the hospital is open, freely ventilated, and healthy as to drainage and elevation, but is probably not free from malaria. 3. The water supply is abundant and wholesome. 4. The outlet for the privy sewage (and there is none other) is immediately outside the enclosure surrounding the hospitals. 5. The height of the lowest wards above the ground is 3 feet. No provision is made for conveying away the roof water, but there are some open trenches around the hospital, which is sufficient for carrying away the rain-fall rapidly. The hospital is built of brick and chunam. The roof and walls are single, but of sufficient thickness to keep the building cool. There is a verandah on each side of the hospital, 10 feet broad. They are never used for the accommodation of sick, convalescents or others. The building consists of one flat.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	Table of Hospital Accommodation. Date of construction, A.D. 1830. Total number of wards - - - - - - 1 Total regulation number of beds not fixed, can accommodate - - 40

Wards, Number.	Regulation Number of Sick in each Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.		Sq. feet.	Inches.		Inches.	Inches.
1	—	140	20	12	33,600	840	70	16	8	45	28

The hospital receives the full benefit of the prevailing winds. The windows open like a door, in two pieces. Their arrangement is good, but the doors are the great means of ventilation.

6. The ventilation of the wards is effected by means of the doors and windows, and also by some needless openings in the roof. There are no jalousies or jhilmils.

7, 8. There is no apparatus for cooling or warming the wards. The walls are cleansed, &c., once a year, and the floor of the ward twice a month. There is no ceiling.

9. The privy is simply a small separate house in one corner of the hospital enclosure, containing earthen pots, and having no door, but a doorway screened by a wall. It is properly drained and watered, but is not placed over a cesspit. It is not offensive outside.

10. There are no lavatory arrangements for the sick.

11. A few tubs, of different shapes, are provided for bathing the sick, which can be used as hip-baths, full-length baths, &c.

12. There is no hospital linen. Quilts, &c. are washed by the commissariat.

13. The storage is sufficient and dry.

14. The bedsteads used in hospital are wooden frames, with cotton tape stretched across, than which nothing could be better.

15. The kitchen is a small house in one corner of the enclosure, provided with earthen fire-places.

16. No diet tables are used. The statistical forms are those common to native troops throughout the Presidency.

17. One or two hospital orderlies, and a special orderly for any man who may require one, is all the attendance provided for the sick.

18. The sanitary condition of the hospital is good at present. We do not know that any epidemic disease, hospital gangrene, or pyæmia have appeared in the hospital, as distinguished from the station.

19. There are no deficiencies or sanitary defects which require improvement.

20. No provision for exercising convalescents is required.

21. Soldiers' sick wives and children can be treated at their homes if they wish it, but they seldom do. This arrangement is satisfactory.

22. There are no special local hospital regulations enforced at the station not included in the General Presidency Medical Regulations.

23. Requisitions for the repairs of hospital are attended to. The medical officer has no power over the diet.

24. There is no convalescent hospital or wards for convalescents, and none are required.

XIII. Burial of the Dead.

1. The cantonment burial-ground is well situated. It is a short distance from the officers' quarters, and to windward during the south-west monsoon.

2. Its area is about an acre. The soil is sandy and dry, and the ground is carefully kept.

3. The grave space is 7 by 3, with an interval between each of from 10 to 20 feet. The depth of graves is from 5 to 6 feet, and not more than one body is ever buried in the same grave. Interment is compulsory at ordinary times and during epidemics within 24 hours. Most of the native population burn the bodies of their dead. Mahomedans and a few others have their own burial-grounds at a distance from the cantonment.

4. The grave-yard is never offensive.

5. The dead of camp followers, or bazaar people, are burned or buried at a distance from the camp.

6, 7. No injury accrues to the public health from the present practice, and no improvement can be suggested in reference to the burial or disposal of the dead.

(Signed) George Logan Colonel,
Commanding 6th Regiment N.I.

D. Campbell, M.D., Assistant-Surgeon,
d. d. 6th Regiment N. I.

8th October 1860.

QUILON.
MADRAS.

QUILON.

Accommodation.—Native Troops—Infantry—Total of all ranks, 1,042.

Reference to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is flat and sandy. It is well wooded, and there is a fine sheet of water, the back water, and also a canal. 2. The station is slightly elevated above the sea, but is on the same level as the adjacent country. There is no higher or healthier ground in the vicinity of the station. 3. The nearest mountains to the station are the Wurrakally Hills, about 12 miles distant, in the direction of Trevandrum. 4. The sea is between 200 or 300 yards distant from the station, and the back water comes up close to it; there is also a canal running through the town and part of the station. During a very heavy monsoon the parade ground is sometimes overflowed, but it does not continue so beyond a few days. There is one water-pit within civil limits, but I am not aware, after every inquiry, that it has any injurious effect on the health of the station. However, as it is generally considered a nuisance, I purpose applying for its being filled up. 5. The station is open and well exposed to sea and land winds, the latter, however, causing rheumatism and neuralgia. The temperature of the station is not raised by exposure to reflected sun heat. 6. The surrounding country is tolerably well cultivated, but there are no works of irrigation near the station. Rice is not cultivated within the limits of the cantonment, but there is, however, a great deal of paddy cultivation to the north of cantonment and in close proximity to it, which does not, however, appear to affect the health of the people. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The large town of Quilon is in the vicinity of the station. 8. The surface and subsoil of the district are chiefly sand, with occasional breaks of laterite, From all I can learn, I have reason to suppose that the space now occupied by the cantonment was never occupied by any population before the present station was formed. 9. Water is usually found at a depth of from 15 to 20 feet during the dry season, but close up to the surface during the rains. 10. The rain-fall and water from surface springs are quickly absorbed. There is no higher ground near the station. 11. The water supply of the station is derived from wells only; there are no tanks. The well water, the only drinking water in the cantonment and native town, is not liable to pollution from leaves or other impurities falling into it. 12. Water is abundant and good, but there are no means of ascertaining its chemical composition. It is always drawn from the wells in buckets or by chatties. 13. I am not aware of any other topographical points bearing on the health of the station. 14. I cannot say what is the nature of the inquiries, &c. which are made previous to the selection of stations.
II. CLIMATE.	1, 2. There are no instruments for conducting meteorological observations, and no table appears to have been kept here. 3. During the rains the weather is close and muggy, during the dry weather parching, but free from dust. There is one canal from this to Quilon, and great part of the way to Trevandrum. The mango jack, and cassarina grow well and luxuriantly. The troops are very healthy, and the diet suits the native, but would not do for the use of European soldiers as the bazaars, &c. are now managed. Light clothing is very necessary, in consequence of the enervating effect of the climate. Drill should be carried on in the mornings, from 5½ to 7 o'clock, the evenings being close and stifling. January, February, and March are considered most unhealthy months on account of the strong land winds that prevail. The remaining months are healthy, particularly those in which we have the monsoon, viz., from the 15th May to the 15th October. 4. I am not aware that there is any district near, the climate of which is more conducive to health than that of the station. 5. The following is a list of stations at which I have served:—Masulipatam, twice; Jaulnah; Palaveram, twice; Secunderabad, three times; Vizianagrum; Vizagapatam; Berhampore; Malacca; Vellore; Bangalore; Kolapore; Samulcottah; Rangoon; Tonghoo; Mangalore, and Quilon. At all the above stations, during the time the 8th Regiment served at each, they were very healthy, and neither officers nor men suffered from any epidemic or in any way.
III. SANITARY CONDITION OF STATION.	1, 2, 3. There is no engineer officer here, he being at this time located at Trichinopoly. No tracings of the country, stations, &c. have consequently been transmitted, as he only periodically visits this station, but has in his office a complete plan of the station. 4. There are 11 prison cells of the usual dimensions, 8 of which, however, are in a ruinous state and quite unfit for any purpose. 5. All the barracks and other public buildings are, with the exception of those occupied by the 45th Regiment, in an almost ruinous condition, without doors or windows, and as it appears they are not likely to be again ever required, are permitted to go to decay. The barracks or place of arms of the 45th Regiment Native Infantry has a verandah on either side, the whole length of the building, but these are never occupied as sleeping quarters. There are no jalousies or jhilmils. 6. No bedsteads are used in barracks. 7. The usual tents are issued to native regiments. 8. There are no means of ventilation, except when the doors are kept open, nor any means of cooling the air admitted. 9, 10. The barracks appear to be built of laterite and chunam; the floors are bricked. The sepoys' huts are constructed of bamboos, leaves, and grass. The floors are of mud, and raised about two feet above the level of the ground. 11. The materials appear to be suitable for the climate. The barracks and cantonments are kept in repair by the engineer officer located at Trichinopoly, who periodically visits the station.

Reference to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	The medical officer, together with the commanding officer, is responsible for the sanitary state of the station. The walls and ceilings of the barracks are cleansed and limewashed once a year. 12, 13. There are no lavatories, cook-houses, or means of cooking provided at the station, nor any conveniences for washing and drying the linen in cantonment; but the dhobies employed by the troops go some short distance to wash and dry the clothes. 14, 15. There are no privies or urinals. 16. The natural drainage is sufficient to carry away superfluous water during the monsoon. There are no drains. No part of any building used as a barrack or hospital is damp. There are no cesspits or foul ditches in the cantonment. 17. The officers keep their own compounds clean, and the lines are kept so by the men of the regiment, and cantonment by the scavenger carts allowed by Government. 18. The surface of the cantonment is kept free of vegetation, and there are no thick hedges, old walls, &c. interfering with the ventilation of the station. It would, however, have been of material benefit to the cantonment to pull down and remove the old barracks and other public buildings not now used, and which are falling to ruins, as it has several times occurred that the carcases of animals which have died from starvation and disease have been found in them, and on one occasion the body of a wretchedly diseased old woman, who appeared to have died of starvation, was discovered. 19. The civil bazaar, although well ventilated, being a broad street, is very dirty, and requires that the refuse, such as bad fish, &c., should be removed once at least every 24 hours. The bazaars are cleaned daily by the owners of the Dorkans, and the system established and regularly kept up appears sufficient for all purposes. The native huts are wretched in the extreme, being composed of nothing but bamboos, leaves, and grass, both for roofing and walls, mud for the purpose of wall building not being available. They are also very much huddled together, and cleanliness is not much attended to. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Three or four sheep are killed daily in the cantonment, about 300 yards from the lines, and all offal is immediately removed. Bullocks are killed at a short distance from the cantonment, but no nuisance is experienced in the station from the condition of the slaughtering places. 21, 22. There are no bazaar horses, cavalry stables, or picketing grounds at Quilon. 23. There are no quarters of any kind whatever for married non-commissioned officers or men.
Officers' Quarters.	1. The officers' houses are all well situated, most of them being close to the sea. No drainage is required, as the water soaks into the sandy soil around them at once. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are healthy. 2. The most prevalent diseases are skin diseases, and these are greatly to be attributed to the want of proper vegetable diet and the large quantities of fish consumed by the inhabitants. 3. The healthiness of the neighbouring native population is attributable to the prevalence of the sea breezes. 4. The troops were at Madras before coming to the present station, from 21st April 1858 to March 1859, and there the men suffered chiefly from beri-beri and general debility contracted in Burmah. They arrived here on 9th March 1859, much improved in health, and since then it has suffered principally from itch, boils, and intermittent fever of a mild type. No portion of the men's accommodation is more unhealthy than the rest. 5. The troops are never camped out. 6, 7. No experience of hill stations. 8. I decidedly approve of the selection of hill stations, particularly for European troops. 9, 10. Never been in charge of troops at hill stations, 11. The hot season is best adapted for residence in hill stations, and one year is the shortest period to obtain the benefit of such residence. 12. No experience with troops at hill stations. 13. The special precautions required for the preservation of health of troops on leaving hill stations for the plains is the provision of light clothing and ample protection from heat by high and well-ventilated buildings. 14. Troops should be located as much as possible on hill stations during their service in India. I do not think frequent change of station on the plains is beneficial to the health and spirits of troops. 15, 16. No experience of hill stations. 17. There is not sufficient table-land on the hills about 15 miles distant, and which are visible from the cantonment, to enable them to be used as a sanitarium or hill station for troops, and the rain there is incessant, except for two or three months in the year. 18. I consider a sandy or laterite soil the most healthy for stations. 19. Soldiers proceeding to India should be from 18 to 20 years of age, and those destined for the Madras Presidency should land there from November to the end of January. Recruits landing in India should be kept as much as possible from exposure to sun, and from frequenting arrack and toddy shops on landing. 20. Troops should be sent direct from home depôts to India, and on arriving there should be sent at once to hill stations if possible. 21. Transit if available, travelling only by night and having the water intended for drinking boiled at halting stations the previous evening are good precautions for preserving health on the route from the port of debarkation to the interior. 22. A British soldier should serve 20 years in India. 23. Difference of opinion may sometimes exist between medical boards as regards invaliding, but I cannot suggest anything on the subject. 24. Invalids should leave India for home in the month of March.
Diseases.	1. There are weekly inspection parades for the discovery of incipient diseases. 2. There has been no scorbutus or scorbutic disease among the troops at the station. 3. There has been no case of hepatitis for a very considerable time. 4. Since joining I have not seen any cases of dracunculus; there have, however, been a few cases admitted into hospital since the arrival of the regiment here.

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Reference to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	5. Venereal disease bears about the same proportion as dracunculus to the total sick in hospital, and there can be no doubt that a well-regulated lock hospital would prove beneficial to the troops and inhabitants of the town. 6. The troops at the station have suffered from— *Fevers.*—Principally intermittent of a mild type. *Dysentery.*—A few cases of a mild nature. *Cholera.*—Never been known here amongst the troops. A few cases have occurred occasionally amongst the fishermen. *Small-pox.*—Occasionally an epidemic occurs. *Rheumatism.*—Rather prevalent. There have been no deaths from any of the above diseases since the regiment arrived at this station. 7. There is nothing particular in the nosological character of the zymotic diseases that have been under treatment at this station. They are most frequent in the hot weather, and are preceded or accompanied by the hot winds. The general bazaar might, I think, be kept cleaner. The refuse of the stale dried fish particularly should be removed once in 24 hours. The native troops I consider generally healthy, as also the inhabitants of the town. 8. The duties the troops have here do not predispose to disease. 9. There has been no occasion for the exhibition of quinine as a prophylactic against malarial diseases at this station. 10. I have no recommendations to make on any of the preceding points, excepting that stated in paragraph 7, on the sanitary condition of the bazaar.
V. INTEMPERANCE.	1. The soldiers are usually very temperate. There is only one confirmed drunkard, a drummer. 2. There has been so very little intemperance at the station that no table showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime, can be prepared. Drunkenness is always punished as an offence. 3. There are no canteens, but arrack is sold in the general bazaar. I am not aware of the quantity consumed by each man, but I should not think much, as there are but few cases of drunkenness. Spirit is no part of the soldier's rations at the station, on march, or in the field. Arrack, of apparently good quality, has been given to weakly men in hospital, to the amount of one measure per diem. Except toddy, I am not aware that any other drinks injurious to health are sold in the bazaar. 4. A moderate consumption of spirits is, I consider, conducive to health and internal discipline and efficiency. 5. It would be decidedly beneficial to restrict the use of spirituous liquors as a part of the ration. 6. Malt liquor is good for the troops, and much superior to wine; nevertheless, a glass of spirits is beneficial. 7. I am not aware whether tea, coffee, lemonade, and similar drinks are much used at the station. 8, 9, 10. I do not think it would be beneficial to the health of the troops to suppress altogether the spirit ration for soldiers or convalescents, or to prohibit the sale of spirituous liquors in the canteens, and to substitute for it beer, tea, &c. No recommendations to suggest. 11. There are no bazaar regulations in force here.
VI DIET.	1 to 4. These queries do not apply to native troops. 5. Soldiers' gardens could not be established here advantageously. The soil being very sandy does not suit without going to great expense in carting good soil from a distance.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress at the station is the usual dress of the native troops. The present dress is too warm for a tropical climate, and the turbans in use with native troops are heat conductors, and consequently bad head-dresses, affording litttle or no protection, and are unseemly.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The routine of a soldier's duties at the station are guards and one hour's drill in the mornings five times a week. The troops do not suffer at all in health from drills. The best hours for drills are from 5½ to 7 a.m. Marches should commence at 4 in the morning, so as to arrive at the encamping ground before 7 o'clock. The average number of nights the men have had in bed during the week for some considerable time past has been about 4½ per week, and sometimes less. 3. Guards are mounted close by the barracks. There are roll calls every afternoon at 5 o'clock. Night guards have no prejudicial effect upon the health of the men.
VIII. INSTRUCTION AND RECREATION.	1, 2. The only means of recreation and instruction at the station are a very good racket court and two native and one English regimental schools. 3. I think the institution of soldiers' savings' banks would be advantageous. 4. There is lots of shade from the large trees planted on each side of the cantonment roads and in the vicinity of the men's lines to enable them to take exercise during the day without injury to health.
IX. MILITARY PRISONS.	1. There are no military prisons, but there are several solitary cells; with the exception of three, they cannot be occupied, as they are so completely out of repair.
X. FIELD SERVICE.	1. There are no copies of regulations for field medical service at the station. 2. Any suggestion of the medical officer, as regards the conduct of the line of march of troops, bivouacking, camping, &c. is at all times attended to. 3. The sites chosen for camping grounds are as much as possible elevated and dry, and the opinion of the medical officer is generally taken upon these subjects. 4. For a native regiment one dooly per company, and two sick carts are provided for the sick on march. On arriving at the station these are returned into store and borne on the returns of the station.

Reference to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	1. There are no records at the station to provide the information under this head. The mortality of the native infantry regiment serving here at present for the last year has been only four deaths.
XII. Hospitals.	1, 2. The hospital is built on a mound, about eight feet above the level of the parade ground, the only mound in the station. It is well situated and sufficiently near to the place of arms and the men's lines. It is a considerable distance from the general bazaar. The site is very open, well ventilated, and there are no obstructions in the neighbourhood. It is generally healthy as to elevation, drainage, and freedom from malaria from all causes. 3. The water supply is ample and of very good quality. 4. A deep drain behind the hospital carries away all refuse water and impurities. 5. There is only one ward having an enclosed verandah with glazed windows in front and rear. The roof water sinks into the subsoil, and the drainage and guttering round the building is quite sufficient. The hospital appears to be built of laterite, with a brick floor, with a single roof, and there are several ventilators in the upper part of the ward walls. The walls are sufficiently thick to keep the hospital cool. The verandahs afford sufficient shelter from the sun, and being about 10 feet broad, they are used for convalescents and itch cases when the hospital becomes crowded. The building consists of one flat only.

Table of Hospital Accommodation.

Wards, Number.	Regulation Number of Sick in each Ward.	Dimensions of Ward.			Cubic Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.			Number.	Height.	Width.
		Yds.	Ft. in.	Ft.		Ft. in.		In.	In.
1	30	27	16 6	14	620	1 3	30	22·5 8·4	43 37

The hospital receives the full benefit of the prevailing winds. The windows open inwards and are conducive to ventilation and coolness.
6. The ventilation of the wards is effected by means of ventilators in the wall. The jalousies and jhilmils are of the ordinary construction.
7. The wards are cooled by means of ventilators, which are opened and shut by a pulley.
8. There are no artificial means for warming the wards. The walls and ceilings of the hospital are cleansed and limewashed once a year.
9. There are no waterclosets or urinals. The hospital privy is cleaned regularly by the two hospital toties. There are no cesspits near at hand, nor any offensive smells.
10, 11. There are no lavatory arrangements, but a large tub is furnished for the sick to bathe in.
12. The regimental dhobies arrange the washing and drying of the hospital linen.
13. The storage is sufficient and dry.
14. Iron cots are used in the hospital, which answer admirably. I can suggest no improvement.
15. There are no kitchens at the hospital.
16, 17. There are no diet tables or diet rolls in use at the station. Hospital orderlies are allowed for the sick when required.
18. The sanitary condition of the hospital is good and no epidemics have occurred in it.
19. No deficiencies or sanitary defects have come under my notice.
20. The convalescents walk up and down before the hospital, and there is ample ground in front for the same.
21. No reply to this query.
22. There are no special hospital regulations not included in the General Presidency Medical Regulations.
23. The medical officer has full power in all matters appertaining to the sanitary state of his hospital, &c.
24. There are no convalescent wards or hospital at this station.

XIII. Burial of the Dead.	1. The burial ground is near the station, but to the eastward of it. Only two Europeans have died here during the last three years; these and four East Indians are all that are buried in the churchyard. 2. The soil is sandy and dry, and I am not aware whether decomposition takes place readily or not. Drainage is not required, the ground being slightly elevated and kept clean. It is 200 yards by 190. 3. The graves are 7 feet long, 2½ broad, with an interval of 7½ feet between each; the graves are 10 feet deep, and none have ever been re-opened. Interment takes place at ordinary times within 24 hours; no epidemic is known here. 4. The burial ground is never offensive. There are no British troops stationed here. 5. The dead of bazaar people are disposed of according to castes; Mussulmans bury their dead some distance beyond the precincts of the town; the Hindoos and other castes burn theirs. 6, 7. No injury to the public health accrues from the present practice. I have no improvements to suggest in the present manner of the disposal of the dead.

(Signed) A. C. Wight, Colonel
Commanding at Quilon.

P. C. Rae, M.D.,
Assistant Surgeon, 45th Regiment
Madras Native Infantry.

9th March 1860.

BERHAMPORE.
MADRAS.

BERHAMPORE.

Accommodation. Native Troops—Infantry

Havildars	50
Naiques	50
Privates	700
Drummers	20

References to Subjects and Queries.	REPLIES.
TOPOGRAPHY.	1. The country surrounding the station is very open, except on the west, where it is hilly and dry; it is flat and dry towards the other points. There is plenty of water in the tanks around, and the country is jungly to the westward. 2. The station is elevated 112 feet above the level of the sea, 76 feet above the lowest ground adjacent, and 6 feet above the nearest water. There is higher but not healthier ground about three-quarters of a mile from the station. It is 15 feet higher than the present cantonment; but its superficial area is not sufficient for buildings of any extent. 3. The nearest mountain is 8 miles distant. Its height above the sea is 2,712 feet, or 2,600 feet higher than the station. 4. The nearest river is 850 yards distant. Tank water is obtainable at a distance of 200 yards. The sea is 8 miles, and the nearest marsh or tumpah 3 miles distant. The vicinity is not liable to overflow of water. There are some water pits and broken ground about half a mile from the station, the effluvia arising from which are prejudicial to health. 5. The station is open and freely exposed to the winds, except on the west, and in no way encumbered with trees, &c., &c., so as to interfere with free ventilation either external or internal. The temperature of the buildings is not raised by exposure to reflected sun heat. The station is exposed to variable winds; to cold winds from November to February, to hot winds from March to June, to south-west winds from June to September, and to north-east winds from end of September to October. They are not prejudicial to health. 6. The country surrounding the station is highly cultivated. There are several small works of irrigation at a distance of from half a mile and upwards from the station; but no particular effect on health from these has been observed. There is no prohibition to the cultivation of rice, and it is in some places cultivated close to the public road, and within a few yards of officers' houses. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Bapoor lies between the barracks and the sepoys' lines; its inhabitants are Ooriahs. The town of Berhampore is about half a mile from the barracks. 8. The subsoil of the station is composed of siliceous rocks and gravel, and the surface is a light loam. The station occupies new ground never before occupied. 9. Water is usually found at a depth of 50 feet below the surface in the dry season, and from 20 to 30 feet during the rainy season. 10. The rain-fall of water from surface springs runs off into the tanks and paddy fields around. No drainage passes into the subsoil of the station. 11. The water-supply of the station is derived from wells and tanks, and is stored in open and closed tanks. The extent of tank water within the station is 33,000 square yards, and within half a mile 62,000 square yards, giving a total of 95,000 square yards. These tanks are sometimes dry during the hot seasons. The animals found in the tanks are, various kinds of small fish, leeches, prawns, a few univalve molluscs, and some small gelatinous bodies of very low organization. The plants which most abound are the æschynomene paludosa, trelumbium speciosum, species of nymphæaceæ, convolvulaceæ, alismaceæ, naiadaceæ, and pistaceæ, and among the cryptogamia species of marsileaceæ, characeæ, &c. The tanks are generally used both for drinking and bathing purposes. Only a few tanks are liable to pollution from leaves and other impurities falling into them, and one or two of the small ones within the station become very offensive in the hot season. They are not necessary, and to prevent nuisance and malaria should be either deepened or filled in. 12. The amount of tank water available for the station is 33,000 square yards, besides numerous large well-constructed wells. A great deal of the tank water is bad for drinking purposes, and has a greenish colour and peculiar smell. The water obtained from the wells, generally speaking, is not good, although clear and free from any smell, being in some places brackish, and having in others a peculiar earthy taste. It is hard, and the amount is insufficient in hot weather. The brackish water is injurious to health. The water is taken away for domestic purposes in chatties and leathern bags. A good reservoir could be made near the hills at the westward, so that water could be obtainable at all seasons. 13. No other points bearing on the health of the station suggest themselves. 14. I am not aware of the steps taken prior to the selection of a new station, and am therefore unable to offer any suggestion as to the manner in which this service should be conducted.
II. CLIMATE.	1. The only meteorological instruments at this station are a pluviometer and an aneroid barometer, which have been only lately received. 3. The climate is variable. It may be considered a dry one from March to the middle of June, the heat from April to the latter part of June being very great. In July and August the climate is variable. September, October, and November are damp months. January and February, cold and foggy. There are occasional dust storms which do not, however, render the air impure. The health of the troops suffers from damp during the rainy season, and drilling the men on wet ground has been found to be most prejudicial to health. Warm clothing is necessary during the rainy and cold seasons. The time of drill is also changed to a later hour in the morning. During the year 1858–59, April, May, and June, were the most unhealthy months, and December, January, and February the most healthy. Fever, cholera, and beriberi were the most frequent diseases during the unhealthy months. But such is not generally the case, as the damp months September, October, and November are the most unhealthy, and fever and beriberi the most prevalent diseases. February, March, April, and May are the most healthy months. 4. I am not aware of any district near the station, the climate of which is more conducive to health than this. 5. The following is a list of stations at which I have served:—Palamcottah, Cannanore, Bellary, Kurnool, Vizianagram, Burmah, Cuttact, and Sumbalpore. The troops suffered severely from fever and dysentery at Bellary, Burmah, and Sumbalpore. I consider Kurnool an unhealthy station, but at Palamcottah, Cannanore, Vizianagrum, and Cuttact the troops enjoyed average health.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, 3. Map and plan of the station and surrounding country, and plan of the barracks are transmitted. 4. Table of barrack accommodation. Total number of rooms or huts, 820. Total regulation number of non-commissioned officers and men, 10 subadars, 10 jemadars, 50 havildars, 20 drummers, 50 naiques, and 700 privates - - } 840

Number of Huts.	Regulation Number of Men in each Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.		Square feet.			Feet. In.	Feet. In.
10	1	31 0	10 0	10 4	3,203½	4,935⅚	520	No rule.	2	1 6	1 6
		20 0	10 6	8 3	1,732½				3	1 6	1 6
10	1	30 0	10 0	10 4	3,100	3,100	300	do.	2	1 6	1 6
50	1	30 0	10 0	8 7	2,575	2,575	300	do.	—	—	—
50	1	18 0	13 3	8 10	2,106	2,106	238½	do.	—	—	—
20	1	30 0	10 0	10 4	3,203⅓	3,203⅓	300	do.	2	1 6	1 6
700	1	11 6	9 0	7 7	784⅚	784⅚	103½	do.	—	—	—
Guard room	18	35 3	16 0	17 10	10,058	558⅞	564	do.	5	5 3	3 9
Prison cells -	1	8 0	8 0	10 4	661⅓	661⅓	64	do.	2	1 6	3 0

5. Windows are built in the barracks generally on one side only, they are open ones with wooden bars. Verandahs also are only on one side, they are 3½ × 13 to 30 feet in length, according to whether it is a subadar or other rank. The verandahs of sepoys' quarters are sometimes during the hot season occupied as sleeping quarters by them. There are no jalousies or jhilmils.
6. Sepoys use the common native cots in their huts; but when in tents they sleep on the ground.
7. The tents are made of canvass three layers thick. They are very small, being only 25½ feet long., 15 feet broad, and 9¼ high, supported by two poles, the ends forming an exact cone, and the sides a triangle. The cubic space is 1,273 feet, and the superficial 333½ feet, which gives for 25 men 50$\frac{22}{25}$ and 13½ respectively. This calculation is made when the small fly is extended outwards as far as possible.
8. The means of ventilation are doors and windows only, and these in tents or huts are certainly insufficient. There are no barrack-rooms at this station.
9, 10. The only barracks at the station are places of arms. Tents are made of canvass, and huts are constructed of mud walls and tiled roofs. The floors are made of earth, and smeared with cow-dung, and are slightly raised; but there is no passage of air beneath.
11. The tents should be larger, and the huts of a better description, with windows, and higher. The repairs to barracks, &c., are executed by the department of public works. The officer commanding the station is responsible for the general sanitary state of it. The walls and ceilings of barracks are cleansed and lime-washed whenever required.
12, 13. There are neither lavatories, cook-houses, or conveniences for washing and drying linen at this station.
14, 15. There are neither privies nor urinals at present; but the erection of some is in contemplation.
16. The barracks being merely places of arms are not drained. No part of any building is used as a barrack or hospital. There are foul ditches in the native town of Berhampore, about one mile from the cantonment.
17. The surface cleansing of the cantonment is inefficiently done, there being no means at present provided, and the refuse manure, &c., being in many instances deposited in front of the native houses.
18. The surface of the cantonment is kept free of vegetation. The Ooriah village before mentioned as lying between the barracks and sepoys' lines, considerably interferes with the ventilation of the latter, but there are no old walls or hedges.
19. The bazaar is drained and ventilated, and there is a good supply of water; but it is not used for drinking. There are no latrines, and the place is dirty and crowded. There are no regulations at present for preserving cleanliness in the bazaar, and no sanitary police; it would be most desirable that such be appointed. The general condition of the native houses is poor, and there are dung-heaps in and about many of them. No nuisance is experienced in the sepoys' lines from wind blowing over the native dwellings.
20. Animals are slaughtered about half a mile from the station at a place appointed, and the offal is disposed of to persons of very low caste. Nuisance is experienced by the neighbouring residents, but not in the station itself, the only means of preventing it would be the erection of a slaughtering-house.
21, 22, 23. No answer to the question.

Officers' Quarters.

1. The officers' quarters at this station are not very good, but they are drained and well ventilated. They would be greatly improved by the prohibition of the cultivation of rice in their immediate proximity.

IV. Health of the Troops.

1. The station and district generally speaking is healthy, but the adjoining native population sometimes suffers severely from epidemics of cholera and small-pox.
2. The principal diseases which occur among the native population are beriberi, rheumatism, syphilis, and fever. Small-pox and cholera occur generally once a year epidemically, spleen disease is not at all prevalent.
3. The healthiness of the native population would be much improved if the houses were better ventilated, kept cleaner, less crowded together, and the number of occupants to each house reduced. The streets also require to be wider and kept cleaner, and means might be adopted for removing the heaps of various kinds of filth which are accumulated in the streets to some appointed locality beyond the town.

BERHAMPORE. MADRAS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	4. The regiment left Burmah in 1854, having been stationed there for two years, and having suffered greatly from fever, dysentery, and rheumatism. The state of their health on arriving here was much impaired by their residence in Burmah. The regiment arrived here in 1854, and the diseases from which the men have suffered since that time have been fever, beriberi, and rheumatism. All parts of the lines are equally healthy. 5. The troops are never camped out, except in cases of sickness. 6. I have never had charge of troops at hill stations. 7 to 16. No answer to these questions. 17. There is no higher ground near this station which could be used as a hill station. 18. No reply to this question. 19. I consider the best age for soldiers to proceed to India to be from 22 to 25 years of age. 20 to 24. No replies to these queries.
Diseases.	1. There is only a weekly inspection of recruits at this station for the discovery of incipient diseases. 2, 3, 4. There has been no scorbutus at this station, and cases of hepatic disease among native troops are exceedingly rare. Dracunculus does not occur at this station. 5. The proportion which those sick from venereal diseases bear to the total sick is about 10 per cent., and this disease almost always occurs among recruits; the weekly inspection of these suffices as far as possible for the discovery of incipient disease. A well regulated lock hospital would be advantageous. 6. The following are the diseases from which the troops at this station suffer:— *Fevers.*—The troops suffer constantly from fever. Quotidian intermittent fever is the prevailing form, and next to that ephemeral fever, small-pox and chicken-pox. *Dysentery* seldom affects the troops, and is generally speaking mild in its attack. *Cholera* generally occurs once a year epidemically, and affects the troops as well as the neighbouring population. *Small-pox.*—The troops do not suffer much from this disease. *Rheumatism.*—The troops suffer from chronic rheumatism, but very often it has been acquired elsewhere. The proportion which admissions from the above diseases bear to the total admissions is not quite 1 to 3; but the proportion which the deaths from these diseases bear to the total deaths is a fraction over 1 to 3. 7. The more frequent zymotic diseases are feb. quotidiana intermittens, feb. ephemera, cholera epidemica, variola simplex, varicella. Quotidian intermittent fever is prevalent during both the hot and damp months. Cholera occurs during the hot months. Small-pox and chicken-pox indifferently. These diseases are preceded by no particular climatic or atmospheric conditions, with the exception of cholera, which most frequently occurs during the hot weather, and during highly electrical states of the atmosphere. Cholera appears to occur as frequently in those localities which may be considered as most cleanly as in those of a contrary description; whereas the other diseases prevail most in those parts where there is overcrowding of dwellings, and the general sanitary condition is bad. The extensive use of bang and opium, ultimately leading to a debilitated state of health, insufficient and impoverishing food often badly cooked, the use of unripe fruit, and the overcrowding of huts where there are large families rendering the atmosphere impure, all tend to predispose to disease. 8. The nature of the sepoys' duties in garrison does not seem to influence the prevalence of epidemic disease. On the march the practice of eating cooked rice in a cold and stale state, the drinking of water procured from the nearest point, and which is frequently unwholesome, their being without food for many hours in consequence of the non-arrival of the bandies, together with the fatigue of marching, influence the prevalence of disease. 9. The prophylactic value of quinine against malaria has not been tried at this station. 10. It has been frequently observed that cholera has been brought into the station by pilgrims returning from Juggernauth, that disease at the time raging there. Could these people be prevented from entering the station by any arrangement, the incursion of the disease might to a certain extent be prevented. As regards the mitigation of epidemic disease, the great point to attend to is the complete sanitary condition of the station.
IX. MILITARY PRISONS.	1. The cells at this station are well constructed, and answer the purpose for which they are intended.
XII. HOSPITALS.	1. A plan of the hospital is transmitted. 2. The hospital is half a mile from the barracks, situated out of the limits of the cantonment, and in the vicinity of a few houses occupied by civilians. There is no bazaar near it; but there are a few houses on the east side of the hospital, which interfere with its ventilation. The site is healthy in every respect. 3. The water-supply is sufficient, and is considered good by the sepoys. It is, however, obtained from a tank, which is used for washing as well as for drinking purposes. 4. The refuse water and other impurities from the hospital are removed by means of a common drain, from which no effluvia arise. 5. The floors of the lowest wards of the hospital are raised above the ground 1½ feet; but there is no perflation of air beneath them. The roof-water and rain-fall flow into side channels, which are on the public road, at 40 yards distance from the hospital, and which are sufficient to carry them away. The roof of the hospital is double, with ventilation between; the walls are of brick and chunam. The hospital is sufficiently cool, with verandahs on both sides of the breadth of six feet, which afford sufficient shelter from the sun's rays. The verandahs, during the cool part of the day, are used by those able to walk about. The hospital consists of one flat only.

References to Subjects and Queries.	Replies.
XII. Hospital—*cont.*	Table of Hospital Accommodation. Date of construction—unknown. Total number of wards - - - - 2 Total regulation number of beds - - - - 49

Number of Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.		Square feet.	Feet. In.		Feet.	Feet.
1	25	78 6	19 6	16 3	24,875	995	61¼	1 8	8	4	3
1	24	77 0	19 6	16 3	24,399	1,016½	62½	1 8	8	4	3

The hospital receives the full benefit of prevailing winds, except on the east side, where there are some scattered houses. The windows open inside, and in addition there are jalousies which open on the outside.

6. There are no special means of ventilation, but the amount afforded by the double roof, doors, and windows is sufficient. The lower part of the jalousies is panelled, and the upper part has venetians of the usual pattern.

7, 8. There are no artificial means either for cooling or warming the air admitted into the wards. The walls and ceilings of the hospital wards are cleansed and limewashed when required.

9. A plan of the privies is transmitted. They are 36 feet from the hospital, and are constructed of brick and chunam, with tiled roofs. They are kept clean by sweepers, and are not offensive.

10, 11. There is no lavatory attached to the hospital; but a large bathing tub, a hip-bath, and a foot-tub are allowed for the use of the sick, and, generally speaking, they are sufficient.

12. One dhobie is attached to the hospital, to look after the cleanliness of the linen.

13. The storage is sufficient and dry.

14. Some of the hospital cots are made of wood, and others of iron. The bedding consists of one paillasse, one quilt, and one pillow, with pillow case, to each patient. All the bedsteads should be of iron.

15. There is no kitchen for the use of patients, but there is one for hospital purposes.

16. Copies of the present forms in use for keeping the statistics of sickness, mortality, and invaliding in the corps are transmitted.

17. One hospital havildar is in attendance, and, when it is considered necessary, an orderly is allowed to attend upon a patient.

18. The hospital is clean, well ventilated, and healthily situated. No epidemic disease, hospital gangrene, or pyæmia has ever appeared in the wards.

19. I have no improvements to suggest.

20. The convalescents take exercise in the verandahs during the cool of the day, and are occasionally allowed convalescent leave to their houses.

21. This question is not applicable to native troops.

22. There are no special local hospital regulations not included in the General Presidency Medical Regulations.

23. The medical officer has entire control over the sanitary state, &c. of his hospital.

24. There are no wards or hospital for convalescents at this station. If a sepoy requires some time to recover from a disease, he is sent on sick certificate to his native village or some advantageous place. If they require a short period of convalescent leave, they are allowed it in the lines, but they have to come to hospital either daily or as directed, to see if they are making any improvement.

XIII. Burial of the Dead.

1, 2. The burial ground is distant 884 yards from the station, and to the south-west—the direction of the prevailing wind. Its area is 1,936 square yards; its soil light loam, and subsoil gravel.

3. Rules for out-station cemeteries (M. G. O., 5th May 1857) provide that lines 10 feet apart, parallel with the paths, should be marked out, within which all graves should be dug, care being taken that the graves are as near together as may be conveniently practicable. The depth of the graves is at least five feet. Graves have occasionally been reopened for laying the foundation of tombs over them, but never for other interments, nor would there be occasion for any such practice at Berhampore. If a death occurs at a very early hour in the morning, interment would, usually, take place about sunset of the same day; if about noon, interment would not take place till about sunrise of the next day; and if at an advanced hour of the evening, burial would probably have to be deferred until about sunset of the next day.

4. The grave yard is never offensive.

5. All natives are (according to caste) either burnt or buried.

6, 7. Injury to the public health does no doubt accrue from the present practices. Bodies being often buried within two feet of the surface, wild animals consequently disinter them, and the effluvia from these must necessarily be injurious. The graves should be ordered to be dug deeper, certainly not less than four feet (?).

(Signed) Arthur Wyndham, Major,
5th regiment N.I., commanding Berhampore.
G. H. Alexander, M.D.,
Assistant Surgeon D.D. 5th regiment M.N.I.
J. E. Hopkins, Sub-Conductor,
Executive Agent, D.P.W.

May 5, 1860.

HURRYHUR.
MADRAS.

HURRYHUR.

Accommodation. Native troops. Infantry, 16th regiment Madras Native Infantry.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is for the most part a champagn country, with a few surrounding villages sparsely scattered here and there. There are very few trees except in the immediate vicinity of these villages. The country is for the most part flat, with a decided and rather steep slope towards the river on the west (with a gradual rise beyond it), and towards the cultivated ground on the north. There is at a varying distance on the north, commencing about 3 miles off, an irregular succession of low hills, seeming to pursue no particular or uniform range. On the east and south the country is for the most part level and open, with hills appearing on the horizon. At a distance of 3 miles in a south-easterly direction are three detached hills about ½ a mile apart, assuming a range E.S.E. & W.N.W., the most easterly being about 300 feet high, and the others about 150 or 200. On the S.W., at a distance of about 25 miles, is seen a range of hills lying S.E. and N.W. The soil generally is dry. There is very little wood, jungle, or water, in the vicinity of the station, save in the immediate neighbourhood of the river, and a few tanks, not one of which is within two miles of the station. 2. The elevation of the station is 1,831 feet above the level of the sea, but can hardly be said to be elevated above the adjacent country, save as regards the before-mentioned slope. The highest part is probably about 50 or 60 feet above the water level of the river at this season (January). The river after the month of June, and between that and October, has its level raised probably not less than 20, and may occasionally be 30 or more feet higher than it is now, for a day or two. I know of no higher or healthier ground adjoining the station. 3. The nearest table lands are: the Babadbooder hills and Mercara, lying south by west from this station, both at a considerable distance. The former is of inconsiderable extent, but believed to be very salubrious, and is over 4,000 feet above the sea. The latter is very salubrious, of large extent, and considerable elevation (4,506 feet), on the Western Ghauts; it is visited by much rain during the south-west monsoon. Davaroydroog and Nundidroog lie to the S.S.E., distant about 140 miles, but are of inconsiderable extent, and are both visited in hot weather by such as can find accommodation on them. The latter is 1,500 feet above the plain, or 4,856 feet above the sea. Ramandroog, on the Ramee Mullay hills, lies N.E. by E., and is about 200 miles distant. It is 3,100 feet above the sea, but of considerable extent. The Neilgherry hills, much more distant, and lying S. by E., I need only advert to, *en passant*, as they are so well known. 4. The station is distant about ¾ of a mile from the right bank of the Toverbuddra river. The lower ground to the N.W. is occasionally, but rarely, subjected to overflow, except in unusually long-continued or heavy falls of rain during the S.W. monsoon. This, however, lasts at most for 2 or 3 days only, as from the continuous slope towards the river it subsides with the subsidence of the body of water in the river bed. There are no ravines or broken ground in the close vicinity of the station, but there are, here and there, ravines running to the west into the river. They do not seem in any way calculated to affect the health of the station. 5. The station is sufficiently open to all the usually prevailing winds, and there seems to be no redundant growth of trees or hedges sufficient to interfere with free external or internal ventilation. As regards the sepoys' lines, it would have been better had they been constructed with wider streets, and had the men not been allowed, from time to time, to build other than the original huts within the enclosure originally allowed for each sepoy's hut. As regards the bazaar lines, many interlopers have from time to time occupied and built houses on ground which should have been left open on the west, and thus the access of wind from that quarter is prevented to the sepoys' lines. From the nature of the soil of the station, there is comparatively little reflected sun heat to operate in raising the temperature of the station. The winds generally are neither cold nor variable, and the more prevalent are from the N.E. and S.W. at the seasons respectively constituting the corresponding monsoons. There are occasionally westerly winds towards the after part of the day, which are generally agreeable, and are usually looked upon as sea breezes. The north-east and east winds, which usually blow in the early part of the year, are mostly hot and dry, and rather prejudicial to health, where people heedlessly expose themselves to their direct influence. 6. All the surrounding country which admits of it profitably is under cultivation. The immediate vicinity of the station is closely cropped with indree, cotton, millet, or dhall. The cultivation is permitted to be carried on in rather too close proximity to the men's lines and bazaar lines on the south and west. The men are in the habit of going into these fields for the relief of nature, and while such practice is allowed, there should be some considerable space of intervening ground free from cultivation, whereas, in the direction designated, there is none. There are no works of irrigation in the immediate vicinity of the station. There is no rice cultivated within some miles of the station that I am aware of, but I do not know that there is any prohibitory order. No indigo is grown near here, nor hemp with a view to the preparation of "jute." The linseed planted is cultivated within a few miles for the oil prepared from its seeds, but no flax is prepared from its stalks. There is no nuisance experienced from this. 7. The town of Hurryhur is situated 2 miles to the south west of the cantonment; its population is by no means numerous. 8. The surface soil is for the most part "regur," or "black cotton," resting on red stiff gravelly earth (with a clayey matrix) which here and there constitutes the surface soil (in the more elevated parts) and is in some parts very stony and barren. Beneath there are found syenite and granite rocks here and there outcropping on the surface. 9. Water is usually found about 40 or 50 feet below the surface, whether in the dry or rainy season. The greater number of the wells furnish water, which is considered unwholesome from the earthy salts with which it is impregnated, and which also make it hard and unfit for washing purposes where soap is used.

References to Subjects and Queries.	REPLIES.

I. Topography—*cont.*

10. The rain fall of the surrounding district seems readily to flow away. The subsoil seems comparatively impervious; consequently, wherever any hollow exists, water lies on the surface until it evaporates; but as before stated, from the cantonment being situated on ground sloping off especially to west and north, there is no lodgment in its immediate vicinity of any consequence at any time. No drainage from higher ground passes into the subsoil of the station.

11. The water for drinking purposes is almost exclusively procured from the river. There are two very fine wells in close proximity to the hospital; but the water is not used for drinking, only for cooking and washing purposes. There are several wells in the compounds of officers' houses, and a few in the lines, some of which furnish water to a limited amount, considered fit for drinking. The tank nearest the station is two miles distant, to the east, and on a somewhat lower level; it is not a source of nuisance.

12. The supply procurable from the river seems unlimited, as even were its bed to all seeming dry, it would be easily obtained at a foot or two at most, by digging. It is, except when at flood, transparent, tasteless, colourless, and inodorous. During the rains it becomes tinged with varying depths of yellow or brown; but this subsides readily on standing, and becomes fit for use after boiling or pouring it through the rough filter in common use in every house in India. It may be inferred that its composition is that of ordinary pure water. It is perfectly soft, devoid of microscopic characters, of good quality, by no means injurious to health, and is sufficient in quantity. The men have the water of the river brought in chatties by the females of their establishments, or employ servants for that purpose. Officers employ "puckallies," who bring it up to cantonment in leathern bags on bullocks. The experimental results of sinking wells are so unfavourable to a reasonable expectation of getting pure water for drinking purposes, that it is doubtful if better water could be obtained than that from the river.

13. No answer to this question.

14. I am not aware of the existence of any definite orders or rules for guidance in reference to the service of selecting sites for new stations, unless the issue to each medical officer on entering the service of the small manual (on Medical Topography) under order of Supreme Government, 22d February 1836 be viewed in such light. Never having been employed on such duty, I know not the amount or kind of inquiry or examination usually looked for, but I am under the impression that usually the report of an engineer officer as to the capabilities of the place is first called for, and, if his report be favourable, that a mixed committee (having one or more medical officers with others) is appointed to examine into the merits or capabilities of the site as already reported on by the engineer officer. I am aware that recently one of the duties of the Inspector-General of Hospitals is supposed to be the making himself familiar with (and reporting on) the topographical and other peculiarities of elevated table lands, as to their adaptability for sanitaria, or for the location of bodies of Europeans. I have not seen or heard of any rules for his guidance, or any that may have been adopted or devised by himself for that purpose. I know also that before the abolition of the medical board inquiries of the kind above adverted to were set on foot in reference to the station of Secunderabad, the barracks having been condemned by some medical officers of Her Majesty's British troops, and the selection of a sanitarium on the eastern coast; but I have not seen published any memoranda of proceedings recommended or adopted on those occasions. The Ramandroog sanitarium was selected as such after the report of a medical committee convened in 1846 to investigate and report on its suitability.

II. CLIMATE.

1. From a comparatively recent period (I have no record of it anterior to June 1857) there has been an aneroid here. In January 1859 thermometrical observations were commenced, and last November only a wet bulb thermometer was furnished in addition to the other; there is also one of Newman's rain guages, but these are the only meteorological instruments at this station.

2. The few means and limited period of observation preclude the formation of a table of much value.

Table of meteorological observations from June 1857 to January 1860:—

Months.	Barometer Mean.	Mean Temperature.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds. Direction.	Remarks.
		°	°	°	°	Inches.		
January - -	27·840	74	74	63	102	—	N., E.	
February - -	27·794	79	—	—	92	—	do.	
March - -	27·841	81	—	—	96	0·1	S.W.	
April - -	27·818	81	—	—	91*	0·55	do.	* There must have been some mistake in recording the observations for these four months.
May - - -	27·701	84	—	—	94*	0·407	do.	
June - - -	27·689	81	—	—	88*	0·84	do.	
July - - -	27·651	79	—	—	89*	0·265	do.	
August - -	27·692	78	—	—	92	0·98	do.	
September - -	27·738	79	—	—	97	0·129	do.	
October - -	27·786	80	—	—	100	0·510	do.	
November - -	27·762	78	78	68	98	0·106	do.	
December - -	27·819	76	76	65	102	—	N.E.	

3. It seems mainly in its features to be a dry climate, with a considerable diurnal range of temperature, especially in the cold months of the year. In all essential respects, however, the atmosphere seems to be pure. Neither has the regiment, nor have I, been here long enough to justify a decided opinion as to the actual influence of the climate on their health, but I should think that with care it must be beneficial to troops coming from the relaxing climate of the coast. In the cold months they require warmer clothing and good shelter. The only precautions necessary as to drill are not to begin too early in the cold months, nor at any time to keep the troops out too late in the morning sun. Cloth trousers and boat cloaks become essentially necessary for night duties, and the former for early parades. From my own experience I cannot pronounce an opinion as to the most unhealthy months at this station, and the residence of the regiment here is too short for observation. From

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	the hospital records of the twelvemonths during which the regiment has been stationed here, the following months in the order named seem to have been the most unhealthy :—January, November, June, October, May, February, and September, and the most prevalent disease has been fever, with cholera in the months of January and June. 4. I do not know of any district near the station the climate of which is more conducive to health than that of this station. 5. The following is a list of stations at which I have served, with my remarks on their comparative salubrity :—I have done duty at Madras, Belgaum, Vingorla, Secunderabad, Seetabuldee (Kamptee), Quilon, Cuddapah, French Rocks, Bangalore, and Hurryhur. I arrived at Madras in June 1840, and served at the General Hospital till November of that year. I suffered much in my own health in acclimation, but others my comrades did not in the same degree. Leaving Madras in November 1840, I proceeded viâ Bangalore, Hurryhur, and Dharwar, to Belgaum, where I arrived in January 1841, and served with left wing H.M. 4th (King's Own) Regiment. In the early part of that year, during the south-west monsoon, I went on field service with portions of that regiment to Neepanee and Baddmee. At the close of this year I went to Vingorla (for about four months) in charge of invalids of that corps, about to proceed thence for England, and I returned to take charge of the wing. My duties were principally with the corps of which I had occasionally medical charge, and eventually left Belgaum in charge of it. This corps suffered much in health in the climate of Belgaum. There were many deaths from fever with cerebral complication, from dysentery and from diseases of the liver. I feel more inclined to think intemperance the prime cause of these attacks than mere climate; yet I believe the men were not sufficiently controlled in their movements, consequently they exposed themselves too much to the sun, whilst, on the other hand, sufficient interest was not taken in their welfare to provide for them amusement or recreation of kinds calculated to lessen their disposition to wander abroad. With due care and ordinary precaution as to suitable dress in the monsoon, and avoidance of undue exposure to sun, I consider the climate of Belgaum very good. I marched from Belgaum, in medical charge of left wing of H.M. 4th (King's Own) Regiment, in latter end of October 1842; our original destination was Kamptee, but, after having got within ten days' march of it, our march was countermanded, and, after three weeks' halt on the north of the Wurdah, we started south for Secunderabad. We arrived in middle of March. In this long march the men were under canvass for nearly five months. Their excellent health formed a strong contrast with that of the previous five months. During the march one death alone occurred (from cholera). In cantonment the deaths monthly were (as nearly as I can now recollect) 3 to 6 or 7. I was stationed in Secunderabad till latter end of October 1843, during which time I suffered much in health, from suppuration of enlarged cervical glands and general rheumatism. The regiment (H.M.'s 4th King's Own) suffered severely in health in that station; many deaths from hepatic abscess, dysentery, and diarrhœa. In addition to more or less of similar influences, above adverted to as having probable existence in Belgaum, I believe the construction of the barracks, and its site (both since abandoned, but long before condemned) had much to do with their bad state of health. The site was, in my view, a powerful instrument to mischief. I entertained the impression that the wells of water were contaminated by the burial ground, situated in close proximity and on higher ground. Troops in other parts of the station enjoyed good health, and, I believe it is, generally speaking, a healthy station. In October 1843 I left Secunderabad, and proceeded viâ the Neermul jungle to Kamptee, which place I reached in latter end of November. Soon after my arrival I was attacked by fever, in all probability contracted on my journey. This degenerated into a most obstinate and severe intermittent, of very irregular character, and eventually, in the month of April, I was attacked by severe inflammation of right knee joint, by which I was confined to bed for five months, during which my life was despaired of, if my limb were spared. I was compelled to return to Europe on sick certificate. I embarked at Bombay on 1st December 1844. It was thought I should have to undergo amputation above the knee. My own sickness and its sequlæ were contracted *in transitu* to Kamptee; but during my residence at Seetabuldee the deaths, especially from fever, among Europeans, both men and officers, were very numerous. So far as I can judge, the principal causes are the great diurnal range of temperature, and the great power of the midday sun at that station. I am inclined to think the bed of the river Kannar, which skirts one side of the cantonment in its entire length, is a more fruitful source of malaria than is generally attributed to it. I embarked at Gravesend, on my return to India, in good health, with an anchylosed knee joint, in charge of recruits, on 1st May 1847. The principal portion of these recruits consisted of those from the famine districts in Ireland. I arrived at Madras in August (19th). On 12th September 1847 I left Madras by sea for Quilon, where I arrived on 19th September, and did duty in that station with 16th Regiment Madras Native Infantry till May 1850. I consider that station a very healthy one. Natives on that coast generally suffer much from cutaneous disease, which I believe attributable in large degree to the large consumption of carelessly dried salted fish. My next station, Cuddapah, was reached by me on 1st June 1850, the journey being performed partly by sea to Madras, and thence by land. During my stay in that station, my own proper duties were civil, but, during my protracted stay (seven years) I had the opportunity of seeing the effect of its climate on four native regiments, of one of which I had the charge for nearly a year, in addition to my own duties. The climate appeared to agree very well with the men of three of those regiments, and especially with those of the 37th Grenadiers. The men of the 52nd Regiment Native Infantry formed the exception, and, although the having charge of them enabled me to enter fully into enquiry, I was unable to arrive at an explanation of their suffering in health so much more than other regiments. It is true while they were there the lines were destroyed, or nearly so, by a flood, and they had to form new lines; and it may be that this was sufficient to account for it. I could assign no other reason. There was also some difference in the health of the European officers of those regiments. Of those belonging to one there were many passionately fond of "Shikar," who lost no opportunity of being out in pursuit of that recreation. The officers of the next regiment

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	were not generally so fond of out-of-doors amusements, and they suffered more in health, as I thought in consequence. The officers of the regiment that next came had some improvements made in their houses, which, in some degree, perhaps had a favourable effect on their health, and the last regiment adverted to had the benefit of similar houses. As a general rule, however, most of those who could afford to do so, or who had the opportunity, were in the habit of getting away from the station during the very hot months. For the marked peculiarity of the station at that season is the excessively hot arid atmosphere, with the perfectly still motionless condition of it all night, rendering it almost impossible to sleep unless under a punkah or thermantidote, or what was, in the absence of either, tried for a limited period of time, in my own case, the having water copiously and frequently thrown over the flooring of the bed room, to lower temperature and lessen dryness of the atmosphere. As regards the effect on the covenanted members of the civil service, some of them were always able to pass the hot months on the neighbouring hill at Mudnapully, and of the others large houses, courts, or cutcherries, cooled by wetted kuskus tatties, and the use of punkahs, or thermantidotes, enabled them to bear up against the climate of the hot season better than the officers in the limited houses of the cantonment could be expected to do. A marked peculiarity, in regard to the station of Cuddapah, almost I believe from time immemorial, was the frequent occurrence of epidemics of cholera, by which the inhabitants of the town and the prisoners in gaol were attacked, and the like frequent recurrence of it in the regiments stationed there. In this latter class I strongly suspect it was most frequently contracted by people who had been in the town, and, having once appeared in the lines, it spread there, as elsewhere, by a process allied to the fermenting, or other not yet fully ascertained or determined. Its frequency in the goal and town, so far as my own experience allows me to form a judgment, was, I believe, very largely, in fact principally, due to want of proper sanitary arrangements, and probably actual defiance of all such measures. Prior to my arrival steps had been taken to open up the town and form good roads through it. This and the forming better drains, and enforcing cleanliness of them as far as possible, were being kept constantly under consideration, both in the town and in the gaol, after my arrival. Cholera for the last three years of my stay in that station was hardly known, except as a sporadic case, or where pilgrims, from Nigrutty or elsewhere, seemed to have contracted the disease at that place, or *en route* from it. It might be almost said to have disappeared from the gaol, and this attributable mainly, I think, to greater attention to the quality of food issued, and the other points above adverted to. One (the last) outbreak has been indelibly impressed on my memory. I succeeded, after careful searching out for its possible cause, in discovering that a large accumulation of refuse of all kinds had been allowed to form for months in rear of the gaol. I had pointed out the necessity of clearing this away and preventing formation of any such accumulation for future, and been informed that its removal would occupy a period of three weeks. Meanwhile the river suddenly and unexpectedly came down, and, after some difficulty, I succeeded in getting permission to cast the whole heap into the river at once, as the quickest, safest, and most useful way of getting rid of it (most useful as, by means of an anicut, it would be carried into a large tank below the town). Such was the dreadful effluvium which spread abroad from it during its removal, that the collector could not sit in his cutcherry that day, but the whole was got rid of, by dint of energy, in *six hours*. Cholera ceased almost immediately, and was hardly known in the gaol again. Intermittent fever is unusually prevalent occasionally in Cuddapah. Much of this due perhaps to the peculiar mode of manuring indigo ground, and not a little to the almost universal habit of keeping all the refuse filth close to every house, till the season comes for spreading it abroad on the field, instead of the daily or periodical removal of it outside the villages. My own duties abroad, occasionally very extensively so, involved much unavoidable exposure at all seasons. The effect was very trying to a constitution naturally strong, yet I never left it in the hot season, but remained continuously at duty till beginning of 1857, when I was attacked by remittent fever, which necessitated a temporary absence on sick certificate to Bangalore. I left Cuddapah in beginning of April 1857, and arrived in Bangalore the same month, and staid there till July, but found the climate most unsuitable to me, after so long a stay in Cuddapah, so gladly proceeded to French Rocks in latter end of July. I remained at the French Rocks till December of the same year with the 20th Madras Native Infantry. With the exception of an attack of epidemic cholera, preceded by one of small-pox (both of which had subsided before my arrival), the only peculiarity noticeable in the state of health of that regiment was the apparently unusual proclivity to attacks of intermittent fever. This I believe attributable to the close proximity of a large shallow tank coming down rather closely on the left flank of the sepoys' lines, with insufficient means of screening them from the wind blowing over the tank, and carrying malarious atmosphere through them. Where the men and their families were in the habit of drawing water out of the shallow parts of the tank—where, from the daily receding of the water under the influence of evaporation, vegetable matter was left exposed to insolation and decay, and in this way the water itself might become impregnated—while the persons going for it were continually breathing the atmosphere contaminated by gaseous exhalations from the decaying vegetable matter. In December 1857 I left French Rocks, returning to Bangalore at end of the month with the 20th regiment Madras Native Infantry. Here, from its arrival, the regiment began to suffer much from fever. It might have been partly due to their having recently only come from the moist, mild, enervating climate of Cannanore, combined with an unusually large increase of duty necessarily attaching to their being the only native regiment then in Bangalore. To lessen the amount of labour, ball practice parades were left off, and eventually nearly all parades. Still fever gained rapidly, and eventually nearly two hundred men at a time were in hospital with it. With a view to determine how much the state of their lines might have to do with its causation, a minute examination of the house and enclosure of each sepoy was made. They were found not to be in so good a sanitary condition as could be considered desirable, from

HURRYHUR, MADRAS.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	overcrowding, insufficient ven lation, insufficient sewerage and cleanliness, but yet this alone would not seem, as com ared with a similar state of things in a regiment near them, sufficient to account for it. Their health continued for any months thus bad, and at length a change of station was recommended to Nellore nd has recently been carried into effect. I left Bangalore in June 1 9, on removal to the 16th regiment Madras Native Infantry, stationed at Hurryhur, wher arrived in same month, and need say no more here regarding this station, as notes regardi g it are forwarded herewith elsewhere. HENRY PETER RICE, M.D., Hurryhur, 1860. Surgeon, 16th Regiment M.N.I.
III. SANITARY CONDITION OF STATION.	1, 2. It is impossible to transmit a general map and plans of this station and the surrounding country, as there is no one from the Engineer or Public Works Department on the spot available for the purpose. 3. The construction of the barracks is similar to that of the hospital, differing only in having no top ventilation and the verandah being deeper, continuously enclosed round its south end, not at all at the other, and having no enclosed area in its rear. 4. The building used as a "Place of arms" for native regiments is usually designated by sepoys "The barrack," but correctly speaking it is not a barrack. The following table shows the prison cells' accommodation, &c. at this station.

Number of Prison Cells.	Regulation Number of Men in each Cell.	Dimensions of Cells.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Two solitary	1	Inner Chamber. Feet. 8	Feet. In. 8 2	Feet. In. 16 6	1522	1522	94 1/8	—	4, and 1 door. 1 folding door.	4 feet	1½ feet.
		Outer Chamber. Feet. In. 3 1	Feet. In. 9 7	Feet. 12							

5. There are no windows except to the guard room, native officers' rooms, prison, and solitary cells. In the first of these they are placed on adjacent sides, in the second and third on one side, and in the last on all four sides. The principal part of the barrack building is used as a place of arms, and has 14 doors. There is a verandah of 9¾ feet wide all round, but this is enclosed at the south extremity, and for about 40 feet on the west, and 20 feet on the east front, for use as native officers' room, guard room, and prison. There are no jalousies or jhilmils to the place of arms proper, only slab doors.
6. No bedsteads are allowed for native troops except in hospital.
7. The tents are made of stout cotton cloth—threefold—the innermost, indigo dyed. They are 22 feet long, 12 broad, and between 11 and 12 feet high. This would give a cubic space and superficial area per man respectively of 60 cubic and 10½ square feet; but they have more, because some of the number of men allowed for each tent are absent on duty, and on ordinary marches, and others are probably sleeping with their families.
8. No means of ventilation are used for the quarters, &c. of the native army.
9. The walls of huts are usually built of well kneaded mud or clay, or of sunburnt bricks. The roofs in some lines are thatched with straw, grass, cocoa-nut, or palmyra leaves, in others they are covered in with tiles. Occasionally the roofs are terraced or "dhaba" with well beaten tempered clay.
10. Usually the floors of the huts are raised above the ground, but it in few instances exceeds two or three inches, there is no fixed rule. They are for the most part made of well tempered clay, but the floor of the place of arms (or barrack) is flagged with stone. There is no passage of air underneath.
11. As regards the general plan of construction of native lines, they should have a larger plot of ground allotted to them so as to admit of wider streets, and a larger enclosure being allowed to each of the huts, as the number of followers attached to the men involves the necessity of building other structures in their several enclosures which prevents generally free circulation of air, while it crowds too many people into spaces too limited for their accommodation. Barracks and important works in the cantonment are kept in repair by the Department of Public Works, and the repairs are usually tolerably quickly executed. Medical officers have generally considered it their duty to see to the sanitary state of their own part of the cantonment and its vicinity; but prior to the issue of G. O. C. C. of 26th August, 1856, and 3rd November, 1856, by Lord Clyde, such was not officially considered to be their duty. Regimental quartermasters were, as still, held responsible for their respective lines being kept clean. Being only used as a place of arms, the barrack walls are cleansed and limewashed once in two years.
12. There are no lavatories at this station for the use of native regiments.
13. There are no means of cooking. The washing and drying of the linen is done by native dhobies, whose services seem fully adequate to what is required of them.
14, 15. There are no privies or urinals at the station. It has been before suggested by me, that such conveniences should, where available space was procurable, be erected in all native lines; and the question has been again more recently adverted to in paragraph IV. of letter No. 2,777 of deputy quartermaster-general of Fort St. George's, under date 24th November 1859.
16. The men of native regiments all live in lines, and the sewerage of all of these that I have seen is most defective. The main drains should be lined or cased with brick or stone, and means and appliances provided for flushing them at suitable times, to ensure their being preserved in a cleanly condition. The drainage such as it is usually found to be, and is

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	at this station, may be said to be "Nil." I know of no part of any building used as a barrack or hospital that is damp. The fluid refuse of the barracks flows for a limited distance into the drains, and is then chiefly disposed of by evaporation, for the nature of the subsoil admits of little subsidence into it. There are no cesspits or foul ditches near the station. 17. Six sweepers are daily employed in the lines for the purpose of surface cleansing. The men or their followers generally throw refuse outside their houses early every morning, and this is collected and carried away to about half a mile from the cantonment into the fields by the sweepers. 18. The surface of the cantonment is kept free from excessive and redundant vegetation, and there are no old walls, thick hedges, &c, interfering with the ventilation of the station or bazaar. 19. The bazaar is generally in much the same state as the men's lines, except that it is somewhat more open in itself, and therefore better ventilated. Four sweepers are kept daily employed at the expense of the shopkeepers in the bazaar to keep it clean. Generally speaking it is the custom of the natives of India to keep dungheaps close to their houses. The cowkeepers at this station occupy a part of the bazaar lines, but their part of the station is very open, consequently I do not think much harm can accrue from it, but it should be prevented there as elsewhere. In other respects their houses seem in a cleanly condition. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Sheep and goats are slaughtered in a small open space on the south side of the bazaar. The number slaughtered is from twelve to twenty per diem, and but little offal is left from day to day. All that is fit for human food is bought for that purpose, and such as may not be, the pariah dogs soon dispose of, and the mere garbage or contents of the bowels is thrown into the fields; no nuisance is experienced. The beef butcher, whose business is very limited, is allowed to slaughter on his own premises; on the express condition that he carefully removes without delay all offensive materials. 21, 22. No answer to the queries. 23. Staff serjeants are the only non-commissioned officers here. Their quarters seem to be sufficient for them.
Officers' Quarters.	There are no public officers' quarters at this station.
IV. Health of Troops.	1. The station, district, and surrounding population seem to be for the most part healthy. 2. There appear to be occasional epidemic attacks of cholera, but in no very severe degree. I have no knowledge of the existence of spleen disease as common here. 3. Grain and other articles of food are tolerably cheap, the country is open, the people tolerably well off, and all these circumstances contribute to their general healthiness. 4. The 16th regiment of Madras native infantry arrived at Mangalore from Aden on the 16th April, 1855, and stayed there till 20th December, 1858, or 3¾ years. Its health while there seems to have been good, considering the nature of the station, and the previous effect on their health of the climate of that (Aden) from which they came. The annexed table will show this, while it will also show the ratio of the principal diseases from which they have previously suffered, and do now. The outbreaks of cholera—two the last year—seem to have been inexplicable and unusual in this station. I have not observed that any one portion of the men's present accommodation at this station is more unhealthy than the rest.

Abstract View of the State of Health of the 16th Regiment M.N.I. for the Period and at the Stations herein-below specified.

Stations.	Years of Observation.	Total Admissions.	Total Deaths.	Strength.	Average Daily Sick.	Number Invalided and Pensioned.	Number sent away on Sick Certificate.	Fevers.		Diseases of Lungs.		Rheumatic Affections.		Diseases of Skin.		Venereal Diseases.		Diseases of Stomach and Bowels.		Epidemic Cholera.	
								Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Aden.	1852-3	477	8	794	22	46	1	99	—	36	1	57	—	29	—	23	—	54	1	—	—
	1853-4	474	13	807	28	—	—	144	1	18	3	76	—	25	—	12	—	51	3	—	—
	1854-5	386	4	778	24	—	—	94	1	14	—	83	—	6	—	11	—	68	—	—	—
Mangalore.	1855-6	467	15	737	29	2	0	82	—	12	4	65	—	19	—	55	—	84	2	—	—
	1856-7	502	7	757	31	38	20	130	2	19	2	61	—	42	—	36	—	89	2	—	—
	1857-8	423	9	639	25	19	25	77	3	13	1	62	—	62	—	14	—	92	3	—	—
Hurryhur.	1858-9	594	37	751	26	6	6	203	2	19	2	69	1	49	—	49	—	56	6	37	20
	The regiment arrived at Hurryhur on 7th January 1859, and the Returns immediately above comprise the period from 31st March 1858 to 1st April 1859. Below I append the exposition of the state of health from 31st December 1858 to 1st January 1860.																				
	1850-60	572	45	869	28	25	3	140	1	23	5	33	—	49	—	40	—	54	3	66	32

5. It is not the practice at this station for troops to be camped out.
6. I have never been in charge of troops at hill stations, nor have I had an opportunity of obtaining personal experience on such stations.
7, 8, 9. No personal experience of hill stations.
10. The precautions I would recommend to be observed by troops at hill stations are moderation in the use of vegetables in their diet, and the use of such clothing as is chiefly woollen. Out-of-door duties by day require more shelter or thought for it than where the necessity seems more palpable—in the lower country; but on these matters I have had no opportunity of personal experience.

HURRYHUR.
MADRAS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	11. I have had no experience to enable me to judge of the seasons best adapted for a residence in the hill stations, but I should think that the shortest period which would enable troops to benefit by such residence would be a year or 18 months. 12. No answer to this question. 13. With respect to the precautions to be observed for protecting the health of troops on leaving hill stations for the plains, I am unable, from want of personal experience, to venture other than theoretical opinions, or I must borrow those formed by others, who no doubt will furnish the results of their experience. 14. Looking to the consideration of this question in the largest point of view, and to the possible necessity at any future time for protracted field service in the plains, I should think it unwise to adopt, at any rate extensively, the plan of locating troops in hill stations with short periods of service in the plains. On the contrary, though I have not the results of observation of troops so situated to give in support of my view, yet I should think that locating them in the plains, with short periods of change to the hills, would be at least equally conducive to their health, while it would keep them in a condition generally better able to bear any sudden call for field service in the plains, whether for short periods or otherwise. My long residence in one of the hottest stations in the south of India inclines me to venture this opinion. It is now 17 years since I was connected with an European regiment; but, looking to my experience then gained during a protracted march with the left wing of Her Majesty's 4th (King's Own) regiment (from October 1842 till March 1843), and the good health and spirits enjoyed by the men on that occasion, also to the desirability of lessening the monotony of the same scenery day after day, month after month, I think that frequent change of station on the plains, for European troops, is highly calculated to have a beneficial effect on the health of the European soldier, and no less on that of the European officer. With regard to native troops, however, I have some reason, however, for thinking otherwise, excepting as regards the colder stations, which are *per se* inimical to their health, or the larger stations, where the price of food is often too large for their pay. A march entails so much expense on the sepoy from the necessity of procuring carriage—often at a great outlay—for the followers, that I think the more protracted stay in stations would be beneficial to his health and spirits; but in such cases every facility should be afforded to European officers of obtaining occasional leave of absence from their regiments. 15, 16. No answer to these questions. 17. I know of no higher ground near this station that could be advantageously occupied as a hill station. 18. This question, relative to the particular classes of surface and subsoil best suited for stations, has not engaged so much of my attention hitherto as to justify my answering it in a detailed or positive manner. In a general way I may note that it has occurred to me that those stations were the most unhealthy where primitive or "igneous" rocks approached nearest to the surface, or, where conjoined with this, the soil or subsoil was of a more or less impervious nature from being calcareous, or more or less clayey; while, on the contrary, *cæteris paribus*, those where the underlying rocks were of the aqueous order, such as the various sandstone, argillaceous, or calcareous rocks or stratiform deposits, with any character of soil or subsoil, excepting the more modern alluvial deposits, were comparatively more healthy. 19. Soldiers should not proceed to India prior to 19, nor after 25 or 26, years of age, and should land there from July till October. I have no experience to say how troops are disposed of on first landing in India, as, on the disembarkation of the troops in charge of which I left England in 1847, they were at once removed from my charge. From my own experience I cannot say what precautions should be adopted for preserving the health of recruits on first landing in India. 20. From what I observed in Her Majesty's 4th (King's Own) regiment, 17 years ago, it seems to me that previous service in Australia is a very good preliminary proceeding. So far as my knowledge of the climate of Bangalore enables me to form an opinion, I should think troops being sent there (if kept under supervision by experienced officers, to exercise the necessary control over their movements) preferable to sending them to the Nielgherries—for the Madras presidency. I would make it a general depôt for all British troops on their first arrival. 21. I have no personal knowledge of the mode of transport of troops from the port to the interior usually adopted. 22. As a general rule, I do not think any man should be made to serve more than 10 years continuously at a time in India. 23. I think, as regards the conducting of medical boards, there should be perfect liberty of expression of opinion, though it may differ from that of any or those of all the other members (senior or other), and, so far as my own experience—now rather large—enables me to form an opinion, it has always been so without detriment either to the state or to the individual concerned. In other respects the modes of procedure open to adoption are calculated to induce conflict of opinion, viz., 1st, inasmuch as the regimental medical officer must include in the roll of men whom he considers on medical grounds unfit for service those also whom the commanding officer considers unfit, although the medical officer sees no ground to justify concurrence in such an opinion. Again, the commanding officer has the right of calling for a board of field officers to support his appeal against the opinion of the medical board who may adjudge any given man or number of men fit for service, notwithstanding his previous expression of opinion as to their unfitness. I see no ground to suggest any change, as the present system seems calculated to protect alike individual interests and those of the state. 24. Invalids should leave India for home so as to arrive in the latter end of spring or the beginning of autumn.
Diseases.	1. There are inspections of the young recruits once a week in this regiment, but it is not general in the native army, nor do I think an adequate advantage is gained by it, as it is calculated to diminish what little self-respect some of them may have. 2. No case of scorbutus has occurred at this station. 3. The occurrence of hepatic diseases among native troops may rather be considered as merely accidental than as *per se* incidental to climate; natives do occasionally suffer from them, but the proportion is small in reference to the sum total of diseases. Natives are apt to

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	suffer from engorgement of the liver no less than of the spleen in obstinate intermittents, and the adoption of a line of treatment thus indicated is often necessary for the arrest of intermittents. In the course of 20 years' service I have met with five fatal cases of abscess of the liver among natives. On examination of the records of this regiment, I find that in a total of 4,400 sick during nine years (1850–9) there were 51 admissions from disease of the liver, and that six proved fatal, one of abscess, and one of jaundice, while stationed at Aden, also one of jaundice and another of abscess after the regiment left Aden: whereas in the three following years there were only two fatal cases. The ratio of hepatic to all other cases is, for this regiment, 1·165 per cent.; the ratio of fatal hepatic cases to all admissions ·136 per cent.; and the ratio of deaths from hepatic diseases to admissions from the same is 11·764 per cent. I am inclined to think, on examination of the records of other native regiments, the disease and fatal cases from it would not be found to bear so high a ratio.

4. Dracunculus seems to be specially endemic in certain localities, contracted through the immersion for a greater or less length of time of the bare extremities in water infested by the animals, the ova of which, or one or more of the young, probably enter the softened cuticle, and eventually become fully developed in the cellular tissue. As a rule, it seems to be found in the lower extremity below the knee, and I have seen a few cases above, only one however have I extracted from the scrotum. Occasionally it is found to obtain a residence in the upper extremity, and I have heard of a case in which the extremity of the nose was the seat. The prophylactic measures to be recommended are self-evident; viz., to avoid recourse to such pools or tanks as these animals are known to be found in. Out of the 4,400 admissions in nine years, there were only eight from dracunculus or a per-centage of ·181. No cases of this disease were known at Aden.

5. Out of 4,400 cases under treatment during nine successive years in this regiment there were 275 of venereal affections, being a per-centage of 6·250. I am doubtful whether the establishment of lock hospitals would be advantageous as regards the native army. I think, however, it might be otherwise for the European portion of the army.

6. The following are the diseases from which the troops at this station suffer :—

Fevers.—From the Table transmitted (in reply to Question 4, Division Health of the Troops,) it will be seen in the last line, that the regiment has suffered very little more from fevers in one year here than it did in the years 1856–7, at Mangalore. Natives usually suffer more from fevers in the higher and drier stations, with more variable temperature, and such will probably be the case in this station. The majority of fevers assume the intermittent form, and usually the quotidian type.

Dysentery.—The troops seem to suffer less from dysentery here than at the last station. In the official year 1856–7 (from March to April) there were 28 cases; in 1857–8 there were 31 cases, and in 1858–9, there were 16 cases. During the last twelve months (the residence here of the regiment since the commencement of the year 1859), there have been only 12 admissions. They get in this station better and cheaper grain than they did in the last. In that they probably consumed much of badly prepared unwholesome dried salt fish, instead of which they can here get as cheaply or nearly so, sheep's or goat's flesh.

Cholera.—There has been no cholera in this regiment since 1854, till it came into this district in 1859. There was an epidemic attack in January, and another in June of that year, which did not entirely leave till September. In the Mysore district generally it commonly prevails, but is said not to be very prevalent here.

Small-Pox.—No epidemic of small-pox has yet been experienced, vaccination is kept up in the regiment as a preventive measure.

Rheumatism.—Rheumatic affections do not seem to exist in unusual amount here.

The following Table shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths.

Period of Observation.	Diseases.	Proportion of Admissions to Total Admissions.	Proportion of Deaths to Total Deaths.
		per Cent.	per Cent.
12 months, from 1st January 1859 to 31st December 1859.	Fever	24·476	0·450
	Dysentery	3·671	6·666
	Cholera	11·537	71·133
	Small pox	1·223	none.
	Rheumatism	5·769	none.
9 years, from 31st March 1850 to 1st April 1859.	Cholera	1·022	19·444

7. The nosological character of the more frequent zymotic diseases is as follows :—

1. Cholera is usually characterized by excessive prostration of vital power in all its manifestations, by more or less of purging of rice-water evacuations (occasionally with a reddish tinge of greater or less depth) and vomitings; though sometimes neither of these present themselves from first to last; suppression of all the true secretions (especially the biliary and urinary), cold extremities, with shrunken skin and features, a feeble almost obliterated voice, deafness, a complete *insouciance* of what is going on around, intellect seems to remain, cramps occasionally, though often none, and intense almost unquenchable thirst.

2. Small-pox is not often seen in its genuine form, but is mostly modified, the "pseudo-pustule" wanting the true central depression, and seldom leaving anything like a "pit" in its site when desquamation takes place. The premonitory fever is seldom well marked.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	3. Measles.—Is generally well marked as regards the catarrhal symptoms, and sometimes severe pulmonary complication supervenes. The skin affection is by no means well marked, it seems seldom to pass into the true exanthemetous form, a thickly aggregated papular eruption only making its appearance. 4. Fevers.—The principal notable feature is their marked tendency to the intermittent form in natives. Of 964 cases treated in the course of nine years, the ephemeral type constituted 35·67 per cent., while the intermittents were 60·12 per cent. A large proportion of those called ephemeral may probably, in reality, be looked upon as intermittents cut short by treatment. 5. Rheumatism, in many of its forms, presents symptoms affording strong grounds for presumption that it owes much to syphilitic poison lurking in the system, for its causation in a very considerable proportion of the admissions. It is difficult to procure sufficiently precise data in support of this view, from the facilities enjoyed by natives of having recourse to native treatment for primary disease. These diseases have seemed to me to occur at any or all seasons indifferently, and I have not noticed that any uniform or determinate condition of climate or atmosphere has preceded or accompanied their appearance. It has not occurred to me to find that these diseases attach themselves to any given portions, specially or exclusively of station, bazaar, or native dwellings, &c., and in fact, when the sanitary condition of all parts is mainly and essentially the same, it can hardly be expected to be otherwise. In cantonments, where officers live in private bungalows, and where, consequently, the sanitary condition can, and ought to be in a better state, the number of cases are comparatively few. Among natives I am inclined to attribute much more of influence in the causation, and keeping up of epidemic cholera, to the carelessness and filthiness of the grain merchants and purveyors of other articles of food, than to any deficiency in drainage, water supply, ventilation, &c., &c., referred to in this question. I attribute much of evil influence to the low order of true personal cleanliness, both as to clothing and in every other respect, among the native population generally, and the class of persons from whom food is usually obtained in particular. 8. I have not observed any marked influence on the prevalence of epidemic disease through the nature of the soldiers' duties, either in barracks, on the march, or in the field. I have only marched once with native troops; but I have been on the march three times with European troops. One of these marches was a protracted one of five months; but the men were so well looked after, that I think their habits on the march can little, if at all, have disposed them to such attacks. 9. Small doses of quinine as a prophylactic against malarial diseases have not been generally tried at this station; but personally I have so used it, and as I believe with advantage. 10. With reference to cholera; where native troops are concerned, I think the bazaar should be completely under European surveillance and control, that an occasional thorough inspection of their premises should be officially made, to see that the articles sold by them are of unquestionably good quality, and duly kept in a cleanly way; that all food considered unfit for consumption should be confiscated and then and there burned; while the person keeping or exposing it for sale should be severely fined, and the process adopted should be speedy, summary, and without appeal. Any marked defect in the sanitary condition of their premises, if not remedied after due warning, should also be punishable by fine levied on the spot. It would, I believe, be found that cholera often begins in the bazaar, and spreads thence.
V. INTEMPERANCE	1. This question as to the temperance or intemperance of troops at this station, is not so easy to answer definitely for natives as for Europeans, for the former are not nearly so much under surveillance, and might consequently go to bed drunk, sleep off its effects by morning, or should he be then still unfit for duty, his condition might not be readily or unerringly assignable to such a cause. The European living in barracks can hardly go to bed drunk without its being known. He can hardly use "liquor" in his barrack room without its being known, whereas the sepoy in his own hut lives in a state of comparative privacy. There are no means existing to give the proportion of confirmed drunkards at this station. 2. There are no records in existence as regards native troops, to enable me to answer this question, with respect to admissions into hospital from diseases caused directly or indirectly by intemperance. Drunkenness is always punished as an offence, but is not so prominently noticed as a crime in the case of natives as in that of Europeans; in all probability because not so easily recognisable or susceptible of proof. 3. The sale of spirits in the regimental bazaar at this town is prohibited; but they are easily procurable in the neighbourhood. The natives however do not have recourse to alcoholic drinks exclusively. Opium and various preparations of hemp and dhatura are easily procurable in the bazaar. Spirit forms no part of the ration for convalescents, nor are rations in India given to native troops. No drinks other than intoxicating drinks are sold in the bazaar. 4. The daily habitual consumption of spirits I incline to think, has an injurious tendency on the health, and is not at all conducive to the efficiency or the internal discipline of the corps. 5. It would, I think, be beneficial to restrict the use of spirit within reasonable limits. Its issue ought to be abolished as part of the ration; but it might not be proper to prohibit its sale in the canteen or bazaar (where the amount consumed can be known), as this might result in the men going elsewhere and getting a noxious spirit, in an unlimited quantity. 6. I am of opinion that sound wholesome malt liquor is much less likely to be prejudicial, and would, I think, be preferable to such wines as could or should be issued in a tropical country. 7. There is no coffee, tea, nor lemonade, &c. at this station, but I am inclined to think that as a general principle those who use these beverages, instead of spirits or malt liquors, are likely to enjoy better health, and therefore, to be more efficient, while also, more amenable to proper discipline than the habitual (and especially the excessive) consumer of spirits or malt liquor.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	8. I think it would be beneficial to the health of troops to suppress altogether the spirit ration. There might possibly be exceptional cases or occasions in which a medical officer would sanction, were it thought desirable to refer to him, departure from the rule as a temporary measure; but there would still be the ground for fear that a man habituated to spirits for a long time past would then seek it elsewhere, irrespective of quality. 9. I think it would be beneficial to prohibit the sale of spirits, and permit only the sale of beer, coffee, tea, &c.; but with well-marked limitations for special subjects or occasions. 10, 11. No reply to these questions.
VI. Diet.	No information under this head.
VII. Dress, Accoutrements, and	1. The soldier's dress consists of the following articles:—Full dress or review order. Tunic, white trousers, turban, and pulputty, pair of sandals, gulputty (stock), and ungreka (worn under the tunic). Heavy marching order. Coatee, cloth trousers, turban and cover, pair of sandals, gulputty, ungreka, haversack, and knapsack, complete with boat-cloak. Drill costume. Coatee, black cotton trousers, roll-call cap, pair of sandals, gulputty, and ungreka. The accoutrements consist of:—Musket, bayonet, ramrod, waist-belt, non-commissioned rank and file, belt-pouch, non-commissioned rank and file, sling musket, frog-buff bayonet, pouch, musket, 48 rounds, pouch percussion-caps, scabbard, bayonet. The weight of the musket and bayonet is 9 lbs., of the accoutrements 5 lbs., and of the pouch with six rounds 3 lbs. 2 oz., with 60 rounds 6 lbs. 8 oz. The pouch alone weighs 2 lbs. 12 oz., and each cartridge 1 oz. The present dress for native troops is, I think, made too tightly fitting to the frame. I would totally discard the red colour for all arms, and have the outer garment hanging loosely over the chest and body from the shoulders. I would, as far as possible, avoid belts to gird the frame; everything save the cartridge-box and bayonet as far as possible should hang on or from the shoulders. Whether by day or night such clothing would on the one hand be cooler, and on the other warmer and more comfortable than tightly-fitting garments. The only difficulty might be in the proper disposition of the fully-equipped cartridge-box on native service; but for this, and every other article save the boat-cloak (to be fastened on as now by loop-straps crossing in front of each shoulder), I think one belt alone necessary, viz., a broad waist-belt, not girding the waist tightly, but rather sitting as if were on the hips. I think the adoption of something like the general style of dress of the "Zouave" would probably be more consonant with the comfort and inclinations of the native force than the assimilation of their dress to that of the European. As regards head dress, I would suggest for Europeans, instead of the wicker helmet lately ordered, one made of "rumdah" (as made up in Dharwar, Bombay) for protection from heat or cold on the hills or plains; a simple waterproof cover might be kept in the crown of it for use, as occasion required. For under clothing I would suggest the general adoption of flannel; for body clothing, the total rejection of scarlet, and adoption of khakee (of cotton drill, or coarse brown holland) for drill purposes and all ordinary duties; adoption of a cloth tunic for full dress, general guards, or field service, its colour to resemble that in use in the Bavarian army, or some tinge of khakee. Socks of woollen to be used at such seasons, as dew or rain fall would expose the feet to damp; or on the line of march loose trousers and leather gaiters; all necessary belts to be of simply browned leather. Natives might wear the khakee if supplied with a simply-made flannel jacket or vest to wear under the thinner one. They would not object, either, to a felt helmet, I am disposed to think; but, as before stated, I am of opinion that a Zouave style of dress would best meet their wishes and requirements. At present they wear on guard the drill dress, and for wet weather they have a boat cloak; their topee, being waterproof, needs no protection. Sentries in exposed places have a sentry box; but under ordinary circumstances no special protection from heat is needed by, or provided for them.
Duties.	1. Looking at this question in a medical point of view, I see no necessity, under ordinary requirements of the service, for the arrival of troops in India with a thorough knowledge of drill, while it appears to me that men are better situated for the process of gradual acclimation, during the time employed in teaching them their drill, than they would be if they landed in a condition that would justify the putting them immediately on the roster for general duties with their older comrades. 2. The following is the routine of the soldier's duties:—In the drill season, from September to March, drill five times a week (for recruits morning and evening), independent of the routine of garrison duties and roll calls. Drill generally lasts about 1½ hours, and the men do not appear to suffer in health from it. The best times for drills and parades are about the hours of sunrise and sunset. The best time to commence a march seems to be about one or two hours before sunrise, according to the length of march. Orders on the subject of "marches" are published in "General Regulations," at pp. 330, *et seq.* The men at this station have from five to six nights in bed during the week. 3. Guards are all mounted within one, or at the most, two furlongs of the barracks; guards last 24 hours. Sentries are relieved every two hours. There is a roll call at 7.30 a.m., daily, for "arms' cleaning," and in the evening one at 5.30, or 6 p.m., according to the season. No prejudicial effect seems to result from the routine of night guards; and the usual precautions suffice.
VIII. Instruction and Recreation.	No information under this head.
IX. Military Prisons.	1. The cells for solitary confinement at this station (as I believe is also the case throughout the division), are, in one respect, defectively constructed. They consist of a square mass of substantial masonry, terrace-roofed, with ventilation through four large openings, near the roof on the four walls, and a small central shaft. They are entered by a smaller and somewhat similar structure of the same depth, nearly half its breadth and two-thirds its height, also terraced-roofed. This latter room is usually provided with some receptacle, open for fœcal or urinary deposits, but the odour from such evacuations naturally pervades the larger sleeping apartment, as from its probably heavier nature it is not likely to be readily displaced by air entering from above. Some contrivance should be added to this outer apartment to permit these evacuations being at once deposited on the outside of the cell, and thus, by a closing trap door, obviate the annoyance, at least of their odour pervading the whole interior.

HURRYHUR. MADRAS.

References to Subjects and Queries.	REPLIES.
X. FIELD SERVICE.	1. No reply to this query. 2. The powers of medical officers seem to be, as regards the conduct of the line of march, &c., comparatively inoperative under ordinary circumstances; as generally interference by them would probably be held to be justifiable only when they see any likelihood of ill results ensuing on the carrying out of orders regimentally issued on these topics. Usually a line of march is arranged, and a "route" forwarded by an officer of the quartermaster-general's department, (without reference as I believe to the medical department), the camping grounds are also specially designated by that department. Practically no deviation is usual from an order so received, but commanding officers are vested with discretionary powers to alter these as circumstances may seem to require, and possibly would not do so without the knowledge and concurrence of the medical officer. Usually commanding officers listen to suggestions of medical officers on the propriety or necessity of avoiding given halting places. Such, however, has not always been done. Consequently, an order was issued some five or six years ago, by his Excellency the Commander-in-Chief, directing attention to the necessity of attending to such suggestions. The place assigned to the medical officer on the line of march is the rear of the column, consequently he has no opportunity of ascertaining the nature of the encamping ground before arrival of the column, and therefore, the camp would not perhaps be changed for light reasons, or such as seemed to be so to others. In European regiments, when practicable, a medical officer goes in advance of the column with the sick, and assists the quarter-master in selecting the ground. It might be advisable to allow the medical officer of the native infantry corps, to go forward when the column has moved on, to enable him to get in sufficiently early before its arrival, to see and form an opinion of the nature of the ground proposed to be taken up. All the ordinary contingencies of a march might be well enough attended to by a medical subordinate. 3. The practical operation of camp regulations, &c., is supposed to be especially under the conduct of regimental quartermasters, who are considered responsible for the sanitary arrangements, &c., on the line of march as they are in cantonment. The powers of the medical officer in these matters are merely nominal, consisting in representations of what in his judgment requires attention, and remonstrances proving of no avail reference to higher authority. 4. Nearly all arrangements for field hospitals, ambulances, &c., are made by the quartermaster general's department, by which office a code of regulations is issued for general guidance. The necessary indents on that department are made out, and forwarded by the quarter-master of the regiment, with the exception of such extra carriage as is provided for by the medical regulations, from which an extract is appended.

EXTRACT FROM CODE OF MEDICAL REGULATIONS, MADRAS.

"The carriage of all hospital stores, including medicines and instruments, will be provided for by the commissariat, at the expense of Government, upon indents countersigned by the superintending surgeon or in his absence by the officer commanding. Duplicates of these indents shall be forwarded by the superintending surgeon to the medical board; and the responsibility will rest upon the indenting officer, until his requisition has received the sanction of that authority. The duplicate indent, when sanctioned shall be returned to the the superintending surgeon for the purpose of being delivered to the commissariat officer, and will be the proper voucher for the supply.

	Ft.	In.	
Length -	3	9	Whenever it becomes necessary to indent for boxes for the carriage of medicines on carts, boxes of dimensions of a six dozen chest as noted in the margin, with padlocks and hinges shall invariably be indented for as being more easily procurable.
Breadth -	1	6	
Depth -	1	6	

"All regiments, European and native, will be provided at the public expense with field medicine chests for the conveyance of the European medicines, &c., when marching or on active service; and detachments either of European or native troops marching from station to station will be supplied with portable medicine boxes Nos. 1 and 2.

"Indents for carts or coolies for the carriage of medicines, &c., submitted to the medical board for sanction must be prepared agreeable to the following form, and superintending surgeons are prohibited from forwarding indents which are not in strict accordance with the form here laid down.

To Captain

Assistant Commissary General.

SIR,

Please to order the following supply for the carriage of medicines, &c., for the use of the Regiment N.I., proceeding from to effective strength.

Description of Carriage wanted.	Number or Quantity.	Required for the Conveyance of	Sanctioned by Superintending Surgeon.	REMARKS.

Station A.B. Surgeon.

Date C.D. Superintending Surgeon.

N.B.—Any further explanations that may be deemed necessary should be entered in the column of remarks, or at the foot of the indent.

References to Subjects and Queries.	Replies.

"Detachments either of European or native troops, moving from station to station will be supplied with medicines for the march, from the depôts of medical stores at the presidency and out-stations, packed in portable medicine boxes, agreeable to a scale fixed by the medical board, and furnished to the medical and deputy medical storekeepers.

"Coolies shall be provided for the carriage of medicines, with all parties of European or native troops, moving from station to station, less than complete corps, but which are sufficiently large to be under the charge of a medical officer in the following proportions, viz., with all detachments consisting of—

Europeans.	Natives.	Coolies.
25 to 75	50 to 150	1
75 to 250	150 to 400	2
250 to 350		3

The above coolies to be supplied in the same manner and under the same forms as prescribed for the carriage of the portable medicine chests attached to corps in the regulations for the quarter-master general's department.

"In detachments, either European or native, less than the above, where the assistance of a medical attendant may be necessary, one cooly for the carriage of medicines shall be supplied.

"When detachments march from the presidency or other stations where public depôts of medicines are maintained, the medical storekeeper at the former, and the deputy medical storekeepers at the latter, are to be charged with the duty of indenting for the carriage authorized by the paragraphs 28, 29, and 30. At other places the duty is to be performed by the surgeon or assistant surgeon proceeding in charge of the detachment, or, in cases where medical attendants of inferior rank only are ordered, by the garrison or other surgeon who may have been in previous charge of the troops about to march.

"Indents for coolies for detachments of regiments should bear upon them the particular duty of each cooly employed, and the nature and weight of carriage conveyed by him.

"On the arrival of detachments at their respective destinations, the boxes with the remains of the supply of medicines will be delivered over to the medical or deputy medical storekeeper, as the case may be, or, at stations where there is no depôt of medical stores, to the senior medical officer present. These medicines to be brought on the hospital books of the medical officers, by whom they are received and accounted for under the head 'Received by Transfer from Detachments."

A true extract.

JAMES PETERKIN, M.D.,
Surgeon of the 16th regiment of Madras N.I.

XI. Statistics of Sickness and Mortality.

No information under this head is given.

XII. Hospitals.

1. A plan of the hospital at this station is transmitted.

2. The hospital is situated in the rear (west) of the sepoys' lines, with an open space of about 100 feet intervening. The bazaar is to the rear (west) of the hospital, stretching away from it on either flank; but there is an open square in the immediate rear of the hospital, used as a market place for supplies brought in from the surrounding country once a week. The site of the hospital is sufficiently open and ventilated, and, although buildings have been erected somewhat too closely on either flank, there are open spaces in front and rear of it, the former 966 feet long and 127 feet broad, and the latter 238 feet long and 236 feet broad. The site is generally healthy, being on the highest part of the space in which it is situated. The surface water from rain-fall runs off on all sides, though there is no special drainage for that purpose. There are no nuisances from marshes, foul ground, water pits, &c., experienced at this station.

3. The water supply is abundant and wholesome, and for drinking purposes is procured by puckallies from the river. There are close at hand, one on either flank to its front, in the space between it and the lines, two fine "bowries," well supplied with water for cleansing purposes, but, being saline, it is not fit for drinking.

4. Refuse water and other fluid impurities are allowed to flow into the cesspit attached to the hospital privy. Solid impurities are swept up and removed daily to some distance from the lines. The cesspit is in the immediate rear of the hospital enclosure, and has no external outlet.

5. The several wards are all on the ground-floor, which is raised a foot and a half from the level of the area in front, and two feet above that in rear of the hospital. There are no underground openings or ventiducts. No provision for the conveying away of roof water is necessary, as the ground slopes away on all sides, and the water runs off without sinking into the subsoil. There is no surface drainage or guttering round the hospital. The walls and pillars of the hospital are built of brick and chunam, the roof of teak wood tiled, the floor of stone flags, and the compound wall brick and clay, plastered with chunam. The walls and roof are single, with verandahs sufficient to keep out excessive heat. There is a verandah all round the hospital, eight feet and a quarter deep, which at the four corners is enclosed to form a surgery, store room, bath room, and dissecting room; the last two occasionally used for contagious cases or others when the number of sick is large. The verandah affords sufficient shelter from the sun's rays to the central ward. The two small corner rooms adverted to are the only parts of the verandah used for sick, &c. The building is all on the ground-floor.

HURRYHUR. MADRAS.

References to Subjects and Queries. | REPLIES.

Table of Hospital Accommodation.
Total number of wards—1 large and 2 smaller ones in time of need available.
Total regulation number of beds - - - - - - 40

Number of Hospital Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet.	Feet. In.	Feet.					Feet. In.	Feet. In.
Centre ward -	36	131 3	18	12 0 side-walls, 17 5 ridge.	44,755	1243	65½	1½	16 doors	7 0	4 0
Surgery - -	—	19 6	8	9 9	1568	—	—	—	1 door 3 windows	7 0 4 4	3 0 3 5
Stores - - -	—	—	—	—	—	—	—	—	—	—	—
Bath room - -	2	—	—	9 9 outer wall, 11 6 inner.	1568	784	80	1½	—	—	—
Dissecting room	2	—	—	—	—	—	—	—	—	—	—
Cook room - -	—	12 0	8	8 8	—	—	—	—	1 door	—	—
Necessary - -	—	—	—	—	—	—	—	—	—	—	—

XII. Hospitals—*cont.*

The principal winds are easterly or westerly, and sweep across the hospital, necessitating occasionally the closing of all the doors on one side when blowing strongly. This is inconvenient, as there are no windows to the central ward. There are only glass windows to the surgery and store room. These, while conducive in some degree to ventilation, contribute in no wise to the cooling, as they are too low to let out upper currents of heated air.

6. The numerous doors, with the openings in the ridge of the roof, are sufficient for the ventilation of the wards. The upper halves of the doors are constructed after the fashion of Venetian blinds, of a succession of horizontal flaps, preventing the passage of air or light when allowed to fall vertically over each other, but admitting their passage from below horizontally, or from above downwards, according to the degree in which they are made to revolve horizontally on their axes. The windows of the bath and dissecting rooms are constructed in a similar way.

7, 8. There are no artificial means for cooling or warming the air admitted into the wards. There are no prescribed periods for limewashing the walls and ceilings of the hospital; but it is done as often as the medical officer may deem expedient either for cleanliness of aspect or with reference to any recent epidemic disease.

9. The privy is an oblong partially double roofed, pent tiled building of brick and chunam 12 feet by 8 feet, and 9 feet high, with openings at the upper part of each gable end. The central part of the roof is elevated about a foot above the general level of the ends, to admit of more complete top ventilation. At the back part of the floor (which inclines well from before backwards, and is flagged with stone) is a long wooden bench perforated with openings, beneath each of which is placed an earthen vessel for the reception of stools. Urine is passed at once into the channel at one end, communicating with the cesspit. The use of a cesspit where it is avoidable is objectionable, but the situation of the hospital renders one necessary. The solid matter is carried away daily, and the free washing of the privy floor into the cesspit seems to prevent its being very offensive.

10. With natives there are no special lavatory arrangements. As much water as the sick require is furnished to them, and occasionally convalescents are allowed to go to their houses for a short time to bathe. Bathing with natives is usually synonymous with presumed restoration to health, and the process of washing which of their own accord usually satisfies them while in hospital, is of the most superficial and unsatisfactory nature to the views of an European.

11. Natives object to bathing except in their own way, consequently it is seldom resorted to except as a remedial measure. For that purpose there is a wooden bathing tub, and a bath of brick and chunam which are sufficient. Hip and foot baths of wood are also available.

12. The washing of the linen is done by the hospital dhobie at the river, half a mile distant. The means are sufficient for the demand.

13. The storage is sufficient, and dry.

14. The bedsteads are wooden frames painted white, and laced with broad tapes to support the bedding, which consists of a blue indigo dyed mattress, filled with straw, when necessary a quilted cotton counterpane, and a pillow stuffed with straw and a pillow case. In such cases as require it woollen "cumblies" are available as extra warm coverings.

15. Natives prepare their own diets, or have it prepared by a relative. The kitchen of a native hospital is consequently almost exclusively used for the preparation of poultices, &c.

16. Copies of diet tables are forwarded.

17. The hospital attendants are, a standing hospital havildar to maintain discipline, &c., and also a daily orderly private. All those sick who require it have orderlies to attend on them as long as such aid is indispensable. The system operates very well, and seems to be sufficient for the purpose.

18. The general sanitary condition of the hospital is good. A peculiar form of ulcer, though not in its intrinsic nature at all serious, prevailed some months ago. I strove in vain to arrive at the probable cause of it, thinking probably it might be due to some carelessness in dressing wounds, but notwithstanding all my endeavours to elucidate the true cause, I could not satisfy myself on that point. It has long since ceased to exist, or has become inoperative.

19. It would I think be a great improvement in every way to the hospital if the first, third, and fifth doors in front and rear were dispensed with, and in their stead glazed windows placed as high up in the walls as possible. In this way by filling up the lower parts of the doorways space would be given for six more beds, while light and ventilation might at all times be increased.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	20. Convalescents are sent out with a non-commissioned officer, if such be in hospital, or in charge of the oldest or steadiest private. The time and place for their walking exercise being prescribed, they only go out morning and evening when shaded walks and seats are not required. 21. It is supposed to be the special duty of native dressers, under the general superintendence and knowledge of the medical officer, to attend to the native "Followers." Occasionally severe or dangerous cases are visited by the medical officer, or admitted into hospital. Such cases are usually kept in the room called the dissecting room (seldom used for such a purpose), and their own relatives are allowed to attend on them. There is also a large supplementary temporary building which was erected some months ago for the reception of cases of cholera. These arrangements are sufficient. 22. No reply to this query. 23. With regard to repairs of building, &c., in the hospital, the medical officer has in general only to make known to the officer commanding the regiment what is necessary, and it receives early, if not immediate attention. For hospital comforts he requires the sanction of the superintending surgeon, and then procures them through the commissariat, excepting such as are provided periodically on monthly indents. The scale of hospital comforts ought to be increased for native sick; the medical officer often having to supply bread, meat, soup, and milk, which are not allowed by the present regulations, at his own expense, or that of officers willing to aid him in doing so. 24. No wards or hospitals for convalescents exist, nor do they appear necessary.
XIII. Burial of the Dead.	1. The burial ground used for British troops is at the north-east corner of the cantonment, and between 200 and 300 yards from the nearest officers' quarters. It is, consequently, during the prevalence of the north-east monsoon to the windward of the cantonment; at most other times it is to the leeward. The station being seldom occupied by British troops, the principal persons buried there are European officers of native regiments, or an occasional native Protestant Christian. The ground has never been consecrated. 2. Its area is between 30 and 40 yards square. Its soil is gravel, aggregated by a stiff clayey matrix, and beneath it probably decomposing syenite. The ground is enclosed by a good wall, and carefully kept, but there is no drainage. I should think that decomposition takes place but slowly from the dry nature of the soil. 3. There are no regulations as to grave space. The ground is about half filled. Graves are generally four or five feet deep, and are never reopened. In tropical countries decomposition takes place so rapidly that interment takes place, if possible, not later than 12 hours after death. 4. The grave-yard is never offensive. 5. Mussulmans have a burial ground on the bank of the river, half a mile to the west of the south flank of the cantonment. Hindoos are either burnt or buried in the bed of the river, in the rear of the north flank of the lines, but lower down the river. There is a small Roman Catholic burial ground, about a furlong from the regimental lines, on its south flank or in the south-west corner of the cantonment. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements in the manner of disposal after death to be suggested.

(Signed) James Peterkin, M.D., Surgeon, 16th Regiment M.N.I.
G. Carr, Lieutenant-Col. Commanding Station of Hurryhur.

March 9, 1860.

MANGALORE.

Accommodation—Native Troops. { Artillery - - One-third Company.
Infantry - - 8th and 51st Regiment M.N.I.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is undulating, wooded, hilly, and dry, with wet cultivation in the valleys; there are cocoa-nut plantations and two rivers within three miles. 2. The elevation of the station above the sea is about 40 feet, and about from 70 to 100 feet below the mean elevation of the adjacent country. There is higher and healthier ground near the station, a portion of which has been allotted for the lines of a second regiment. The country generally, though higher than the cantonment, is of an undulating and broken character, much intersected by streams and cultivated valleys. 3. The nearest mountain or table land is about 50 miles to the Mysore country in a direct line, and 80 miles by the nearest road. The Mysore table land is about 2,500 feet above the sea. 4. The nearest water is the sea at Mangalore harbour distant about a quarter of a mile from the station; there are also two rivers, one on the north, the other on the south, within 3 miles. The vicinity is not liable to overflow. There is no broken ground, ravines, or water pits near. 5. The station is tolerably open to the sea, but shut in on the land by cocoa-nut plantations and higher ground. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. The station is exposed to land and sea breezes. 6. All the valleys are richly cultivated. There are no works of irrigation. The cultivation of rice is not prohibited. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The town of Mangalore is within a quarter of a mile.

MANGALORE.
MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	8. The heights are of varied geological structure capped with laterite, with narrow valleys of rich alluvium. The present cantonment stands upon ground probably occupied by native population in former times. 9. Water is usually found at a depth of 20 or 25 feet below the surface during the dry season, and 10 or 12 feet during the rainy season. 10. The rainfall or water from surface springs flows readily away. There is no adjacent higher ground, the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from wells, and is not stored in open tanks. There are no tanks. 12. The water is good and abundant, but its chemical composition has not been ascertained, and is raised by hand. 13. There are no other topographical points bearing on the health of the station not included in the foregoing replies. 14. New stations are selected by the Commander-in-Chief and his Quartermaster-General's Department in communication with the medical authorities and the Engineer's Department.
II. CLIMATE.	1. There are no means or instruments available at the military station for conducting and registering meteorological observations. 3. I have no observations to offer with regard to the character of the climate, or as to its influence upon the health of the troops. 4. The site chosen for a new cantonment is more conducive to health than that of the present one. 5. The stations at which I have served are Palamcottah, Quilon, Trichinopoly, Paulyhurst, Cannanore, Secunderabad, Sholapore, Kulladghee, Madras, Penang, Vellore, Mangalore. To the best of my recollection the latter station is the most trying to native troops. The climate is debilitating.
III. SANITARY CONDITION OF STATION.	3. There are no European troops or barracks at this station. 17. Hitherto surface cleansing has been performed solely by the heavy rains falling from May to September, but authority has now been granted to the officer commanding the station to entertain scavengers' carts, and sweepers. 18. The surface of the cantonment is kept free from vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station, bazaar, &c. 19. Save 5 or 6 stalls, the bazaars are in the adjacent native town. Within the military cantonment the ground is patrolled, to prevent nuisances. No camp followers are resident therein (save the relations of sepoys living in regimental lines), except the small proportion of the officers' servants, who sleep in their master's compounds. There are no public latrines, but directions to apply for sanction to erect such have just been given by Government. The condition of the native houses generally is good and clean. 20. No nuisance is experienced from the condition of the slaughtering places. 21. There are no horses in the station. 22. There are no artillery or cavalry stables, or picketing grounds. 23. No reply to this query.
Officers' Quarters.	1. The condition of the officers' quarters is generally good and well drained. I have no improvements to suggest with regard to them.
IV. HEALTH OF THE TROOPS.	1. The station, generally speaking, is healthy, and the adjoining native population is generally healthy. 2. The most frequent disease is fever, frequently attended with enlargement of the spleen. 3. I know of no particular circumstance to which the healthiness or unhealthiness of the neighbouring native population is to be attributed. 4. The last station at which the detachment of artillery were located was St. Thomas's Mount, but the time they were resident there is not known. Left it and arrived at Mangalore in 1858. The last station of 8th Regiment Native Infantry was Tongoo, where they remained for three years, which place they left, arriving in Mangalore in November and December 1858. The state of health and chief diseases of Tongoo were,—stomach and bowel diseases, fevers, ulcers, and rheumatism, with dropsy. The chief diseases at Mangalore were—mild fevers, rheumatism, diarrhœa, ulcers, and catarrhal complaints. The last station of 51st Regiment Native Infantry was Palamcotta, where they remained a year and half; left it and arrived at Mangalore in December 1858, the state of health and chief diseases being, health generally good, suffering from fever, dysentery, and diarrhœa. The chief diseases at Mangalore being fever, dysentery, and diarrhœa. 5. The troops at the station are not camped out. 6. I have not been in charge of troops at hill stations. 7. I have had no means of observing the liability of troops residing at hill stations to febrile and other diseases on returning to the plains. 8. I approve of good elevated sites for stations for troops. 9. I am not aware of any diseases to which troops are liable to be attacked on going to hill stations. 10. A flannel cummerbund should invariably be worn on proceeding from the plains to hill stations. 11. The best seasons adapted for residence at hill stations are immediately before and after the commencement of the monsoon; and the shortest period of residence to benefit the health of troops should be not less than from 1 year to 18 months. 12. No experience of hill stations. 13. Care should be taken not to allow troops leaving hill stations for the plains to be exposed to the night air; diet should also be particularly attended to. 14. European troops should, as far as the service admits, be located on hill stations. When required for service in the plains they would, in my opinion, be better able to undergo fatigue and exposure. I consider an occasional change of station on the plains most beneficial to all. 15. As well as I remember the barracks at Jackatalla are sufficient for the health and comfort of the troops. 16. No experience at hill stations.

References to Subjects and Queries.	Replies.
IV. Health of Troops—*cont.*	17. There is no higher ground near the station which could be advantageously occupied as a hill station, except Mercara in Cavoy. 18. Cannot say what is the most suitable soil for stations. 19. The best age for soldiers proceeding to India would be from 18 to 20 years, and the best period for landing is in what is usually termed the cold season. 20. I think it would be a good plan to send young soldiers as soon as possible after landing to some hill district. I cannot, however, speak from experience. 21. The mode of transport of troops is by marching them early in the morning from one encamping ground to another. I know of no other precautions than are at present adopted for preserving the health and comfort of the troops on the route. Railways are making progress, and will no doubt effect a great saving of health and life. On some lines of road the European troops are moved in bullock carriages. Troops of all classes should on the march reach their ground half an hour after sunrise. 22. If a British soldier is temperate in his habits, he can well serve 20 years in India. There are of course exceptional cases. 23. No suggestions to make regarding medical boards. 24. Invalids should leave India so as to arrive in England at the commencement of Midsummer.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at this station. 2. There is not nor has there been scorbutic disease among the troops at the present station. 3. Hepatic disease is very uncommon among native troops. 4. Dracunculus is rare here. 5. The proportion of the constantly sick from venereal diseases to the total sick in the hospital is one per cent. I could not suggest any additional precautions with natives. It is not worth while establishing lock hospitals for native troops. 6. Troops at the station suffer not unfrequently from:— *Fevers* of a quotidian type. *Dysentery.*—Rare. *Cholera.*—Uncertain. *Small-pox.*—Troops here are generally free from small-pox, even when that disease is prevalent around. *Rheumatism.*—Native troops are very liable to rheumatism; especially during the land winds. The proportions which admissions and deaths from these diseases bear to the total admissions and deaths, are as follow; viz.:—

Average for year ending 31st January 1860.

	Admissions.	Deaths.
Fevers	27½ per 100	1 in 4
Dysentery	5 „	None
Cholera	None	None
Small-pox	None	None
Rheumatism	17¾ per 100	None

[o experience in the nosological character of the more frequent zymotic diseases. There is) bazaar or native huts in the station, but many close to it.
'he prevalence of epidemic disease is influenced by the crowding, and insufficient diet of e families on the march, which predisposes to epidemic diseases, such as cholera, &c.
[uinine has not been tried as a prophylactic against malarial diseases.
More cleanliness would tend to prevent or mitigate epidemic disease at the station.

V. Intemperance.	1. There are no European soldiers at the station. The sepoys are generally sober, and there are no confirmed drunkards. 2. Drunkenness is very rare among native troops; it is punished when it occurs as an offence. 3. Distilled spirits are sold in the bazaar. The quality and quantity consumed is not known there being no Europeans. There are no other drinks sold at the canteen or bazaar other than intoxicating drinks, which are injurious to health. 4. It is not conducive to the efficiency and internal discipline of the corps. 5. We think it would be highly beneficial to the health of the troops to restrict or abolish the sale of spirits in the canteens or bazaars. 6. Malt liquors or wines are generally not requisite to maintain good health; the use of spirits is under all circumstances positively injurious to health. 7. Coffee, tea, lemonade, soda water, and similar drinks have a beneficial effect on the health, and are more favorable (when used in moderation and proper quantities) to efficiency and discipline than malt liquors and wine, and decidedly more so than spirits. 8. We think it would be beneficial to the health of European troops to suppress altogether the spirit ration whether for soldiers or convalescents, and to substitute for it beer, tea, or coffee, &c. 9. We think it would be beneficial to prohibit the sale of spirituous liquors in the canteens. 10. I have no recommendations to make on these points, other than in the foregoing replies. 11. There are no canteen or bazaar regulations on these subjects.
IX. Military Prisons.	1. The cells for native troops at this station are bad, low, very confined, and ill ventilated.
X. Field Service.	1. There are no regulations for field medical service not included in the General Presidency Regulations. 2. The practical working powers of the medical officers depend in a great measure upon the commanding officers. 3. I cannot suggest any change in the practical operation of the regulations for preservation of the health of the troops as to the selection of camping grounds and general sanitary regulations. 4. Regulations adopted in the Presidency for field hospitals, ambulances, transport of sick, and of hospital supplies, can be supplied by the Quartermaster-General's Department.
XI. Statistics of Sickness and Mortality. I.A.	No information under this head is afforded.

MANGALORE. MADRAS.

Reference to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	2. There are no European barracks or stables for troop horses in the station. A large number of public cattle are kept at one spot within the station, fully 400 yards from the hospital and not in the direction of any prevailing wind. The hospital is within 80 yards of a bazaar, where fish and vegetables are sold. The site of the hospital is freely ventilated; in the rear, and close to the hospital, are low native huts and tall trees. The remaining three sides are open and freely ventilated. It is is quite free from all nuisances depending on water or marsh. 3. The water supply is abundant and wholesome. 4. Refuse water and other impurities are removed by means of a sink and closed drain, the latter having its outlet much below the level of the hospital at about 120 yards off. 5. Both wards are on a level of four feet from the ground, and there is no ventilation under the floors, which are of masonry. Roof water runs off of itself. Percolation hardly takes place at all on a laterite ridge such as the hospital stands on. The surface drainage is left to nature and is sufficient to carry off the heaviest rainfall with rapidity. The hospital is built of laterite stone, in mortar. The roofs and walls are single, but thick enough to keep the interior cool. A verandah runs along the whole range of walls inside and outside the building. It is 10 feet broad and amply sufficient, and the sick and convalescent have free access thereto. The hospital consists of one flat only. Total number of wards, 2. Total number of beds, 56.

Number of Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height of Opening.	Width of Opening.
		Feet.	Feet.	Feet.	Feet.	Feet.	Square feet.	Feet.		Feet.	Feet.
Measurements, &c., same for both wards.	Space for 28 cots.	72	30	14	30,840	1,101½	77	2	8	5	5
										Doors.	
									3	7	4

The hospital receives the full benefit of prevailing winds. The windows open outwards and their arrangement and construction are conducive to ventilation and coolness.

6. The wards are ventilated by the windows and doors, which is sufficient. Jhilmils are constructed in the body of the shutter from top to bottom.
7. There are no means in use for cooling the air admitted into the ward.
8. No means for warming necessary. The walls and ceilings of the wards are cleansed and lime-washed once a year, but oftener if required by the medical officer.
9. There is one privy to each ward in the corners inside the hospital yard. They open into a covered drain. Lime is thrown down, and the drain is flushed with water every morning. They are not offensive since openings have been pierced in the walls and a dormer ventilator placed in the roof of each.
10. There are no lavatories.
11. The means of bathing for the sick is a large wooden tub,—one to each ward—which is sufficient and convenient.
12. The washing and drying of the hospital is done by means of the dhoby.
13. There is no storage for linen.
14. All hospital cots should be iron and of light configuration. There are a few such in hospital, but the greater number are of the old wooden muster, and there is no bedding.
15. There is a convenient cook room forming the rear of the hospital range, used only for medical preparations, as there are no European troops in garrison.
16. The diet tables, diet rolls and all other returns, required for working the internal economy of the hospital, are the same as those laid down for the army in general.
17. The attendance on the sick is supplied by a hospital havildar in each ward, detailed from the effective strength of the garrison,—orderlies are detailed on requisition from the medical officer—and is sufficient
18. The sanitary condition of the hospital is good; no epidemic disease, gangrene or pyæmia, has ever made its appearance.
19. I can suggest no improvements.
20. Convalescents are allowed to go to their houses, parading once a day at hospital.
21. Native regiments do not come under the provision for treatment of soldiers' sick wives and children, and no improvement is necessary in the present arrangements.
22. There are no regulations enforced at the station which are not included in the General Presidency Medical Regulations.
23. The medical officer may recommend anything he thinks fit, both as regards diet and medical comforts.
24. There are no convalescent wards or hospital at the station.

XIII. BURIAL OF THE DEAD.

1. The burial ground used by British troops is close to the station on the land-wind side.
2. The area is 5,000 square yards.
   Soil and sub-soil: hard laterite.
   Drainage: perfect.
   The rate of decomposition is unknown and the ground is carefully kept.
3. The grave space allowed is eight feet from end to end, and the graves range side by side as near as practicable. The depth is four and a half to five feet, and the graves are never re-opened.
   There is no regulation as to period of interment after death, but it generally takes place the same afternoon or the succeeding morning.
   The same remark applies to native troops.
4. The European grave yard is never offensive, it is enclosed by a wall.
5. The dead of the camp-followers or bazaar people are disposed of by burial.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	6. The native graves are shallow, and the grave yards—Roman Catholic, Hindoo, and Mussulman—in contact with the native town; some are in the heart of it, which, no doubt, affects health. 7. I would suggest that native burial grounds should be removed further from the population.

(Signed) TH. T. PEARS, Colonel, Madras Engineers, District Engineer of South Canara.
J. M. MADDEN, Lieutenant-Colonel, Commanding Mangalore.
B. S. CHIMMO, Surgeon, Madras Army, Senior Medical Officer in Garrison.

29th February 1860.

COCHIN.

Accommodation :—Native Troops - Infantry - { 160 Rank and File, with Commissioned and Non-commissioned Officers in proportion.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The surrounding country is low and sandy, and covered with cocoa-nut topes. It is flat and surrounded with water. 2. The elevation of the station above the sea is about 4 feet. There is no higher or healthier ground, in British territory, adjoining the station. 3. The nearest high ground is about 30 miles distant from the station. The hills rise to a height of 6,000 feet above the level of the sea. 4. The station is surrounded with water, the sea being on one side and the backwater on the other. The vicinity is not liable to overflow of water. Near the station is the old fort ditch, which is in a swampy state and ought to be filled up. 5. The station is open, but inside the fort the old rampart rather impedes the ventilation. The temperature of the station is decidedly raised by the exposure of the buildings to reflected sun heat. The station is exposed to cold and variable winds from the land side during the dry season, beginning in November about 7 p.m. and gradually becoming later until in February its commencement is about 2 a.m. During the continuance of these winds rheumatism, elephantiasis, and fever are very prevalent. The sea breeze is also unhealthy, which is probably due to the elements of malaria having been carried out to sea and returned with the sea breeze. 6. The surrounding country is cultivated, being covered with plantations of cocoa-nut trees. There are no works of irrigation near the station. There is no cultivation of rice, although no prohibition exists, nor of indigo, neither is the preparation of hemp or flax carried on near the station. 7. There is a native town about 2 miles across the water at Ernacotum. 8. The surface and soil of the district is sandy. The ground on which the station stands was formerly occupied by the Dutch or Portuguese, but to what extent their native town extended beyond the fortification I am unable to state. 9. During the dry season water is found from 4 to 6 feet below the surface, and from 3 to 5 feet during the rainy season. 10. The rain-fall and water sinks into the pervious sandy soil. 11. The water supply of the station is derived in part from wells, which from the unclean state of the privies have become unfit for use. That for drinking purposes is brought daily from Alwaye, 18 miles off. There is one tank, which is used by the sepoys; it is generally well supplied with water. The plants and animals contained in the tank are those which usually exist in tanks filled during the monsoon and left to themselves in the dry weather. The water in the tank is used for drinking purposes and also for bathing. With regard to the pollution of the water in the tank, it depends upon the season of the year. During the monsoon the water is good, but in the dry season it often becomes impure from stagnation and vegetation. No nuisance or malaria apparently proceeds from the tank. 12. Water may be had at the station in any quantity but its quality is not good. It is brackish and injurious to health. Those who do not get water from Alwaye obtain it from the sepoy tank or from the wells. 13. No reply. 14. Cannot say by whom or after what amount of examination new stations are selected. No new station should be permanently occupied until after one year's trial at least by competent persons.
II. CLIMATE.	1. The meteorological instruments at the station are one thermometer and an aneroid barometer which is unserviceable. There is also a pluviometer. 2. No meteorological table transmitted. 3. The climate is variable; the breeze from the land, owing to its coming over a large expanse of water, is moist and chilly. It is occasionally very sultry. The climate appears to occasion rheumatic affections amongst those troops exposed to the night air.

COCHIN.
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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	The following comparative table of deaths amongst the civil population for each month is based on an average of the years 1855–56–57 and part of 1859–60, and will show the most healthy and the most unhealthy months at the station. The population is about 11,326.

Deaths, Average.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
Non-epidemics - -	25¾	26¾	28⅔	24⅔	30¼	26⅓	35	36⅔	32¼	30	23¾	27½
Epidemics - - -	14¼	11¾	15⅓	6	5⅓	2⅔	3⅔	2	26	11	7¾	11
All causes - - -	40	38½	54	30⅔	35⅓	29	38⅔	38⅔	58¼	41	31½	38½

The epidemics in 1855–56–57 were small-pox; in 1859–60, cholera. The prevailing diseases in the unhealthy months are those of the bowels.

4. If Cochin were kept moderately clean it is very improbable a more healthy place could be found near the station.

5. The stations at which I have served are Rangoon and Burmah, Bangalore, the Mount, Poonamalee, Jackatalla, Bellary, Bolarum, and Aurungabad. The two last are by far the most healthy. Rangoon and Burmah are very moist, which conjoined with great heat affected the liver and bowels. At Bangalore, native troops predisposed to fever suffer severely. The Mount and Poonamalee are pretty healthy. Jackatalla is a good station for men who do not drink.

III. SANITARY CONDITION OF STATION.

1, 2, 3. No map or plan of the station is transmitted. A ground plan of the barracks is sent.

4 to 8. No replies to these queries.

9. The barracks are constructed of laterite in chuman, with tiled roofs. The huts are constructed of bamboo mats with cudjan roofs. The base is filled with hard material and coated with chunam 1½ inches thick; the floors are raised about 2 feet above the level of the ground. No air passes underneath.

11. The barracks and cantonment are kept in repair by the Fiscal of Cochin. All public buildings are limewashed once a year.

12, 13. No reply as to lavatories, &c., and barrack cook-houses. The sepoys wash their clothes in the sepoy tank, and dry them at its sides.

14, 15, 16. No replies to these queries.

There is a very foul ditch caused by the engineer's department having removed the old rampart, to obtain the stones for the purpose of mending the roads. A ditch has been thus made, which is employed as a public privy.

17. Within what is called the fort, the road and parade is kept pretty clean; but the old rampart, the sides of the road, and every odd corner, are in the most disgusting condition; cleansing is hardly attempted. The refuse should be removed to the sea beach.

18. The surface of the cantonment is only kept free of vegetation by the cattle, which are allowed to roam all over it, and sometimes the convicts cut down the larger weeds. The remains of the old rampart on the land side, which is the receptacle of all kinds of filth, impedes the sea breeze from coming to the sepoy lines, and should be levelled.

19. The sanitary condition of the bazaar is as bad as it could possibly be; cleanliness is unknown, and there is no drainage. The streets are used as privies without hindrance. No regulation for preserving cleanliness is attempted. The suggestions of the civil surgeon to the joint magistrates meet with no attention whatever. Either the opinion of the medical officer should be taken, or reasons for the contrary course placed on record. The native houses are in a filthy condition, especially those of the Moptahs; their compounds are used as receptacles for filth. A small village of native Protestants was most injudiciously permitted to be erected between the sea and the sepoy lines. It is a most unhealthy row of houses, and in a bad situation. It would be a great benefit if they were removed and erected elsewhere, further from Cochin.

20. Animals are slaughtered in the bazaar. No regulations are in force on the subject. The offal used to be thrown down in a moist ditch, close to the Civil Government Dispensary. All animals should be slaughtered on the sea beach, and the offal buried there.

21, 22, 23. No replies to these queries.

Officers' Quarters.

1. No reply under this head.

IV. HEALTH OF TROOPS.

1. The station, district, and native population are generally healthy.
2. The disease most prevalent among the native population is elephantiasis Arabum, or Cochin leg, which fatal disease generally terminates by dropsy. Spleen disease is unknown.
3. Unhealthiness amongst the native population is attributable to their filthy habits and deficient sanitary police.
4. The troops at this station were previously stationed at Madras, where they had been for some months. No portion of the men's accommodation at Cochin is more unhealthy than the rest.
5. Troops are never camped out.
6. With regard to hill stations, I have done duty at Jackatalla with H. M.'s 74th. They suffered from dysentery, which appeared to me to be due to drinking freely, and being crowded in barracks.
7. No experience as to whether long residence on hill stations renders troops more or less liable to febrile and other diseases on returning to the plains.
8. I decidedly approve of hill stations for the generality of European troops, but there are many exceptions.
9. The diseases to which troops are liable on going to hill stations are diarrhœa, and less frequently dysentery and hepatitis, whilst rheumatism, phthisis, and secondary syphilis appear to be severe there.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	10. No reply. 11. The best season for residence on hill stations is the cold dry months, and the shortest period of residence to enable troops to receive the benefit of it, is from 10 to 12 months. 12. If Europeans from cold climates suffer less from disease in India than soldiers who have been long in the tropics, I should not be inclined to believe that a prolonged residence on the hills would be detrimental to subsequent service on the plains. 14. My own experience, from having served with troops in the hills, is, that European troops from cold climates do not stand fatigue like seasoned Europeans, and consequently, service on the plains, with short periods of change to hill stations, would be most conducive to the health of troops, should they have to go on service in the plains. Frequent change of service on the plains causes great dissatisfaction from the expense it entails, and thus depresses the spirits and tells upon the health. 15. No reply to this query. 16. No experience of the elevation above the sea most suitable for hill stations. 17. There is no higher ground in British territory, which could be advantageously occupied as a hill station nearer than the Neilgherries. 18. The most unhealthy soil for stations is the black cotton soil. 19. The best age for soldiers proceeding to India is from 22 to 28 years. They should land in India after the hot season has subsided. They should be sent at once to their regiments or to hill depôts. 20. Troops should be sent direct from the home depôts to India. I have done duty with two of Her Majesty's regiments from the Cape, and they appeared as liable to disease as men direct from Europe. On landing, troops should be sent to hill depôts, if such were established. 21. Troops are transported from the port to the interior by rail for a short distance, but generally by marching stage by stage. 22. The number of years a British soldier should serve in India is about 10. 23. In the conduct of the business of the medical boards I have never known a conflict of opinion as regarded invaliding. In pensioning sepoys the present plan is most unsatisfactory; they commence, if not promoted, skulking into hospital after about 15 years' service, and so on, till they get pensioned. A better plan would be to send all into the invalid battalions unless they have served 40 years or lost a limb, and never pension a man direct from his corps or division. All pensioners should be yearly examined in the first two years to see if they get well. 24. No experience as to the best time of year for the departure of invalids leaving India for home.
Diseases.	1. A regular inspection parade takes place when itch is very prevalent, every Tuesday at 5 p.m. 2. There has been no scorbutus among the troops. 3. Hepatic disease is very rare; no admissions for it among the troops for several years. 4. Dracunculus does not exist in this part of India. Sepoys affected with it have come to Cochin from infected localities; but in them it invariably disappears after 12 months' residence. 5. Venereal diseases have occurred to the extent of about 1·7 per cent. of the total sick. Lock hospitals properly managed would be a great boon and save many from being permanently disqualified for the service. 6. During the year ending 1st April 1859, 20 cases of fever are registered by my predecessor as having occurred; viz. ephemeral, 7; quotidian, 8; common continued, 5. These last I have never personally seen amongst natives in Cochin. *Dysentery.*—Two cases in the year. *Cholera.*—Two cases have occurred since 1st April 1859. *Small-pox.*—None. *Rheumatism.*—Nine cases. The proportion of admissions from these diseases to the total admissions and deaths are—

Diseases.	Admissions.	Deaths.	Per cent. of Admissions to Total.
Fevers	20	0	17·0
Dysentery	2	0	1·7
Cholera	0	0	0·0
Small-pox	0	0	0·0
Rheumatism	9	0	7·7

7. The most frequent zymotic diseases are small-pox and cholera. The former is most prevalent during the cold dry months of January, February, and March, and the latter from August to January. The climatic and atmospheric conditions which precede and accompany these diseases are various. The most low and dirty parts are the most affected by these diseases, where crowded dwellings with filth of all sorts around them abound, and no sanitary precautions worth mentioning are attempted. The troops are cleanly, but the dirty habits of the civil population, their addiction to spirits and fermented liquor, opium eating, and consumption of semi-putrid fish, only makes it wonderful that the mortality is not ten-fold what it is.

8. The prevalence of epidemic disease is not at all influenced by the nature of the soldiers' duties, &c.

9. No experience of small doses of quinine as a prophylactic in malarious diseases, never having seen it tried on large bodies of men, but have given small doses of camphor and quinine as a prophylactic in those diseases with satisfactory results.

COCHIN.
MADRAS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	10. Cleanliness would prevent or mitigate epidemic disease at this station. The natives are allowed to attend to the calls of nature wherever they may happen to be. Large holes exist by the side of the roads, and rubbish is thrown down everywhere, causing the atmosphere at times to be excessively foul. The East Indians and old Dutch inhabitants should not be permitted to have closed privies as at present, and the drains should be taken care of and kept clean.
V. INTEMPERANCE.	1. The soldiers at the station are temperate. 2. Unable to state the proportion of admissions into hospital from diseases caused by intemperance. Drunkenness is always punished as an offence. 3. There are no canteens iu Cochin. Distilled spirits are sold in the bazaars. 4. Spirits are necessary to recovery in some instances, when taken in moderation; but as generally drank by the troops, are the cause of much sickness. Their abolition would be a gain in every way. 5. It would be beneficial to restrict or abolish the spirit ration, provided the soldier could not obtain an inferior spirit in the bazaar; as it is, doing so would probably send him to the native dealers, where he would buy a most deleterious description of spirit. 6. Malt liquors are much more conducive to health than wines, and wines more so than spirits. 7 to 11. No replies to these queries.
X. FIELD SERVICE.	1, 2. With regard to the practical working of the powers of medical officers in reference to the conduct of the line of march, &c., if the commandant pleases, he can adopt and carry out the recommendations of the medical officer. Some commandants send the senior medical officer forward with the quartermaster, to choose the ground. Other commandants detach a few men the night before. 3. The medical officer should, in conjunction with the quartermaster, select the site of camping grounds; the hospital should be to the leeward of the camp, and the tents faced N. and S., to prevent the morning and evening sun from shining in under the kanats of the men's tents. Twenty-five men is too many for the present tents. The tentage for the hospital department is insufficient. The medical officer's powers are laid down in the regulations. The power of the commandant is supreme. 4. The ward coolies are quite insufficient in number for field hospitals, if cholera breaks out; besides which they are apt to abscond. There is a distinct staff attached to the field hospital, under a senior surgeon. The sick are transported in doolies or sick carts.
XI. SICKNESS AND MORTALITY.	No reply under this head.
XII. HOSPITALS.	1. Ground plan of hospital transmitted. 3. The water supply is abundant and wholesome. 4. There are no means of drainage employed to remove the refuse water and impurities. 5. The height of the lowest wards above the ground is 1½ feet. No air passes underneath the floor. The roof water sinks into the subsoil. The verandahs are never used for the accommodation of the sick, convalescents, or others. The hospital is placed so as to receive the benefit of the prevailing winds. 6, 7. No replies to these queries. 8. There are no means of warming the wards. Since my arrival in Cochin 14 months since, I have been unable to get the hospital whitewashed; twice or three times the division has been applied to. It should be done twice a year at least. The wards are cleansed and whitewashed as often as it is necessary. 9. There is no drainage to the privies, nor water supply. One small opening exists through the wall, and urine passing through sinks into the ground outside; the place is frequently very offensive. 10. No reply. 11. Two tubs are used for bathing the sick, and, if properly repaired, would be sufficient. 12. The hospital linen is taken away by the cornicopoly, who gets it cleaned. The present means for that purpose are sufficient. 13. The storage is sufficient, and dry. 14. There are five cots in the hospital. 15. Reference to plan. 16. No reply. 17. The provision for attendance on the sick is as follows:—one hospital orderly and a sweeper. If a sepoy is unable to cook his own food, or requires the attendance of a person to himself, one of his comrades is told off for that purpose. The present plan appears to work well. 18. The position of the hospital is unobjectionable, and no epidemic diseases have broken out in it. 19. The repairs of the hospital are as yet untouched; the building, if left as it is, will probably before long be a ruin. Even whitewashing is not regularly done. The privies are merely one small room, with no place in which the excrements can go to be cleared away, whilst the urine merely flows outside, and sinks into the soil. 20. Convalescents can take exercise outside the hospital, in the parade ground under the trees. 21. The families of sepoys may come into the hospital; if too ill to do so, the medical subordinate goes to the lines to see them, and according to his report, the medical officer goes or not to their hut. No complaints have been made of the present arrangements, and they appear to be satisfactory. 22. The only hospital regulations enforced are those in the medical code in use. 23. The medical officer's powers in matters pertaining to the hospital are confined to complaints to the commandant of the station, for transmission to the division. He cannot repair the building. He can alter the diet, should any European patients be in hospital. He can also order sago, arrowroot, wine, or other medical comforts for sepoys, and they are supplied by the cornicopoly. 24. There are no convalescent wards, nor are they requisite.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial ground in general use is about a mile from the town, and well situated with regard to the prevailing wind. The old burial ground (now closed, except in the case of one or two registered vaults) is within the fort, and the prevailing sea breeze passes over it before reaching most of the houses. 2. Its area is 144 by 136 feet. The subsoil is sea sand; the rain rapidly sinks in. I presume decomposition is rapid. The ground is properly enclosed with neat stone walls, and gate, with lock and key. 3. The grave space allowed is 6 or 7 feet by 2 feet, in the case of common graves; greater width where stone monuments are erected. The ordinary interval is about 2 feet The depth is 5 or 6 feet, the loose nature of the soil, and the certainty of coming to water in abundance at most seasons of the year, rendering it difficult to go to a greater depth. The graves are not usually re-opened, the Protestant population being small. Interment usually takes place 24 hours after death. 4. I am not aware of the new ground ever being offensive to any one. 5. With reference to the dead of camp followers and bazaar people, if they have friends, they bury them in their own burial places; if not, they are carried by the police to an island, about 1¼ miles from Cochin, and interred there. 6. No injury to the public health accrues from the present practice.

March 20, 1860. (Signed) W. Barwise, Captain, Commanding Cochin.
Francis Day, Civil Surgeon.

CUDDAPAH.

Accommodation—Native Troops, Infantry, One complete regiment of Native Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is entirely surrounded by a chain of mountains which rise abruptly from the plains, the sides of which are for the most part covered with jungle; are dry and smoothly excavated. There is not much wood in the vicinity of Cuddapah, there being only a few large mango, peepul, and tamarind trees. During the dry weather the supply of water is deficient. 2. The station is elevated about 507 feet above the level of the sea, but it is about on the same level with the adjacent country. Yerramullah, an elevated platform forming part of a range called the Palcondah hills, is a higher and healthier situation than that of the station. These hills are about 17 miles distant east from Cuddapah, and 1,800 feet above the town of that name. 3. The mountains to the north-east and south are from three to six miles off, and from 1,000 to 1,500 feet above the level of the station. 4. Two nullahs, having their source in the south-west range of hills, are the nearest water. One of these runs immediately in front of the cantonment; the other, called the river Boga, is larger, and sweeps along the west of the town. The chief river is the Pemaur, which receives two rivers within the district. It is distant from Cuddapah nine miles. Tanks abound in the district. The Ralla river sometimes overflows its banks during the south-west monsoon. Ravines and water-pits exist in the neighbourhood of the station with an injurious effect on health. 5. The station is open and freely exposed to winds, and not at all subjected to high temperature by reflected sun heat. It is, however, exposed to the land winds, the effect of which is injurious. 6. The plains environing the station are cultivated and irrigated by the numerous tanks in the vicinity of the cantonments. Artificial irrigation is observed to affect the health of the station when indigo is grown. The cultivation of rice is not prohibited, and it is grown close up to the station. One crop of rice is averaged within the year to two of indigo, the latter yielding the highest profit. The indigo grown near the station has a most injurious effect on health, generating malaria, which is attributed to the nature of the manure employed, viz., green boughs of trees, &c. 7. The large town of Cuddapah is close to the station. 8. The soil of the plains to the north and west of the cantonment is of rich black cotton loam, but in the vicinity of the hills and valley of Cuddapah it is overlaid with alluvial deposit, the débris of the neighbouring rocks being light sandy, and in some places intermixed with an adhesive reddish earth. The eastern and western range of mountains consist chiefly of gneiss overlaid with sandstone and sienite, the beds being intersected with veins of greenstone. The principal rock in the southern ranges is granite with gneiss and mica slate more or less in a state of decomposition. In other parts the formation is sandstone; it usually rests on limestone, and is non-fossiliferous. 9. Water is usually found during the dry season at a depth of 30 feet, and during the rainy season at five feet below the surface. 10. The rain-fall and surface water sink into the pervious subsoil, what remains on the surface very soon evaporating. The drainage from the adjacent higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from the river, wells, and from a few tanks or pits which receive the rain-water. They are dry for the most part, except during the rainy season, and when they become low they are used by the natives for the deposit of every description of filth, the water being liable to every kind of pollution. There are plenty of tanks in the native town, surrounded by prickly pear, which, when decomposing, is a great source of malaria. The best means of prevention would be by not allowing the natives to use such tanks for depositing their excrement in, and cutting down or removing the prickly pear to a distance. 12. The water supply throughout the district is deficient, and is strongly impregnated with the saline matters of the soil. These become concentrated by evaporation in the hot weather, so that river water is generally used by the major part of the native population.

CUDDAPAH.
MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	13. The hills on the north, east, and south being within three to six miles of the station have a most injurious effect by greatly increasing the heat of the station. 14. All new stations should be tested by quartering a few companies of a native regiment for some months previously on the spot. Its range of temperature should be ascertained, as well as its topography, and the supply and nature of the water as well as the prevailing diseases of the locality.
II. CLIMATE.	1. The instruments available at the station for meteorological observations are a thermometer, dry and wet bulb, and a barometer. 2. TABLE of Meteorological Observations from 1st January 1859 to 31st December 1859.

Months.	Barometer, Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
Jan. -	29·658		7	78	74	77	72	98	—	East.	Calm.	31	
Feb. -	29·858		13¾	82	74	80½	71	95	—	Do.	Do.	28	
March	29·761		12	89	79	86	75	98	—	Do.	Do.	31	
April	29·656		10	90	86	89	79	100	2·6	Do.	Moderate.	28	2 days cloudy—rained.
May -	29·661		11	93	86	93	82	108	1·20	Do.	Do.	29	2 days cloudy—rained.
June -	29·648		10	91	86	90	81	99	4·40	S.West.	High winds.	26	4 days cloudy—rained.
July -	29·592		9	87	83	87	78	101	9·45	Do.	Do.	11	20 days cloudy—rained
Aug. -	29·556		7	86	82	85	78	95	6·50	Do.	Do.	11	20 days cloudy—rained
Sept. -	29·558		7	87	83	85	79	97	2·75	N.East.	Moderate.	20	10 days cloudy—rained
Oct. -	29·557		8	85	83	84	77	95	3·20	Do.	Do.	19	12 days cloudy—rained
Nov. -	29·710		5	77	73	77	74	90	9·80	Do.	High winds.	8	22 days cloudy—rained
Dec. -	29·761		8	77	73	76	72	85	—	N.	Calm.	29	2 days cloudy—no rain.

3. The climate is intensely hot during the day, with great closeness and stagnation of air at night. The mean temperature in the shade during the year is 81½°, the maximum being 98° and the minimum 65°, average daily range within doors from 15° to 20°. The difference of annual extremes is 33°. It has its cool, hot and dry, and hot and humid seasons. Malarious diseases are most frequent from the commencement of the rainy season till the drying up of the ground, in consequence of the extreme heat, so that from February till the end of May malarious diseases are not frequent. This place is quite unfit to be occupied by troops, being, in fact, the worst station in India. There are plenty of places on the surrounding hills which would be more suitable for a station. The most unhealthy months are those in which the ground is moist and capable of affording constant evaporation from the surface under intense heat. This lasts from the end of June till the end of January, which period includes the monsoon weather, the filling and drying up of nullahs, rivers, &c., when the vegetable and animal deposits in them are exposed to the rays of the sun, and prove a source of miasma. From February till the end of May the soil is dry and burnt up; the source of malaria is then dried up, and intermittent fevers are less frequent.
4. Maddenpully, about 70 miles distant, possesses a climate more conducive to health than that of the station.
5. No reply to this query.

III. SANITARY CONDITION OF THE STATION.

1 to 17. No reply to these queries.
18. There are some old walls, &c. existing which interfere with the health of the town, and such is the case in every native town, unoccupied houses being used as places for the deposit of filth.
19. In the bazaar improvements are being made, such as the removal of old walls, the prickly pear, &c., but it is still in a bad condition. The native houses in the town are in a wretched condition, dung-heaps and cesspits being found within them.
20 to end. No further information under this head.

IV. HEALTH OF THE TROOPS.

1. The station and adjoining districts are very unhealthy.
2. The natives suffer a good deal from intermittent fevers, and a few have diseased spleens.
3. The unhealthiness of the neighbouring native population is attributed to the low situation of the town of Cuddapah, and to the large quantity of wet cultivation in and around it.
4. The troops here were formerly stationed at Arcot, where they had been for nearly six months, and marched from thence for Cuddapah on the 23rd June 1858. The health of the men while at Arcot was good, and they arrived at Cuddapah in a healthy condition. They have, however, suffered a good deal from intermittent fever since. No instance has appeared of any portion of the men's present accommodation proving more unhealthy than the rest.
5. The troops are never camped out at this station.
6, 7, 8. I have had no personal experience of hill stations, but the benefit of selecting such for troops cannot be doubted.
9, 10. Men on first going to hill stations are subject to fevers and dysentery. After a residence in the plains they should avoid exposure in the first instance, and wear clothing suitable to the temperature.
11 to 14. It would be most beneficial to the health of troops to locate them on hill stations, with short periods of service on the plains. Frequent change of stations on the plains would not be beneficial to the health and spirits of the soldiers or to convalescents.
15, 16. No experience to reply to these queries in reference to hill stations.
17. There is some higher ground in the vicinity of the station which could be advantageously occupied.
18. I cannot speak from experience as to the class of soil or subsoil which would prove more healthy or unhealthy for stations.
9. Soldiers proceeding to India should be from 18 to 23 years of age, and should land there during the cold season. I have no experience to show how troops are disposed of on first landing, but in order to preserve their health they should be sent to a cool station.
20. Whether troops are sent direct to India from the home depôts or to an intermediate station for a time is a matter of no importance, provided they are sent to a cool station on arrival and exposure avoided. They should be sent to the hill districts and gradually accustomed to the climates.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	21. I cannot say what is the usual mode adopted for transporting troops from the port to the interior. 22. The number of years a British soldier should serve in India is from 20 to 25, as a general rule, so as to be effective for active service. 23. No reply to this query. 24. Invalids should leave India so as to arrive in England at the commencement of the summer, and thus avoid the extreme change of temperature from India to the winter of England.
Diseases.	1. No inspection parades for the discovery of incipient diseases are necessary at this station. 2. No case of scorbutic disease has occurred at this station. The disease is attributable to bad living and the absence of fresh vegetables. 3. In a native corps there are very few cases of hepatic disease. 4. There have been very few cases of dracunculus at this hospital, but it is very common in the gaol and native town. 5. Very few cases of venereal disease occur in a native corps. 6. Table of Admissions into the Hospital, 3rd Extra Regiment N.I., from the 7th July 1858 till the 7th March 1860.

Diseases.	Admissions.	Deaths.
Fevers { Feb. Ephemera	29	—
Fevers { „ Quotidian Intermittent	1,342	5
Fevers { „ Tertian Intermittent	274	—
Dysentery	21	1
Cholera	15	3
Small-pox	10	—
Rheumatism	61	—

7. The nosological character of the more frequent zymotic diseases is, class pyrexiæ; order febris. They are most prevalent in the wet and cold seasons after the heavy rains, when the vegetable matter in the beds of rivers, tanks, indigo factories, and the manure employed for the growth of indigo is not too wet to undergo decomposition. Fever is endemic in the native town. The native dwellings are much crowded together. The causes which predispose the natives to these diseases are bad food, want of cleanliness, and crowding together in small huts.
8. No reply to this query.
9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases.
10. The only remark I have to make is that the place is not suited for a military station.

V. Intemperance.

1, 2. The necessary information to form a statistical table showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime at the station, is not obtainable.
3. It is a habit among Europeans to take a dram before morning parade. The effect is most pernicious, not only as being productive of drunkenness, but also as tending to produce hepatic disease, dysentery, &c., especially as regards recruits. Spirit is given under the direction of the medical officer to convalescents; it is good in quality. The amount given is variable in quantity.
4. The consumption of spirits in the morning is most injurious. When judiciously given to convalescents it is beneficial, as it is also for troops marching through a country where the water is bad; but malt liquor is far preferable.
5. The use of spirituous liquors as part of the ration for European troops should be abolished, and malt liquor supplied instead.
6. Malt liquor and wines in moderation are beneficial, but spirits are most injurious.
7. The use of tea, coffee, lemonade, &c. is excellent in their influence on health, efficiency, and discipline. Spirits should not be issued to the men.
8. As regards Europeans, it would be most beneficial to suppress altogether the spirit ration; beer, however, is necessary. In reference to convalescents, no absolute rule can apply to them. To those recovering from dysentery and diarrhœa, for instance, malt liquors would often be injurious, whereas a judicious allowance of spirits would be beneficial then.
9, 10. It would be advantageous to abolish the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c. to be sold there within certain limits; a limited supply would be beneficial.
11. No reply to this query.

X. Field Service.

1, 2. Medical officers have very little influence as regards the conduct of the line of march of troops, camping, bivouacking, &c. In the campaign of 1857–58, flat paddy-fields, with rising ground on either side, I always found were chosen as the site of our encampment ground, so that the first shower of rain covered the surface of the ground with water; in many instances it was more than six inches deep during the monsoon.
3. Except in the monsoon, ordinary ground may be chosen where the supply of water is abundant and good. During the monsoon the site of the encampment ground should not be surrounded by rising ground.
4. No reply to this query.

XI. Statistics of Sickness and Mortality. } No information under this head.

XII. Hospitals.

1, 2. The position of the hospital is to the west of the town, which is distant about a mile, and south of the cantonment, bazaar, and native houses. The site is open and well ventilated, but Cuddapah is full of malaria. The hospital is not very far from the river.
3. The water supply is abundant and wholesome.
4. All impurities are removed from the hospital by toties.
5. The wards are not raised above the level of the ground. There is no provision made for carrying off the roof-water, but there is a trench round the hospital at a distance from it, and foul water runs off by this, as also does the rain-water. The hospital is built with brick,

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	and has a tiled roof. It is well ventilated, but hot. There are verandahs all round the building, and these are occasionally used for the accommodation of the sick when the wards are full. There is no upper story to the hospital.

TABLE of Hospital Accommodation.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
No. 2	Large 40	Ft. in. 32 0	Ft. in. 19 4	Ft. in. 14 10	576	16	Breadth. Ft. in. 2 7 Length. Ft. in. 6 5	Ft. in. 1 6	10	Ft. in. 6 6	Ft. in. 3 10½
	Small 12	17 7	Do.	Do.	504	4	Do.	Do.	2	Do.	Do.

6, 7. No reply to these queries.
8. No means for producing artificial warmth are required in Cuddapah. In the north-west provinces and in Oude stoves are used for this purpose.
9 to 15. No replies to these queries.
16. The native sick provide their own rations, any article of food considered injurious by the medical officer being prohibited, and extras ordered at his direction.
17. The sick natives are attended by any comrade they may select, besides which there is one hospital serjeant and two orderlies to a hospital.
18. The sanitary condition of the hospital is good, and no instance of gangrene or pyæmia have appeared in it. Fever prevails epidemically at the station during the wet and cold seasons.
19. No reply to this query.
20. No arrangements are made for the exercise of convalescents among the native sick.
21. In European regiments the soldiers' sick wives and children are generally attended in hospital by the medical officer in charge. In native regiments, as a general rule, they are attended by the apothecary, or, if there be no apothecary, by the hospital dresser. The medical officer attends in dangerous cases.
22. No reply to this query.
23. The medical officer, as a general rule, has every power in matters appertaining to the sanitary state of the hospital, repairs of buildings, change of diet, &c., as far as the exigencies of the service will admit.
24. There are no convalescent wards for native sick, such not being absolutely necessary for them.

XIII. BURIAL OF THE DEAD. } No information under this head.

(Signed) J. G. MACDOWELL, Lieut.
T. G. HOWELL, Assistant Surgeon.
G. HEMERY, Captain, Madras Engineers.

31st July 1861.

PALAMCOTTAH.

Accommodation.—Native Troops Infantry { Havildars 51, Naiques 50, and Privates 700

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The cantonment of Palamcottah, comprising a portion of the Old Fort, is situate about two miles to the S.E. of the river Tambrapoorney. It lies in latitude 8° 42′ north, and longitude 77° 47′ east. The country to the S. and E. of the station is composed of light red soil, is well drained, and cultivated mostly in dry grain. To the N. and W. is an extensive sheet of rice cultivation irrigated by a channel running parallel to the river. The cultivation is carried to the margin of the river bank. Two crops are yearly raised, and the country may be said to be under water for nine or perhaps ten months of the year. To the S. and E. low hills, composed chiefly of pure quartz rock, rise up from the plain, which is in parts sandy. The soil may be described as a sandy loam overlaying a species of mouldering gneiss rock. Close to the banks of the Tambrapoorney there are several thick topes. The sandy plain W.S. and E. is dotted with clumps of the palmyra, for the growth of which the soil is well adapted. Good water is procurable from the canal, running to the N. of the Fort, and when the canal is dry, water of tolerably good quality is to be had in the numerous wells which have been sunk in all directions. 2. The station is about 120 feet above the level of the sea, and may be said to be situated on an extensive plain; it is above the adjacent country. The portion of the cantonment outside the Fort is situated on rather higher ground than that of the Fort itself. No better position appears available. 3. The nearest mountains are between 20 and 25 miles distant from the station, but there is very little table land to be found on them. The peaks of the hills rise to a considerable

References to Subjects and Queries.	Replies.

I. Topography—*cont.*

height, one called the Agusteer peak, supposed at one time to be inaccessible, has been found by the barometer to be 6,200 feet above sea level. The Travancore Rajah has established an observatory on the extreme summit of this hill, where a series of valuable observations have been taken for several years past.

4. The nearest water is that of the canal, running parallel to the river. The station is about 30 miles W. of the sea coast. The vicinity is not liable to overflow except on the occasion of extraordinary freshes, and then only to the north of the river. The ground around the station, although slightly broken up in parts, resulting from the sinking of pits for gravel, is not sufficiently so to cause the lodgment of any quantity of water.

5. The interior of the Fort is not badly ventilated, but a great improvement would doubtless take place in the health of the inhabitants, were the Fort walls, which are high, levelled. The cantonment outside the Fort is particularly well ventilated. The temperature of the interior of the Fort is usually hotter than that of the cantonment outside. This results partly from the ventilation not being so free, and from the houses being more crowded. The station being situated so near to the apex of the peninsula is exposed to winds which are, except during the very hottest months, moderately cool. The S.W. wind which sets in towards the close of May, passes over an extensive sheet of cultivation, and is thus rendered pleasantly cool, although disagreeable at times on account of its violence. The winds from N.E. round to S.W. may be called sea breezes.

6. The country to the north of the station is rich in rice cultivation; sugar, betel, and other grains requiring water being also raised. The ground to the E. and S. is sown with gram and other dry grains. The principal work of irrigation is a canal derived from the Tambrapoorney river; it is about 20 miles bong and irrigates a large extent of land. It runs in a semi-circular direction round the W., N.E., and E. sides of the station, the nearest point to the cantonment being about half a mile distant. Several small tanks exist also in different directions. The irrigation being kept up chiefly by minor channels taken from the main canal, the water in which is continually fresh, no ill effects to the health of the station appear to result from artificial irrigation. After the second crop has been reaped (generally towards the middle of March) the fields dry up so very quickly that malaria appears to have no time to generate. No prohibition whatever is made regarding the proximity of rice cultivation, every available piece of ground is brought under irrigation, and although the houses of a large portion of the European community are, as it were, surrounded by rice fields, no ill effects have been noticed. No indigo plantations exist near the station. Flax is occasionally grown by means of artificial irrigation, in small patches bordering the river, and at some distance from the cantonment.

7. The nearest town to Palamcottah is Tinnevelly, one of the largest and most important of the native towns in the district to which it gives its name.

8. The fort of Palamcottah is built on a barely covered rock, generally described as mouldering gneiss although in parts the out-cropping rock is hard and compact. The soil of which the plain is composed (a light red sandy loam) would appear to have been formed by the partial disintegration of the neighbouring hills, which are now chiefly composed of hard imperishable quartz.

9. Well-water is found in the dryest seasons at a depth of from 15 to 20 feet; but during the rainy season the water rises to within 2 or 3 feet of the surface.

10. The country is generally well drained; the rainfall is either caught in tanks, or flows into and is carried off by the irrigating canal to the north of the station. There is no higher ground the drainage from which passes into the subsoil of the station.

11. The water supply is derived chiefly from wells, but the water from the irrigating canal is extensively used, and is preferred by the natives on account of its being generally purer than well water, much of the latter being slightly brackish, and impregnated with lime and magnesia. Water is procured also from small tanks scattered about in various directions.

The rain-fed tanks near the station generally hold water for a space of from four to five months. They are free from weeds, and abound with small fish, which are eagerly sought after by the natives. The natives generally wash their clothes and bodies first in the tanks, and then secure chatties of the same water for drinking and other purposes. The water in the tanks being generally drawn off for the irrigation of rice, &c., is not liable to stagnate, and hence the generation of malaria appears to be prevented. No malaria proceeds from any tank.

12. The best drinking water is procurable from wells bordering the irrigating canal, the water of which, itself derived from perennial mountain streams, percolates through the soil to the well cavity, and is sweet and wholesome. That procurable from wells sunk through the gneiss rock, and at some distance from the canal, is generally more or less brackish, owing to the subsoil containing carbonate of lime, magnesia, and other salts. The water from the canal and tanks is simply taken in chatties; that from wells is drawn by means of picottahs.

13. There appear to be no other topographical points worthy of notice.

14. No reply to this query.

II. Climate.

1. The instruments available for conducting and registering meteorological observations are an aneroid barometer, a thermometer, and a pluviometer.

2. Table of meteorological observations from 1st January 1855 to 31st December 1859 inclusive.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Winds, Dews, Storms, &c.
January -	29°·569	82°	8°·86	86°·2	76°	—	—	104°·2	4°·075	N.E.	Moderate.		
February -	29·560	84·5	8·4	90·4	76·6	—	—	104·	1·180	Do.	Do.		
March -	29·686	87·4	9·12	92·6	81·6	—	—	106·8	5·165	N.E. & S.E.	Do.	—	Wind S.E., principally in the afternoon.
April -	29·416	88·8	12·76	94·2	84·2	—	—	107·4	20·145	S.E.	Very moderate.	—	The wind, though principally from S.E., very variable.
May	29·354	84·96	9·74	94·	84·4	—	—	108 2	9·240	N.W.	Moderate.	—	At times the wind is high towards the end of the month.

PALAMCOTTAH. MADRAS.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Winds, Dews, Storms, &c.
June -	29·344	89·62	8·58	93·2	83·8	—	—	106·	1·11	W. & N.W.	High.		
July -	29·330	89·5	7·12	91·8	83·	—	—	83·	·01	N.W.	Do.		
August	29·354	88·61	6·26	93·	82·4	—	—	84·8	·070	Do.	Moderate.	—	Wind sometimes high, depending probably on the fall of rain in the mountains.
September	29·374	80·2	8·16	93·4	82·6	—	—	106·2	2·21	Do.	Do.		
October -	29·383	86·53	10·08	90·6	81·6	—	—	104·2	14·305	Do.	Do.	—	Wind is variable during this month.
November	29·421	83·8	8·46	86·8	79·	—	—	104·6	25.315	N.E.	Do.		
December	29·465	82·62	8·1	85·8	77·2	—	—	103·	8·220	N.E.	Do.		

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate is a very dry and healthy one; the thermometrical heat is high, and the daily range not great. High winds prevail generally from the end of May to the end of August, raising a considerable dust, but not apparently with any injurious effect. The most unhealthy months are at the commencement of the north-east monsoon, when cholera generally shows itself in an epidemic form, and also dysentery and diarrhœa in November and December. The months of March and April are the hottest time at the station when fevers of the intermittent and ephemeral type prevail. 4. There is no district near the station the climate of which is more conducive to health. 5. No reply to this query.
III. Sanitary Condition of Station.	1, 2, 3, 4. A map of the surrounding country, with a plan of the station, is transmitted. There are no barracks; the sepoys are hutted in lines. All the drains are open, and have a free escape. The drainage is admirable, the whole station being situated on ground sloping from 1 in 30 to 1 in 100 to the north-west. 5 to 8. These queries are not applicable to native troops. 9. The huts are constructed of mud wall with tiled roofs. 10. Not applicable to native troops. 11. A sanitary committee is responsible for the sanitary state of the cantonment, and an establishment is kept up by government. The hospital and place of arms are whitewashed whenever necessary. 12 to 15. No reply to these queries. 16. No part of the hospital is damp. The cesspits are more than 300 yards from this building. There are no foul ditches. 17. The surface cleansing of the cantonment is performed effectually by an establishment kept for the purpose. 18. The surface of the cantonment is kept free from vegetation. The fort walls interfere greatly with the ventilation of the fort, but they are being gradually pulled down. 19. The sanitary condition of the bazaar, which is small, is efficient and good. Its cleansing is efficiently attended to and performed by an establishment kept for the purpose. The native houses are of very inferior construction, and rubbish heaps are frequently kept within their yards. 20. Very few animals are slaughtered at the station, the number being about 10 sheep a day, and 4 oxen a month. No nuisance is experienced from the slaughtering places. 21. No reply to this query. 22. There are no cavalry or artillery stables at this station, neither are there any picketing grounds. 23. Not applicable to native troops.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is very good. The cantonment is on a slope, and drains itself into the surrounding tanks. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population may be pronounced as decidedly healthy. 2. The most prevalent diseases are fevers of an intermittent and ephemeral type during the hot months of March and April, and cholera and bowel complaints at the commencement of the north-east monsoon. 3. The healthiness of the neighbouring native population is attributable to the ground on which the fort is situated, being high, the soil dry, and the drainage efficient. The population also is not crowded. 4, 5. No reply to these queries. 6 to 16. No experience of hill stations. 17. With regard to whether there is any higher ground which could be advantageously occupied as a hill station, such stations are not necessary for native troops. 18. Gravelly and light soils, with a substratum of sand, are generally the most healthy. 19. The best period of life for soldiers to proceed to India is at 18 years of age, and they should land there in the cold season, from November to February. Freedom from exposure to the sun and from temptation to drinking are the best means of preserving the health of recruits on first landing. 20. Cannot say whether troops should be sent direct from the home depôts to India or sent to an intermediate station for a certain time; or whether they should be sent to hill districts on first landing, or how disposed of. 21. No reply to this query. 22. The period of service of a British soldier in India should be 10 or 12 years. 23. No experience of the manner in which the business of medical boards is conducted either at stations or at the presidencies. 24. Invalids leaving India for home should not depart later than the end of February or the beginning of March.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*—*Diseases.*	1. There are no regular inspection parades for the discovery of incipient diseases at the station. 2. There has been no scorbutus at this station. 3, 4, 5. No data exist upon which to form an opinion either as to the proportion of hepatic disease, dracunculus, or venereal disease. 6. The following diseases of endemic or epidemic class are those which the troops at the station suffer from:— *Fevers* of the ephemeral and intermittent type occur during the hot months of March and April. *Dysentery* / *Cholera* } Occur during the north-east monsoon. *Small-pox* has never occurred to my knowledge in an epidemic form among the troops stationed here. *Rheumatism* is not, I believe, particularly prevalent. No data are available to determine what is the proportion of admissions and deaths from these diseases to the total admissions and deaths. 7. The only zymotic diseases known at this station, as far as my experience goes, are cholera, variola, and very rarely rubeola, which are prevalent in the cold season at the commencement of the north-east monsoon, when there is a considerable moisture in the atmosphere from rain fall and a diminution of temperature. These diseases are not more prevalent in one part of the station than another, and I am aware of no particular habits and conditions among the troops or native population which predispose to these diseases. 8. Cannot say to what extent the prevalence of epidemic disease is influenced by the nature o the soldiers' duties and occupations in barrack, or habits on the march or in the field. 9. With regard to whether quinine has been tried as a prophylactic against malarial diseases at the station, malarial diseases are not prevalent here. 10. No reply to this query.
V. Intemperance. VI. Diet.	Queries under these heads do not apply to native troops.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress at this station is decidedly not suited to the climate. The dress of a native soldier should be loose like that usually adopted by themselves, and not tightly fitting or of thick cloth.
Duties.	1. This query does not apply to native troops. 2. The best hours for drills, parades, and marches are in the morning. They should not last after seven o'clock. 3. No reply to this query.
XII. Hospitals.	1, 2. The site of the hospital is open and freely ventilated, and there are no walls, trees, or buildings interfering with ventilation. It is healthy in every respect. 3. There is an abundant supply of good wholesome water, procurable from a well immediately outside the hospital compound. 4. The drainage is simple, carrying off all refuse water readily to the neighbouring tank, to the north of the cantonment. 5. The surface drainage and guttering round the hospital is sufficient for carrying away the rainfall rapidly. The hospital is built of brick and chunam, and is a cool and pleasant building. It is supplied with verandahs, which afford sufficient shelter from the sun's rays. The hospital accommodation is so extensive that the verandahs are not required for the accommodation of sick, convalescents, or others. The building consists of one flat, and is so placed as to receive the full benefit of the prevailing winds. The windows open horizontally, and have both glass and venetians, and answer all the purposes needed for ventilation and coolness. 6. The doors and windows are sufficiently large and numerous to keep the wards at all times free of odour and closeness, besides which there are ventilators in the upper parts of the walls near the junction of the roof, supplied with weather boards, which can be opened or shut at pleasure. The jalousies or jhilmils are in the usual style adopted in India. 7, 8. There are no means of cooling or warming the wards. The walls and ceilings of wards are cleansed and lime-washed once every six months. 9. The privies are built of brick and chunam. They are thoroughly cleansed daily, and are not placed over cess-pits. They are not offensive. 10. This query is not applicable to native troops. There is, however, one bath for the sick in case of emergency. 11, 12. Not applicable to native troops. 13. The storage is sufficient and dry. 14. The cots are made of iron, and the bedding consists of a straw paillasse and quilts and cumblies. 15, 16. Do not apply to native troops. 17. Orderlies are allowed to attend on the sick on the doctor's application. 18. The sanitary condition of the hospital is excellent. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19. There are no deficiencies or sanitary defects which require improvement. 20. There is no special provision made for convalescents. 21, 22, 23. No reply to these queries. 24. There are no convalescent wards or hospital, and such provision is not required, as there is only a native regiment here.
XIII. Burial of the Dead.	1, 2, 3, 4. No reply to these queries. 5. The dead of bazaar people are burnt or buried according to caste. 6, 7. No reply to these queries.

(Signed) W. K. Babington, Lieutenant-Colonel, Commanding Palamcottah.
Geo. V. Winscom, Captain Engineers, District Engineer, Tinnevelly.
Fred. L. Clementson, Zillah Surgeon, Tinnevelly.

17th October 1860.

RANGOON.—BRITISH BURMAH.

Accommodation	European Troops	Artillery	Non-commissioned Officers and Men	164
			Women	24
		Infantry	Non-commissioned Officers and Men	869
			Women	48
	Native Troops	Artillery	Non-commissioned Officers and Men	84
		Infantry	Non-commissioned Officers and Men	3,600

References to Subjects and Queries.	Replies.
I. Topography.	1. The country to the south and west of the station is flat, covered with jungle, swampy, and intersected with numerous creeks flowing into the Irrawaddy and Pegu rivers. On the north it is undulating, with forest trees and thick underwood. In this direction it is, generally, sandy and dry. The whole country for miles round is covered with forest trees and low jungle. During the monsoon the country is under water. 2. The height of the station above the sea varies from the sea level to about 80 feet, and its height above the adjacent country varies to the extent of about 70 feet. There is a freshwater lake or tank about a quarter of a mile to the east of the station. It is the only one of any size in the vicinity. The river Irrawaddy flows past about the same distance to the westward. There are numerous creeks and nullahs in the surrounding country, but none of sufficient size to require special notice. There is no higher or healthier ground adjoining the station. The cantonment is situated on a spur of a hill, on the highest point of which is the Great Shoey Dagon Pagoda, the base of which is almost 100 feet higher than the cantonment, and is admirably calculated for defensive military purposes. 3. There are no mountains or table land within sight of the station or within 100 miles. 4. The nearest water of any size is the lake or tank already mentioned, about a quarter of a mile distant, and the Irrawaddy river at about the same distance. The vicinity of the station is not liable to overflow from the river, but during the monsoon, from May to October, it is under water from the heavy rains, which soon runs off or dries up. In the course of a month or six weeks after the rains the country is dry. The surrounding ground is broken, and there are ravines, but there are no water pits except a few near the artillery barracks, and the committee is not aware that they have produced any injurious effect on the health of the troops, although it is most desirable that the said pits should be filled up, as it is believed that their existence is one cause of beri-beri. 5. The station is open and freely exposed to all winds. There is nothing calculated to affect, materially, the free external or internal ventilation of the station. The temperature is not raised by reflected sun heat. There are no ungenially cold, variable, or land winds. The sea breeze blows freely at certain seasons, and is most conducive to health. 6. There are patches of cultivation here and there, generally the surrounding country may be said to be cultivated. There are no works of irrigation in Burmah. The lake to the eastward of the station may be used for the purpose to a very limited extent, but not so as to produce any effect on the health of the station. No description of grain is allowed to be grown in military limits. Rice is grown to a considerable extent on the western bank of the Irrawaddy, distant four or five miles; and it is also grown to the eastward and south of the station about the same distance. The Committee is not aware that indigo, hemp, or flax are grown in or near the station. 7. The nearest town is Rangoon, which is close to the station, and on the same side of the river Irrawaddy, along the bank of which it extends six or seven miles. The population is composed partly of Burmese and partly of natives of India, with a few Europeans. 8. The surface and subsoil in the vicinity of Rangoon consist of a series of clay and sandstone, with a large development of laterite. This rock is met with on the spurs and ridges which terminate the Zoornah range of hills at this place, the Great Shoey Pagoda being erected on the highest spot to the north-east of the station. The plain below consists of clays and sandstones, each occasionally predominating, the former being sometimes of a very aluminous kind like pipe-clay. The surface soil is always clayey and alluvial, but at varying depths the subsoil becomes gritty or gravelly, from the admixture of nodules of a brick red and dark brown colour. These nodules are more numerous as we descend, and at length give the rock a conglomerate alluvial character, resembling a nodular clay ironstone, constituting, in fact, the laterite before alluded to. The alluvial soil of the cantonment has, by analysis, been found to contain 50 to 70 per cent. of alumina; such being the case, it may be concluded that drainage by percolation must be insufficient. Generally speaking, as the ground of the cantonment slopes to the south and west with considerable gradients, the water is readily carried off, and the roads soon become dry after rain. But in some of the lower parts of the cantonment, where the surface soil is of a very retentive character, much artificial drainage and improvement are required. 9. The depth at which water is found varies at different parts, but on an average water is usually found during the dry season from 25 to 30 feet below the surface; during the rainy season from 15 to 20 feet. 10. There are no surface springs, but the rain-fall flows very readily away or sinks into the porous subsoil, and is drained off, and does not ooze out again; this as regards the station. In the surrounding flat country much remains on the surface, and is dried up during the hot months. There is no higher ground, the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from wells and one or two tanks. The dhoby or washermen's tank and the Scots tank to the north of the Great Pagoda might be used for the like purpose. It is most desirable, considering its site, that the latter should be reserved for this purpose. From the use made of it by the commissariat it is, at present, utterly useless for drinking water, and is becoming less so every year. There is an extensive sheet of water east of the cantonment; there are other smaller tanks (ponds) within the boundary of the cantonment. Drinking water is usually obtained from wells not from tanks. The low swamp between the 41st lines and its mess-house might, with great advantage, be dug out and formed into a reservoir or tank for water. This measure is particularly recommended as a sanitary precaution.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	The tanks are never dry and are brimful during the rains. There are fish of different kinds in them, and there is a water plant in them (name unknown to the committee) which prevents the water becoming decomposed, and keeps it always sweet and wholesome. There is a small tank near the 41st mess-house adjoining the Prome road (east), that is always dry during hot weather. There is a luxuriant creeper spreading over the surface of many of the tanks, which has the property of keeping the water at all times pure and sweet. No tank used for supplying drinking water is also used for bathing, and none of the tanks are liable to pollution from leaves, drainage, &c., getting into them. The committee is not aware of any nuisance or malaria proceeding from the tanks. 12. The amount of water supply is ample, with the exception of the hot months, when the supply in the wells becomes scanty. The water is of most excellent quality, as regards colour, taste, and smell. When drawn it is of a whitish colour, particularly at the commencement of the rains, when it is very dirty, but soon deposits a sediment and becomes comparatively clear; after filtering it becomes perfectly so, it being then very pure and tasteless. The water is soft and contains very little lime and no animalculæ, and the sanitary officer considers it by no means injurious to health if filtered. It is raised and distributed by bheesties or water-carriers. The committee is not aware that any better means could be devised, unless some machinery were introduced. 13. The committee is not aware of any other topographical point requiring notice besides the above. 14. As regards the present procedure in selecting new stations, sufficient attention has not hitherto been paid to the important considerations of topography, climate, diseases, &c. Generally cantonments have been placed on low ground, as being more convenient for water supply, which is highly objectionable. In the selection of a site for a cantonment a board of experienced officers should be appointed to make the necessary sanitary inquiries, and, if possible, a previous trial of the spot should be made by troops before erecting permanent buildings.
II. CLIMATE.	1. The meteorological instruments at present available at the station are thermometers, barometers, hygrometers, and rain gauges, but no adequate means or instruments have hitherto existed in this province, and no records embracing all the necessary observations have been kept. Complete sets of instruments have, however, been lately received, and are to be put up and scientifically observed. Properly instructed persons and a suitable department are needed for this purpose. 2. The following table gives the result of eight months' observations.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Rain.*	Winds.		Remarks.
									Direction.	Force.	
1852.	In.	°	°	°	°	°	°	Inches.			
November	30·06	81·09	14·04	88·11	74·07	81·79	74·80	—	N.E.	Moderate	Generally clear.
December	30·094	76·70	18·00	85·7	67·70	78·13	69·33	0·21	E. & N.E.	"	Fine and clear.
1853.											
January -	—	77·22	22·22	88·33	66·11	77·78	67·82	—	N.E.	"	Fogs frequent.
February -	—	77·45	28·90	91·9	63·01	78·93	69·85	—	Variable	—	Fogs frequent.
March -	—	82·90	23·45	94·63	71·17	83·73	75·93	0·15	—	Light -	Fine, with occasional thunder and lightning and gusts of wind.
April -	—	85·5	21·00	96·00	75·00	87·28	78·48	0·9	W. & S.W.	Moderate	Clouds accumulative; squalls of wind.
May -	29·779	83·92	14·40	91·13	76·72	84·83	76·60	8·04	W. & S.W.	Squally -	Cloudy, with rain; opening of S.W. monsoon.
June -	29·745	80·106	6·40	83·37	76·95	80·72	78·29	15·01	S.W.	Strong -	Cloudy, with rain.

* About 80 inches usually fall during the monsoon.

3. The climate is dry from the middle of October until the middle of May. Heavy dews and mists prevail during January, February, and March. The day heat is excessive from March till May, but a refreshing sea breeze generally sets in about 4 p.m.; nights and mornings cool. Thermometer usually varies about 20° during the 24 hours.

An extensive forest with much underwood on the north side. The river Irrawaddy and several creeks on the south and west. Cantonment very dusty in dry weather owing to long drought and the bad materials (only kind procurable) of which the metalled roads are made.

Rangoon is found to be healthy for Europeans, but not so for native troops, owing principally, it is considered, to the want of nourishing meat diet. Throughout the year light woollen clothing should be worn by both Europeans and natives. The shelter afforded by the present wooden barracks is insufficient (executive engineer says "is ample"), and some of the barracks of the natives are not sufficiently raised from the ground. As a general rule, all drills and exercise in this climate should take place before 7 o'clock a.m., and should not exceed one hour. Night duties should be restricted as much as possible, and a man should not be brought on guard duty oftener than once in four days.

The hot months, from March till May, are considered the healthiest. The wet months and those immediately preceding are the most unhealthy. During the wet season bowel complaints are prevalent among Europeans, and during the wet and cold season fever and beri-beri prevail among the natives. The sanitary officer is of opinion that when the monsoon is copious, that is, of normal amount, the wet season would appear to be healthier than

RANGOON. BRITISH BURMAH. MADRAS.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	either the cold or hot season, there being no evaporation, and great equability of temperature. In his opinion the drying up of the numerous shallow ponds or tanks causes fever, bowel complaints, and beri-beri.

4. Thyet Myo, about 200 miles up the Irrawaddy river, is reported to be a healthy and desirable station for European troops, especially on their first arrival from Europe. It is 160 feet above the level of the sea. Its surface and subsoils are a series of sandstone and gravel to the depth of 25 feet or more, beneath which is a retentive stratum of calcareous clay. The surface is undulating and drainage good. The water supply is excellent, and is found at a depth of 25 to 35 feet. Its climate is many degrees cooler than that of Rangoon, the thermometer ranging from 45° in the cold months to 104° in the shade in the hottest weather. It is reached by water in 8 days. (*Vide* Appendix to this Report.)

5. As regards the comparative healthiness of stations. It appears that stations situated in valleys, on low ground, or near stagnant water, are unhealthy, while those on high table land are generally the healthiest, but there are other circumstances relating to the subsoil and surrounding country which also require to be considered.

The following table, showing the relative salubrity of a few of the principal stations as regards European troops, is taken from various reliable sources.

Stations.	Periods.	Deaths per 1,000 of Strength per Annum.
Bangalore	10 years, 1829 to 1838	28·03
Cannanore		37·69
Trichinopoly		39·34
Masulipatam		51·00
Secunderabad		71·68
Rawul Pindi	6 years, ending 1854–5	27·60
Jullundur	9 „	28·06
Dugshai	5 „	29·8
Sholapore	20 years ending 1849	22·25
Kolapore		20·5
Thyet Myo	2 years, 1858–9	29·75*

* Including 6 deaths by cholera in 1859. Deducting these, the mortality would be 19·6 per 1,000.

III. SANITARY CONDITION OF THE STATION.

1, 2, 3. Maps and plans of station, &c. The country to the south and west, on the other side the river, has not yet been surveyed. Every road in the cantonment has a ditch or drain cut on each side of it, and by these ditches the cantonment is drained. There are no covered sewers. The general slope of the cantonment is to the south towards the Rangoon river, which receives the drainage.

4. The following table shows the barrack accommodation :—

Date of construction, 1852–53–54.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Ft.			Ft.		Ft. in.	Ft. in.
European Infantry.											
18	50	140 0	45 0	18 0 average.	113,400	2,200	120	2	24	5 6	4 6
European Artillery.											
5	50	140 0	45 0	18 0	113,400	2,200	120	2	24	5 6	4 6
Native Infantry.											
20	60	90 0	20 0	16 0	28,800	460	30	–	4	4 0	4 0
240 huts	10	16 0	16 0	10 0	2,560	256	25½	–	–	—	—
Guard Rooms.											
European Infantry	12	33 0	26 0	14 0	13,012	1,080	71	2	–	—	—
European Artillery	6	30 0	20 0	14 0	8,400	1,400	100	2	–	—	—
Native Infantry	14	25 0	20 0	15 0	7,500	535	35	–	–	—	—
Prison Cells.											
European Infantry	1	9 10	9 8	9 4	877	877	94	2	–	—	
European Artillery	1	10 0	10 4	18 5	1,860	1,860	103	2	–	—	—

5. The windows are on opposite sides of the barrack rooms, and open inwards like doors. There is no verandah, as this term is used in India, but the roof on both sides of the building is carried out about 10 feet beyond the outer wall, and forms what is usually called a "pandall," the floor of which is the ground, and much lower than the floor of the building itself. This pandall is never used as a sleeping quarter by soldiers or others. There are no jalousies or jhilmils in the barracks of the European troops. The windows are glazed. In those for the native troops they are plank or mat.

6. The artillery bedsteads are of wood, those of H.M.'s 68th Light Infantry are partly wood and partly rattan. The latter are preferred by the men, and recommended by the committee. The bedding consists of a small cotton carpet, a quilted quilt, and a blanket. No bedsteads are allowed to native troops in barracks, nor bedding, they provide the latter themselves.

7. European tents are 21 feet long by 15 feet broad, 5 feet high at the sides, and 10½ feet in the centre, giving 315 superficial feet, and 2,441 cubic feet of space. They are intended for 25 men, giving to each man 12½ superficial, and 97½ cubic feet. A native tent is 22 feet

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	long, with an average breadth of 11 feet; height in centre 8 feet, and at sides 1¾ feet; it holds 25 men. The tents are made of thick white cotton cloth, doubled or trebled, and lined with blue cotton cloth. The European tent has a double fly, with a distance of a foot and a half between the flies. 8. Barracks and guard-rooms in Burmah are ventilated by doors and windows, and also by a narrow opening of from 4 to 6 inches all along the top of the side walls. This ventilation is, generally speaking, sufficient, but it might be improved by having ridge ventilation along the top of the roof. Tents are ventilated by doors and windows, and when necessary, by lifting up the sides; but the new mode of ventilating tents recently adopted in England should be introduced into this country. The air in barrack-rooms is cooled by punkahs, formed of a framework of wood 16 feet long by 3 feet wide, covered with cloth, suspended from the roof by ropes, and pulled by men, so as to oscillate like a pendulum. The air is thus set in motion, producing the same effect as is caused by a fan. There are generally five such punkahs in a barrack-room; cost of the five about 200 rupees. 9. Barracks and huts in Burmah are built of wood and bamboo mats, with thatched roofs; tents are of cotton cloth. 10. Floors are generally of plank, some few of bamboo; they are raised from 2 to 8 feet above the level of the ground, allowing a free passage for air underneath. 11. Wooden barracks are not well suited to the climate, being damp in wet weather, and not affording sufficient protection in the hot season. Substantial masonry barracks raised on arches or pillars are recommended by the Special Committee, to be constructed of two stories, so as to admit of the lower part being used as exercising ground, ball court, skittle alley, &c. (I differ from the committee in their answer to this question. I consider that wooden barracks with shingled roof and boarded ceiling are greatly to be preferred to masonry barracks. The former are undoubtedly cooler at night, and from an experience of nearly five years, I should say, are certainly not damp, whilst they are not liable to destruction by earthquakes, which are not unfrequent in Burmah. (Signed) Jas. Bell, Major-General, Commanding Pegu Division). The barracks and cantonment are kept in repair by the Public Works Department. Repairs are executed as quickly as circumstances will admit of. The sanitary officer, who is the senior medical officer, is held responsible for the sanitary state of the cantonment.* Masonry buildings are whitewashed once a year, hospitals oftener if necessary. 12. There are lavatories, but no baths. (Sketch appended.) 13. Food is cooked in metal boilers and saucepans, and occasionally in earthen vessels. The method is most simple. Fires are lighted on the ground, or on a raised brick platform or fireplace running round the cookhouse, the boilers being placed on stones or bricks put round three sides of the fire. Native cooks generally superintend the cooking of soldiers' food. Water carriers bring the water required. Refuse matter is carried away to a distance by the cooks and sweepers. Linen is taken away by dhobies, who wash it in the neighbouring tanks. The conveniences are quite sufficient. 14. In the privy arrangements the ordure is received into wooden boxes lined with zinc, and these are daily carted to a distance, and the contents there emptied. 15. Barracks are lighted at night by oil lamps suspended from the roof in glass globes. Glazed windows are required. 16. The drainage is by open drains dug so as to carry off the rain water, &c. Where the barracks are on high ground the water runs off readily. The drainage is not sufficient in some parts where the ground is low. In low parts the water is allowed to stand and evaporate. The buildings used as barracks or hospitals are damp during the monsoon. The marshy ground near the 41st Regiment's lines is about 200 yards from the hospital and barrack. There are no foul ditches. 17. Surface cleansing within the cantonment is done to some extent either by removal to a distance or burning of refuse substances. It is not efficiently done. 18. During and after the rains there is much vegetation on the surface of the cantonment, but it is easily removed periodically. More might be done in this respect than is done, but upon the whole the station is kept pretty free from vegetation. The committee is not aware of the existence of any old walls, hedges, or other obstructions to ventilation. 19. As regards the sanitary condition of the bazaar. The bazaar has good open drainage. The ventilation is good, and the water supply abundant. It is kept very clean. There are private latrines, but no public ones; they are not offensive. The bazaar is not crowded. The conservancy of the station is under the jurisdiction of the cantonment magistrate, who has ample powers, under specific regulations, to ensure its sanitary condition. The committee has no suggestion to offer on this point; but although beside the questions under consideration, the committee would take the liberty of offering an opinion that, as a question of military organization and expediency, it would be desirable that the officer exercising this jurisdiction should be under the military authorities only, and not be, as he is, partly under the military and partly under the local civil authorities, as such joint jurisdiction is calculated to lead to clashing between the two authorities. The native houses near the station may be said to be in a dirty state. The military authorities have no jurisdiction beyond military limits and cannot interfere. Some other and better arrangements are required in regard to the removal and places of deposit of night-soil. This is now deposited at a spot to the eastward of the Great Pagoda, on the road leading to the artillery practice ground, and is most offensive. The atmosphere near is poisoned with the stench. If pits were dug and filled up from time to time it might lessen the evil.

* *Extract from Cantonment Orders.*—"Commanding officers and heads of departments will send in to the brigade office by the 25th May, a report to the effect 'that the localities and lines respectively are cleared of all rubbish, old thatch, &c., and are in a satisfactory sanitary condition.' These reports are to be first sent to the sanitary officer for countersignature, and that officer will satisfy himself that he above order has been properly carried out."

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of the Station—*cont.*	None of the barracks except those on the eastern platform of the Great Pagoda are sufficiently near to the place of deposit to cause the wind blowing over it to be much felt. The committee is not aware that any nuisance is experienced from the wind blowing over native dwellings. 20. Cattle for the use of troops are slaughtered within cantonment limits at a place to the eastward of the Great Pagoda. All arrangements connected therewith are made by the commissariat officer. It is not sufficiently near barracks to be a cause of nuisance. Committee have no suggestion to offer; but, as connected with the subject, they would remark that at times, when cattle or elephants die near the cattle sheds the nuisance is great for those who may be taking exercise in that direction. They would suggest whether it would not be advantageous to have sick cattle lines at a greater distance, and that the dead animals should be buried, instead of being kept to decompose on the surface as is now done. 21. The only ponies in the bazaar are those belonging to the hack carriage proprietors, who are, under regulations, obliged to provide proper stabling for them, and to remove the manure, &c. This is properly attended to. There are no horses or ponies belonging to the camp followers, nor are there any picketing grounds for horses or ponies in or near the station. 22. The artillery battery horses are picketed under sheds made of thatch. They are about 300 yards to the north of the barracks, and 500 to the north-east of the hospital. The sheds are open all round; there is one dung-heap to the north of the sheds or stables, and about 200 yards distant. The remainder of the dung is removed daily to a distance in the surrounding jungle. The following are extracts from the Cantonment Regulations:— "i. It is the duty of the executive engineer to attend to the general conservancy of the station, and he is required to draw the attention of the officer commanding to any instance in which the precautionary rules against fire have been neglected. "ii. The conservancy of the Sudder bazaar rests with the officer in charge, and commanding officers and quartermasters of corps and detachments and heads of departments are required to attend to the cleanliness of their own lines or premises. "iii. No nuisances are permitted within the cantonment south of Tiger Alley and Arsenal road, or west of Lake road. "iv. Residents in cantonments are consequently required to have trenches dug within their respective compounds for the use of their dependants. These trenches are to be filled up and renewed as often as deemed necessary by the medical officer in charge of the lines in which the compounds may be situated. "vi. Towards the end of each monsoon all compounds and regimental lines are required to be cleared of all jungle, weeds, and rank vegetation; fences to be repaired, and hedges cut according to regulations. Officers commanding regiments and heads of departments will, on or before the 1st November in each year, report to the brigade majors that this order has been complied with by all under their orders or residing within the lines under their charge." (True extract.) A. S. STEELE, Captain, Brigade Major." 23. There are no quarters specially built and set aside for married non-commissioned officers and men. The married non-commissioned staff have quarters, as is customary in India. The Artillery have what is called a patchery, which the married men occupy. The families of the 68th Light Infantry have not yet joined head-quarters, but some large buildings, formerly used as a detail hospital for natives, have been set apart for them. There are no married families living in the same barrack with the men. The native troops have not their families with them.
Officers' Quarters.	There are no public quarters for officers. They occupy private bungalows in the vicinity of their barracks. The committee is not aware that they are unhealthy, although the ground on which many of the bungalows are situated might be improved by being properly and systematically drained. The committee is of opinion that it would be advantageous if officers were supplied with public quarters, and it is suggested that in European regiments, the adjutant and quartermasters should be in or near the barracks.
IV. HEALTH OF THE TROOPS.	1. The station, the district in which the station is situated, and the adjoining population are very healthy. 2. (No reply to this question.) 3. (No direct reply to this question. But under 2 and 3, both of which relate to the sanitary state of the *native population*, the following information regarding immigrants from India is given.) The natives residing within the limits of the cantonments, who are chiefly from Madras, Calcutta, and Cocanada, appear to be healthier than the troops, which may be attributed to their having better food and no night duty. The unhealthiness that exists among the native troops may be accounted for by the neighbouring swamps and the want of drainage in the lower parts of the cantonment. The men being without their families have no one to cook their rice, which is another cause of their being unhealthy. N.B. by the executive engineer signing these proceedings. "I do not know of any lower "parts of the cantonment which require draining."—(Signed)—E.L. 4. The following are the stations at which the troops served before coming here:— D company, 1st battalion, Madras Artillery, from Secunderabad in 1856; was there 10 years; left 26th January 1856. State of health there, fair; diseases, hepatitis and fever. State of health on arriving at Rangoon, 23rd April 1856, good. Since arrival, suffered from dysentery and hepatitis. D company, 4th battalion, Madras Artillery, from Kamptee in 1856, was there nine years, left 15th October 1855. General health there good; diseases, hepatitis and fever. State of health on arrival at Rangoon, 21st January 1856, good. Since arrival, suffered from hepatitis, dysentery, fever. H.M. 68th Light Infantry; Rangoon, first station in India. State of health on arrival, 23rd March 1858, good; since experienced dysentery, fevers, bowel complaints.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	6th Regiment Madras Native Infantry, from Bangalore in April 1857; there two years, left February 1857. State of health there, very good; diseases, fever and rheumatism. State of health on arrival at Rangoon, good, and for a year afterwards. Suffered during the last year of residence from diarrhœa, rheumatism, beri-beri, fever. Casualties about 65 in Burmah and India during three years' service. Returned to the coast 24th March 1860. Although numerically stronger than the 23rd or 41st Regiments, was far more healthy, attributed to the 6th being in better barracks and well raised from the ground. 23rd Regiment Light Infantry, from Russelcondah in 1858; was there one year 11 days; left 15th March 1858. State of health there, good; diseases, intermittent fever and rheumatism. State of health on arrival at Rangoon in April 1858, good; since arrival has suffered from diarrhœa, rheumatism, beri-beri, fever. 39th Regiment Madras Native Infantry, from Thyet Myo in 1860; was there three years; left 9th February 1860. State of health there very bad for a period from fevers, beri-beri, bowel complaints. State of health on arrival at Rangoon in February 1860, fair; since arrival, suffered from diarrhœa, rheumatism, fever, beri-beri. 41st Regiment Madras Native Infantry, from Secunderabad; was there one year; left 13th March 1858. General health there, good; diseases, intermittent fever, rheumatism. State of health on arrival at Rangoon in April 1858, bad; since arrival suffered from beri-beri, dysentery, rheumatism, fever. The committee is not aware of any portion of the men's accommodation at Rangoon being more unhealthy than the rest. 5. The troops are not camped out here. 6. I was in command at Mercara, a hill station near the western coast of Southern India. The garrison consisted of the 28th Regiment Native Infantry, and about 30 European artillerymen. The climate was found to be highly favourable for all. 7. I have not observed that troops who have been resident at hill stations have been more liable to disease on returning to the plains. 8. I think it would be highly beneficial for European troops to select hill stations. 9. I do not remember any diseases with which troops are liable to be attacked on going to hill stations. 10. Men going to hill stations require to adopt precautions as to warmer clothing, and avoidance of sleeping exposed to the night air. 11. I know of no exceptions as to the times best adapted for residence at hill stations. During the cool season the plains, also, are always agreeable. The period of residence at the hills should not be under two years. 12. There is no period beyond which residence on the hills would produce injury to health. The longer troops are kept on the hills the more they become fitted for service in the plains. 13. I know of no special precautions required for protecting the health of troops on leaving hill stations for the plains. 14. As regards the question of relative periods of residence on the hills and in the plains, I am quite satisfied that troops which had enjoyed the benefit of a bracing climate would be more fit for service in the plains than if they had been all the time under the enervating effects of the burning sun of the plains. The committee is of opinion that troops, European and native, should never remain longer than three years at one station. Frequent change is beneficial to health and discipline. The great objection, however, to this arrangement is the ruinous expense to which the troops would be put for carriage. 15. With reference to the kind of accommodation for sick at hill stations, there was an excellent hospital erected at Mercara, the station already mentioned, and it was no doubt highly advantageous to the recovery of the sick. 16. I have never heard of the Neilgherries or Pulney Hills being visited by any epidemic, though I believe dysentery was present in one of Her Majesty's regiments when first it was stationed at Coonnor. The height of these hills is from 6,000 to 7,000 feet. The Shevaroys near Salem, and Nundoomungalum near Trichinopoly, have both had seasons of unhealthiness, but I have not heard of any such visitation within the last 20 years, or more. They are, the former, I believe, between 5,000 and 6,000 feet, the latter 4,000 feet above the level of the sea. Mercara is, I think, under 3,000 feet, and Ramanuddy near Bellary is not more than 2,300 feet above the level of the sea. I have never heard of either of these places being unhealthy, and from all I know of any of these localities, I should say they are admirably suited for European troops. 17. There is no high ground near the station, but Thyet Myo would, it is considered, be found a more desirable station than the present one. The Major-General does not at all subscribe to this opinion. Thyet Myo is 200 miles off, and only during the cold season can it be said to be more bracing than this place, and for native troops decidedly more unhealthy. 18. As regards soils for stations, those subsoils that admit most readily of percolation are the most healthy. All surfaces into which alumina largely enters retain moisture, and exert an insanitary influence. Surface soils in which oxide of iron abounds, are considered to conduce to epidemic fevers. On the other hand, the most feverish places have been where the soil is black cotton. 19. The best age for soldiers proceeding to India is 20 years; and they should arrive at the beginning of the cold season. Troops are disposed of on landing according to local arrangements, and the precautions must depend entirely on local circumstances. 20. In sending troops to India, it would certainly be advantageous, as far as health is concerned, to acclimatize them at intermediate stations. After landing in India, the balance of evidence is in favour of gradual acclimation by earlier residence at hill stations of moderate elevation. They should certainly be sent to those stations in their respective presidencies, which statistics and experience have proved to be the most healthy. 21. As regards modes of transport, on the Irrawaddy river troops are moved in large flats capable of holding 300 men, and towed by steamers. To the stations on the Sittang river they proceed in country boats, there not being sufficient depth of water in the river for the steamers now in use. Every precaution is taken to protect the health of the troops on the route. 22. A soldier should serve 10 years in India.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	23. Medical boards or divided responsibility in any form is objectionable. Where an opinion on a single point is required, the decision of a board would appear to be desirable. A standing medical committee is far preferable to one constantly changed, particularly with a perpetual president. 24. Invalids should leave India for home in January and February.
Diseases.	1. There are disease inspections in some regiments once a week. They are not generally adopted in native corps, unless on particular occasions. 2. There is no scorbutic disease of indigenous origin at this station. Among natives such diseases are caused by the want of a proper nourishing meat diet. 3. The returns do not show the exact proportion of cases of hepatic disease under treatment at Rangoon. The following table embraces the whole Pegu division for 1858–59 :—

—	Per-centage		Died, to Cases treated per Cent.
	Of Total Admissions.	Of Total Deaths.	
Hepatic Diseases - -	2	11¼	4⅝

Causes.—Residence in a tropical climate; exposure to the sun's rays; undue excitement of the liver by the use of fermented liquor, especially ardent spirits. The immediate cause of acute inflammation is generally cold, or a chill experienced during sudden alternations of temperature.

The following per-centage of admissions of hepatitis to strength among different classes of soldiers, has been ascertained from the medical returns of six European regiments serving in the Madras Presidency in 1849–50 :—

—	Teetotallers.	Temperate.	Intemperate.
Per-centage to Strength -	5·77	5·766	10·191

The disease cannot be considered the consequence of other diseases. *Prophylactic measures recommended,*—

1. Avoidance of the solar heat in the hotter months of the year.
2. Moderation in diet and drink, especially the disuse of spirits.
3. Precautions against cold or chills, especially after fatigue or at the close of the hot season.
4. Protection of the abdomen by a flannel belt.

4. Guinea worm is not common among Europeans. It appears from the medical returns, 1829–38, that out of the aggregate strength of the Europeans of the Madras Presidency only 1 in about 1,880 admissions was from guinea worm; while among the natives the average was 1 in 562 admissions.

The only prophylactic measures which can be suggested is the avoidance of water, either for the purpose of ablution or drinking, in which the microscope detects the presence of any worm like the tank worm, described as the probable cause of guinea worm.

5. The returns do not show the exact proportion of venereal disease among the troops. Prostitutes in Burmah do not generally reside in the cantonment, and it seems doubtful whether lock hospitals would be of much avail.

6. The European troops suffer in a limited degree from fevers of the ephemeral, intermittent, remittent, and continued types; also from dysentery, of the form usually met with on the continent of India.

The following table gives proportions per cent. to the total admissions into hospital and deaths in 1858–59 :—

Diseases.	Per-centage of Admissions.	Per-centage of Deaths.	Deaths to Cases treated.
Fevers - - -	16½	9 1/12	8/11ths
Rheumatism - -	4⅘	None.	None.
Cholera and Small-pox -	Not appreciable.	—	—

7. Fevers, and some forms of diarrhœa and dysentery may be considered the more common forms of zymotic diseases. The general characteristic of fevers is mildness, and amenability to treatment. Of dysentery and diarrhœa the occasional tendency is to pass on to the ulceration stage, without that intensity of the antecedent symptoms which might be expected. Dysentery and diarrhœa prevail during the rains and immediately after. Fevers prevail most in the hottest months.

As regards the native population, these diseases prevail more generally in the lower part of the cantonment. The cantonment is distant about two miles from Rangoon. The Burmese are naturally a dirty race, and an absence of all cleanly arrangements marks their dwellings. Drainage and water supply bad. Ventilation generally good. Dwellings not crowded, and but little disease among the civil population.

Among predisposing causes are the parsimonious habits of the native troops not admitting of sufficient nourishing food, and meat not forming part of their ration. Among Europeans the use of ardent spirits must no doubt predispose to disease in some cases.

References to Subjects and Queries.	Replies.

IV. Health of the Troops —*Diseases—cont.*

8. The proportion of disease is greatly influenced by night duties, by monotonous barrack life, and by want of amusement. On the line of march disease is greatly caused by exposure, fatigue, &c., and with native troops by the men having to look after their families. To remedy the latter evil the families should be sent on in advance.

9. In Burmah, malaria is not so rife as to have led to the use of quinine as a prophylactic.

10. The following means of mitigating or preventing disease are recommended :—

First.—It appears to be of the greatest consequence to the health of Europeans that every practicable restriction should be placed on the use of ardent spirits.

Second.—Much of the disease that prevails among native troops may be attributed to the separation of the men from their families; the difficulty of procuring animal food; their partaking of imperfectly cooked rice, which in Burmah is pounded without having been previously boiled, as is done in India.

Third.—A thorough system of conservancy is required in this cantonment. At present ordure from the privies of the whole force is carted away nightly, and strawed broadcast over an extensive area on the N. E. side of the cantonment. The wind blowing from that direction during a great portion of the year, the atmosphere of the cantonment must be sensibly vitiated by the stench that arises. Regimental privies are not so fully deodorized as it is possible to keep them, nor are the barracks or hospitals as efficiently drained as they might be. But improvement in these particulars cannot be hoped for until the sanitary officer is provided with an efficient establishment, and empowered to carry out all necessary measures.

Fourth.—The dusty condition of the roads of the cantonment must likewise be prejudicial to health.

V. Intemperance.

1. The soldiers at this station are generally temperate. There are no confirmed drunkards in the full meaning of the term.

The following table, obtained from the superintending surgeon's department, shows the extent of disease, mortality, and crime among different classes of men :—

Total Strength of Europeans, 2,201, in Pegu Districts, 1858–9.	Teetotallers.	Temperate.	Intemperate.
	16	1,373	962
Of average strength each class admitted per cent.	—	169	135
Of treated died per cent. - - -	—	$1\frac{1}{4}$	$1\frac{1}{2}$
Punished by courts-martial, per cent. - -	—	34	$54\frac{1}{4}$

Drunkenness *per se* is invariably punished as an offence.

3. Distilled spirits are sold in the canteens and bazaar, but not to European soldiers in the latter.

The canteen is the only place where the European soldier can legally obtain spirits, which is of excellent quality. The average consumption per man in the Madras Artillery is $1\frac{3}{5}$ drams per diem. In Her Majesty's 68th Light Infantry, $\frac{1}{2}$ dram per diem.

Spirits form no portion of a soldier's ration in quarters, on the march, or in the field. The soldier can obtain spirits in the canteen on payment to a limited extent, but not before noon. The custom of dram-drinking in the morning does not now exist.

Spirits are never given as a ration to convalescents. No other intoxicating drinks are sold in the canteen, and the committee are not aware that such drinks are sold in the bazaars.

4. The committee consider that the moderate use of good and wholesome spirits is not injurious to health, while at times and under certain circumstances such use might be beneficial, but that the immoderate use of spirits is most injurious to health. It is also assuredly injurious to the efficiency and discipline of a corps.

5. The committee consider that, under existing circumstances, to abolish the sale of spirits in canteens would not be beneficial. The sale of it is sufficiently restricted under existing regulations. The sale of spirits in bazaars to European soldiers is prohibited under heavy penalties.

6. The use of malt liquor and of wines is most beneficial to health as compared with the immoderate use of spirituous liquors.

7. Tea, coffee, &c., are used at the station. Coffee shops with reading rooms have been largely introduced into the army of late years, and with great benefit to health, efficiency, and well-being of the soldier.

The use of such drinks as compared with the immoderate use of any intoxicating drink must necessarily be good, and have a most beneficial influence.

8, 9. If the sale of spirituous liquor were suppressed in the canteens, then the soldier would obtain it elsewhere, and would not substitute for it beer, tea, or coffee. Every means should be adopted to induce the soldier to substitute the one for the other, but the committee do not consider that this end could be obtained by suppressing altogether the sale of spirituous liquors in the canteens. But the gradual suppression of the use of ardent spirits is desirable unless when men are undergoing heavy work or exposure on field service, and when malt liquor cannot be obtained.

10. As regards recommendations, the committee consider that every encouragement should be given, and every aid afforded by Government for the establishment of a good coffee-room, &c.

The soldier should be able to obtain there anything, except intoxicating drinks, and at a moderate price. Such establishments should be as far as practicable from the canteen, and all places of amusement or recreation should be as near the coffee-room as possible. The canteen regulations provide for the establishment of such shops, but as they are dependent on the profits arising from the canteen, it would seem advisable that they should be put on a more desirable footing, and in a measure independent of the canteen.

11. The canteen regulations are contained in a general order, dated 17th August 1855. The rules are full and complete, and answer the purpose admirably.

RANGOON. BRITISH BURMAH. MADRAS.

References to Subjects and Queries.	REPLIES.
VI. DIET.	1. The ration for Queen's troops and European troops of the Indian army consists of 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅞ oz. tea, 1 oz. salt, 1 lb. vegetables, 3 lbs. firewood. At certain seasons of the year when beef (the only meat ration) is not very good, salt provisions are occasionally issued in lieu of beef; and yams and potatoes when green vegetables are not procurable. It is recommended that potatoes should at all times be issued as part of the soldier's ration, and that when fresh vegetables are not procurable, preserved mixed vegetables be issued instead. The rations are inspected regimentally by the officer of the day and by the quartermaster. 2. A complete ration with a due proportion of vegetables is provided for the troops at this station. Fruit forms no part of the ration. There is no stoppage for the ration. The soldier has three meals a day, breakfast at 8 a.m., dinner at 1 p.m., tea at 4 p.m. Breakfast consists of tea or coffee, bread, and a portion of the meat ration; the dinner consists of this ration; and the tea, of coffee or tea, and bread, with such additions as the soldier himself may feel disposed to provide. There is always 1 lb. of vegetables in the ration whenever procurable. 3. To improve the ration, mutton should be issued occasionally. Salt rations with peas once a week. The Chinese inhabitants of Rangoon rear pigs to a considerable extent. The pork is excellent, and it might occasionally form part of the meat ration. No arrangement necessary for preventing the troops selling their rations. 4. For cooking rations, each company has a cookhouse. Government provides copper boilers, gridirons, frying pans, ladles, choppers, and baskets. The commissariat provide for the regular tinning of the cooking utensils. The cookhouses (they can hardly be called kitchens in the usual meaning of the word) might be better. They are not sufficiently light. The supply of water is ample. The rations are sometimes boiled, sometimes roasted. The cooks are natives, and every thing considered, the cooking is properly done and sufficiently varied. Tea and coffee are prepared in accordance with the wishes of the soldiers. There are no complaints on the subject. It is, however, recommended that the means of roasting and grinding coffee be furnished by Government to the soldiers. In India it is the custom to have coffee for the men on the march. 5. A soldiers' garden, for cultivating vegetables, has been introduced in this station, and is extensively used by the European soldiers. Each applicant is allotted a piece of ground, and he is provided with seeds. These he cultivates himself. The produce is sold to the commissariat officer (under whose charge the garden is) at the rate of 2 as. a pound. The supply of vegetables from this source is considerable, and the quality is excellent.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. Dress consists of helmet or cap, coat or tunic, great coat, trousers, socks, boots, shirt, pouch, bayonet belt. Suggestions for dress, &c., see Appendix B. The dress is suitable to the climate, seasons, and duties. The wicker helmet lately introduced affords no protection. A thick, soft, light, felt helmet, well ventilated, should be substituted. A limited supply of water-proof capes for men going on guard and other duty during heavy rains would be a most useful addition to the present dress, and the committee would strongly recommend a supply of them for all regiments serving in Burmah, where it rains heavily for nearly half the year. The guard dress is in accordance with the season. Light cotton clothing is worn during the day and hot months; cloth or woollen during the wet or cold months. The men are protected on guard from rain and wet by sentry boxes, gun sheds, and verandahs.
Duties.	1. Men should be thoroughly drilled before being sent to India. 2. The usual routine of duties consists of guards, drills, and fatigues. Parades are generally in the morning, and sometimes in the evening; an hour is the usual duration. Short drills three or four times a week must be beneficial to health. The best hours for drills and parades are 6 to 7 a.m. Troops should be moved so as to arrive on the new encamping ground an hour after sunrise. There are no special orders on the subject. The average number of nights the men have in bed were, on the 1st January 1860,—Europeans, four nights a week; natives, three and a half nights. 3. There is one European guard in the town, two miles distant; all the other guards are much within this distance. The guards are relieved daily. There are roll-calls both by day and night. The number and times according to circumstances regimentally determined. Frequent night guards must necessarily be injurious to health. There should be water-proof capes or coats for guard, as already recommended.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at this station:— *A ball court* (in the course of construction). *Several skittle grounds*, and also American bowling alleys. *Schools*, with good schoolmasters. *A garrison library*; a company library, in the Artillery; one in H. M. 68th Regiment, with a reading room. The former is not lighted, the two latter are sufficiently lighted. *Day-rooms* in the Artillery and H. M. 68th Regiment. *A soldiers' garden*, as already mentioned. *Shops* for different trades. H. M. 68th Regiment has applied for tools for a carpenters shop. *Theatres.*—One in public rooms; one in the barracks of H. M. 68th Regiment. No gymnasia. The means of recreation and instruction are considerable, but not sufficient during the wet season and during the heat of the day. In H. M. 68th Regiment the men are restricted from going out in the sun during the hot months from 11 a.m. to 4 p.m. There is no restriction on the Artillery. The restriction must necessarily be good with young soldiers fresh from England; old soldiers, such as the Artillery usually are, do not require restrictions, as experience has taught them the danger of exposure. 2. We would suggest in the way of improvement, lofty open sheds in which could be erected a gymnasium. 3. The existing savings' banks are all that are required on this point. 4. There are no means of affording shelter for the men to take exercise.

References to Subjects and Queries.	Replies.
IX. Military Prisons.	1. There is no military prison at the station. Punishments are carried out regimentally. The means are generally defective, especially in H. M. 68th Light Infantry, but there are brick and mortar cells in the Artillery lines, and also under construction in the 68th lines.
X. Field Service.	1. There are no local regulations for field service. 2. With reference to the powers of medical officers on marches, &c., there has been very little marching in this division. All movements of troops are by water. Medical officers have full power to order anything that is necessary for the comfort of the men generally. Their suggestions are always complied with, and the practical working of such power has always been found to answer. 3. As regards general sanitary arrangements, the regulations of the service are explicit, and as a general rule work well. 4. Each corps has a certain number of hospital tents, according to their strength, also doolies for natives and Europeans, and sick carts for the latter, with the power to engage any further amount of carriage on the march that may be required.
XI. Statistics of Sickness and Mortality.	No information.
XII. Hospitals.	1. Plans and sketches. 2. As regards position, the Artillery hospital is on high ground, 100 yards south-west of the nearest barrack. The 68th Light Infantry hospital is on a high plateau, 180 yards from the nearest barrack. The 23rd Regiment Native Infantry hospital is on low ground, about 150 yards north from the lines. The hospital of the 6th Regiment Native Infantry is on high ground, 100 yards south-east of the nearest barrack. The 41st Regiment Native Infantry hospital is on low ground, surrounded by buildings about 100 yards north of the lines. The two native infantry hospitals are however 40 feet above high-water mark of the river, and above any portion of the town. The ground gradually slopes from the north of cantonments to the river. The several hospitals are about two miles northward from the bazaar and town of Rangoon. The sites are open and freely ventilated, and there are no high walls, buildings, or trees, to interfere with the ventilation, except as above mentioned. The sites of the hospitals of the 23rd Light Infantry and 41st Regiment Native Infantry are low, and require drainage. 3. The water supply is not abundant during the hot season; and filters, which are absolutely necessary, are not in general use. Each hospital should have its own well. 4. The drainage is defective in every instance; the existing drains being merely trenches dug in the natural soil, without sufficient attention to slope or removal of the sewerage water to a distance. Drains of masonry are required round the building. 5. The hospitals are constructed of wood; some covered with thatch, and some with shingles. All are sufficiently raised from the ground on posts, admitting of a free perflation of air underneath the floor. There is no efficient provision for carrying away the roof water, which sinks into the subsoil. The drainage and guttering round the hospital are not sufficient to remove the rain-fall rapidly. The native hospital walls and roofs are single, and do not keep the interiors so cool as would be the case with a double roof. The European hospitals have double roofs. The roofs project, and form verandahs for shelter from the sun, but not available for exercise. The buildings are one story in height. The hospitals were built in 1853, 1854, and 1855. The following table gives the ward accommodation :—

Wards.	Regulation Number of Beds per Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area per Bed.	Height of Bed above Floor.	Windows. Number.	Height.	Width.
H.M.'s 68th Regiment Light Infantry.	Beds six feet apart, and two beds in each side room.	Ft. in.	Ft. in.	Ft. in.	Ft.		Ft.	Ft. in.		Ft. in.	Ft. in.
2 male wards - -		163 0	46 0	15 0	112,470	1,874·5	124	1 6	24	5 0	5 0
1 female ward - -		60 0	20 0	12 0	14,400	900	76	1 6	11	5 0	5 0
Artillery.											
1 male ward - -		100 5	42 5	13 0 ceiling	59,514	1,053	126	1 4	18	4 10	4 10
5 rooms - -		- -	- -	- -	2,835	1,417	204	1 4	—	—	—
1 female ward - -		20 0	20 0	11 6	4,400	1,100	100	1 4	5	5 0	4 0
		20 0	9 6	10 0	1,800	900	90	1 4	2	5 0	4 0
1 native ward - -		59 5	20 0	14 5	17,255	826	59	- -	10	5 0	4 0
6th Regiment Madras Native Infantry.											
1 male ward - -		122 0	20 0	14 0	- -	455·6	32·6	1 10	21	4 6	4 6
23rd Regiment Madras Native Infantry.	No regulation.										
1 male ward -		120 0	20 0	15 0	36,000	- -	- -	1 7	20	5 0	5 0
41st Regiment Madras Native Infantry -		120 0	20 0	12 0	28,800	360 to 720	30 to 60	1 6	18	4 10	4 10

The hospital of the 68th Regiment is shut out from the south-west wind by buildings. The Artillery and 6th Regimental hospitals do not receive the advantage of the prevailing winds, as they run north and south instead of east and west. The windows open outwards,

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	and are generally considered sufficiently large and numerous. Those in the Artillery hospital are small and too high above the floor. 6. The ventilation is considered sufficient, but roof ventilation for all the hospitals would be advisable. The only ventilation at present is by windows and doors. There are no jalousies. 7. There are no means of cooling the air. 8. No means of warming are required. Till lately only the hospital of the 68th Light Infantry has been limewashed. This should be renewed once a quarter. The floorings are washed weekly. 9. The privies of the European hospitals are constructed of masonry. Those of the native regiments are of matting, which is most objectionable, as allowing the escape of noxious effluvia. The Europeans have connected covered passages; the natives none. The ordure is received into oblong boxes lined with zinc, carted away nightly, but not to a sufficient distance from cantonments, being allowed to remain on the surface and vitiate the atmosphere. Near the female hospital of the 68th regiment is a privy with a wooden seat over a cesspit, which has never been cleaned out, and is offensive. This should be altered. Although charcoal and lime are liberally used, it is difficult to keep the boxes of the privies clean. The boxes should be frequently fresh painted with coal tar. The latrine arrangements are defective. 10. The lavatory arrangements of the 68th Light Infantry appear fair. Those of the Artillery inefficient, but steps have been taken to remedy this. In neither hospital can warm or hot baths be readily commanded. Shower baths are considered essential, and one has been sanctioned for the Artillery hospital. 11. The bathing accommodation has been totally inefficient, but steps have been taken and sanction obtained for improvements in the Artillery hospital. Hitherto there has been nothing but a tub of water, without basins, soap, or towel. The 68th Regiment has been supplied to some extent, but regular baths are required. 12. The hospital linen is washed by the commissariat department. During the monsoon it is aired over large baskets by means of charcoal fires. 13. The storage is a wooden room beneath the hospital. It is damp and insufficient. A substantial masonry building is required. 14. The bedsteads are wooden cot frames, and rattan bottoms. Some are wooden planks. They have mosquito poles and curtains. The bedding consists of straw mattresses and pillows, quilted coverlid, a blanket or two if necessary, and a pair of sheets if ordered. The straw stuffing is objectionable. Iron cots with coir stuffing should be substituted. 15. The hospital kitchens are masonry buildings, furnished like all Indian cook-rooms, the utensils being of a primitive kind—chatties, frying pans, kettles. There are no boilers, spits, nor gridirons. The cooking is indifferent, and not so varied as is desirable. The cooks are ignorant of the art of cookery. A system of instruction should be established both for hospitals and barracks, and none but certified cooks employed. A cooking range would also be an improvement. 16. Hospital forms. 17. The following is the hospital establishment for a European corps of the full strength:—1 hospital serjeant, 1 writer, 1 purveyor or a cornicopoly, 1 assistant ditto, 1 cook, 1 assistant ditto, 1 cooly maistry, 3 coolies for leechings, &c., 8 ward coolies, 3 sweepers, 3 toties, 2 puckallies, 2 tailors, 2 dhobies, 1 female nurse, 1 cooly woman. With the detachment of Artillery the establishment is smaller, and with native corps it is very inefficient. The sick soldier also obtains the services of a comrade on the requisition of the surgeon. Native servants, as a rule, are very inattentive, and require great supervision, and Europeans are averse to be waited on by them. 18. The sanitary condition of the hospitals has on the whole been good, notwithstanding the drawbacks mentioned. There are no records of hospital gangrene or pyæmia. 19. The following improvements in the hospitals are suggested by the medical officers, and in which the special committee fully concur. Greater comfort in serving up meals; at present tin vessels are used for all purposes; the same tin pot serving as a tea cup, a soup bowl, and drinking cup. Crockery and glass should be substituted for Europeans, with cutlery, which at present the patients bring with them from the barracks. A meat ration is decidedly necessary for natives. 20. The convalescents of European regiments take exercise morning and evening in small carts or doolies, if necessary; they usually resort to the public gardens, which are in close proximity to the European hospitals. Regimental exercising grounds are unnecessary. The public gardens require enlargement and improvement. 21. There are separate detached wards for females and children, and the general arrangements are satisfactory. 22. There are no local hospital regulations. 23. As regards the powers of medical officers, they have no controlling power. The medical officer can only represent, which may be approved of or otherwise by the authorities; but his representations are generally attended to. In the matter of diet there is no difficulty, as the superintending surgeon generally sanctions any extra diet or comfort for which valid reasons can be given. It is desirable, however, that mutton should be available when required. 24. There are no convalescent wards. The medical officer considers that a convalescent hospital might be established with advantage near the mouth of the river. A hulk might be preferable for this purpose.
XIII. BURIAL OF THE DEAD.	1. The British burial ground is about 800 yards from the station. The wind blows in that direction for only a short time during the cold weather. 2. Its area is 22,755 square feet. Soil sandy; drainage, except in the low corner, good. Decomposition is believed to take place readily. The ground is tolerably kept. 3. The grave space is sufficient; graves are 3 or 4 feet apart. Depth 6 feet, width 7 feet. Only one body interred. Graves never re-opened. The time of interment is dependent on circumstances, and never beyond 24 hours after death. Hindoos burn their dead. Mussulmans and others bury theirs. Their burial ground is at a considerable distance from cantonments. Burial or burning takes place a few hours after death. The following is the order on this subject:—"The funerals of deceased soldiers are to take place at sunrise, or at half an hour before sunset, according to circumstances.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	The corpse is on no account to be carried into church previous to interment." There is also an order for preserving the ground in proper order. 4. The burial ground is not offensive. 5. The dead of the bazaar people are disposed of in the same manner as those of the native troops. 6, 7. No injury to health accrues from the present practice, and no improvements are required.

(Signed) concurrently,
Jas. Bell, Major General, Commanding Rangoon and Pegu Division.
E. S. Tribe, Surgeon and Sanitary Officer.
Rangoon, 6th June 1860. Edward Leeds, Captain and Executive Engineer.

Answers principally filled up from information obtained by a special committee.
President—Colonel Croggan, Madras Artillery.
Members { Lieut.-Col. M'Gown, 6th Regiment Madras Native Infantry.
Lieut.-Col. Greer, Her Majesty's 68th Light Infantry.
Major Haly, 41st Regiment Madras Native Infantry.
Major Tapp, 23rd Regiment Light Infantry.
Brigade Office, Rangoon.

APPENDIX A.

Climate of Pegu.

Replies to Queries on Climate addressed by Colonel Croggan, Artillery, President Special Committee.

Meteorological Instruments.	1. Thermometers, barometers, and hygrometers.
Meteorological Observations.	2. Only acquainted with the climate for three years, and have no adequate observations at command.
Climate; Dryness, Moisture, &c. &c.	3. Rain prevails throughout Pegu, though in varying quantities, from May to October, inclusive. Average fall, probably 80 inches. During the remaining six months, there are for about two-thirds heavy dews generally, and frequently morning mists. Towards the close of this period the air becomes very dry, the wet bulb being probably twenty degrees below the other; and a faint approach is made to the hot wind common at this season on the continent of India. A favourable characteristic of this season is the rapidity with which the thermometer falls about sunset. In the coldest season the variability of temperature is marked; in some parts, as at Rangoon, the thermometer, which stands below 60° at sunrise, will rise to 90° by 2 p.m. The actual heat does not appear excessive for a tropical region. Rarely does a thermometer exposed on the northern aspect of a house under the shelter of an open verandah rise above 96°. The thermometer so placed probably rarely falls below 54° in any part of the Pegu province. As for tree-planting, the whole country is nearly a pathless jungle. Canal irrigation, there is none, but two-thirds of the province being the delta of the Irrawaddy, there are abundance of streams, and rice is the staple production of the country. There appears to me no admixture of dust or other noxious matter sufficient to vitiate the atmosphere to any sensible degree.
Healthfulness.	4. Medical returns support the general opinion that for Europeans Pegu is a very healthy country. The porosity of the soil generally is remarkable; and, speaking generally, disease of malarious origin is far from rife in Pegu.
Clothing suitable.	5. Owing to the dampness of the climate for half the year, and its variability for a moiety of the remainder, light woollen clothing may be considered most conducive to health for nine months of the year for outer clothing, and as regards the inmost garment recommendable throughout the year. As regards diet and shelter, I know no special requirements. As regards military exercises, I much deprecate evening drill. Daylight closes in early. The sudden fall of temperature which takes place about sunset has been already noted; whilst two hours before that period the diminution has scarcely begun. The soldier of necessity becomes much heated at parade, and immediately it is over is pretty sure to throw off the greater part of his clothing. These evening drills, in my opinion so objectionable, are chiefly found in the commands of officers recently arrived in India, and as yet unaccustomed to very early rising.
Military Exercises. Evening parades objectionable.	
Comparative Healthfulness of different months.	6. The healthiest months are from February to May, inclusive. The most unhealthy months are June, when the rains are in their first burst, and September and October, when they have reached their maximum, and drying up begins. This limited unhealthy season applies only to Europeans. As regards natives, from their susceptibility, the period from November to the middle of January has to be included therein.
Disease, when most prevalent, and of what character.	7. Among Europeans bowel complaints are the especial product of the wet or unhealthy season. There is also some increase of fever and of unhealthfulness generally; but, as inductive of disease, different seasons are much more strongly marked in the native army, among which, at the close of the rains, and throughout the cold season, fever becomes epidemic, though to a much less extent than in many parts of India at the same period.
No Sanitaria known in vicinity.	8. Rangoon being the lowest point of the delta of the Irrawaddy, it is not likely there is any adjacent district the climate of which, from superior elevation, is more conducive to health; neither have I heard of any so deemed, from the above or for any other reason.
Salem, Madras, Vellore, Trichinopoly, French Rocks, Secunderabad, Kamptee, Jaulnah, Saugor.	9. The stations I have served at previous to coming to Pegu are given in the margin. Salem, as lying in a valley rife with malarious disease, may perhaps, *per se*, be deemed "positively injurious;" but a great abatement thereto is made by the immediate vicinity of the Shevaroy hills, rising from 3,000 to 5,000 feet above the sea; and certainly, for nine or ten months of the year, perfectly healthy. The three next named are probably of equal, and, for Southern India, of average salubrity. In this last respect the same may be said of all the remaining stations. All are on table land of more or less elevation, Saugor being the greatest, and

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References to Subjects and Queries.	REPLIES.
	except the French Rocks and Saugor, not far removed from the same latitude—Saugor on the verge of the tropics, being at once the most northerly and the most elevated, and the French Rocks the most southerly station. Europeans are subject to severe fever and bowel complaints in all these stations; but these may yet be deemed "conducive to health" in this country, so far as the greater intensity of the cold season tends that way in the European; and, judged by the average standard of health in India, none can be deemed "positively injurious."

Superintending Surgeon's Office, Rangoon, 27th March 1860.

H. GRAHAM, Superintending Surgeon.

APPENDIX B.

SUGGESTIONS for the DRESS, CAMP MANAGEMENT, &c. of the ARMY IN INDIA, by MAJOR G. T. HALY, of the MADRAS ARMY.

SECTION I.—HEAD DRESS.

"Puggeree" (cloth) round the Cap most objectionable.

THIS most important article of dress should be light and well ventilated; the plan too often adopted of wearing a "puggeree" (cloth) round the cap is most objectionable, as entailing extra weight, besides engendering heat.

Ventilation and Lightness are the great Desiderata.—Every extra Ounce tells on the Man with killing effect.

The argument advanced that it is worn by the natives is fallacious. Firstly, the native, from his youth upwards, has been accustomed to it and to the climate; secondly, the native only wears a muslin or light cloth turban, invariably either loosely put on or open at the top, and not over an air-tight cap, which makes all the difference.

Description of Helmet.

In the "field service helmet" proposed, and already submitted by me, lightness with ventilation has been the principal aim, as the following description will exemplify, viz.:

Neutral Colour.

Soft thick felt, ventilated by an air tube on the crown, communicating with a broad air-chamber running round the head over the temples, with a false inner band or head-piece to fit the head; the vacuum* thereby caused giving further ventilation, and preventing the direct action of the sun on the head.

SECTION II.—WOOLLEN COAT.

Ventilation and Protection from Heat. White is objectionable, causes a painful Glare, and is too conspicuous.

A loosely-fitting tunic of a neutral colour, with strong pockets from side-seam to front as haversacks, open at the arm-pits for ventilation and to admit of closing by lacing; the back of the tunic to be padded between the shoulders with a loosely-spun felt (or numda cloth) as a protection to the spinal marrow.

SECTION III.—TROUSERS.

Pattern as worn by Sailors.

Trousers strong and loosely made, of the same colour as the tunic, to fit without braces (sailor pattern), braces being highly objectionable, as interfering much with free action, as well as causing heat and adding weight.

SECTION IV.—SHIRTS AND FLANNELS.

Calico and coloured Flannels and ditto Bands.

Strong calico, with the collar fitting loosely round the neck, and a couple of coloured flannel ditto when on actual field service. A flannel waistcoat should be invariably worn next the skin with cotton shirts, as well as flannel drawers in the cold seasons, and worsted socks on all occasions of work, as well as flannel bands.

SECTION V.—NECK-TIES.

Square Silk most useful.—Cotton Handkerchief most refreshing when wetted.

A square black silk neck-tie, to tie in a bow, and go once or twice round the neck, according to the season. A kerchief, besides being cooler or warmer according to pleasure, will be found much more useful in many other ways than a stock; and no soldier should be without a handkerchief, which, besides its many other uses, will be found most refreshing wetted and placed on the head in the hot season, or loosely in the helmet on the line of march, &c., and many a *coup-de-soleil* has been thus prevented.

SECTION VI.—SHOES.

Brown Leather, with Brass or Copper Sparables, lasts longer and is easier to the Foot.—Sambre-skin worn by all Sportsmen.

Ammunition ankle-boots, of brown leather (the black attracting the sun), and a composition of wax, lard, resin, and camphor, will make them water-tight, and preserve and soften the leather. The soles and heels should be studded with brass or copper sparables, the iron ones rusting and eating away the leather and stitching even of new ones during the monsoon. A very good and cheap description of boot for the dry season can be made up in India of sambre (elk) skin; the leather is so soft and pliable as to obviate the necessity of wearing socks. They are well known, and worn by all sportsmen, racket, and cricket players in India.

SECTION VII.—GREAT COATS.

Too heavy and soak the Rain, and thereby cause Sickness.—Weight is as damaging to the Soldier as to the Race Horse.

The present thick woollen great coat is much too heavy for general use in India; a lighter one should therefore be substituted, made of some material that will throw off the rain, and not, as with the present one, soak it in, and thereby not only double its weight but likewise cause much illness, owing to their being worn and slept in when in a wet state, for when once saturated they take hours to dry.*

SECTION VIII.—BEDSTEADS.

Sleeping on the Ground most injurious.

Few things are more injurious to health than sleeping on the ground, particularly during and for some time succeeding the rains; and though it would be impossible to carry cots for an army in the field, yet much can be done in the way of a substitute by raising sleeping places by means of brushwood, straw, &c., and tarpaulins should be laid down in the tents.†

Saving to State.

These can always be carried, and would be found most useful as a covering or protection for the baggage, &c., &c. on the line of march, but on the regular line of route there should be cots kept or raised platforms erected. This great comfort for the men, with certain beneficial results to health, and thereby incalculable saving to the State, can be readily obtained at a mere trifling expense.

SECTION IX.—TENTS.

Ventilation and Punkahs required.

The tent furnished for the European soldier in Indin is perhaps the best in the world, requiring simply ventilation above, on the principle adopted in the present home ordnance tent; and no time should be lost in calling the attention of the authorities in India to this valuable improvement. Punkahs, likewise, would have a most beneficial effect, as the agitation of the air caused by them would effect the double object of cooling the men and causing a free ventilation; further, they would induce the men to keep more in the tents during the heat of the day

* In this vacuum a light wadding is placed but so as not to interfere with the ventilation, for this is the grand secret of a solar head dress.

* I have since invented a cloak which opens out into a blanket, and can be converted into a tent.

† Mosquito curtains are thought by the Chinese indispensable t health; and I believe them to be so in that country.

and at night—most essential objects to be gained, but difficult to obtain, owing to the discomfort of the heated atmosphere of an ill-ventilated and crowded tent.

Section X.—Camp and Encamping Ground.

Elevated, dry, open Position to windward of Town to be selected.

The most open, dry, and elevated spot should be selected for encamping; to windward, and as distant as practicable from the town or village, as well as from any swamp or marshy ground. The practice of encamping, even in the dry season, in paddy (rice) fields is most objectionable, and should be strictly prohibited.

Cleanliness essential.—Impurities to be destroyed by Fire.—Unhealthy Tracts to be passed between Sunrise and Sunset.

Care should be taken to burn all impurities in the vicinity of the camp for even a day's halt; but for a standing camp cleanliness becomes still more essential, and, therefore, in one even of the shortest duration the strictest attention should be given to this important point, and all rank grass or jungle in the vicinity should be destroyed by fire, cutting it and allowing it to lay having a pernicious effect; and in case of any epidemic in a jungle country, fire should be kept burning night and day to windward of the camp. All suspected and unhealthy tracts shall be passed during the day, if practicable.

Section XI.—Water.

Wells to be dug, with other Measures for purifying the Water.—Purifying Effects of Charcoal on Water.—Charcoal and Water Bags.

The necessity for having this necessary of life pure and wholesome is well admitted in all countries, and the natives of India, with some justice, perhaps, attribute most sickness to impure and unwholesome water;* and as filters cannot be carried for a whole army small wells should be dug—two or three feet deep will suffice—in the beds of rivers and vicinity of tanks (ponds). A few baskets of charcoal (always procurable), thrown in at the bottom, and kept down by covering it with sand or clay, will ensure filtration, with a certain degree of purification. Boiling it has likewise a beneficial effect, but not so easily accomplished for bodies of men. Bags of charcoal should likewise be kept in the camp; "puckalie (water) bags," as well as the small ones to contain about two quarts of water with which every man ought to be provided.

Simple Filterers in common use in India.—Earthen Pots.

In standing camps, cantonments, or garrisons, there is a most simple and efficacious mode of forming filterers; one in common practice in all gentlemen's houses throughout India, viz., by placing three chatties (earthen pots) one over the other, the bottom one simply to catch the water, the other two having small holes drilled through the bottom, the centre one three-fourths filled with a mixture of sand and charcoal, the upper one as a reservoir for the water, from which it drops through straws placed in the holes to regulate the dripping; but they are too commonly in use in India to need further description.

Section XII.—Diet.

Exposure on empty Stomachs injurious.—Hot Coffee or other warm Beverage advisable first thing in the Morning.—Spirits, unripe Fruits, &c., prejudicial.

The practice of marching and exposing the men with empty stomachs to the malarious effects of the chilly vapours before dawn is most injurious, the system being then more prone to disease. Hot coffee or other warm beverage with a biscuit or slice of bread should, therefore, be provided and taken by the men ere quitting their tents or barracks. Too much care cannot be taken to prevent the men drinking toddy, eating unripe fruit, or crude vegetables. Drinking spirituous liquors should be discouraged as much as possible, and never served as a ration, or from the canteen, in a raw state; the best preventive against this is to facilitate the procuring of malt liquors.

Meat Rations generally too much.—Vegetables and Fruit occasionally to be substituted.

The present meat ration is well suited for field or hard work, but is by far too much for the idle life led in garrisons. Vegetables and fruit, in lieu of a full ration of meat, would, there is no doubt, at times be conducive to health, and such is the opinion of most medical men, who ought to be empowered to regulate such matters.

Section XIII.—Exercise and Cleanliness.

Exercise in Open Air.

Exercise is most essential, and the men should be sent out morning and evening to walk in *small* parties, under a non-commissioned officer, if thought necessary. But the practice of marching them out in a body, particularly in the hot weather, is both distressing and injurious to health, owing to the clouds of dust raised, and the quantity of it that thereby must be inhaled.

Swimming and Gymnastics.—Swimming Baths.

Swimming and gymnastics of all descriptions should be encouraged; cleanliness of body and clothing is most essential to health; and bathing, at least once a day, should form part of the day's routine in the field. There should be a swimming bath attached to every European barrack for the same purpose.

Section XIV.—Miscellany.

Clasp Knife, with Needle.—Cords for drawing Water.

Every man should carry a clasp knife, with a needle (made on purpose), for mending clothes, shoes, &c., and a small semicircular tin pannikin (made to stand the fire), with a small cord twelve yards long attached to draw water with. This cord would be found most useful in many ways, forming escalading ladders, &c., and can be carried in a hank in the pannikin. The necessity for these is admitted in the native army, forming a portion of the kit of the sepoy, under the denomination of "jumboo and rope."

In the field, great coats should invariably be put and kept on when heated after a march or work of any kind.

Board Ship.*—A few Remarks on Cleanliness and Exercise.

Previous Training required.—Supervision of Officers most necessary.

Shipboard duties and discipline should form part of the training of the army, and ought to be as regularly practised on shore at parades for the purpose as any of the other duties, particularly tying knots, lashing, unlashing, slinging hammocks, &c. There is no situation in which a soldier is placed requiring more foreknowledge both in officers and men, nor one in which the personal care and supervision of the officer is more immediately necessary, or requiring stricter attention to carry out regulations.

Difficulty of Insuring Cleanliness and Exercise.

The difficulty of insuring cleanliness and exercise to troops on board ship is well known to all, yet both can be secured with care and attention to a system adopted by me while in command of troops during two long voyages (each over three months) between India and China.

Mode of Bathing.—Bathing Parade.

The men were paraded every morning (weather permitting), in bathing drawers, when the following order of parade was gone through:—"Prepare for bathing"—both ranks immediately sat or squatted down, the front rank leaning a little forward, men detailed for the purpose passing along in front with buckets of water, *douching* each man as they proceeded, the rear-rank men scrubbing the backs of their fore-rank men, each front-rank men washing the fore-part of his body at the same time. This continues for fifteen minutes, the command "Stand up" was then given to ease their limbs; "Right-about" was given, and the same order of washing was gone through with the rear rank.

This mode not only ensured cleanliness of person, but a certain degree of healthy friction for the body, with more exercise than may at first be supposed.

Washing Decks; good Feeling thereby obtained between Soldier and Sailor.—Watches kept to their Work, with other Modes of obtaining Exercise.—Drill, &c., with Ball Firing.—Suffering of Troops in China from want of Exercise.

The decks (with the exception of the forecastle) should always be washed by the soldiers, both with a view to pro-

* The water up the Yang-tse-Kiang was about the colour and consistency of pea-soup; drank in this state, it must have been most unwholesome; and to this I attribute much of our illness up that river, as it contained much decayed vegetable matter, a large deposit of which was obtained after standing a few hours.

* The whole of this system was fully carried out by me with the greatest success during my late voyage with recruits from England.

RANGOON. BRITISH BURMAH. MADRAS.

mote a good feeling between the soldier and sailor (for nothing is more disliked by sailors than to clean for the soldier), and dry holystoning between decks was likewise frequently practised both as an exercise and keeping the decks sweet and clean without damp. The other methods of obtaining exercise are more numerous than may be supposed, for instance, the watches were kept, not nominally, as every man was kept at his post and alert at his duties, trimming sail, &c., and not, as is too often the case, sleeping through his watch. But beside the regular duties of the ship, the men off duty daily had some work that enforced a certain degree of exercise, such as drawing the water for bathing, washing decks, and for other ship uses; manual and platoon exercise was, weather permitting, daily gone through, including aiming practice, with ball practice once a week; marching, likewise, was performed by passing along and round the decks, with counter-marching by files, and this, by placing lines for the purpose of steadying the men, could be gone through even in rough weather, and for a long voyage nothing is more essential than constant exercise, both as regards the immediate as well as after health of the men; and the want of exercise on the voyage out was one of the causes assigned for the unhealthy state of the troops in China during the expedition of 1842 and 1843.

All European Soldiers shall be trained as Artillerymen.

With a warfare such as is now going on in India, it becomes most essential that every European soldier should be a trained artilleryman, accustomed to move and handle heavy ordnance, which practice could be fully carried out during the voyage, and at the same time give full and manly exercise.

Sleeping between Decks in a crowded and heated Atmosphere to be avoided.—Sleeping on Deck under an Awning to be enforced.

Contrary to the instructions laid down in Her Majesty's Regulations, page 316, par. 41, my experience has shown that much disease is engendered by sleeping below in warm weather, in a crowded and overheated atmosphere, and that sleeping on deck (under an awning) should not only be encouraged but enforced during the warm weather and calms, to the extent of at least half the numbers.

APPENDIX C.

MADRAS ARTILLERY.—HOSPITALS.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	The hospital is situated on the south-western side of a quadrangular area forming the Artillery lines, and which area occupies the north-eastern angle of cantonment.
2. Position of Hospital, &c.	(1.) It (the hospital) lies to the westward of the barrack buildings, distant about 100 yards from the nearest, and about 290 yards from the stables.
	(2.) It lies about two miles to the northward of the bazaars, and of the houses of the civil population generally, that is, of the *town* of Rangoon.
	(3.) The site is open and freely ventilated, and there are no buildings, high walls, or trees, which interfere with ventilation.
	(4.) The site itself, as relates to elevation, capability of drainage, absence of malaria from river banks, marshes, nullahs, and ditches, is good; but water-pits and "foul grounds" exist within the area of the regimental lines, though not perhaps within that of the hospital, the limits of which, however, are not well defined by any fence or enclosure.
3. Water supply.	The water supply is *not* abundant. No water is obtainable within the hospital limits; all has to be brought from a well in the lines of the 6th Regiment. The water itself is wholesome, but at the present season is liable to become turbid from the wells failing. A well should be dug within the hospital compound.
4. Drainage.	No drainage, but a simple ditch round each building, exists. These ditches are constantly becoming obstructed by the banks falling in. The refuse water is led off by a similar channel to low ground, some 20 yards to the south-west of the hospitals, where it sinks into the soil.
5. General structure and arrangement of hospital buildings.	(1.) The ward of each of the hospitals, European (male and female) and native, are raised eight feet from the ground, and there is a free perflation of air underneath the floors.
	(2.) No provision is made for carrying away the roof water, except by the ditches already mentioned; much of it sinks into the subsoil.
	(3.) The surface drainage and guttering round the hospital has been already described, and is *not* sufficient to carry off rapidly and effectively the rain-fall.
Materials of which the hospital is built, &c.	(4.) The hospitals are built entirely of wood, with thatched roofs; the walls of none are double. The roof of the male European ward may be said to be double, as it has an interior lining (roofing) of plank; this ceiling, however, has not a single ventilating aperture. The arrangement of roof just described (with the addition of ventilating apertures) will suffice I think to keep the ward as cool as can be expected. The native ward and the female ward do not possess this advantage.
Existence of verandahs.	(5.) No covered, boarded verandahs available for exercise exist. Nothing but a space equivalent to the overhang of the roof exists all round the hospital, which has a breadth of 7½ feet, but is not available for convalescent exercise in wet weather, though affording sufficient shelter to the building from the sun's rays.
Number of flats of which Hospital consists.	(6.) The hospitals consist of only one flat, divided into one ward for the general sick and side rooms for dispensary.
	(7.) The male hospital is not placed so as to derive full benefit from prevailing winds. Its long axis is from north to south. It would have been better to have built it extending from east to west; the native hospital is thus built.
Arrangement and construction of windows, &c.	The windows open outwards, and are glazed; and the only fault I find with them is that they are small, and should extend nearer to the floor. The slope and projection of roof beyond them is such, that sufficient light and air does not enter.
6. Means of ventilation.	No means of ventilation but by doors and windows exist. With the small number of sick usually accommodated, the wards can at all times be kept free from odour or closeness; but if they were called upon to accommodate the full number for which they are supposed to offer accommodation, I do not think the air could be kept pure.
Jalousies and jhilmils.	There are none in either hospital.
7. Artificial means of cooling the air.	No artificial means are in use.
8. Artificial means of warming.	None in use.

References to Subjects and Queries.	Replies.
Cleansing and limewashing wards.	The wards are washed and cleansed once a week. They have not hitherto been limewashed, but I have taken steps to ensure its being done, as I consider it essential to health.
9. Privies, water-closets, urinals.	No water-closets exist. The privies for Europeans and natives are under the same roof, divided by a partition, and are situated about 15 yards from the hospital. The "urinals" consist of a urine tub standing in the privy.
Drainage, water supply, &c., of privies.	The drainage is indifferent, indeed there is no drainage properly so called, for shallow trenches in the soil cannot be called drains. The privies are not placed over cesspits, and are often offensive. The ordure is received into wooden boxes lined with zinc, which are removed and emptied each night. It is difficult to keep them clean and free from odour, though charcoal and lime are liberally used. They might be kept sweeter by being constantly fresh painted with coal tar.
10 and 11. Lavatory arrangements, and bathing for the sick.	The lavatory arrangements may easily be described. They consist of a large tub of water standing in the centre of a damp floor of a room beneath the hospital, without basins, towels, or soap. They are not only not sufficient for the sick, but positively hurtful to them. A lavatory furnished with basins, soap, towels, a shower bath, with conveniences for a hot or warm bath at any moment, ought to exist on the same flat with the wards.
12. Washing and drying hospital linen, &c.	This does not come under my cognizance, the linen is washed by the commissariat department, by contract.
13. Whether the storage is sufficient and dry.	The storage is in a small room on the ground floor, that is, beneath the hospital, and cannot be dry in the wet weather, neither can be considered sufficient or good.
14. Bedsteads and bedding in use.	The bedsteads and cots are of wood, with rattan bottoms, and furnished with poles and mosquito curtains. The bedding consists of mattresses and pillows stuffed with straw, a pailliass or quilted coverlid, a quilt, a blanket, or two if necessary, and a pair of sheets for each cot, when considered necessary. The only improvement which suggests itself to my mind is, the substitution of coir for straw in the mattresses and pillows.
15. Hospital kitchen, cooking, &c.	The kitchen is situated 15 yards to the westward of the hospitals, and is as well furnished as cookrooms in India usually are. Some additional cooking implements might be furnished with advantage. The diets are fairly cooked, and can be sufficiently varied. There is room, however, for great improvement in cooking, and great benefit would be conferred upon the sick, if some rules for plain hospital cooking were drawn up and printed in Tamil for the use of the cooks who should be proved to be well instructed in such duties before being entertained.
16. Diet table, diet roll, statistical forms of sickness, &c., &c.	Forms transmitted.
17. Attendance upon the sick.	The hospital establishment consists of one hospital serjeant and one hospital orderly (European); but the services of the comrades of any European sick are obtained on application:— Besides these individuals, there are the following native attendants attached to the hospital:— 1 cornicopoly in charge of clothing and diet. 5 ward coolies, for attendance on the sick. 1 leech man. 2 surgery coolies. 2 bheesties or water drawers. 3 toties. This attendance suffices for the number of sick usually under treatment. The native soldier also has the services of a comrade as an attendant in all cases requiring it. A nurse is entertained in the female ward.
18. General sanitary condition of hospital.	The sanitary condition of the hospital has apparently been fair since its erection, and I can find no record of epidemic disease, hospital gangrene, or pyæmia, having appeared in the wards.
19. Sanitary defects.	Some of these have been already touched upon, and consist of inefficient drainage, insufficient water supply, and the absence of any comfort or convenience for ablution. I would add, also, the absence of comfort in the arrangement of meals for the sick and convalescents. They have to eat off *tin* dishes and drink out of *tin* pots. The improvements necessary are— 1st. A system of pucka drains leading all refuse water and sewage to some distance from the hospital. 2nd. The excavation of a well for the use of the hospital itself. 3rd. The erection of a dead-house away from the hospital. At present it is beneath the building—a highly objectionable arrangement. 4th. A well furnished lavatory, with basins, towels, soap, and a shower bath on the same level as the wards. 5th. The substitution of vessels of earthenware for messing for the tin ones now used. 6th. The whitewashing of the interior of the hospitals, and the addition of a boarded roof or ceiling to the native and female wards. 7th. The introduction of a few plain rules for plain cooking.
20. Provision for exercise for convalescents.	There is no provision for convalescent exercise. The only place available is the space below the hospital, but that must be damp in the wet weather. Hitherto the convalescents have not been allowed the advantages which are at their disposal. I have lately applied for a sick-cart to convey them to the public gardens of an evening, which gardens, being so near to the Artillery lines, afford a pleasant lounge for this class of patients, rendering any *special* convalescent exercising ground scarcely necessary.
21. Provision for treatment of wives and children.	The wives and children of soldiers are admitted when necessary into a ward or detached building set apart for the purpose. Trifling cases are treated as out patients, and medical aid is now afforded them at their own quarters, or in the patchery in special cases. These arrangements are, I think, good and satisfactory.
22. Special local regulations.	I am not aware of the existence of any.

References to Subjects and Queries.	REPLIES.
23. Powers practically vested in medical officers.	Practically, no powers are ceded to the medical officer in questions of this kind; he can only *represent*. His indents upon departments for supply or repair, &c., must be countersigned by the officer commanding his regiment, or by the superintending surgeon; and owing to this, inconvenient and hurtful delay is often experienced in carrying out any necessary sanitary measures. Indeed, even when the representations are admitted and supported by commanding officers, delays occur in higher quarters detrimental to the welfare of the sick. The medical officer, whether he be regimental or garrison, although held responsible for the sanitary condition of his regiment or of the cantonment, as the case may be, has virtually no power to enforce a single suggestion, or carry out a single measure of sanitary reform. In the matter of diet and medical comforts there is no difficulty. The superintending surgeon's sanction is always given to any diet or comfort for which any valid grounds can be shown; and in his absence from the station, the regimental surgeon can order anything he likes, furnishing at the end of the month a memorandum explanatory of any unusual or excessive expenditure.
24. Convalescent wards or hospital.	No convalescent ward exists in the hospital of which I have medical charge, and no convalescent *hospital* for the *station*. The latter would be of great advantage to the sick, and I conceive that the organization of a well found hospital ship to be stationed at the mouth of the river, say off Elephant Point, and to which convalescents, or sick not convalescing favourably in hospitals on shore, could be sent, would be found to answer admirably, by shortening the period of convalescence and by saving many valuable lives. Date of construction not known. Total number of wards. { 1 Male, with 2 small side rooms for special cases. 1 Female, with one verandah room for ditto. 1 Native. } Total regulation number of beds.—No regulation on the subject.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Mean Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in feet per Bed.	Height of Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
		ft. in.	ft. in.	ft. in.	ft.			ft. in.		ft. in.	ft. in.	
Male ward - - -	No regulations to be found on this subject. Beds 6 feet apart; rarely more than 10 patients; could accommodate say 36 patients and 2 in each side room.	109 5	42 6	13 6	59,514	1,053	126	1 4	18	4 10	4 10	Besides this there are 6 doors, each 7′ 10″ × 4′ 10″.
Do. side rooms, each		17 6	12 0	—	2,835	1,417	204					
Female ward, centre room		20 0	20 0	11 6	4,400	1,100*	100	1 4	5	5 0	4 0	2 doors.
Do. side room -		20 0	9 6	10 0	1,900	900†	90	1 4	2	4 11 / 3 0	4 0 / 2 11	1 door, 6′ 2″ × 3′ 5″.
Native ward - -		59 6	20 0	14 6	16,520	826‡	59	No cots in use.	10	4 11	3 11	6 doors, 6′ 11″ × 3′ 11″.

N.B.—In calculating cubic contents, &c. fractional parts of a foot are omitted.

* Allowing 4 beds, which is as many as the ward can accommodate, with due reference to purity of atmosphere.
† Allowing 2 beds.
‡ Allowing 10 beds each side.

Rangoon, 12th March 1860.

(Signed) J. L. RANKING, Surgeon in Medical Charge, Artillery, Rangoon.

APPENDIX D.

HOSPITAL OF HER MAJESTY'S 68TH REGIMENT LIGHT INFANTRY.

HOSPITALS.

1, 2. The 68th regimental hospital is situated near the southern extremity of the sort of irregular plateau formed by the gradual rise of the ground from the Rangoon river from the east and south, towards the Shoay Dagon Pagoda.

1st. It is to the south of the barracks, and distant about 180 yards from their nearest bungalow.

2nd. It is to the eastward of the regimental bazaar, and distant about 400 yards, while it has the sudder bazaar and the civil population of Rangoon and Pusondoung to the south, at distances varying from half a mile to two miles. On the west, about a mile and a half off, is the village of Kemendine. There are besides in the immediate neighbourhood the huts and sheds of squatters and followers, comprising the lowest and dirtiest class of natives, as dhobies, toties, sweepers, &c.; as, for example, about Dhoby's tank, on the south-east, the huts between Lake road and the barrack site, and those located round and about the Shoay Dagon Pagoda, commissariat cattle lines, &c.

3rd. The site might be said to be good, and nearly as well chosen for the purpose as the nature of the ground allows, but that the three buildings which compose the native detail hospital and division medical stores, erected close to its southern extremity, effectually keep off the sea breeze from that quarter.

4th. The site, if another hospital was thought of, might be better selected, although its elevated position, being nearly as high as the barracks, affords facility for natural drainage. All the low ground immediately around the hospital site, including as it does at greater or lesser distances within its area marshy land, imperfectly made nullahs and drains, together with native dwellings in a noisome condition and not subject to a sanitary police surveillance, these and other nuisances, as the habits of native regiments with regard to latrines, and last, not

References to Subjects and Queries.	REPLIES.
Hospitals—*cont.*	least, the close proximity of a hospital for native details to windward, all tend to render the site a dangerous one, under existing circumstances, from without. 3. The supply of water to the hospital is sufficient, and is of good quality: but for drinking purposes it would be better if filtered. There are no filters. 4. Shallow open cuttings are made around the hospital buildings in a line with the projecting roof, and these, with a few similar cross-cuttings to meet, take the direction of the cook-houses, which they pass by towards the ravine on the east of the buildings. During the monsoon these open cuttings are flushed with the rain water, which carries with it down the slope the refuse water from the cook-houses, &c. During the six months of dry weather there is no provision made for carrying off the refuse water. 5. There are three buildings used for the treatment of the sick; viz., two large bungalows, of equal size, and one of smaller size, which has been painted green, and is the ophthalmic ward. The two large bungalows are superior in construction; they have a double roof, *i. e.*, an inner ceiling of teak boards, and an ordinary leaf and bamboo roof externally, and with an interval of some 3 feet between it and the inner ceiling. 1st. The height of the ward floors from the ground in each building averages 6 feet, and there is a free perflation of air underneath them. 2nd. The only provision made for carrying away the roof water is that already described when speaking of the refuse water. No doubt a great portion of the rain and roof water finds its way into the subsoil. 3rd. I have nothing further to add regarding the surface drainage, in addition to what has already been said regarding the shallow cuttings; no doubt the provision is not sufficient, although it carries away much of the rain-fall. 4th. The hospital bungalows are raised on pillars of teak wood, some 6 feet from the ground; the sides or walls are of teak planks, ¾ inch thick; the roof, as above stated, is double, but the sides are not double-planked; the double roof permits of good ventilation, and if the walls were double-planked it would be a great improvement; the floor is of teak planking, set on in the rough, *i. e.*, without much planeing or close approximation of the adjacent boards; hence there is free ingress for the cool air upwards through the floor, which is single. 5th. The external or Palmyra leaf roof projects downwards and outwards all round the bungalow for some 10 feet, thus forming a verandah on every side, the floor of which is the *ground*. Convalescents can avail themselves of the shelter thus afforded, and seats are provided here and there for their convenience; the hospital sentry makes his rounds also beneath this verandah roof. 6th. There is but one flat. 7th. The hospital is shut out from the south-west monsoon by the three buildings already referred to. The windows open like a glass door on hinges, and towards the outside; they are large enough and numerous enough. 6. Large openings in and along the apex of the inner ceiling in the large bungalows communicate with the external atmosphere, through the interval left between it and the outside roof; a draught is thus indirectly kept up, which facilitates the removal of the lighter air; the numerous openings, also, by means of doors and windows on every side of the building, besides the many open chinks in the floors, render the natural ventilation of the wards very fair, and keeps them, with proper attention to cleanliness, &c., pure and sweet within. There are no jalousies in any of the buildings. 7. Except it be punkahs, there are no artificial means employed for cooling the air admitted into the wards. 8. There are no artificial means for warming the air admitted into wards employed. The walls and ceilings of the wards were thoroughly cleansed and limewashed some five months back; it was then done on the requisition of the surgeon, myself, and doubtless would be so done whenever required. 9. There is one brick-built privy in the centre and eastward of the two large bungalows; it contains a wooden seat, opening over portable wooden boxes lined with zinc, and which receive the soil. These boxes are carted away and cleansed with water and quicklime daily; the boxes are inserted through a sort of trap door in the posterior or eastern wall of the privy, and likewise removed. There is another privy within the hospital enclosure, which belongs specially to the ophthalmic bungalow; it is also to the eastward of the building, and only a little way removed from it, like its fellow of the large bungalows, and, unlike it, built of wood; it contains a wooden seat, with holes, over a cesspit or hole dug in the ground, which hole receives and has received the excreta since it was originally built; it has not been cleaned out, and the smell is offensive. The plan should be altered. 10. Wash-houses built of wood, and raised some 3 feet from the ground, sufficiently supplied with water, tubs, tin basins, soap, and latterly, towels, are within easy access of the large bungalows; one to each. Within the wards a corner room is set apart for the convenience of such sick as cannot with propriety use the wash-house below. But a regular bath-room properly furnished and supplied at pleasure with hot and cold water is an essential to the efficient working of a hospital. A shower bath, too, is not only a desideratum, but an indispensable means of treating certain classes of complaints. I regret to say that a shower bath has not been considered a necessity for a European regimental hospital by Dr. Graham, the superintending surgeon of this division, and, consequently, my repeated and urgent request for one through the officer commanding the regiment has been refused. 11. Without a bath-room properly furnished and fitted up specially as such, the answer to this question must be in the negative. 12. The hospital purveyor is responsible for the washing of the linen, and issuing it, when required, dry. The linen during the monsoon is always more or less damp, but it is aired beneath the hospital in such cases by means of charcoal fires placed beneath bamboo frames, upon which the linen or bedding is placed. 13. The storage is not sufficient, nor does it afford sufficient protection from damp in a climate like Burmah. It is a small wooden structure; the store ought to be a pucka building. 14. The bedsteads now in use are strong wooden frames with strong cane bottoms and light iron fixings wherewith to fasten a mosquito frame. The beds are made of cotton

References to Subjects and Queries.	REPLIES.
Hospitals—*cont.*	

ticking filled with straw; the pillows are now filled with coir; a blanket, cotton coverlid, and a pair of sheets are supplied, and changed whenever ordered by the surgeon; sheets and night-shirts are invariably changed twice a week.

The *bedsteads* appear admirably suited for this climate, as there do not appear to be any bugs harboured by them, as in India, where charpoys are preferred for this reason. The straw supplied for the *bedding* is very indifferent, and a hair mattress is the only proper bedding as regards comfort and economy: the curled hair can be weighed, and when necessary can be washed; the expense is only for the first outlay; some of the fibres which have from time to time been proposed as substitutes for curled hair might with advantage be used for bedding, in lieu of the dirty paddy straw obtained in this country.

15. There are two pucka-built kitchens, one close to the southern extremity of the hospital range, and one at its northern extremity; both are to the eastward of the bungalows, and only a few feet from them.

The means of cooking are very limited, and consist merely of chatties, frying-pans, and kettles. There is no such thing as a kitchen range or boiler, turnspit for roasting, &c.

The cooking of diets is but very indifferently done, and cannot be sufficiently varied under existing arrangements.

16. Copies of forms in use are annexed.

17. The following table will show what a regimental hospital is entitled to in respect to serjeants, nurses, &c.:—

Hospital Serjeant.	Writer.	Purveyor.	Assistant Purveyor.	Cook.	Assistant Cook.	Cooly Maistry.	Coolies for leeching, &c.	Ward Coolies.	Sweepers.	Toties.	Puckalies.	Tailors.	Dhobies.	Female Nurse.	Cooly Woman.
1	1	1	1	1	1	1	3	8	3	3	2	2	2	1	1

The duties of the hospital serjeant are manifold, and occupy all his time; he is entrusted with the entire discipline, dress, and is responsible for the conduct and behaviour of the convalescents and sick, whether out or in hospital.

The native servants, especially those supplied to the hospital here, are not trustworthy, and require the greatest vigilance on the part of the subordinates to ensure any work being done. The complaints here against the hospital ward coolies, toties, and sweepers, by the hospital serjeant and by the senior apothecary, are frequent, for drunkenness, absence without leave, and inattention to the patients, and generally to their duties.

Whenever a man is seriously ill it consequently becomes necessary to apply for the services of a European soldier to wait on him, else he would not receive the care or attention he requires, or is presumed to have.

Under these circumstances I cannot say that the attendance for the sick provided by regulation is of the kind it ought to be, or what *à priori* might be expected from looking merely at the above table, without knowing the working of the system.

18. I think that, on the whole, the sanitary condition of my hospital is good, notwithstanding any drawbacks I have mentioned.

The sick have never been attacked with hospital gangrene or pyæmia within its wards.

Bowel complaints and fevers have appeared from time to time in an epidemic form, according to the season and time of year, induced, I believe, in a great measure by local influences of a remediable nature, but not confined to the immediate vicinity of the hospital.

19. Many suggestions occur to me with respect to this question.

1st. The cantonment should be cleared *far* and *wide* of jungle, and subjected to an extensive and efficient drainage.

All squatters and camp followers should have their places of residence told off for their use; and their huts ought to be erected by the Government on a definite and suitable plan, instead of allowing them to congregate as now in any number and with or without shelter, as the case may be; a strict and efficient police should then enforce cleanliness and order and prevent the clandestine sale of liquors, spirits, fruits, bad meat, fish, &c.

Dhoby's tank should not be used for washing clothes. It might, with some little expense perhaps, be made a suitable swimming bath for the regiment, and *officers* of the cantonment generally.

The dhobies should not be allowed to wash clothes nearer to the hospital than the large Lake, where suitable sheds might be erected under regulations calculated for the purpose.

Roads ought to radiate, as it were, farther into the jungle from the cantonment, and a road for driving round the large Lake should claim attention. While these measures generally are called for for the well-being of the sanitary condition of the hospital and the cantonment, it is quite as essential that the adjoining town of Rangoon and villages of Posendoun and Kemendine should be placed under the surveillance of an efficient sanitary police.

Diseases are there generated in excess, as the mortality of the last quarter will show, which are to all intents and purposes preventible, and might at any moment be wafted northward to our men, and then the tale is soon told; a fine regiment becomes panic-struck, perhaps decimated. With every death the Government loses 150*l.*—it cannot be less, besides a European and a soldier, whose loss can hardly be estimated in India by money.

2nd. The dieting of the sick is capable of much improvement. I would suggest what I have repeatedly done before, that mutton be issued to the sick every day, instead of every second day as now. Mutton is the best flesh for a sick man as a standing dish. It is more manageable for the purposes of division into chops, and best suited for a weak digestion, an almost universal concomitant of disease in this country.

Some alteration in the mode of preparing the diets is also required.

References to Subjects and Queries.	Replies.
Hospitals—*cont.*	If a quarter or two of mutton were occasionally roasted, and served up as for a mess in a joint, it would be a great change on the present regulation plan of boiling, so as to make a proportion of broth, and would afford more nourishment and give zest to the failing appetite. The joint in this case should be cut when on the table, and served out under proper directions, instead of being cut up, as now, by native cooks, whereby I have every reason to know peculation is carried on, and cannot be prevented under the present system. Enough messing articles are not issued for the comfort and convenience of the sick soldier. Everything necessary for enabling him to partake of his meals comfortably, when once well served, should be supplied from the hospital establishment; and he should not be dependent on his own kit for a knife, fork, spoon, &c. The same "tin" that holds his morning milk or tea may be, and generally is, used to carry his mutton broth or chicken soup at noon, again to be used for tea in the evening, or, mayhap, some beer or wine and water, if ordered. It is almost certain to be greasy, which often produces an indifference, if not a loathing for food, when nourishment is of great importance. I would suggest such articles, including common porcelain soup bowls, tea cups, &c., be supplied in sufficient quantity, and in proportion to the size of each ward. As has been above said, the native hospital servants fall far short, at all events in Burmah, of their duty, require close watching and troublesome urging to obtain even moderate work from them. I would suggest that a soldier of experience and established good character should be allowed to take the superintendence of the hospital kitchens, to ensure care and cleanliness in cooking the diets and the extras, and prevent anything like peculation, which I fear will never be avoided without such European supervision. He would receive any particular instructions from the surgeon regarding the cooking of food or extras for particular patients, and see all served hot and comfortable. 20. The convalescents and sick generally take daily exercise morning and evening, either walking or riding in "sick-carts" or in doolies. Indents are made for the quantity and kind of carriage required for the following day upon the commissariat department, and the authority of the major-general sanctions what may be indented for by the surgeon. The exercise is taken on the roads of the cantonment and in the cantonment gardens, which are provided with seats. The senior non-commissioned officer present is responsible for the conduct, &c., of the sick and convalescents while taking exercise. 21. There is no provision whatever for the treatment of the soldiers' sick wives and children. But it is right to state that hitherto there has not been a necessity for such provision, as the families of the men have not as yet arrived in the country, although they are now daily expected. A regular female hospital, with a lying-in ward, is absolutely necessary. 22. I know of no local hospital regulations. 23. The medical officer can only represent matters appertaining to the sanitary state of his hospital. His representation or recommendation may be approved or disapproved of by the authorities, or wholly disregarded. As to diet, it is prescribed by regulation. Any change in the items composing it might be deemed very necessary by the surgeon, but the change could not be effected unless the superintending surgeon recommended it also, as is the case at this station now. I have recommended the issue of mutton to be daily. The superintending surgeon says no, and it is not issued. The surgeon can order anything in the shape of an extra to his patient when it is procurable (mutton is only procurable every second day), as wine, beer, eggs, &c., at his discretion. I have already shown that the surgeon has no power practically as regards the means and appliances for medical treatment. He cannot obtain a shower bath for a regiment of some 1,300 men, because the superintending surgeon does not think it necessary. He cannot procure the medicines for his hospital, except so far as the superintending surgeon thinks fit to sanction them. For example: at this station my requisitions for quinine are always curtailed to a minimum, viz., one pound, a quantity that might be used with the 68th Light Infantry in two days, were it considered necessary by me to administer the medicine as a prophylactic agent. On one occasion there was none of this indispensable drug in the division stores to meet my requisition, and I was obliged to do without it till some was received from Calcutta. At this present time my requisition for iodide of potassium, an indispensable medicine in any hospital, has been returned to me with the remarks, and them only, "none in store." At the same time, my requisition for camels' hair pencils for the treatment of eye diseases was returned to me with the remarks, "not sanctioned." Thus it must appear that the surgeon who *alone* has the treatment, and who is *alone* responsible for the health of his regiment to his commanding officer on the spot, and to the Director-General of the Medical Department in London, is practically without powers, which is the answer to the question. 24. There is no convalescent hospital at this station. There are no wards in my hospital to spare for such a special use. In case of much sickness, indeed always, a separate hospital for convalescents is most desirable. (Signed) Geo. Peacocke, M.D., Staff Surgeon, in Med. Charge 68th Regt. Light Infantry. Rangoon, 2nd February 1860. N.B. I would wish to bring specially to the notice of the committee, and in reply to question No. 23, that the surgeon has not power, it would appear, to reject rations, as bread and meat, which he may consider as objectionable. He can call for a board or regimental committee under such circumstances, and it may happen that, by the decision of such committee, the surgeon's opinion may be dissented from altogether, by which the power of regulating the *quality* of the rations for the sick is virtually taken from the surgeon, who is, in nine cases out of ten, and always ought to be, the best judge of the quality of bread, meat, &c. Such is the local custom, at least, that obtains. G.P.

RANGOON.
BRITISH BURMAH.
MADRAS.

APPENDIX E.

6TH REGIMENT NATIVE INFANTRY.—HOSPITAL.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	2. The hospital is situated between the most easterly barrack and the Kemendine road; rather inconveniently near the latter. Distant 150 paces from the nearest barrack. Not near any bazaar. On an open, freely-ventilated site. Not in the neighbourhood of any marsh or other probable source of malaria. 3. The water supply is abundant and wholesome. 4. The drainage is effected by trenches cut in the ground, which itself has a slight natural slope. 5. The lowest and only ward is raised seven feet from the ground, which allows a free passage of air below. There are gutters for the removal of the roof water, but as the soil is soft it must partly sink into it. At one spot, just in front of the gate, the water is apt to collect, but from the same cause (sandy soil) it soon disappears. The hospital is of wood throughout, the floor of planking, the walls of double matting, and the roof of "shingle," lately substituted for thatch. The verandahs on both sides consist of a projection of the roof beyond the walls to a horizontal breadth of nine feet, and are not of a nature to be used as accommodation. The hospital consists of one flat. Date of construction, not known. Total number of wards, 1. Total regulation number of beds, not fixed.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each.	Dimensions of Ward.			Cubic Feet per Patient.	Superficial Area in Feet per Patient.	Height of Patients' Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.				Number.	Height.	Width.
1	—	122 ft.	20 ft.	14 ft.	455½*	32½*	1 ft. 10 in.	21	4½ ft.	4½ ft.

* These numbers are calculated on the supposition of 75 patients, the largest number that has been in the hospital, and are exclusive of the space in the angle of the roof.

The hospital is open to the wind on all sides.

The windows are of glass, and open outwards in two pieces like folding doors, affording plentiful and manageable ventilation.

6. Included in the last answer.
7. No means of cooling the air used.
8. No means of warming are required. The walls and roof are not limewashed. They are cleaned once a quarter.
9. The privy is an oblong house, containing two fixed wooden troughs, opening out by the back of the house. The greatest number that can use it at one time is eight. There is no drainage, water supply, or cesspit; but the night-soil is daily removed. It is not offensive, except within a short distance at the back.
10, 11, 12. Do not apply to the arrangements of a native hospital. There is a large tub for warm baths.
13. The storage is sufficient and dry.
14. The bedsteads are of rattan work, stretched on a simple wooden frame. The sick can be supplied with coarse blankets, if required, but usually provide better ones of their own.
15. The cookhouse is a simple brick building, roofed with tiles, and containing a few earthen fire-places. Nothing more is required.
16. The only diet roll in use is a list of the men receiving other diet than their rations, mentioning the articles. When a man in hospital is recommended special diet his ordinary rations are not interfered with, so that all special diet becomes at the same time extra diet, forming an evident temptation to a man to exaggerate his complaint. The statistical forms are the usual ones of a native corps, and are given in the code of Medical Regulations (pp. x., xi., xii, xix., xx., xxi., xxiii., xxviii., xxix., xxx., xxxi.), and I believe also in the General Regulations.
17. One havildar and two orderlies are attached to the hospital, and are found sufficient. Any man so ill as to be helpless is usually allowed to name an orderly to attend specially on himself.
18. In good sanitary condition, and has not been subject to epidemics.
19. No improvements to suggest.
20. No shaded walks for convalescents required.
21. Wives and families not with the regiment, except a few East Indians, who are attended, when necessary, at their houses.
22. No local hospital regulations.
23. No repairs have been lately required, but the hospital building has been considerably improved. At this station the medical officer has some power as to change of hospital diet; in camps and on march, none.
24. No convalescent hospital required. A man being discharged before he is fit for duty is quite an exceptional case; and in such case he is usually allowed, on the representation of the medical officer, exemption from duty for a time.

Rangoon, 23rd February 1860.

D. CAMPBELL, M.D.,
Assistant Surgeon, 6th N. I.

APPENDIX F.

23RD REGIMENT NATIVE INFANTRY.—HOSPITAL.

SIR, Rangoon, 2nd April 1860.

I HAVE the honour to acknowledge the receipt of your letter of 26th March 1860, with series of questions on the subject of hospitals, and beg to annex a rough ground plan and elevation of the hospital 23rd Regiment Light Infantry at Rangoon.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	2. The hospital is situated on the left rear of the lines of the regiment, and at a convenient distance. There is no bazaar near, and the civil inhabitants are at a considerable distance. There are no buildings, walls, or trees to interfere with ventilation, and the site appears to me unobjectionable. My short experience of Rangoon renders me unable to answer question No. 2 more fully. 3. There are four bowries for the supply of water in the lines, which give a sufficient supply of good water during nine months of the year, but at present there is considerable scarcity of water, and it is dirty and muddy, requiring to be filtered by the sepoys before it can be used. The sick sepoys in hospital are dependent for their supply of water on the regimental puckalies. I am of opinion that it would be of advantage if one or more puckalies, as might be required, should form part of the hospital establishment, and be ready at any moment to bring a sufficiency of water for hospital purposes. 4. The hospital is surrounded by a gutter, which carries the water in the rainy season into a large nullah, at a considerable distance from the hospital. The filth of the necessary (urine and fæces) is carried away to a distance by a conservancy cart daily. 5. The large ward of the hospital is raised on piles 7 feet from the ground, and the four small rooms at each corner are 3 feet 7 inches from the surface. The ground part of the hospital has also recently been walled in and converted into a ward, to be used when necessary, but, of course, will not be available in the rains. The roof water falls directly into the gutter surrounding the hospital and is carried off. The gutter I have mentioned is, I am informed, sufficient to carry off the rain water as rapidly as it falls. The hospital is built of piles, planks, tatties, and bamboos; the roof being of bamboos and cocoa-nut leaves. The walls and the roof are single, and the heat during the day in the hot season is very great. A verandah or pandal surrounds the hospital all round, the breadth of which is 10 feet, and which is sufficient to prevent the direct rays of the sun from entering the hospital. This verandah is never used for patients of any description. There are, of course, two flats in the hospital, if the ground part is to be considered a flat. Accompanying this letter will be found the table required. The hospital is so situated as to be open to the wind on all sides. There are 10 glass windows on each side of the large ward, 5 feet in height and 5 feet in breadth. Each window is in two pieces, and opens outwards. The hospital is sufficiently ventilated by these windows and other means. 6. The ventilation of the hospital is carried on by means of the windows, doors, and floor, and appears sufficient to keep the hospital free from odour or closeness. 7. There are no artificial means used for cooling the air entering the hospital. I am of opinion that punkahs would be of great advantage to the sick in native hospitals. Orderlies are frequently employed in had cases with hand fans, but a few coolies would be sufficient to pull the punkahs for the whole hospital. 8. There are no artificial means of warming the air in use. The walls and ceiling have never been whitewashed. They are swept down occasionally. 9. The privy is an ordinary tatty building 26 feet long by 10 broad, and 7½ feet height, situated at the north-west corner of the hospital compound, at a distance from the hospital of 102 feet. The ordure is removed daily by the toties and a conservancy cart. The privy ought to be a pucka building. 10. There are no lavatory arrangements in use in the hospital. The patients clean themselves in the hospital compound, each after his own manner. 11. There are no baths attached to the hospital. I have often wished to be able to prescribe warm baths to patients with cutaneous diseases (which prevail greatly in Burmah). 12. The hospital bedding, &c. is washed by dhobies, supplied by the commissariat on monthly indent. 13. The store-room is sufficient for the purposes required and dry. 14. The usual number of cots and bed-clothing allowed to native hospitals are in use in the 23rd Light Infantry hospital, viz., 19 barrack cots of wood and rattan work, 7 feet 4 inches long, 2 feet 11 inches broad, and 1 foot 7 inches in height, and the necessary supply for these of pillows, quilts, paillasses, &c. This number of cots is perhaps sufficient in the more healthy stations in India for the whole sick of a regiment, but in Burmah I consider that at least fifty (50) cots should be supplied to a native regiment, with the requisite bedding, &c. 15. A pucka building has just been erected at the east side of hospital compound, 33 feet long, 18 feet broad, and 10 height, as a kitchen for the use of the patients, who all cook their own diet by themselves, or when too sick by orderlies. There is no cooking in the hospital otherwise. Patients, when suffering from pretty severe illness, yet not dangerously ill, always wish to have orderlies to cook for them, and I have found it almost impossible to arrange so that one orderly might cook for several patients, their caste prejudices being so inveterate. Would not a high-caste Hindoo and a Mussulman cook be advantageously attached to the establishment of a native regiment when on foreign and field service, thus obviating the withdrawal from the ranks of numerous trained sepoys for cooking purposes? 16. The patients in a native hospital supply their own diet (except in a few exceptional cases in Burmah); there are no diet tables or diet rolls. Annexed will be found a copy of the monthly return for February 1860, which will show how the statistics of the hospital are kept. A return for the whole year, in almost the same form as the monthly return, is sent annually. 17. A native hospital has usually a havildar or naique, who looks after the cleanliness, and keeps order among the patients. There are no nurses, but each patient, at the discretion of the medical officer, is allowed an orderly comrade when too sick to look after himself. 18. The hospital of the 23rd has never had any epidemic disease prevailing in it that I am aware of.

RANGOON. BRITISH BURMAH. MADRAS.

References to Subjects and Queries.	REPLIES.
Hospitals—*cont.*	19. I see nothing to improve (with the exceptions previously mentioned—privy, baths, &c.) in the hospital as a native hospital, except that a superior kind of roof would be of advantage, the present bamboo and leaf roof not being thick enough to keep the hospital cool in the hot weather. 20. There is no provision made for convalescents taking exercise. 21. In native regiments, families, when present, receive medicine from the hospital, and are visited by the medical officer or subordinates in their huts when necessary. 22. There are no special local hospital regulations in force at this station that I am aware of, except that the medical officer in Burmah can order extra diet in certain cases to the sick. 23. The medical officer has no power practically to order any repairs, &c., in hospital, or to choose the site for encamping grounds. He communicates with his commanding officer when he considers that anything is required. In Burmah, as mentioned above, he can supplement the diet of the natives provided by themselves with a few articles of extra diet, such as chicken, mutton, milk, and wine, &c., when necessary. 24. I am unable to state whether there are any convalescent wards for convalescent patients at this station; there is none attached to the hospital under my charge, and indeed is not required for natives, their best convalescent ward being a hut in their native country.

I have the honour to be, &c.,
JAMES ADAMSON, Assistant Surgeon,
23rd Regiment Light Infantry.

To Col. Croggan,
President of Special Committee.

Date of construction not known.
Total number of wards, 1.
Total regulation number of beds.—No regulation number of beds.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
One large room.	No regulation.	120 feet	20 feet	Walls 12 ft. Ceiling 18 ft.	36,000 feet	- - -	- - -	1 ft. 7 in.	10 on each side; Total 20	5 feet	5 feet

February 1860.—23rd Regiment Light Infantry.—MONTHLY RETURN of NATIVE SICK.

Classes of Diseases.	Specific Diseases.	Native Commissioned, Non-commissioned Officers, Privates, and Musicians.												European Commissioned Officers.	
					Discharged from the Hospital.										
		Remained last Return.	Admitted in.	Total treated.	Cured.	Transferred Sick.	Invalided Sick.	Pensioned Sick.	On Sick Leave.	And from the Service, &c.	Total.	Died.	Remaining.	Reported Sick.	Died.
Fevers	Feb. Ephemera	1	1	2	2	-	-	-	-	-	2	-	-	-	-
	„ Quot. Int.	3	8	11	6	1	-	-	-	-	7	1	3	-	-
	„ Remittens	1	2	3	2	-	-	-	-	-	2	-	1	-	-
Dis. of the Lungs	Bronchitis Ac.	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Catarrh Ac.	3	-	3	3	-	-	-	-	-	3	-	-	-	-
	Phthisis, P. T.	-	2	2	-	-	-	-	-	-	-	-	2	-	-
Dis. of the Stomach and Bowels	Diarrhœa	3	6	9	7	2	-	-	-	-	9	-	-	-	-
	Dyspepsia	4	1	5	3	1	-	-	-	-	4	-	1	-	-
Dis. of the Brain	Paralysis	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Dropsies	Anasarca	2	1	3	1	1	-	-	-	-	2	-	1	-	-
	Beri-beri	47	20	67	28	14	-	-	-	-	42	1	24	-	-
Rheumatic Affections	Arthritis	1	-	1	-	-	-	-	-	-	-	-	1	-	-
	Lumbago	-	2	2	1	-	-	-	-	-	1	-	1	-	-
	Rheum. Ac.	-	1	1	-	-	-	-	-	-	-	-	1	-	-
	„ Ch.	9	3	12	4	2	-	-	-	-	6	-	6	-	-
Venereal Affections	Bubo Simplex	4	1	5	1	-	-	-	-	-	1	-	4	-	-
	Orchitis	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Phymosis	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Syphilis Consecut.	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Abscess and Ulcers	Phleg. Abscess	1	4	5	5	-	-	-	-	-	5	-	-	-	-
	Ulcers	2	4	6	6	-	-	-	-	-	6	-	-	-	-
Wounds and Injuries	Ambustio	-	1	1	-	-	-	-	-	-	-	-	1	-	-
	Contusio	2	3	5	4	-	-	-	-	-	4	-	1	-	-
	Vulnus Incisum	1	-	1	1	-	-	-	-	-	1	-	-	-	-
Dis. of the Eye	Nyctalopia	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Dis. of the Skin	Psora	8	6	14	13	-	-	-	-	-	13	-	1	-	-
	Psoriasis	-	1	1	-	-	-	-	-	-	-	-	1	-	-
Other Diseases	Atrophia	2	5	7	3	1	-	-	-	-	4	-	3	-	-
	Carditis	1	1	2	1	-	-	-	-	-	1	-	1	-	-
	Otitis	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Scrofula	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Tumores	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Total	101	76	177	97	22	-	-	-	-	119	2	56	-	-

February 1860.—23rd Regiment Light Infantry.—Monthly Return of Native Sick—*cont.*

—	Native Commissioned and Non-commissioned Officers, Privates, and Musicians.	European Commissioned Officers.
Numerical Strength	741	8
Average daily Sick	72½	—

ABSTRACT of the preceding Return.

Classes of Diseases.	Remained.	Admitted.	Total treated.	Dis-charged.	Died.	Remaining.	Remarks.
Fevers	5	11	16	11	1	4	
Eruptive Fevers	—	—	—	—	—	—	
Disease of the Lungs	3	3	6	4	—	2	
Disease of the Liver	—	—	—	—	—	—	
Disease of the Stomach and Bowels	7	7	14	13	—	1	
Disease of the Brain	1	—	1	—	—	1	
Epidemic Cholera	—	—	—	—	—	—	
All other Diseases	85	55	140	91	1	48	
Total	101	76	177	119	2	56	

OF NATIVE COMMISSIONED and NON-COMMISSIONED OFFICERS, PRIVATES, and MUSICIANS.

—	Number.	Out of Hospital.	Number.
Admitted by transfer	4	Invalided	—
Convalescent of the corps not included in this return.	—	Pensioned	—
Recruits joined	—	Proceeded on sick leave	—
		Discharged the Service, &c.	—
		Died	1

DETACHMENT of the CORPS incorporated in this Return.

Detachment at Bassein, Strength 151.

RETURN of MEDICAL OFFICERS and SERVANTS.

Names.	Rank.	Date of Rank. In the Army.	Date of Rank. In the Regiment.	Remarks.
J. Adamson	Assistant Surgeon	1st April 1854	17th Sept. 1859	Joined 27th Feb. 1860; present.
T. Condasaumy, No. 488	2nd Dresser	12th May 1859	1st June 1859	Present.
Sunthea	Toty	22nd April 1857	22nd April 1857	Present.
Doing Duty.				
R. Dampster	Assistant Surgeon	—	26th Oct. 1859	Not joined.
W. F. Davis, M.D.	Do.	28th July 1857	11th Jan. 1860	Relieved from D.D., vide D. O., 10th Feb. 1860.
J. Lutchmial Nindros, No. 470	2nd Dresser	4th May 1857	30th Dec. 1857	Present.

TABLE showing the Strength of Native Commissioned and Non-commissioned Officers, Privates, and Musicians, &c. (given in the 1st page), under the following two Classes.

Caste.	Years of Age. 20.	25.	30.	35.	40.	45.	50.	Above 50.	Years of Service. Under 1.	1 to 2.	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	Above 30.	Total.
Hindoos	70	73	82	93	112	51	8	1	80	62	38	26	16	30	42	34	40	41	53	20	8	490
Mahomedans	25	16	24	32	48	51	15	4	30	32	11	12	14	17	15	11	17	20	20	6	10	215
Europeans, E. I. &c.	4	6	7	8	9	2	—	—	—	5	—	—	2	4	6	4	6	4	5	—	—	36
Total	99	95	113	133	169	104	23	5	110	99	49	38	32	51	63	49	63	65	78	26	18	741

Rangoon, 1st March 1860.

(Signed) JAMES ADAMSON, Assistant Surgeon, 23rd Regiment Light Infantry.

RANGOON.
BRITISH
BURMAH.
MADRAS.

APPENDIX G.

41st REGIMENT NATIVE INFANTRY.—HOSPITAL.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	2. The hospital of the 41st Regiment Native Infantry is situated on open ground about 100 yards or less to the north of the barracks, and to the south of the officers' lines, at a distance of ½ or ¾ of a mile from the town or bazaar; the site is open and freely ventilated, with a few trees in the neighbourhood, but not so many as to impede ventilation. Its situation is sufficiently well drained, but to the north-east, at a distance of 200 yards, is a pond which dries up in the dry weather, and is in my opinion prejudicial to the lines and hospital by causing malaria; this is, however, a moot point. 3. The water supply is tolerably abundant, except at the end of the hot weather, and I believe it to be wholesome; it would, however, be very much improved by filtering. 4. The ground slopes down from the hospital towards the river; there is no sewage, the ordure from the latrine being removed daily in carts. 5. The hospital of the 41st Native Infantry is a wooden building with mat walls and a thatched roof, which is going to be shingled. The roof is 140 feet long by 40 feet broad, but the walls enclose less than half this space, as there is a verandah of protection 10 feet broad round the four sides, leaving a space 120 feet long by 20 broad, with a floor of planks raised 6 feet from the ground. The building faces the south, where there are four doors 7 feet 10 inches high by 4 feet 10, and eight windows 4 feet 10 inches square; there are ten windows of the same size behind, and one door at either end. There was of course free perflation of air under the floor, but I was obliged to get the eastern half of the under portion of the hospital matted in, the upper portion being insufficient to hold all the patients. There is no provision made for carrying off the roof-water, nor is it necessary, as the soil is porous and slopes towards the river. I consider the hospital an excellent one for natives; it is sufficiently cool, and the verandahs afford abundant protection from the sun's rays; it is also a good protection from the cold and damp. Ventilation is ample from the doors, windows, roof, and floor. The windows are each in two portions, and open outside. 6. No particular contrivances are used for ventilation, and there are no jalousies, the windows being glass and the doors panelled. 7. Native hospitals hardly require to be cooled. 8. The walls were once whitewashed, because there were many patients with bad ulcers. 9. There are latrines at a short distance from the hospital, from which the ordure is removed daily in carts. 10, 11, 12, and 13, apply rather to European hospitals. 14. The cots are of teak rattaned, and there are cumblies and coverlets. 15, 16, 17, refer to European hospitals. 18. I consider the sanitary condition of the hospitals at Rangoon to be good. There are occasionally ulcers of the gangrenous kind, but not in my opinion attributable in any way to the construction of the hospitals. 19. The hospital would be improved by having a fence round it. 20 and 21, apply to European hospitals. 22. There are no special regulations that I am aware of in Rangoon. 23. I never had any difficulty in procuring obtainable comforts for the sick, or in getting any repairs or improved sanitary arrangements in hospitals. 24, applies rather to European troops. Total number of wards, 1. Total number of beds.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1 - -	40, but will contain 80 if closely packed.	120 feet	20 feet.	12 feet to the tie-beams.	28,800 feet to the tie-beams.	360 to 720, according to the number of patients.	From 30 to 60, according to the number of patients.	1½ feet, but all are not on beds.	18	4 ft. 10 in.	4 ft. 10 in.

Rangoon, 5th March 1860.

E. S. TRIBE, Surgeon,
41st Regiment Native Infantry.

TONGHOO.

Accommodation
- Queen's Troops
  - Artillery - - - - 99
  - Infantry - - - - 582 H.M. 69th Regiment.
- Native Troops
  - Artillery, Gun Lascars - 45
  - Sappers - - - - 152
  - Infantry - - - - 984 2d Regiment M.N.I.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The adjacent country is flat, marshy, and jungly. The soil is compact red sand. There are extensive paddy fields under cultivation all round the station. There is some undulating ground near the Sittang river to the east of the cantonments, which is well wooded. Across the river and distant about a mile laterite is found in great quantities, also valuable timber trees, such as teak, padauk eeiu, pengado, sal or eughine, pema, and various others.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	2. The cantonment is situated about 300 feet above the level of the sea. It is on a plateau having an elevation of some 30 or 40 feet above the surrounding country. It is bounded on the east by the Sittang river; and during the S.W. monsoon, which commences towards the end of May, and terminates in October, the surrounding country is one universal marsh. There is no ground adjoining the station, sufficiently capacious for a cantonment, which is either higher or healthier. "Report of E. O'Reilly, Esq., late district commissioner at this station. "The want of a position in the vicinity of the station, affording a change of temperature from that of the plains, has long been considered a desideratum, and on former occasions of my ascent of the ranges nearest the valley, the subject has had my attention both in regard to altitude, space on the surface, and means of access; I had hitherto not succeeded in selecting a position adapted for the purpose until my reaching the 'Bangalee' range on my return route; the position, at a height of 500 feet, possesses a broad surface sufficient for the requirements of a building accommodation, is connected with other ranges by a ridge line of easy inclines, is free from jungle vegetation, is distant from Tonghoo about 28 miles, which place is visible from the position, and from the hot springs 8 miles, which occur at the base of the range at a height above the plains of 540 feet; a supply of pure water is obtained at a moderate distance below, and the range of the thermometer 63°–78° during the few days of my stay there. Hence should the hot springs be found to possess restorative properties, and it be desirable to apply them to such purposes, the position of the Bangalee range affords the necessary requirements for the formation of a sanatarium for temporary resort during the periods of extreme heat and humidity of atmosphere of the plains." 3. The nearest range of mountains are distant about 12 miles, the elevation of the highest of which is but 2,000 feet above the level of the sea. The eastern range, distant about 15 miles, varies in elevation from 2,000 to 6,000 feet high; the table land being distant from the station about 28 miles (vide above report). 4. The station is situated on the Sittang river. There are various mountain streams and other creeks which fall into the Sittang river not far distant from the cantonments. There are several jheels within the old town walls of Tonghoo, the ditch of which passes through a portion of the cantonment. The surrounding country is one universal swamp during the monsoon, but more particularly so during the four latter months of its continuance. The rains fill the numerous creeks and ravines not far distant from the cantonments, but with no injurious effect on the health of the troops here. 5. The station is surrounded with dense jungle, but being situate on a plateau, the ventilation is not much affected thereby. There is still some jungle in the cantonment, but it is being rapidly cleared away. The Burmese are in the habit of burning their jungle periodically, which fires endanger the safety of the public buildings. It should be cleared away at least a mile from the cantonment boundary. The temperature of the station is not affected by reflected sun heat, but it is increased by the fires all round the station during the hot months. From November to February cold northerly land winds prevail, the sea is distant about 160 miles due south. During the cold season dysentery cases are aggravated, and during the southerly winds fevers prevail. 6. The greater part of the surrounding country is cultivated with paddy. No works of artificial irrigation exist. There is no cultivation of rice or indigo, nor is the preparation of hemp or flax carried on near the station. 7. The old town of Tonghoo, little more than a mile square, is in the immediate vicinity of the cantonment. Its population is stated to be 3,939 adults, and 2,513 children. 8. No geological survey has yet been made of the district; most of the minerals exist in small quantities. There are lime, laterite, and iron ore in great quantities. The subsoil is generally compact red sand, but very valuable clay for pottery is also found. The cantonment was formerly occupied by Burmese population, but had to be cleared of jungle and brushwood by us. 9. Water is found during the dry season about 30 feet below the surface, and during the rainy season almost at the surface. 10. The rain-fall and surface water flows readily from the station; but in the lower ground adjacent the water lies on the surface till evaporated. There is no higher ground adjacent, the drainage of which passes into the subsoil of the station. 11. The water supply of the station is derived partially from the river, but principally from wells. It is not stored in open tanks. No tanks exist. The wells are protected by a thatched covering from all impurities. 12. The supply of water is ample and very good. In the monsoon, being turbid, it requires filtration. The water is hard, colourless, tasteless, and devoid of odour. Bheesties distribute the water. No better supply can be wished for. 13. The climate of the station is favourable to the European constitution. The native troops suffer in some measure from climate, but there is reason to believe their general health would be improved by the addition to their rations of animal or other solid food. 14. The site of a station is generally at first chosen by the principal military and engineer authorities, and afterwards reported on by a medical committee; the highest ground and the most advantageous for defence in a military point of view, and the most accessible by water, is that which is generally preferred. Jungly ground, never before inhabited, should not have troops located on it till three years after its clearance, as, for example, the unhealthiness of Nunyan and Shoayghine, which were occupied immediately after clearance; the former had to be given up, and the latter is still very unhealthy.

TONGHOO.
MADRAS.

References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. No instruments available at the station for taking meteorological observations. 2. The following table has been compiled from the hospital returns of Her Majesty's 69th Regiment, from January 1859 to December 1859.

Months.	Thermometer. Mean Maximum.	Thermometer. Mean Minimum.	Thermometer. Mean Dry Bulb.	Thermometer. Mean Wet Bulb.	Rain, Inches.	Winds. Direction.	Winds. Force.	Remarks.
January -	82	57	$69\frac{1}{2}$	61	—	N.E.	Moderate	Clear.
February -	90	63	$76\frac{1}{2}$	65	—	N.E.	Moderate	Clear.
March -	90	70	80	69	1·90	N.E.	High Winds.	Clear.
April - -	$98\frac{19}{30}$	$80\frac{15}{30}$	$89\frac{17}{30}$	$79\frac{3}{30}$	2·40	N.E., S.W.	High Winds.	Clear.
May - -	$90\frac{24}{31}$	$78\frac{2}{31}$	$84\frac{18}{31}$	$76\frac{30}{31}$	6·35	S.W.	Monsoon.	Clear, with thunderstorms.
June -	$83\frac{26}{30}$	$77\frac{18}{30}$	$80\frac{22}{30}$	$77\frac{17}{30}$	16·83	S.W.	Monsoon.	Clear, do.
July -	$84\frac{1}{31}$	$76\frac{24}{31}$	$80\frac{18}{31}$	$77\frac{5}{31}$	11·95	S.W.	Monsoon.	Clear, do.
August -	$84\frac{27}{31}$	$76\frac{16}{31}$	$80\frac{21}{31}$	$77\frac{14}{31}$	14·90	S.W.	Monsoon.	Clear.
September -	$85\frac{18}{30}$	$75\frac{27}{30}$	$80\frac{23}{30}$	77	9·30	S.W.	Monsoon.	Clear, occasional thunderstorms.
October -	$86\frac{12}{31}$	$75\frac{1}{31}$	$80\frac{29}{31}$	$76\frac{8}{31}$	4·70	S.W., N.E.	Monsoon.	Clear.
November -	$83\frac{28}{30}$	$68\frac{27}{30}$	$76\frac{18}{60}$	$71\frac{13}{60}$	1·05	N.E.	Moderate	Clear.
December -	$82\frac{5}{31}$	$65\frac{29}{31}$	$74\frac{3}{62}$	$68\frac{18}{31}$	0·05	N.E.	Moderate	Clear.

3, 4. The climate for a tropical one is good; from November to February the nights and mornings are very cold, the thermometer falling down at times to 49° Fahrenheit; during the day it is dry and hot, with heavy dews at night and fogs in the morning. From 1st March to end of May it is very hot and sultry, the thermometer being 105° (?) in the shade; from June to October close and very damp, thermometer 81°. During the hot season the station is enveloped in clouds of dust, owing to there not being any sanctioned modes of watering the roads; the cantonment would be greatly improved if this was done. The European troops are well rationed, but an addition of animal or other solid food to the native ration would be an advantage, nothing of the kind being procurable here in the bazaar. Clothing of serge and other light woollen material appears suitable to this climate; flannel should be worn next the skin. Cholera belts, already supplied, should be invariably worn. Drills are carried on during the dry season, and at such hours as to prevent unnecessary exposure to the sun. The most healthy months are from November to the end of February, the most unhealthy from May to the end of August. The prevailing diseases are fevers and bowel complaints. There is no district near the station which is likely to be more conducive to health.

5. I have served in India, at Bangalore, Kurnool, Hyderabad, Samulcottah, Rajah Mundry, Condapilly, Masulipatam, and Rajapore; in Burmah, at Rangoon, Prome, Nunyan; inland, Padong myo, Thyet-myo, and inland and at Tonghoo; I have also resided for brief periods at Sittang, Shoay ghein, Moulmein, Henzadee, and Ava. In India, Condapilly was the most sickly, and in Burmah, Nunyan, Shoay ghein, and Mendoon inland from Thyet-myo, appear the worst; whilst Tonghoo and Enghma, inland from Prome, appear to be the most healthy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. A plan of the cantonment is forwarded, but it was not thought necessary to include the four miles of the surrounding country, as it is all jungle with a few paddy fields here and there.

4. Table of Barrack Accommodation.

Date of construction of barracks; European infantry, 1857–58; European artillery, 1855.

Total number of rooms or huts; European infantry, 20; European artillery, 4.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Dimensions of Rooms. Breadth.	Dimensions of Rooms. Height.	Dimensions of Rooms. Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows. Number	Windows. Height.	Windows. Width.
20 Half Company European Infantry Barracks.	50	143	46	$17\frac{1}{2}$	115,115	2,302	131	2′ 6″	24	4	4
4 Half Company European Artillery Barracks.	40	120	20	$14\frac{1}{2}$	34,800	870	60	2′ 6″	16	3	3
Guard Room :—											
Infantry - -	—	40	30	16	19,200	—	—	—	6	5	$3\frac{3}{4}$
Artillery - -	7	20	20	$15\frac{3}{4}$	6,300	900	57	2′ 6″	4	3	3
Prison Cells :—											
European Infantry											
2 each - -	—	20	20	$18\frac{3}{4}$	7,500	—	—	—	3	2	2
2 each - -	—	10	10	13	1,300						
European Artillery											
1 each - -	—	20	20	$15\frac{3}{4}$	6,300	—	—	—	4	2	2
2 each - -	—	20	$9\frac{1}{2}$	$15\frac{3}{4}$	2,992	—	—	—	2	2	2

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. Each barrack has on all sides of it glass windows, which open outwards. The European barracks have an open verandah, 12 feet broad, all round them. The artillery and native barracks are not so good, and have smaller verandahs with corner rooms for non-commissioned officers; the verandah is never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads are most uncomfortable, being either of iron or boarded; the former have mattresses allowed for them, but none have been granted for the latter, although they have been applied for upwards of a year; they are most necessary for the health and comfort of the men. 7. The tents are Madras European of the following dimensions, 14 ft. × 21 ft., with 2 standing poles 10 feet 3 inches high to caps inside, and having walls 5 feet high, supported with bamboos, and long enough to form porches to doors front and rear, for which there are 4 small poles; there is also a ridge pole to keep the fly sufficiently off the shell. Superficial area per man, 11 feet 9 inch $\frac{3}{25}$. To contain 25 men each:— Cubic space / Contents in feet } 1,996 nearly. 8. In barracks the means of ventilation are,—by ventilating boards at the top of the floor; by the doors and windows; and by a space left between the roofs and walls. In guard-rooms nearly the same; the ventilation is ample for the purification of the air night and day. There are no means of cooling the air in barrack rooms as yet; punkahs have been applied for. 9. The barracks and all places of abode are built of wood. The natives have barracks with mat walls plastered and whitewashed. 10. The floors are constructed of wood. The floors of the European infantry barracks are raised 7 feet above the ground; those of the artillery and native barracks about 3 feet. There is a free passage of air beneath. 11. The materials used in the construction of the barracks, huts, and tents, are suitable to the climate; they are very salubrious. The public buildings, however, should be either shingled or tiled, as at present they run a great risk of being burnt down. All public buildings and cantonments are kept in repair by the executive engineer, and sanctioned works are speedily executed. The senior surgeon is responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are always kept perfectly clean; they are not whitewashed, being built of wood. 12. There are ten wash-houses for the men, built of wood, one to each company, supplied with water by bheesties. 13. The barrack cook-houses are temporary buildings, and in a very bad and dangerous state; the means of cooking are ample, and the water supply sufficient. The drainage is imperfect. The roofs are thatched, and there is no ventilation ridge for the escape of smoke; one was burnt down a few days ago. The linen is washed by dhobies, kept expressly for that purpose; they are sufficient for the wants of the station. 14. The privies are temporary buildings, and very bad, the soil passes into a cesspool; there are no means of cleaning them out, they are purified by pounded charcoal and lime. Urinals have not yet been erected. 15. The ventilation of these buildings is ample, and the means used for that purpose are the same as those employed in the barracks; they are not lighted at night time. Being a long way off from the barracks they are very inconvenient. The barracks are lighted at night by means of lanterns suspended from the tie beam. 16. The drainage of the barracks is natural; no sewers are required. Each barrack is surrounded by a drain to carry off the rain water falling from the roof; the drainage of the bath houses requires improvement, that of all the other buildings is ample. There are no women's wash-houses yet, the families of the European infantry not having arrived. No part of the barracks or hospital is damp, being well raised off the ground; all water is carried away by the natural drainage to the lower ground beyond the cantonment. There are no cesspits except those attached to the privies, which are about 100 yards distant from the barracks, and not placed near any well. There are no foul ditches. 17. No surface cleansing is required in the cantonment beyond occasional sweeping about the barracks and carting away of the refuse, for which means are placed at the quartermaster's disposal. 18. The surface of the cantonment is not yet free of vegetation. The jungle is being cleared, and a proposition has been made to Government to keep the surface free from undergrowth. The removal of the jungle will improve the ventilation, but if allowed to increase it may seriously affect the health of the troops. There are no old walls, thick hedges, &c. 19. There is at present no cantonment bazaar, but a temporary one will shortly be erected The condition of the Burmese huts in the vicinity of the station is good, those of the native followers, especially those of the artillery living within their lines, are very bad and dangerous; they are also objectionable on the score of health, and ought to be pulled down as soon as possible. Quarters should be built for all native camp followers apart from the rest of the cantonments; their pay being very small they cannot afford to build for themselves, and living in wretched huts get ill. The barracks of European infantry are free from all nuisances, but not so those of the artillery, which are close to the huts, as stated above; were they removed, and a barrack built, the nuisance would at once cease (this barrack has been since built). The commissariat bearers are particularly badly off, drawing only 7 rs. a month. They cannot build; and live anywhere and any how. Numbers are always sick, and numbers die or have to be sent away. 20. The animals for consumption are slaughtered in a slaughter-house, situated on a rising ground, half a mile east of the cantonments: the offal is sold to a Burman, who removes it daily. No nuisance is experienced from the condition of the slaughter-house. 21. There are no bazaar horses. 22. The stables for the artillery horses are most commodious, and are built of wood and thatched. They are well lighted and ventilated, owing to the height of the building and the sides lifting up and down. They are well removed from the barracks and hospital. There are no dung-heaps, the manure being thrown away at a safe distance. The horses are picketed immediately in front and rear of their stables. 23. The quarters for the married men of the artillery are bad, and not sufficiently roomy. No other married men's quarters are yet erected, but their construction has been sanctioned.

TONGHOO. MADRAS.

References to Subjects and Queries.	REPLIES.
Officers' Quarters.	1. There are no public quarters for officers, each lives in a building erected at his own expense. Their sanitary condition is good. No improvements are suggested.
IV. HEALTH OF THE TROOPS.	1, 2, 3. The station is healthy; the adjoining native population are liable to intermittent fever, and consequent spleen disease. The presence of fever amongst them is ascribable to the marshy and jungly nature of the surrounding district. 4. The 69th Regiment arrived at Tonghoo from Plymouth on the 24th February 1858. They left the latter station on the 17th November 1857, after a residence there of six months, having returned in May of the same year from 10 years' foreign service, six of which had been passed in the West Indies (Windward Islands); their health in the West Indies was good, but while there they suffered much from three epidemics of yellow fever and one of cholera. Their state of health on arrival at Tonghoo was good, and has remained so ever since. They have chiefly suffered from fevers and bowel complaints, the mortality is trifling. 5. The troops are never camped out. 6 to 13, 15, 16. No experience of hill stations. 14. A frequent change of stations in the plains is beneficial. 17. See E. O'Reilly's, Esq., report (Topography, 2). 18. With regard to the healthiness or unhealthiness of particular classes of surface and subsoil for stations, no general rule can be laid down, as much depends on local influences. Preference is given to light sandy soil. 19. Soldiers proceeding to India should be about 22 years of age, and should land there about November. The troops on arrival here were at once marched into barracks; their India kit had been previously issued at Madras, and they at once entered on the usual duties of the post. On recruits first landing they should avoid exposure to the sun, and over indulgence of all kinds, and the wearing of flannel waistcoats or cholera belts should be made compulsory. 20. Soldiers should be sent direct from the home depôts to India. In order to diminish the dangers of the earlier years of service, attention should be paid to the season of their arrival; and they might then be sent at once to any healthy station on the plains. 21. Troops are transported to Tonghoo from the coast in native boats, up the Sittang river. During their transport their health is excellent. 22. Ten years is the period a British soldier should serve in India. 23. The manner of conducting the business of the medical boards, as regards invaliding, appears to answer, with the exception of the anomaly, that an appeal from such medical boards may be made to boards composed solely of field officers, which is likely to produce a conflict of opinion. 24. Invalids should leave India for home in February, at the conclusion of the cold season.
Diseases.	1. There are health inspections weekly at the station for the discovery of incipient diseases. 2. Scorbutic disease is unknown at the station. 3. Hepatic disease is infrequent; it rarely occurs in an acute form. 4. Dracunculus is not known as a disease at this station. 5. Venereal disease is of very rare occurrence. The establishment of lock hospitals would be advantageous to the health of the army. 6. No epidemics occur at the station. The prevailing diseases are fever (both intermittent and remittent) and dysentery. Cholera among Europeans is unknown, but sporadic cases occur among the native population. Small-pox occasionally rages as an epidemic among the native population. Rheumatism—occasional severe cases. The mortality for the last two years at the head-quarters of Her Majesty's 69th Regiment has been about one per cent. as regards strength. 7, 8. The more frequent zymotic diseases are remittent fever, ague, rheumatism, dysentery, diarrhœa, secondary syphilis, itch, tape and round worm. Fever and diarrhœa prevail about May, June, July, and August; dysentery, in its more severe form, about November and December. The increase in the number treated under fever and diarrhœa may be ascribed to the close damp weather then prevailing; dysentery, in its aggravated form, to the sudden decrease and change of temperature towards the end of the year. There are no localities particularly obnoxious to this class of diseases, nor can any predisposing causes to them be ascribed to any personal habits or condition of the troops. 9, 10. Small doses of quinine have not been tried as a prophylactic against malarial diseases at this station.
V. INTEMPERANCE.	1. The troops at this station are unusually temperate. There are no confirmed drunkards. 2. The proportion of admissions from diseases occasioned by intemperance is so trifling as to be inappreciable. There are no total abstinence men among the European troops. The sickness, mortality, and crime occasioned by intemperance are so trifling that no statistical table of any value can be drawn out. Drunkenness is always punished as a crime. 3. Distilled spirits are sold both at the canteen and the bazaar, but in the latter under severe police restrictions. Each man can get, on payment, out of the canteen one dram of arrack and a quart of malt liquor, or in lieu thereof two drams of arrack; both are of good quality. Spirit is not given as part of the ration; they have to pay for it at the station, on march, and in the field. The canteen is not open until after parade; soldiers cannot, therefore, obtain a dram before morning parade. It is not beneficial for them. Spirit is never given as a ration to convalescents. No deleterious drinks other than intoxicating drinks are sold at the canteen or bazaar. 4. The quantity of spirits drawn by each man is considered conducive to health and discipline. 5. Spirit is not issued as a ration. Further restriction with regard to it than that already exercised is considered unnecessary. 6. If the canteen should be restricted to the sale of either spirits, wine, or beer solely, beer would be preferable, but the use of spirits is recommended. 7. Tea and coffee are much used at the station, but lemonade and soda water are not procurable by the men. With regard to their influence on health, efficiency, &c., total abstinence is not considered beneficial to health. 8, 9, 10. The suppression of the sale of spirits in the canteen is not recommended.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. The canteen regulations are too voluminous to be transcribed here; they are compiled from general orders issued from time to time. The following are the chief canteen regulations:— Hours during which the canteen is open for sale of liquors:— Open at 12 noon for the issue of malt for the guard and mess tables. Open from 1 to 3 o'clock p.m. for malt and spirits. Open from 5½ p.m. to gun-fire for ditto. One serjeant and 1 corporal on duty in the canteen during the above hours. Daily allowance per man:— Malt, 1 imperial quart. } Or 2 drams of arrack. Arrack, 1 dram.
VI. Diet.	1. The ration for Queen's troops and European troops in the Indian army is the same, and is as follows:—

	lb.	oz.
Bread	1	0
Meat	1	0
Rice	0	4
Sugar	0	2½
Tea	0	0⅝
Salt	0	1
Vegetables	1	0

3 lbs. of firewood is also allowed to each man. 1⅜ ozs. of coffee is sometimes used instead of ⅜ oz. tea to each man.

It is not considered necessary to make any periodical changes in this or any other portion of the rations. The officers of the day and quartermaster inspect the rations.

2. A complete ration, including vegetables, is provided for troops, the stoppage being 3 annas 4 pice per diem. The soldier has breakfast at 8 a.m., dinner at 1 p.m., and supper at 4½ p.m. One pound of vegetables to each man is part of the ration.
3. The rations for the Europeans are ample and good, those for the natives might be improved by the addition of animal or other solid food. No instance of the sale of rations is known. Certain men are detailed to look after the cooks.
4. Cooking is performed in large pots by native cooks. The cook-houses are temporary and very bad; they are kept as clean as such wretched buildings can be. The water supply is sufficient. The food is properly cooked and varied. It is sometimes boiled, and at other times roasted or curried. The men have coffee before a march.
5. Gardens for the cultivation of vegetables by the soldiers could be advantageously established, but the wells would have to be dug.

VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the soldiers at the station are according to regulations. They are suitable to the climate; but an addition of serge trousers in the monsoon would be an improvement. Nothing can be better than the present dress of the 69th. It is khakee during the day, and a serge tunic by night for guards. The guards are protected from the sun and damp by having good guard-rooms surrounded with verandahs, under which the sentry is posted.
Duties.	1. Men should be thoroughly drilled at home before being sent out to India. 2. The usual routine of a soldier's duties is as follows:— The rouse sounds at 5 a.m. *Occupation*:—Cleaning, washing, and getting ready for morning parade at 6¼ a.m. Guard mounting, inspection of arms, &c. until 7 a.m. Breakfast 8 a.m., and afterwards cleaning arms, &c. until 11 a.m. Dinner at 1 p.m., and afterwards mending clothes, &c., and reading in temperance library. School from 9 to 11 a.m., and from 2½ to 3½ p.m. Supper meal at 4 p.m. The best hours for drills in the warm weather are from 5 a.m. to 7 a.m.; in the cold weather, mornings and evenings. The average number of nights the men have in bed is five. 3. Guards are mounted close to their own barracks, and last as a rule for 24 hours. A few are reinforced and mount at retreat beating, and are relieved at reveille. There are roll-calls by day, and occasionally check roll-calls by night. The health of the troops is not affected, apparently, by night guards.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction. There are no ball courts or skittle grounds. There is a school conducted by a serjeant of the regiment. A barrack room is used at present as a library and reading room. There are no soldiers' clubs. The men amongst themselves grow a few small vegetables—the artillery have none. There are no workshops, but there is a theatre erected by the men themselves. A small gymnasium has lately been commenced by the executive engineer, but it is not yet sanctioned. A larger one is recommended. Were all the above erected there would be ample amusement for the men, but as yet they have little or none afforded them of any kind. The men are restricted from exposure to the sun and rain out of barracks when off duty and with benefit to health. 2. It is strongly recommended that the men be supplied with the means of playing cricket, with quoits, boxing gloves, and spare ammunition for rifle matches among themselves. 3. A soldiers' savings' bank already exists. 4. There is sufficient space for the men to amuse themselves under their barracks during the day.
IX. Military Prisons.	1. There are no military prisons built yet.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. With regard to the practical working of the powers of the medical officers in reference to the conduct of the line of march, &c. there never has been any marching of troops to or from Tonghoo. Troops are brought here and leave again in boats. 3. No camps exist in the station, and there are no regulations. 4. The arrangements adopted in the presidency for field hospitals are as follows:— Hospitals are furnished in garrison and in the field with supplies and medical comforts by the commissariat department. Each entire European regiment in garrison and in the

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References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	field is allowed a native purveyor and an assistant purveyor, who are attached to the hospital, under the orders of the medical officer, and under the supervision of the commanding officer of the force. The hospitals of European regiments on the line of march and in the field are furnished with sick carts drawn by bullocks, and bearers with doolies and muncheels. A field medicine chest is carried by dooly bearers. The hospitals of native regiments on the line of march and on the field are furnished with sick carts, drawn by bullocks, or in lieu of them by bullocks or tattoos, and doolies and muncheels carried by dooly bearers. Also a field medicine chest carried by dooly bearers. Large supplies of medicines or reserve supplies on the line of march and in the field, either for European or native troops, are carried in bullock bandies. Rules regarding the carriage for European and native hospitals on the line of march and in the field are laid down in the general orders of the Madras presidency in the printed code of regulations, of the quartermaster general's department of the Madras army, and the printed code of medical regulations of the Madras army. All military and medical officers serving in the Madras Presidency are guided by these rules.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No information under this head.
XII. HOSPITALS.	1. No regular hospital is yet built for the European infantry, two barracks are used for that purpose. The artillery and native infantry have hospitals similar to their own barracks. 2, 3. Hospitals form the extremity of the barracks, being part of them. The site is well ventilated and healthy. The water supply is abundant and wholesome. 4. There is no refuse water or other impurities near the hospital. The drainage is the same as for the rest of the barracks. 5. The height of the lowest ward above the ground is 7 feet. There is a free perflation of air underneath the floors. There is a drain all round the building which carries off the roof water. The drainage, construction, materials, windows, ventilation, supply of verandahs, &c. is the same as the barracks. The roof and walls are sufficiently thick to keep the hospital cool. The verandahs are never used for the accommodation of sick or others. The building consists of one flat. Table of accommodation:— Date of construction, 1857–58. Total number of wards, 5.* Total regulation number of beds, 83.

Wards or Hospital Hut, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Two blocks of the Barrack Buildings	42	143	46	17½	115,115	2,302	131	Ft. 2 In. 6	24	4	4

* Five wards are returned; three of these are rooms about 15 by 12 feet, built off from the larger rooms.

The part of the barracks used as hospitals, in common with the remainder of those buildings, are not placed so as to receive the full benefit of the prevailing winds, as the barracks are not built as they ought to be, *en echelon*.

6. The ventilation of the wards is sufficient; there are no jalousies or jhilmils.
7. There are no means of cooling the air admitted to the wards. Punkahs will be shortly erected.
8. No means of warming the wards are required. The walls and ceilings are constantly kept clean, they are of wood, and are not whitewashed.
9. The hospital privies are temporary buildings; the refuse is removed twice a day; the accommodation is not good, they are situated close to the hospital, but are not offensive.
10. Temporary wash-houses are built close to the hospital, and are sufficient for the sick.
11. Tubs filled with water are used for bathing the sick, and the means are sufficient for that purpose.
12. Dhobies wash and dry the hospital linen, and are sufficient for the requirements of the hospital.
13. The storage is sufficient and dry.
14. Cots made of wood with rattan or tape bottoms are in use in the hospital, and are considered good.
15. A good cook-house has recently been completed; the walls are of mat, plastered; the roof shingled, with ventilation ridge. There is a good brick range sufficient for all purposes. The ventilation is ample; its position is close to the hospital. The cooking of diets is properly done, and sufficiently varied.
16. Diet rolls, &c., according to regulations.
17. The provision for attendance on the sick is that laid down in the Madras medical code, and is sufficient.
18, 19. The sanitary condition of the hospital is good. There have been no cases of hospital gangrene, pyæmia, or anything of an epidemic character. Nothing to suggest in the way of improvement.
20. The convalescents are plentifully supplied with seats, and have ample space for exercise under the hospital buildings.
21. No arrangement has yet been made for the treatment of soldiers' sick wives and children.
22. There are no special local hospital regulations not included in the general presidency medical regulations.
23. The medical officers have every necessary power in matters appertaining to the sanitary state of the hospital, &c.
24. Soldiers when discharged from hospital are generally allowed to be convalescents in barracks for some days, this is considered preferable to having any distinct convalescent hospital.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1, 2. The old burial ground has been given up, and a new one chosen well away to leeward of the rest of the inhabited portion of the cantonment; its area is 300 by 200 feet. The subsoil is compact red sand; the drainage is natural. The ground is not yet completed. 3, 4. So few deaths have occurred, and so much space is available, that a large interval is left between the graves; the depth of graves is generally 6 feet. They are never re-opened, and there is never more than one body buried in the same grave. Interment is compulsory 24 hours after death, sometimes less. The Burmese burn their dead; the natives either burn them or bury them a long way off in the jungle. No one has been buried in the new graveyard; British troops are buried according to regulation. 5, 6, 7. The dead of camp followers and bazaar people are generally burnt or buried a long way off in the jungle. No injury to public health accrues from the present practice. No improvements are suggested.

(Signed) J. F. G. Campbell, Brigadier, Commanding Tonghoo.
Huntly Geo. Gordon, M.D., Surgeon 69th Regiment, H.M. Bn., Senior Surgeon.

17th March 1860.

Executive engineer absent from the station, signature not obtainable.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

Accommodation	Queen's Troops	Artillery	24
		Infantry	200
	Native Troops	Infantry, Pegu Police	600

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country, except in a south-westerly direction, in which the town lies, is all jungle. North, east, and south, hilly; mountains to the east, distant from 15 to 20 miles; north-west, west, and south-west, flat, low, and from June to November, either lake or swamp. Wood, jungle, and water in great quantities. 2. The elevation of the station above the sea is about 125 feet. To the east and south-east, the country is of nearly the same level as the cantonment. In all the other directions, as the country is flooded during the monsoon, and the tide extends many miles above this, the station may be about 80 feet above the general level. In the dry season, the nearest waters are those of the Sittary and Shway Gheen rivers, about equi-distant (three-quarters of a mile) from the station. During the monsoon, the inundations extend to the foot of the high grounds on which the station is built, and about 500 yards from the European barracks. There is no higher or healthier ground adjoining the station. 3. There are mountains about 15 or 20 miles distant, but no table land. The height of these mountains is about 5,000 feet. 4. The nearest waters are the Sittary and Shway Gheen rivers, about three-quarters of a mile from the station. During the monsoon, there are two streams which form the boundary of the cantonment. They flow from June till January. From the end of June till the end of October, the town and country to the westward is flooded. There is no broken ground, nor any ravines or water-pits near the station. 5. The station is perfectly open and quite free from all obstacles to external and internal ventilation. The construction of the houses does not admit of their becoming heated, being made of wood, and by no means crowded. The station being higher than most of the surrounding country, must be exposed to all winds. The sea breeze is occasionally felt. The health of the troops does not seem to be affected by the winds. 6. The surrounding country is uncultivated. There are no works of irrigation near the station. The cultivation of rice is not prohibited within certain limits. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The town of Shway Gheen lies about a mile from the cantonment. 8. The cantonment stands upon a gravel and laterite formation, the subsoil of the district varies greatly, but is generally covered with dense jungle. The station occupies new ground from which the jungle was cleared. 9. No wells have been sunk. 10. The rain-fall runs off easily, and does not lie on the surface anywhere in the cantonment No drainage from any higher level passes into the subsoil of the station.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

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References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	11. The water supply of the station is derived from the Shway Gheen river. It is not stored in open tanks, there being none within the vicinity of the station. 12. The river supplying the station flows perennially, and the water is clear, tasteless, and odourless, the quality is decidedly good, and not injurious to health. Water carts are used for the Europeans. No better arrangements could be made for the water supply. 13. There is an extent of jungle to the north-west and west, which commences immediately beyond military limits, and extends to the left bank of the Sittary river. This was formerly cut down, but never rooted up. It has now grown up more dense than ever; and as during the monsoon it is a deep swamp, with 10 and 12 feet of water over it, I consider it by no means improbable that this jungle swamp does influence the health of the troops occupying this station. 14. The conveniences of wood and water being found, the rest of the selection as to topography, climate, diseases, sanitary condition, &c., for new stations, is left to chance. With reference to this country, the Burmans say that Burman mud is wholesome, and Burman hills unhealthy for a location, and there certainly appears some truth in these conclusions. At the same time, provided high ground was procurable in the vicinity, like this on which Shway Gheen stands, I would never suggest that the cantonment should be formed on the bank of a river which is annually flooded.
II. CLIMATE.	1. There are no instruments available at the station for conducting and registering meteorological observations. 3. The climate is dry only during the months of February (the latter part), March, April, and the early part of May. It is very damp during the rest of the year, and being never very hot nor very cold the variability is not great. Fogs are rare. It is merely from the roads that any dust is raised, but during the dry months above mentioned the air is loaded with smoke and particles of burnt matter, from the jungles being on fire on all sides. But this does not seem to affect the troops in any way. The climate is unhealthy. Diet should be generous. Shelter from the sun, wind, and rain are precautions that should always be attended to. Clothing must be varied according to season. Drill and exercise should invariably take place in the morning, and decidedly at this station they are very objectionable in the evenings. The hot months are the most healthy both for Europeans and natives. The rains and cold months are the most unhealthy. Fevers and diseases of the bowels are the prevailing diseases. 4. The station of Sittang, distant about 40 miles, appears to be more healthy than this. It is not quite so high above sea level. The drainage is not superior to this. The water is procured from wells. Its being more healthy is unaccountable, as the jungle is more dense than that around here, and approaches very much closer to the station. The high ground is much too limited for adoption, except for a very small force. 5. The following is a list of stations on which I have served, and their comparative salubrity:— Palaveram, Merkara, Cannanore, Madras, Secunderabad, Samulcottah, Waltair, Vizianagrum, Shway Gheen, Tonghoo, and Rangoon. *Palaveram* is a very healthy station and remarkable for the absence of cholera, which rages around but never enters the cantonment. *Merkara* in Coorg, situated at an elevation of 4,763 feet above sea level, was an extremely healthy station, both for Europeans and natives. *Cannanore*, on the western coast of the peninsula, is a damp but on the whole not an unhealthy station. If during the monsoon, which lasts from June to 15th September, there happen to be several consecutive days without rain, cholera was sure to make its appearance. At *Madras* my corps occupied the Perambore lines, which in those days (1843) were low, swampy, and unhealthy. Cholera was a never-absent disease, and was particularly prevalent during the cold months. My corps has since occupied the Vepery lines at Madras, and these are positively injurious to health; they were condemned 13 years since, yet still the low marshy and unhealthy ground continues to be occupied by a regiment of native infantry. *Secunderabad* was very unhealthy during the time my corps was stationed there, but the locality had a great deal to do with this, though in an unaccountable manner. At *Samulcottah* there were 42 cases of admission on the sick report of European officers, and nearly 3,000 of natives, of a regiment numbering about 12 of the former and 700 of the latter. The mortality also amongst the latter was very great; but this amount of sickness was principally owing to the employment of the corps in the unhealthy jungles of Golcondah. *Waltair* is a healthy station, except during the months of October, November, and December, when fevers are prevalent. The situation of the lines entirely excludes the occupants from the benefits of the sea breeze. *Vizianagrum* is both a healthy and a favourite station, although exceedingly hot. *Shway Gheen.* During my first occupation of this station, in March 1854, the whole of the troops were located inside the stockade, and the jungle was still standing on the ground where the cantonment now stands. The Europeans consisted of two companies of H.M.'s 29th, a detachment of Madras artillery, and a wing of the 36th Regiment Madras native infantry formed the garrison. The Europeans were on the whole healthy, but they occasionally suffered from a fever, which Assistant-Surgeon Macqueen, in medical charge of the station, said was of a type common in some of the districts of France. He termed it a gastric fever. It was very fatal. *Tonghoo*, I found a far more healthy station then either Shway Gheen or Rangoon. *Rangoon.* At this latter place I lost a large proportion of men, considering how short a time my corps was stationed there. In my opinion the natives of India certainly become acclimatized to Burmah, and suffer less and less each succeeding year.
III. SANITARY CONDITION OF STATION.	1. The executive engineer of this district being ill and confined to his bed, most of the questions under this head must remain unanswered.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	4. Table of Barrack Accommodation. Date of construction, 1855 and 1856; and within stockade, 1853. Total number of rooms or huts. } 4 barracks for European infantry. 1 barrack for artillery Total regulation number of N.C. officers and men. } 200 European infantry. 26 European artillery.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
5 1	50 26	120 90	20 20	14 14							
Guard Room - -	10 natives.	20	20	14							
Prison Cells - -	1	15	15	10							

5. The barrack windows are on opposite sides and open inwards. There are verandahs on one side of the European infantry barracks, and a verandah all round the artillery barracks. The verandah is never occupied for sleeping purposes by soldiers or other persons. There are no jalousies or jhilmils.

6. Trestle bedsteads are used, and the bedding consists of cotton razai and blankets.

7. The troops are not encamped in this country.

8. The ventilation is effected by means of doors and windows, and a ventilating board, one foot broad running along one side of the barracks at the height of the floor; *i.e.*, with its lower edge at the same level as the floor. The air is kept sufficiently pure by these means night and day. No means are used for cooling the air of barrack rooms.

9, 10, 11. The four European infantry barracks are constructed of wood. The walls and floor are planked, and the roof tiled. The one for the European artillery is similar, except the roof, which is thatched. The planked floors are raised about 3½ feet from the ground. The materials cannot be improved upon, but the construction certainly can.

The barracks are kept in repair by the executive engineer. The repairs, unless requiring reference, are quickly executed, The commanding officer is responsible for the sanitary state of the cantonment so far that he calls on the executive engineer for the execution of works required. There are no stated times for the cleansing and whitewashing of the barracks, but it is done when required.

12. There are no baths, washing tubs are used, for which the water is brought in carts. The drainage is open and good.

13. The cook-houses are in a state of dangerous decay; there are 6 coppers and four native cooks to each company. The water is brought in carts, and the drainage is open.

There are no conveniences for washing and drying linen.

14. Cesspools are being sunk for the purpose of removing the contents of the privies and urinals.

15. The barracks are lighted by means of lamps slung from beams.

16. An open drain runs all round the barracks, leading into the road ditch, and this carries off the water into the low ground. There are no sewers or covered drains, but the drainage is quite sufficient. There is no dampness in any part of the barrack or hospital. There are no foul ditches.

17. The surface cleansing is effected by annually burning the grass, &c.

18. The surface of the cantonment is annually freed from vegetation.

There are neither walls nor hedges at this station.

19. There is no military bazaar at this station, nor are there any native houses anywhere near. No nuisance is consequently experienced in barracks from wind blowing over them.

20. The slaughter-house used to be in a position which, although outside the cantonment, was to the windward of it as regards the prevailing wind. It has been removed, and, though within the limits of the station, it is so far (about a mile) from the European barracks, and so situated, namely, in a hollow, that no nuisance whatever is experienced from it.

21, 22. There are no bazaar horses.

23. There is no proper accommodation for married men at this station. Two temporary buildings have been run up, but they are utterly unfit for the purpose required.

Officers' Quarters.

1. At this station officers have built their own houses. They appear to be healthy; the drainage is good, and the ventilation more than sufficient, as must be always the case in wooden buildings with mat walls. No improvements are suggested in them.

IV. Health of the Troops.

1. The station is not considered a healthy one. The district is very thinly populated, except along the banks of the rivers. The native population suffers from fevers in the town of Shway Gheen, but are generally strong and healthy.

2. The prevalent diseases are fevers, small-pox, and cholera, but the latter does not prevail to any great extent, not as in India.

SHWAY GHEEN MARTABAN, PROVINCE BURMAH.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	3. The healthiness of the native population is to be attributed to their living on the banks of rivers, where there is no malaria. Their unhealthiness, as far as fever is concerned, to their proceeding into the hilly districts for the purposes of traffic. 4. The following are the stations, with their influence on health, at which the troops were before coming to this station:—The detachment H.M.'s 69th Regiment has just arrived from Thounghoo; and that of the Madras artillery from Secunderabad. The Pegu police battalion was raised at Palaveram during the early part of 1858; they embarked on the 6th September of the same year, and arrived here on the 24th of the same month. Very healthy, both at Palaveram and on arrival here, but since then the battalion has suffered much from fever, diarrhœa, and dysentery. No part of the present accommodation for troops is more unhealthy than the rest. 5. The troops are not camped out. 6. With reference to experience of the healthiness of hill stations; I was adjutant of my regiment at Merkara, which being 4,762 feet above sea level, may be termed a hill station. The health of both Europeans and natives was better, and the mortality much less than at any station at which I have been located. 7. No opportunity of judging whether troops long resident on hill stations are more liable to attacks of febrile and other diseases on returning to the plains, but should say decidedly not. 8. Such localities as the Western Ghauts and Neilgherries are decidedly favourable as stations for troops, particularly European troops. 9, 10. Diarrhœa is a very common complaint on first going to the Neilgherries. The best precaution is a flannel belt. 11. The Neilgherries and Western Ghauts are adapted for residence during the whole year. The full benefit of such a residence could not be felt under two years. 12. No experience of the period of residence beyond which injury is likely to be inflicted on the troops on returning to service in the plains. 13. The precautions required in leaving hill stations are to guard against exposure to the sun as much as possible, and to reduce the amount of clothing according to the increase of temperature. 14. Residence at the hill stations to which my experience goes, is much the same as what would be felt, as far as climate is concerned, in the warmer counties of England, and therefore there can be no question that location on the hills would much longer preserve the vigour of the European. But how far a long residence on the hills would render a soldier more apt to contract the diseases of the plains I cannot say. "Short periods," if by that is intended less than two years, would not be beneficial or conducive to the health of troops in general. Doubtless change of station, as well as change of scene, is beneficial to convalescents. 15. No experience of barracks or hospital accommodation at hill stations. 16. The most suitable height for hill stations, even within the tropics, must in a great measure depend upon the degree of latitude. In the Madras presidency I consider about 5,000 or 6,000 feet above sea level the most suitable. 17. Ranges of hills of great height, said to be upwards of 8,000 feet in height, are to the N.E. of this station, but I do not know this of my own knowledge. They must be about 100 miles from this. My informant, the former Deputy Commissioner of Tonghoo, found ice there late in February; these hills should be examined to see if they are fit and could be advantageously occupied as a hill station. 18. With reference to the class of surface and soil for stations, Burmah is decidedly an exception to the general rule—muddy soil, like that of Tonghoo, being healthy, and a gravelly and laterite soil, like Shway Gheen, being unhealthy. 19. In considering the best age at which to send soldiers to India, much depends upon the natural conformation of the man. As a general rule about 19 or 20; they should arrive in October. No knowledge of the disposal of troops on first landing. To preserve the health of recruits on first landing they should be kept out of the arrack shop; as much as possible out of the sun; should have dry feet; and a flannel belt or cummerbund round the stomach. 20. Cannot say whether troops should be sent from home depôts to India, or to an intermediate station for a certain time. Sending them in the first place to a hill station would doubtless be a beneficial measure. 21. Know nothing of the transport of troops to the interior. 22. The British soldier seems to wear out very fast in India, and is considered an old man after 15 years' service. I think a British soldier might serve very well for 20 years, and I would suggest this period being divided thus:—His first 4 years at a hill station, the next 10 years on the plains, and the remaining 6 years on the hills. 23. In matters relating to invaliding, the captain of a man's company, who has seen him for years and knows all about him, is in my opinion a far better judge than a committee which sees him only for five minutes. But how to avoid conflicting opinions seems to me utterly impossible. 24. Invalids proceeding home by sailing vessels should leave in January or February.
Diseases.	1. Inspections for the discovery of diseases take place on Saturdays. 2. There have been no cases of scorbutus or scorbutic disease. 3. About one-fourth have been afflicted with hepatic disease. The causes are variable; generally the consequence of fevers. Not aware of any prophylactic measures which would diminish its frequency. 4. Dracunculus is unknown here. 5. Amongst the European soldiery venereal disease is unknown; amongst natives the proportion is about one-half per cent. There can be no question of the advantage of re-establishing lock hospitals. 6. The epidemic and endemic diseases are,— *Fevers.*—Remittent, intermittent, and continued. *Cholera.*—None. *Small-pox.*—None. *Rheumatism.*—Infrequent.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	Table showing the admissions and deaths from these causes in 1859.

Date of Admissions.	Number.	Diseases.	Number of Deaths.
Total number during the year 1859	188	Fever	22
		Dysentery	2
		Cholera	0
		Small-pox	0
		Rheumatism	0

The total number of deaths during the year, 26. This includes the detachment of H.M. 69th Foot, and European artillery only.

7. The usual characters of intermittent fevers are seen here. Diseases are most prevalent during the wet and cold seasons. The atmospheric condition consequent on the changes of the different seasons precede and accompany their appearance. There are no bazaars. Not aware of any predisposing causes to these diseases.
8. Exposure during night duties is the cause of epidemic diseases among the soldiers.
9. Quinine has been tried as a prophylactic against malarial diseases, but the result was unfavourable.
10. More room should be provided in barracks for European soldiery, also some provision for them to take exercise during the day without exposure to the sun. The jungle surrounding the cantonment should be regularly cleared.

V. INTEMPERANCE.

1. The soldiers are temperate. There are no confirmed drunkards.
2. During the past year the admissions into hospital from diseases directly caused by intemperance were 5.

The detachment H.M.'s 69th has just been relieved, therefore any statistical table would extend to about 15 days' experience. Drunkenness *per se* is punished as an offence.

3. Spirits (arrack) are sold at the canteen. The quality is good; it is supplied by the commissariat department. The probable amount consumed by each man is one dram.

(1.) In barracks, spirit is no part of the soldier's ration. (2.) On march it is served out as such. (3.) No experience as to its being supplied as a ration in the field. No experience as to its quality and amount. Spirit is never given as a ration to convalescents. No other drinks are sold in the canteen.

4. In regard to health, difference of opinion exists as to the consumption of spirits by soldiers. I am of opinion that spirits are injurious to health. If taken in moderation there is no reason why spirits should not be conducive to discipline.
5. It would be injurious to abolish the use of spirits altogether, but beneficial to restrict it as at present, to a moderate quantum.
6. In my opinion, malt liquor and wines are far more conducive to health than spirits.
7. Coffee, tea, and ginger-beer are much used at the station. Their influence on health and discipline is far better every way than spirits, but I consider if European soldiery are required to undergo hard work, and long and fatiguing marches, malt liquor is requisite to keep up their stamina.
8. No spirit rations are issued to troops on the station.
9. It would be objectionable to prohibit the sale of spirituous liquors entirely at the canteen, because the men would procure a much more deleterious spirit in the bazaar.
10. I consider the present arrangements on these points very good.
11. The following is a copy of the Canteen regulations of H.M.'s 69th Regiment:—

"(1.) The commissariat will supply liquor to soldiers at the rate of 1 dram of arrack and 1 quart of porter per diem, to each man; or at the option of the man, 1 pint of beer will be issued in lieu of the dram.

"(2.) The charge for 1 quart of porter will be 3 annas, and for 1 dram of arrack an anna.

"(3.) The canteen will be open from 1½ till 2½, and from 6 till 8 o'clock p.m., after which hours no liquor will be issued.

"(4.) The canteen will be under the charge of a serjeant, who will be responsible for the regularity of the canteen, and account for the liquors under his charge. He will be allowed an European assistant.

"(5.) A non-commissioned officer will be detailed daily, who will receive from the orderly serjeants of companies, at 12 noon daily, a list showing men in hospital, confined to barracks, and on duty, and the latter only shall be allowed 1 quart of beer."

VI. DIET

1. The following is the ration of—

	Queen's troops.	European troops of the Indian Army.
Beef	1 lb.	Not known.
Bread	1 lb.	"
Vegetables	1 lb.	"
Rice	4 oz.	"
Sugar	2⅔ oz.	"
Tea	⅔ oz.	"

And once a week, Coffee, ¾ oz. is substituted for tea.

An inspection of the rations is made daily by the orderly officer.

2. A complete ration is provided, the price of which is 3 annas 4 pice. No stoppage is made for this, except that the daily pay of a soldier is about 3½*d.* less than his gross pay in England. 1 lb. of vegetables is allowed for each man. There are 3 meals daily; breakfast at 8 a.m., dinner at 1 p.m., supper at 5 p.m.
3. Mutton twice a week would be a pleasant change for the men in lieu of the perpetual beef. The orderly corporal and the orderly man at the cookhouse are responsible that the whole of the rations issued to their company are forthcoming at meal times.
4. There are 4 native cooks to each company, and 6 coppers.

The cookhouses are dangerously bad. The food is invariably boiled. The cookhouses, for they cannot be called kitchens, are kept clean, but are in a falling state and positively dangerous. On the march, tea, coffee, or other refreshment is provided.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

MADRAS.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. A portion of ground has been set aside for cultivation since the first marking out of this cantonment in 1854, and has always gone by the name of "The Soldiers' garden," but none of the soldiers have ever turned a spade of earth in it; the reason, no doubt, being that this is merely a detachment, and that they do not remain here long enough to benefit by their labour.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress for European soldiery is,—1 cloth tunic, 1 pair cloth trousers, 1 woollen cap with cloth cover, 1 serge smock frock, 4 pairs of white trousers, 2 khakee jackets, 2 pairs ditto trousers, 3 pairs of worsted socks, 2 pairs of white cotton ditto, 5 white shirts, and 2 coloured ditto, 3 flannel ditto, 2 flannel belts, 1 waist-belt, 1 pouch belt, 1 40-round pouch, 1 20-round pouch, 1 knapsack and straps, 1 canteen and cover. The head dress, which fits too close, is the only objectionable part of a soldier's present dress, and this is to be altered into a wicker helmet, which will, no doubt, be a very great improvement. I think now, the soldier's dress is as nearly perfect as it can be. The present guard dress is khakee during the day, and the serge smock frock at night.
Duties.	1. It is decidedly advisable that the men should be thoroughly drilled at home before being sent to India. 2. The usual routine of soldiers' duties is,—guard once about every five days. One hour's drill in the morning from 6 to 7 a.m. Cleaning of arms and accoutrements in the middle of the day. The men do not appear to suffer in health from drill in the morning, and they certainly seemed to do so when there were evening drills. The best hours for drills or parades are from daylight to 7 a.m. For marches, at such an hour as to complete the march not later than two hours after sunrise during the hot, and three hours during the cold weather. There are general orders on this subject. The men at this station have from five to six nights in bed during the week. 3. The most distant guard is about 500 yards from the barracks. There are three roll calls by day, occasionally check roll calls by night at uncertain hours. I consider the night guards at this station very injurious to health, and all precautions have been taken already by having as few as possible.
VIII. INSTRUCTION AND RECREATION.	1. The means of recreation are as follows:—There are no ball courts, and the skittle-ground, made by the soldiers themselves, is very inferior. There are no schools or schoolmasters; no library or reading room, no day room or clubs, nor are there gardens, workshops, or gymnasia. There always had been a theatre until the arrival of the present detachment of H.M.'s 69th, but it is now pulled down. The means are not sufficient to occupy the soldier during the wet season or the heat of the day. The men of the 69th Foot are not allowed to go out in the sun after 9 a.m., nor before 4 p.m. The artillery, on the contrary, are allowed to go out at any time during the day; the result will be much better seen by reference to the returns of the Madras Fusileers and 2nd European light infantry, who enjoyed the same privilege, and apparently without any ill effects to health. 2. The means suggested for recreation and employment are a good library, two good skittle-grounds, a ball court, gymnasium, and a theatre. 3. Soldiers' savings' banks have already been established for years. 4. There are no trees in this cantonment. No sheds; and the verandahs are not sufficient for the men to take exercise in.
IX. MILITARY PRISONS.	1. There is no military prison. The cells are portions of the orderly room boarded off. They are not unhealthy.
X. FIELD SERVICE.	2, 3. Cannot say what is the practical working of the powers of medical officers in field service. No knowledge of the practical operation of camp regulations for the preservation of the health of the troops. 4. I do not know the arrangements adopted for field hospitals, &c., nor am I able to transmit copies of regulations.
XII. HOSPITALS.	1. The executive engineer being ill, no ground plan or sketch of the hospital could be procured. 2. It is distant about 150 yards from the nearest European barracks. The bazaar and civil population is far removed. The site is open and freely ventilated, and there are neither buildings, walls, nor trees to interfere with such ventilation. The site is generally healthy as to elevation, drainage, absence of malaria, &c. 3. The water supply is abundant and wholesome. 4. For mere drainage of water open drains are used, but other impurities are removed by the hospital attendants and thrown into the cesspools. 5. There is only one range of wards about four feet from the ground. Beneath the flooring it is perfectly open, and consequently there is a free passage of air. There is an open drain all round the building, from which the water readily runs off to the lower grounds. It is quite sufficient for carrying away the rain-fall. The hospital is built of wood, with tiled roof and wooden ceiling, plank walls (single) and floor. The roof and walls are sufficiently thick to keep the hospital cool. There is a verandah on one side only; on the other side the roof extends in the form of a narrow verandah, and I consider that on this side (the west) some further shelter from the sun's rays should be afforded. The verandah is not used for the accommodation of sick or others. The following table gives the accommodation:—Date of construction, 1856. Total number of wards, 2; *i.e.* the same room divided by a grating. Total regulation number of beds, 32.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area of Feet per Bed.	Height of Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft. In.
1	22	100	20	19	—	—	—	2 6	17	3 3	3 3
1	8	20	20	19	—	—	—	2 6			

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is so placed as to receive the benefit of prevailing winds. The windows open inwards, and a ventilating board one foot in width, opening with hinges at the level of the floor, keep the wards free from odour and closeness. There are no jalousies or jhilmils. 7, 8. There are no means of cooling the air admitted into the wards, nor means of warming the hospital. The walls and ceilings are whitewashed and cleansed upon requisition, but at no stated intervals. 9. The privies are at about 30 yards distance from the hospital; they are placed over cesspools, and are not at all offensive. 10. The lavatory arrangements consist of a bath-room, which is insufficient. 11. A bath-room about 10 feet square is the only means of bathing the sick; this is not sufficient, and a regular bath is required. 12. There are no means of washing and drying the linen attached to the hospital; it is issued as required by the commissariat department. 13. The storage is insufficient, but dry. 14. Cane-bottomed cots, straw bedding, stuffed mattrasses, and rezais and blankets are used in the hospital. No improvement is required. 15. The kitchen is situated about 30 yards from the sick wards. The means of cooking are insufficient, and diet not sufficiently varied. Apparatus for cooking consists of two coppers, one frying-pan, and a few chatties. 16. Diet tables, &c. of detachment Her Majesty's 69th, according to regulations. 17. A lance corporal of Her Majesty's 69th acts as hospital serjeant. There are no nurses. Orderlies are furnished as required. The attendance is sufficient. 18. The sanitary condition of the hospital is bad. No epidemic disease, hospital gangrene or pyæmia have shown themselves in it. 19. The hospital is altogether much too small, too low, and too narrow. A new hospital is the only suggestion that can be made. 20. No provision is made for convalescents taking exercise, nor is there ground suitably fenced, or shaded walks, or seats set apart for their use. 21. No provision is made for the treatment of soldiers' sick wives or children. The present arrangements are extremely unsatisfactory. 22. There are no special local hospital regulations. 23. The medical officer has no further powers than that of representing matters appertaining to the sanitary state of his hospital, and such representation is, of course, immediately attended to, provided it is reasonable. Change of diet and medical comforts are entirely within his own province, and in his own power to order. 24. Convalescents are sent to their barracks. A convalescent ward would be a great advantage.
XIII. Burial of the Dead.	1. The burial-ground is about 300 yards from the nearest European barracks, and nearly to windward of this last barrack. 2. It has a frontage of 120 and depth of 90 yards; soil, gravel; subsoil, hard decomposed rock, with gravel; drainage, good, being on the slope of a hill. Whether decomposition takes place readily or not it is impossible to say, as no bodies have been exhumed. The ground has not been carefully kept until now. 3. There are no regulations as to space between graves. Their depth is from 4 to 6 feet, according to whether rock is met with or not. They are never re-opened again. Interment almost invariably takes place the morning after death. There are no orders on this subject. The native Christians are buried in the same burial-ground as Europeans, other natives about a mile and a half to the northward of the cantonment. 4. The grave-yard has never been offensive. There are no regulations, that I am aware of, regarding the burial of British troops. 5. The dead of the camp followers and bazaar people are buried in the native burial-ground. 6, 7. No injury accrues to the public health from the present practice. No improvement can be suggested for the burial or disposal of the dead.

(Signed) H. W. Blake, Lieutenant-Colonel, Commanding Shway Gheen.
J. J. Heffernan, Assistant Surgeon.

4th April 1860.

THYET MYO.

Civil Government that of Bengal, but Garrisoned by Madras Troops.

Accommodation -	Queen's Troops -	Artillery - -	48
		Infantry - -	310
	Native Troops -	Infantry - -	1,834

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is undulating and covered with low jungle. These are no hills of any altitude. The surface is undulating and generally dry. There is an abundance of wood, jungle, and water. 2. The elevation of the station above the sea and adjacent country is 240 feet. The nearest river is the Irrawaddy. There is no higher or healthier ground adjoining the station. 3. Three miles to the S.S.W. of the station there is a range of small hills from 200 to 400 feet high, covered with jungle. 4. The station is on the banks of the river Irrawaddy, which generally overflows in August, and the vicinity is inundated for from 10 to 12 days. A deep precipitous nullah is the northern boundary of the station, emptying itself into the river. The water carries away much rubbish and filth, and is conducive to health.

THYET MYO.
MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	5. The station is open where houses are built, but the jungle grows close up to the confines, and therefore it is not freely exposed to winds. The temperature of the station is raised by the buildings, which are almost all built of wood and bamboo mats, being exposed to reflected sun-heat. It is exposed at certain seasons to very cold winds, which may cause disease. There is no sea breeze. 6. The surrounding country is generally uncultivated; some spots reclaimed from the jungle are cultivated. There are no works of irrigation near. The cultivation of rice is not prohibited, but the tracts of ground under cultivation are very small, and some few are on the limits of the cantonment. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The native town of Thyet Myo is within 200 yards of the station. 8. The geological structure of the station is much varied. In some parts gravel crops up within a foot of the surface; in others, red and black earth. The subsoil consists of gravel, sand, and black mould, but there is no certain rule. The station occupies new ground. 9. Experiments recently made show the depth at which water can be found to be from 12 to 60 feet, irrespective of seasons. 10. The rain-fall does not flow very readily away in consequence of the imperfect drainage. It flows from the higher into the lower part of the cantonment, and sinks into the soil in some places; in others, it lies on the surface until it evaporates. There is no adjacent higher ground, the drainage from which passes into the subsoil of the station. 11. The water supply of the station is derived from the river Irrawaddy. There are no tanks. 12, 13. The supply of water is equal to the requirements of the station. It is a dirty white in colour, but pleasant both to taste and smell. It is soft, and full of animalculæ; its quality is good. It is brought from the river by puckallies. No better water supply could be obtained. 14. No knowledge of the mode of inquiry or examination as to topography, climate, &c. in the selection of new stations.
II. CLIMATE.	1. The meteorological instruments available at the station are an aneroid barometer, a thermometer, a wet bulb, and rain gauge. 2. The following Table shows the result of the observations made from 1st January 1859 to 31st December 1859:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Min.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Winds, Storms, &c.
January -	29·851	70·5	36·	88·5	52·5	70·5	57·	No black bulb thermometer for ascertaining this.	—	E. & N.E.	No instrument for measuring this.	—	Clear, Fine, Fogs morning.
February -	29·855	78·5	33·	95·	62·	78·5	59·5		—	N.E.		—	Do. Do.
March -	29·810	82·4	31·7	98·3	66·6	82·4	60·		·25	N. & N.W.		—	Heat, Haze.
April - -	29·760	89·	24·	101·	77·	89·	63·7		·50	W.		—	Do.
May - -	29·700	85·3	25·7	93·2	77·5	85·3	74·8		2·25	W.		—	Cloudy, Monsoon begins about 15th.
June - -	29·590	79·6	9·3	84·2	74·9	79·6	72·		16·52	S.W.		—	Cloudy and Rainy.
July - -	29·615	81·8	9·7	86·7	77·	81·8	77·6		6·85	S.W.		—	Do. Do.
August -	29·680	82·1	9·2	86·7	77·5	82·1	77·4		9·75	S.W.		—	Do. Do.
September -	29·702	82·6	10·2	87·7	77·5	82·6	78·4		4·77	S.W.		—	Do. Do.
October -	29·739	81·4	10·4	86·6	76·2	81·4	77·		6·78	S.		—	Clouds and Rain first part of month.
November -	29·846	75·2	19·5	85·	65·5	75·2	68·9		—	S. & S.E.		—	Dense Fogs prevail in the morning.
December -	29·862	73·2	21·8	84·1	62·3	73·2	66·1		·35	E. & N.E.		—	Do. Do.
Ann. Means and Totals	29·751	80·1	20·	89·7	70·5	80·1	69·4	—	48·02	—	—	—	

3. The character of the climate, as compared with India stations generally, is that of greater moisture of atmosphere and more clouded state of sky, from a monsoon of nearly six months' duration, the immense extent of jungle, &c. It is favourable to the health of Europeans, and very unfavourable to that of the Indian native troops, as is the climate of Burmah generally. The hot months and rains are most unhealthy for the European, and the rains and cold weather for the native of India. The most unhealthy period extends from the month of August to December, attaining its culminating point in November, from its following the close of the monsoon in October.
4. Not aware of any district near the station the climate of which is more conducive to health.
5. No certain data can be given in comparing the salubrity of one station with another. What may have been an eminently unhealthy station 15 years ago is the contrary now, and vice versâ. That which may be healthy for the European may be unhealthy for the native. Cuddapah is, in my opinion, the most injurious to health of all the stations at which I have ever served.

III. SANITARY CONDITION OF THE STATION.

1, 3. There is no general map of the station and adjacent country in the executive engineer's office. The plan of the station is very incomplete; a tracing of it, however, is sent, which gives a sufficiently clear idea of the position of the river, nullahs, &c. All the drains in the cantonment are open, with a free outlet to the river. A ground plan is also sent, showing the general construction of the barracks.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	4. *Table of Barrack Accommodation.*—

Date of construction, 1854, 1855, 1856.

Total number of rooms or huts, 24 for Europeans, and 28 for natives.

Total regulation number of non-commissioned officers and men; Europeans, 1,000; natives, 2,800.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in feet per Man of floor space.	Height of Men's beds above the Floor.	Doors and Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		′	′	Mean.	Feet.			′ ″		Feet.	Feet.
European Barracks -	40	120	20	16′	38,400	960	60	1 9	16	3½	3
Native Barracks - -	100	140	20	16	44,800	448	28	Sleep on floor.	16	3½	3
Do. Do. - -	50	70	20	16	22,400	448	28	Do.	14	3½	3
Guard Room - -	10	30	20	16	9,600	960	60	1 9	8	3½	3
Prison Cells, 2 - -	1	12	10	12	1,440	1,440	120	1 9	Ventilators all round top of wall, no windows.		

5. The windows are on opposite sides, and open outwards. There is a verandah all round the building, 10 feet broad, two ends of which are enclosed for serjeants' rooms. The verandah is never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils.

6. Iron bedsteads, wooden cots, and mattresses, are used in barracks. The iron bedsteads are bad; wooden cots are preferred by the men.

7. The tents for European soldiers are 21 feet long by 15 broad, 5 feet high at the sides, and 10¼ in the centre, giving 315 feet superficial, and 2,441 feet cubic space. They are intended for 25 men, giving each man 12½ superficial, and 97½ cubic feet. They are made of thick white cotton cloth, doubled or trebled, and lined with blue cotton cloth. The European tent has a double fly, with a foot and a half between the flies.

8. The barracks are ventilated by means of doors and windows. The boarding of the wall is not carried up to the roof, but a space is left open for ventilation. The ventilation is quite sufficient to keep the air pure by night and day. No means are used for cooling the air of barrack rooms.

9, 10, 11. Barracks are constructed of teak wood; the roofs are thatched; the floors are planked, raised generally four feet from the ground. There is a free passage of air beneath. The materials used in construction are suitable. The barracks should be larger with double verandahs. The barracks and cantonment are kept in repair by the department of public works. Repairs are executed with tolerable rapidity. The officer commanding, senior surgeon, and executive engineer are responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed whenever considered necessary by the medical officer; generally once a year.

12. The lavatories are temporary buildings. They are rooms 22 feet by 15, with partly planked, partly mat walls, Venetian doors and windows, and brick floor. The water is brought by Puckallies and Bheesties; there are 12 of them. Drainage is effected by means of open channels to the low ground adjacent, which is made use of generally as a garden.

13. The cook-houses are built of wood, with a centre wall of brick. The roofs are planked. Fire-places are constructed along the floor and next to the brick wall. Water is brought from the river or well by bheesties. The drainage of refuse water might be better. Linen is washed in the river by dhobies, and there is plenty of ground for drying it. The conveniences are sufficient for the wants of the station.

14. The privies are brick buildings; they are drained by drains leading to cesspools. The contents are received into iron buckets, one of which is placed under each seat, and all is removed daily to some distance outside the cantonment, and buried. The cesspools are for urine only. No solid matter can find its way into them.

15. Barracks are lighted at night by means of globe lamps, hung from the ceiling.

16. The drainage of the barracks is effected by open drains, which are mere excavations out of the ground. It is all carried into the river, about 100 yards from the barracks nearest to the river, and about 800 from the furthest. The drainage of privies is good, but the general drainage of the other buildings might be much improved. The buildings are, however, only of a temporary nature. No part of any of the barracks is damp. Whatever fluid refuse is not carried off by means of drains, partly evaporates, and partly sinks into the subsoil. There have been no complaints as to the sufficiency of the drainage. Cesspits are only attached to privies, and are distant from the men's quarters 150 to 200 yards. They have never been cleaned since constructed in 1857, nor do they require it. There are no foul ditches.

17. The cantonment is tolerably clear from all obnoxious matters; each regiment, detachment, and department keep their own lines clear. Refuse and manure from bazaars, &c., is carted away to the jungle.

18. The surface of the cantonment is kept tolerably free of vegetation, but requires constant attention. There are no old walls, &c., to interfere with the ventilation of the station, but the jungle should be cleared for 500 yards all round the cantonment.

19. With regard to the drainage of the bazaar, the water flows off readily to lower ground. The streets are at right angles, and sufficiently ventilated. The houses are rather crowded, caused from want of space. Water is procured from the river, and from one well recently made. Each house owner keeps the front of his house clean, and all filth is removed by sweepers. There is a large number of cows in the bazaar, and their removal would be advantageous; but there are many difficulties in carrying this into effect, from the absence of any ground to remove them to. There are no native houses nearer than the native town. No nuisance is experienced from the wind blowing over native dwellings.

20. Animals are slaughtered for the use of soldiers a mile below the cantonment, on the river bank. The offal is carried away by the stream. No nuisance is experienced from the slaughter-sheds.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	21. There are no bazaar horses. 22. There are no cavalry or artillery stables, or picketing grounds. 23. There are no quarters for married non-commissioned officers and men. No married people occupy barrack rooms with the men.
Officers' Quarters.	1. Compounds are too small, and the houses are too close together. There is little privacy, and a constant dread of fire. Nearly one-third of the cantonment has been recently burnt down. The drainage and ventilation are tolerably good, but there should be more space. No improvements are suggested, except what would involve a fresh laying out of the whole cantonments.
IV. HEALTH OF THE TROOPS.	1. The station I consider favourable to health. The district is for the most part covered with jungle, and some parts of it therefore very malarious; but the native population are healthy and robust, and do not exhibit any of the signs of suffering from malarious disease. 2. I am not aware of their suffering from any epidemics except small-pox, or from any particular disease, or from spleen disease. 3. The general healthiness and robustness of the natives, I consider, result from the peculiarly moist but not relaxing climate, enjoyed during a great portion of the year: the wind from an extensive seaboard, which gives the province a semi-insular character. 4. The various regiments come from different stations of the Madras Presidency, and Her Majesty's 68th Light Infantry from Ireland. The native troops have suffered severely from the climate of Burmah, which produces in them fevers, rheumatism, diarrhœa, albuminuria, beriberi, atrophy, &c. No portion of the men's accommodation is more unhealthy than the rest. 5. The troops are not camped out. 6, 7. No experience of the health of troops at hill stations. 8. Hill stations, if well selected, would be decidedly beneficial to the health of the European troops. 9. Increased action of the bowels is generally experienced on proceeding from the plains to hill sanitaria, for which reason they do not seem so favourable for those suffering from chronic diarrhœa or dysentery. 10. With reference to the precautions necessary in hill stations, doubtless flannel and warm clothing generally, with abundant exercise and attention to diet, are of great importance in guarding the system against suffering from the decided change to a hill station, and enabling the valetudinarian to benefit thereby. 11. No experience of the seasons best adapted for residence in hill stations. 12. No injury is likely to be inflicted on the health of troops returning to service in the plains at well selected stations. 13. Not aware of any precautions for the protection of health on leaving hill stations for the plains, other than the general ones adopted on coming suddenly into a tropical from a temperate climate. 14. I am of opinion that the course most adapted to the health of European troops would be to locate them on moderately elevated hill stations, with short periods of service on the plains. Occasional change of station is conducive to the health of the troops. 15. No acquaintance of the barrack or hospital accommodation provided at hill stations or sanitaria. 16. I consider from 300 to 600 feet above the sea to be the range of elevation most suitable for hill stations in the tropics. 17. No higher ground near the station which could be advantageously occupied as a hill station. 18. Black cotton soil I consider especially unfavourable to health, while a gravelly soil with the laterite of Western India, and the red soil of the eastern coast, are perhaps the best in a sanitary view. 19. The soldier should not be sent to India before he is 20 years of age, and thoroughly trained. The troops should land in India in the end of November or beginning of December. No knowledge of the system at present adopted on troops first landing, as regards barrack accommodation, clothing, drills, &c. I think it of the first importance to guard the soldier fresh escaped from the monotony of a long voyage, from the excesses he is then so prone to indulge in. 20. I do not consider there is any particular advantage in sending the troops to an intermediate station, unless perhaps to allow young troops to attain mature vigour of constitution at a healthy station such as the Cape. 21. The communication from the port of debarkation to the interior is entirely by the river Irrawaddy, and troops are conveyed in transports with the greatest comfort and convenience. 22. I consider every soldier would derive benefit from revisiting Europe after a sojourn of 10 years in India. 23. With regard to the manner of conducting the business of medical boards in reference to invaliding, differences of opinion often arise, not between the medical officers themselves, but between them and the commanding officer, and the reason is obvious. A commanding officer brings before the committee a man who from long personal observation he knows to be unfit for service, although his health may be just sufficiently good to enable him to keep out of hospital. This fact weighs well with the committee, and the man having no fixed disease, and his name not appearing in the hospital books, medical officers cannot conscientiously, on medical grounds, invalid such a man. The commanding officer has an appeal to a board of field officers, and I think, under all circumstances, it is as good an arrangement as can be devised. 24. Invalids should leave India for home in February or March.
Diseases.	1. When disease is prevalent in an epidemic form, such as psora, it is usual to have parades for its detection. 2. No scorbutic disease among the troops at this station. 3. Hepatic disease seems unusually prevalent in this province. The largest number of admissions from any single class of disease is from hepatitis. 4. Dracunculus is a purely epidemic affection; the ova being deposited in the skin chiefly of the legs and feet, natives are the principal sufferers, from their habit of going bare legged, and wading in the tanks and streams. To avoid its occurrence the localities in which the parasite exists must be shunned.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	5. About ⅓ of the admissions into hospital are from venereal disease. The best precautions for diminishing the liability of troops to this disease that suggest themselves, is the general discouragement of vice and debauchery among the men, especially drinking, the fruitful parent of every other vice. 6. The native troops suffer very severely from fever, chiefly of the intermittent quotidian type. Dysentery is of less frequent occurrence than at most Indian stations. Cholera occasionally occurs; last year 4 Europeans and 10 natives died from it. Small-pox prevailed epidemically at the beginning of this year (1860), when many of the Sepoys took the disease. Rheumatism prevails extensively and severely among the native troops especially. Fever.—The ratio of admissions is in the European troops from 250 to 300, and in the native troops 350 to 400 per 1,000 of total admissions. Dysentery.—In Europeans, 150 to 200 per 1,000, in natives about 65 per 1,000. Rheumatism.—In Europeans 36 to 45 per 1,000, in natives 60 to 100 per 1,000. Cholera and small-pox being only of occasional occurrence, formed but a very small fraction of the admissions. 7. The most frequently occurring zymotic disease is fever of the quotidian intermittent type. This disease is most prevalent during and immediately subsequent to the rainy season. During the rains the air is loaded with moisture, and during the months immediately following, with exhalations raised by the sun acting on the ground saturated by the previous rain, and by rank vegetation. The only conditions among the troops peculiarly predisposing to disease are the duties of night guards. Amongst the native population doubtless there is much want of cleanliness and general attention to sanitary points, but as the bazaars are at a distance, this does not affect the health of the troops, whose habits of cleanliness, or the reverse, are attended to by the regimental and brigade authorities. 8. As regards the influence of the soldiers' duties, occupations, and habits, is the occurrence of epidemic diseases, I have no particular remark to make beyond the well-known influence of exhaustion and depression of the vital powers in predisposing to the reception of epidemic disease. 9. No experience of the effect of quinine in small doses as a prophylactic against malarial diseases, but in strongly malarial spots I should certainly be disposed to employ it. 10. In order to prevent or mitigate epidemic disease at the station, the general sanitary condition should be improved by clearing away gradually the surrounding jungle, draining some swampy spots, and maintaining the cleanliness of the station, and freedom from undergrowth; also strenuous efforts should be made to disseminate vaccination.
V. Intemperance.	1. The soldiers at the station are on the whole temperate; about 4 per cent. are confirmed drunkards. 2. Of 562 admissions into the hospital, 4 were *directly* from drunkenness, or ·7 per cent.; and 25, or 4·44 per cent., indirectly from intemperance. Drunkenness is always punished as an offence.

Average Strength, 330.	Total Abstinents, Number, 5.	Temperance, Number, 306.	Drunkards, Number, 19.	Total, 330.	Per cent. from Abstinents.	Per cent. from Temperate.	Per cent. from Drunkards.
Admissions - -	5	531	26	562	93·5	173·52	136·8
Deaths - - -	—	7	—	7	—	2·287	—
Crime - - -	—	—	—	—	—	—	—

3. Colombo or Batavia arrack, 25 below proof, is issued monthly to the canteen at 2 rs. 4 a. per gallon, and retailed to the men at 2 rs. 8 a. The allowance for each man per diem is 2 drams or one dram of arrack, with 1 quart of malt liquor; spirit forms no part of a soldier's ration at the station. They are permitted, as above, to purchase 2 drams daily from the canteen at 1 anna per dram, and in the field or on the march the same quantity at the same rate from the commissariat. It is never given as a ration to convalescents; deleterious drinks are not openly sold in the bazaar or canteen that I am aware of, though they are frequently smuggled in and sold in every cantonment.
4. Spirits are in no case conducive to the health of the troops, but almost always injurious to it, and to the efficiency and internal discipline of the corps.
5. To abolish the sale of spirituous liquors in the canteen would be beneficial to the health of the troops if they could not procure worse liquor elsewhere, but if none was to be bought there they would probably get worse in the bazaars. But in this question is involved the loss which would accrue to the revenue from the abolition of the sale of spirits in the bazaars. In one cantonment 1½ lacs of rupees has been given for the Abkarry contract.
6. Wines and malt liquors are often beneficial to health, seldom injurious in moderation; spirits, on the contrary, are almost always injurious, and in no case conducive to health.
7. Coffee, tea, lemonade, soda water, and similar drinks are moderately used. With regard to health, efficiency, and discipline, these drinks are greatly superior to fermented liquors of any kind.
8. The suppression of the spirit ration would be beneficial if such a measure would stop spirit drinking, and beer or effervescent drinks were substituted for it.
10. I recommend a more close watch over the issue of spirits; that each man who drinks spirits should be specially registered, and that not even a dram should be issued without an entry being made of it, and to whom it is issued; this would involve less extra labour than is at first apparent. A monthly table noting from on one side the date, and from the other the names of the registered spirit drinkers, would be easily kept up. The advantages arising from such a system, both in regard to the assistance it offers to a soldier endeavouring to break himself of the habit, and the insight it would give into the real amount and extent of spirit drinking, and who drinks it, would more than amply compensate for the trouble involved. At present it is impossible to get accurate information as to who drinks much or little, or even who drinks at all.
11. The following are the more important of the canteen regulations:—
" 3. No man of another regiment is to be admitted into the canteen without the written

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	sanction of his commanding officer, and of the officer commanding the artillery, and no spirits are to be issued under any circumstances to a man of another regiment. 4. The canteen will be open daily on week days from 10 to 12½ a.m., and from 1½ to 3 p.m., and from 6 to ¼ to 8 p.m., but no spirits will be issued at the first period. And on Sundays from 1 to 3 p.m., and from 5 to 6 p.m. 5. The utmost amount of issue to any one man in one day will be 2 drams of arrack, or 1 dram of arrack and 1 quart of porter, but no man is to receive more than 1 dram of arrack at the same period of issue. 6. No liquor is to be taken out of the canteen without the written sanction of the commanding officer; those men who wish to do so may receive not more than half the daily allowance at the dinner table by giving in their names to the orderly corporal, who will draw the amount. 7. No man on duty or under punishment is to enter the canteen, men on convalescent list are allowed to enter the canteen, but not to receive any liquor without the written sanction of the surgeon, countersigned by the commanding officer. 8. No games or singing are permitted in the canteen on Sunday, and all gambling at all times is strictly prohibited." In the bazaar no liquor is sold, and any one found bringing liquor into the cantonment without a pass is handed over to the civil authorities. The regulations are obeyed as far as I am aware.
VI. DIET.	1. The daily ration to European troops is as follows:— Bread, white - 1 lb. Rice - 4 oz. Tea - ⅝ oz. Coffee - 1¾ oz. Salt - 1 oz. Beef - 1 lb. Sugar - 2½ oz. Vegetables, alternate days - 1 lb. Firewood " - 3 lb. The ordinary tea ration consists of one-third green, and two-thirds black. The vegetable ration consists of such descriptions as may be procurable according to seasons. At this station esculents, such as yams, cocoa, and occasionally potatoes are issued when practicable, as they are more nutritious and preferred by the men to the green vegetables. The rations are issued daily under the superintendence of a warrant or non-commissioned officer of the commissariat department. Before issue they are inspected by a quarter-master and regimental officer of the day, also by orderly corporals of companies, who report to the day officer on the quality of the rations; if any article is considered objectionable a committee is assembled. 2. A complete ration, including vegetables, is issued daily, fruit is not supplied by the State. The regulated stoppage per man per day is 3 annas and 4 pice. There are three meals, the first at 7½ a.m., tea or coffee, bread and meat; the second at noon, bread, meat, and vegetables; the third at 4 p.m., tea and bread; 1 lb. of vegetables is given daily. 3. A greater variety in meat and the mode of cooking it would be an improvement, also a larger proportion of farinaceous diet; at this station beef alone can be procured. I have not heard of any instance of the European soldier selling his rations, or of any arrangement for its prevention. They usually purchase extra articles to add to it. 4. The cook-houses have cooking places built of brick and mortar down the centre; cooking pots furnished by the commissariat department are used to prepare the food; it is cooked by native cook boys. The kitchens are wooden buildings with brick and mud floors, and are kept as clean as practicable. There is a sufficient supply of water. The food is boiled, grilled, or stewed. The cooking, &c., is tolerably well done. Tea, coffee, or other refreshment before a march is a matter of regimental arrangement in many corps. 5. Small plots of ground near the barracks are re-cultivated where vegetables are grown for the soldier's private use, and are as advantageous as any others capable of being established at this station.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress is composed of flannel waistcoat, cotton shirt, worsted socks, white trousers, white frocks, red serge frocks, blue serge trousers, khakee jackets, red cloth tunic, cloth trousers, blue cloth great coat, dress and undress forage caps with white linen covers, waist belt with pouch and bayonet, shoulder belt with pouch in rear and cap pocket attached to it in front. The present new dresses are well adapted to this climate and for soldier's duties by day and night and at different seasons. I suggest that collars should be re-abolished, as the neck should be perfectly free in this climate. A waterproof cape would be a good thing for the soldiers during the heavy monsoon. The men should guard during the day in white clothing, and change to cloth at sunset, but this varies with the season. The men are protected from the sun by verandahs or trees when on sentry, and put on great coats in wet weather.
Duties.	1. It would be advisable in every respect that the men should be thoroughly drilled at home before being sent to India. 2. The soldiers rise at 5 a.m., and go to bed at 9 p.m.; parades generally take place four times a week from 5½ to 6½ a.m.; men do not suffer in health from drill. The best hours for drills, &c., in the hot season are before the rise and after the decline of the sun; but in the cold, when heavy fogs are frequent, not until an hour after sunrise. The average number of nights the men have in bed during the week is 6. 3. All guards are adjoining the barracks, except two about three-quarters of a mile distant; these are night-guards; they are mounted at sunset, and withdrawn at sunrise. The day-guards last 24 hours. There are roll calls at 4 p.m. and 9 p.m., and oftener as circumstances may require. The men are healthy, and night guards do not *seem* to affect them, but generally speaking the effect of night guard is a diminution of the power to resist morbid diseases in exact proportion to their frequency, and to their influence may be attributed a certain proportion of sickness. In this station I should say this is a predisposing cause of fever.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction:—There are no ball courts. There is one skittle-ground for each company. There is a school with assistant schoolmaster. A station library will shortly be established. It will not be lighted at night; but there is a coffee-room which is lighted, and may be called a day or club-room. About 1½ acres are under cultivation for soldiers' gardens, under the supervision of the commanding officers. There are no workshops other than a shoemaker's shop. One barrack is turned into a theatre. There is no gymnasium, but one has been sanctioned. I consider these amusements, together with cricket and boating—Government having liberally supplied four 10-oared boats—ample. Hard labour and exposure is not, I consider, detrimental to the European soldier in Burmah. For example—seven men have been employed for months in making bricks under the executive engineer, and though the work is hard the men have enjoyed excellent health. The same may be said of those who play at cricket, as scarcely a man has been in hospital, though much exposed to the sun. There is no restriction as to exposure to sun and rain off duty, nor has any case of disease been traced to the influence of voluntary exposure. I am strongly of opinion that no restriction should be placed on men in this respect, and that every indulgence should be afforded them. 2. There are sufficient means of recreation at this station, but what I would recommend is a system of workshops organized for different trades found amongst soldiers, which would give them profitable employment, and in no wise detract from their efficiency as soldiers. 3. Soldiers' savings' banks exist, and are much used. 4. There is sufficient shade from trees, &c. to enable the men to take exercise without injury to health during the day. Men play at skittles, quoits, cricket, &c., all day in the open air. To this I attribute their general good health. This station is eminently adapted for the enjoyment of life by the soldiers. Between the barracks and the river bank it is only a short distance, and this is green turf with trees here and there. Their boats also add much to their amusement. What with climate and local causes, I have never been at a station offering so many advantages from natural causes to the soldier as Thayet Myo.
IX. Military Prisons.	1. There are no military prisons at this station.
X. Field Service.	1, 2. There are no local regulations for medical field service. 3, 4. No reliable information as to the practical operation of regulations for the preservation of the health of troops in camp, or as to the arrangements adopted for field hospitals, &c.
XII. Hospitals.	1. Ground plan and sketch of the hospital of detachment H.M.'s 68th L.I. sent. 2. The hospital buildings are at one end of the line of barracks, and of the same general construction as them. They are remote from the bazaar and the civil population. They are open and freely ventilated. The sites are healthy and generally free from malarious influences. 3. The water supply is abundant and wholesome. 4. All impurities are removed to a distance from the hospital by sweepers employed for the purpose. 5. The hospital floors are raised generally about three feet above the surface, and there is a free perflation of air beneath, as they are supported by posts merely. The rain flows off the surface readily. The ground slopes from the hospitals, and there are small drains cut to catch the roof water and facilitate its removal. The hospitals are built, some of planks and some of mat walls, with a thin thatch, and are therefore altogether insufficient to prevent the heating power of the sun upon the buildings. The wards have verandahs on all sides, affording sufficient shelter from the sun's rays. During the sickly season the verandahs on one side of the native hospitals are used for the sick, from the great increase of sickness then: they all consist of one floor only. The following Table shows the accommodation:— Date of construction, 1854–5. Total number of wards—2 men's, 1 women's, and 1 smaller extra ward. Total regulation number of beds, 24 in each ward; 48 for men.

Wards.	Regulation Number of Beds per Wards.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet for Bed.	Height of Bed above Floor.	Windows.		
		Length.	Breadth.	Width.	Cubic Contents.				Number.	Height.	Width.
								Feet.		Ft. In.	Feet.
1	24	118·4	20	18·10	33,720	1,405	98 sq. ft.	2	12	3 5	3
2	24	118·4	20	18·10	33,720	1,405	98 „	2	12	3 5	3

Most of the hospitals, except one occupied by native troops, are sufficiently well placed for ventilation. The European hospitals have Venetian windows; those of the native hospitals are of mats, and are opened sufficiently in the day for ventilation.

6. In addition to the doors and windows there is an open space between the roof and the top of the wall, admitting free ventilation in all the hospitals and barracks. The Venetian windows open to the sides like a lattice or French window.
7. No means of cooling the air by tatties or thermantidotes are employed at this station.
8. There are no means of warming the hospitals. The ceilings and walls are whitewashed about every six months, or upon requisition by the medical officer.
9. The privies are small detached buildings, with night chairs and vessels for holding urine. The filth and urine is removed frequently during the day, and the privies are kept clean by the sweepers employed for that purpose.
10. The lavatory arrangements are sufficient.
11. Various kinds of baths are provided for the sick.
12. Washermen are employed to wash the hospital linen at a regular monthly rate of pay.
13. The storage is sufficient for all purposes.
14. The bedsteads in use in the European hospitals are wooden with rattan work.
15. Cook-rooms are attached to all the hospitals, and cooks also for the European hospitals. The cooking is properly done, and can be sufficiently varied.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	16. Diet, &c. according to regulations. 17. A proper staff of ward coolies, leechmen, nurses for female ward, &c., is always kept up for European hospitals, in addition to hospital serjeants and orderly attendants, as required by severe cases. In native hospitals there are only two toties to apply leeches, and do the dirty work of removing filth, &c. 18, 19. The sanitary condition of the hospitals is sufficiently good, except that the hospital of European artillery is constructed of mats in frames instead of planks, and one of the hospitals of the native regiments is badly situated, while the other two native hospitals are too close together. 20. The sick and convalescents are, when requisite, carried out in doolies, or allowed to walk morning and evening. 21. Separate wards with nurses are provided for the soldiers' wives and children. The present arrangements seem ample and satisfactory. 22. There are no regulations enforced beyond the Madras Presidency hospital regulations. 23. The medical officer sends in requisitions for any repairs or sanitary measures needed, which being sanctioned by the brigadier commanding the station, are complied with. Sufficient hospital comforts are always available. 24. There are no convalescent wards. No advantage could accrue from them at this station.
XIII. BURIAL OF THE DEAD.	1. The burial ground is about 500 yards from any house; it is within the limits of the cantonment, and sheltered from all winds by a tope of trees. 2. It is 400 paces square. The soil is red earth and gravel. The water runs off. No knowledge whether decomposition takes place readily. The ground is carefully kept. 3. The grave space is 6½ feet by 3 feet, with an interval of 3 feet; the depth is 6 feet. Graves are never re-opened. The time of interment is in no case compulsory, but as a rule, if a man dies during the day he is buried on the following morning; and if in the morning, he is buried in the evening. The same rule applies to native troops. 4. The graveyard is never offensive. 5. The dead of camp followers and bazaar people are taken to the jungle and either burnt or buried. 6, 7. No injury accrues to public health from the present practice. No improvements are suggested.

(Signed) G. W. OSBORNE, Brigadier, Commanding Thyet Myo.
G. P. DE P. FALCONNET, Lieut.-Engineer, Executive Engineer, Thayet Division.
C. TIMINS, Surgeon, Senior Surgeon, Thyet Myo.
T. C. LONGCROFT, Captain, Major of Brigade.

15th June 1860.

MOULMEIN.

Accommodation:—Native Troops.—Infantry - - - One Regiment Native Infantry.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The cantonments of Moulmein are on two sides nearly surrounded by the broad waters of the Salween, close below its junction with the Gyne and the Attaran. On the south is a native town, prettily situated on the slopes of the hills which dip to the Salween westward, and the Attaran eastward. A ridge of hills, varying from 100 to 300 feet of altitude, and half a mile distant from the Salween, forms the eastern boundary of the station and principal part of the town, all of which, as also the cantonments, are on dry red soil. Swamp and rice fields prevail east of the hills. The station to the west and the town are prettily wooded. Jungle abounds on the hills where not occupied by the residences of the upper classes. An unhealthy dirty ditch, covered with jungle, surrounds the cantonments east and south. Water is everywhere and at all seasons abundant. Vegetation is very rank during the rains, which are very heavy. 2. The cantonment is about 50 feet above the sea. It rises from the river bank north and east to a maximum height at its south-east angle of 150 feet, which point would command the cantonments and the best part of the town. The same ridge of hills which forms the promontory, on which Moulmein is situated, continues it in a north-north-west course, broken only here by the united waters of the Salween, the Gyne, and the Attaran, and rises to the height of 3,000 feet to 4,000 feet, but only in sharp ridges, with but little dry soil at their base, till some distance from the station southwards they run in a similar course, but only obtaining a few hundred feet of elevation, and serve to divide the waters of the northerly running Gyne from those of the southerly going Salween,—a very beautiful range of hills, broken only here and there by easy passes. No place could be healthier than the present station. The low hills would be more airy and agreeable in the hot weather, but water and steep roads are objectionable in a military point of view. As the hills command the town and cantonments, they would require to be occupied in all cases of disturbance, and are now perfectly accessible for artillery. 3. At a distance of two days river sail by boat, and one long march, there is said to be very beautiful table land, varying at from 3,000 to 8,000 feet of elevation. The country is wild, and but little known and peopled, only by sparsely scattered nomadic Karen tribes. Other table lands, more extensive, but only having about 2,000 feet of elevation, exist some four marches southward. 4. The station is surrounded by lakes, marsh, nullahs, &c., and almost all the waters in them are washed by every tide, which at Moulmein has a rise of 20 feet. The rice fields or marshes are only freed from inundation in the dry weather, but the vicinity of the station

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	is not at any season liable to overflow. There are no ravines, water pits, nor any broken ground near the station. 5. The station is now very much covered with jungle and ruinous houses, but these have been ordered to be cleared away. I imagine that the temperature of the station is not raised by the buildings being exposed to reflected sunheat. The cantonments are exposed both to the sea-breeze and the north-easterly wind during the cold season. 6. A great quantity of dense jungle runs along the east face of the low range of hills which bounds the cantonments to the east. There are no works of irrigation near the station. The cultivation of rice is not that I am aware of prohibited, except within the limits of the cantonment; neither is the cultivation of indigo, nor the preparation of hemp or flax, carried on near the station. 7. The town of Moulmein abuts on the boundary pillars of the cantonments. 8. The stones and soils of the district are mostly those of the tertiary group, with deep alluvial basins and plains, broken by long regular lines of sandstone, running about 30° west of north, and dipping eastward. A deep blue clay is generally found about 20 feet below the surface, and yields an abundant supply of fresh water even to the seashore. The character of the dry lands is more or less ferruginous. All stations and towns have been occupied for one or two centuries. 9. Water is usually found at a depth of 20 feet in the dry, and 10 feet in the rainy, season below the surface. 10. The rainfall and water from surface springs flow very readily away; generally speaking, it sinks into a pervious subsoil, and oozes out in the rivers, but does not lie on the surface till it evaporates. There is no drainage from higher ground which passes into the subsoil of the station, as the lie and dip of strata is so very considerable that what sinks into it will be carried deep and in an opposite direction to the station. 11. The water supply of the station is derived from wells. It is not stored in tanks, and I cannot say what plants or animals it contains. 12. Four wells of a moderate hard water of excellent quality supply the station. The water is raised in buckets. 13. There are no other topographical points bearing on the health of the station which are not included in these queries. 14. New stations, whether on hills or plains, are generally selected by a committee of commanding officers and medical men specially selected by Government for their known fitness for such a duty, together with the engineer officer to be entrusted with the building of the station. The service could not be better conducted.
II. Climate.	1. There are no means or instruments, that I am aware of, available at this station for conducting and registering meteorological observations. 2. No table of meteorological observation appears to have been kept here, and the only information I can afford for the year 1860 under this head, is the amount of rain which fell. This is as follows in inches, viz.:—January, 0·10; February and March, none; April, 1·90; May, 6·10; June, 31·90; July, 36·30; August, 32·0; September, 19·00; October, 5·10; November, 0·40; and December, none; thus making 133 inches in the course of the year. The average annual fall of rain is believed to be from 150 to 200 inches. 3. In my opinion the peculiarity of the climate of Moulmein is its excessive moisture, owing to the north-west monsoon lasting from the end of April to that of September, during which time the rains are excessive. The absolute heat is not so great as that of India generally, but from the combination of moisture and heat the temperature of Moulmein during the hot season and the rains is most exhausting to some constitutions. There are fogs, I believe, in the cold season, but I, as yet, have never seen any in the hot weather or during the rains. The damp is greater than I have experienced in Turkey or India. I am not aware of any tree planting in this station, nor do I think it would be needed. Burmah being over wooded, I am unable to say anything about irrigation. I have not seen any dust nor dust storms up to this date, and my residence here only embracing the period of six months, I can consequently say but little on this head. I do not believe that the climate of Moulmein agrees with natives of India, particularly those who come from the southern part, such as the Telinga and Malabar races. The present diet, shelter, and clothing of the native troops are, I think, sufficient. Drill only takes place in the cold season, when the ground becomes firm and dry. The most unhealthy months are those at the commencement and termination of the monsoon, viz. May and September, the prevailing diseases then being, dysentery, diarrhœa, intermittent and remittent fevers, rheumatism, and psoriasis. 4. I understand that at the entrance of the Moulmein river there is a place called Amherst, the climate of which is said to be more conducive to health than that of this station. 5. During my period of service in India (now three years and five months), I have been stationed in Cawnpore, Futtypore, Calpee, Banda, and Secunderabad, and I consider that any prolonged residence in Cawnpore, Calpee, or Banda, must be attended by results positively injurious to the health, particularly of Europeans.
III. Sanitary Condition of Station.	1, 2. There is now only one irregular regiment of native infantry in the station. The soil of the station is not sufficiently strong to answer the purpose of drainage without masonry. The outlets of the drains, sewers, &c., are quite free. There are no cesspools, but a very objectionable fort ditch, which it would cost about 40,000*l.* to fill up. 3, 4. The native infantry barracks are of wood, raised 3 feet above the ground, with doors and windows at every 10 feet. The ventilation is ample. These are the only barracks in use. 5. The windows are on opposite sides of the barracks, and open on hinges. There is a verandah all round 8 feet broad, but this is never occupied as sleeping quarters by the soldiers or any other persons. There are no jalousies or jhilmils. 6. Flanked cots are in use in the barracks for sleeping purposes, but the native soldiers generally prefer the floor. 7. Tents are not used in the station. 8. Every chink of the planks, roof, and floor besides the doors and windows at every 6 feet afford sufficient means of ventilations, and keep the air pure by night as well as by day. There are no means required in this province for cooling the air for barrack-rooms. 9. The barracks are constructed of wood, tents of cloth, and huts of bamboo and grass. 10. The floors, which are of wood, are raised 3 feet above the level of the ground, so that there is a perfectly free passage of air beneath them.

MOULMEIN.
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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	11. The materials and construction of the barracks, huts, &c., are very suitable for the climate, and no improvement in either of these points would increase their salubrity. The walls and ceilings of the barracks are cleansed and limewashed annually. 12. There are no lavatories, baths, or washing places for the men at this station. 13. A cook-room is attached to every three or four barracks, where the native soldiers cook for themselves on raised fireplaces. 14. A marginal sketch of the privies, &c. sent herewith. 15. The barracks are lighted at night by lanterns suspended from the roof. 16. A deep drain runs round each building, leading into a freely running stream or the main river, and this is found sufficient for conveying away all surface water and drainage. I have no fault to find either with the barracks or hospital on the score of dampness, inasmuch as no place can avoid being saturated with moisture during the monsoon, and so long as the roof remains watertight no more can be expected. There are no cesspits near the station or wells, but the old native fort ditch before mentioned surrounds the cantonments on two sides. 17. The surface cleansing of the cantonments and their vicinity is conducted by officers commanding the corps, with occasional aid from the executive engineer. All the refuse, &c. is removed in hand carts. 18. In consequence of the desertion of the cantonment, the ruinous state of the houses, and the rapid growth of vegetation, the surface has not been kept free, and there are numbers of high and thick hedges, but these have been ordered to be cut and removed. 19. The bazaar is kept very clean, and no improvement on this head is practicable. The native houses are generally clean, and the privies being erected over tidal nullahs, are very seldom offensive. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. No animals are permitted to be slaughtered within the limits of the cantonments. 21, 22. There are no stables or picketing grounds for artillery, cavalry, or bazaar horses at Moulmein. 23. There are no Europeans at this station.
Officers' Quarters.	1. The sanitary condition of the officers' quarters at this station is good. The necessary orders with reference to the removal of houses in a ruinous state, and to the clearing of compounds have been already issued.
IV. HEALTH OF THE TROOPS.	1, 2, 3. I do not consider the station to be an unhealthy one, but I am unable to say anything about the native population as they have never come under my observation nor treatment. 4. The regiment was at Kamptee for two years and eight months, and left on the 10th of October 1859. The corps seems by the returns to have enjoyed good health whilst there; the principal diseases being fevers of the intermittent and remittent types. The regiment arrived in Moulmein on the 21st January 1860, and since then sickness has been very prevalent amongst the men, the prevailing diseases being diarrhœa, dysentery, febrile affections, rheumatism, psoriasis and ulcers. I do not find any portion of the men's present accommodation more unhealthy than the rest. 5. The troops at this station have not been camped out since March 1861, when I took medical charge of them. 6, 7, 8. I have never been in charge of troops in the hills; but from the little I know of hill stations, I think that they are well suited for Europeans. 9, 10. No replies to these queries. 11. As far as I am enabled to judge, I do not think that a residence in the hills of less duration than 18 months or two years would suffice to enable troops to derive the full benefit of such residence to their health. 12. I cannot state confidently, but I think that a very prolonged residence in a hill station might unfit troops proceeding on duty in the plains, in the same way as a long residence in a temperate climate might unfit them for their stay in a tropical one. 13. I think troops should not be removed from the hills to the plains either in the hot season or during the monsoon. 14. As a general rule, I think, that a moderate residence in the hills, with short tours of duty in the plains, the most conducive to the preservation of the health of troops serving in India. The present rule is to let a corps remain three years in a station. I believe it to work well. 15, 16. No experience. 17. I am not aware of any higher ground near this station, which could be advantageously occupied as a hill station. 18. The most unhealthy station which I have as yet known is Banda, in Bundelcund. It is situated in a plain of clay and gravel, interspersed with large hills consisting of water worn granite boulders. 19. I consider 22 or 23 years the best age for soldiers to proceed to India, and the cold season the best period for landing them here. I never did any duty with troops newly landed, having been sent immediately on my arrival in Calcutta in April 1858, on active service in the North-west Provinces; but with freshly arrived troops, I would advise, as a precaution for the preservation of their health, an avoidance of undue exposure to the mid-day sun, employment within doors, and precautionary measures against their visiting bazaars and arrack shops. 20. If soldiers land in India in the cold season, they may get accustomed to the climate even in the plains, but if the hot weather sets in, the newly landed might with benefit be sent to the hills till the next cold season. 21. I have generally known troops on landing to march from the port to the interior, and I think that the present regulations for marching ample in precautions. 22. I deem ten years sufficient for a British soldier to serve in India. 23. I have acted as a member on several invaliding boards, and I think they work well. 24. It would be advisable to send invalids home in February, so that they might arrive in England about the middle of June, or earlier if possible.
Diseases.	1. There are inspection parades for scabies and venereal disease, generally once a week amongst the recruits. 2. I have never seen any scorbutus or scorbutic disease among the troops at this station, but if the disease should show itself, I would advise the exhibition of lime juice.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	3. I have only had three cases of hepatic affection in the course of six months, 2 of which were the result of intemperance. The disease is very often caused by exposure to a cold wind when heated by exercise. Any person subject to hepatic disturbances should, in my opinion, avoid cold bathing, stimulants, and exposure to the noon-day sun. Chronic dysentery if unchecked causes abscesses on the liver. 4. I have never seen dracunculus in Burmah, but it is very prevalent in Secunderabad. Whilst I had charge of the 49th regiment Native infantry, as far as I can now remember, the proportion was as high as nine or ten per cent. of total sick, and the cause attributed the water. This I am certain of that the 10th regiment Native infantry stationed in the same place, and of which also I had the medical charge had few, if any, cases of dracunculus amongst them. 5. The proportion which venereal diseases bear to the total sick in hospital from all other diseases is 1 in 9. I am clearly of opinion that the only precautions of any value against this disease are to establish lock hospitals and to institute a strict watch, and health inspections at stated periods over the bazaars and their inhabitants. 6. Since I assumed medical charge of the 32nd regiment of Native Infantry, I have found the most prevalent form of diseases to be, and in proportion, as follows, viz. :— *Fevers.*—Intermittent and remittent - - - 1 in 17 admissions. Dysentery - - - - - - 1 „ 17 „ Cholera - - - - - - - 2 „ 17 „ Rheumatism - - - - - - 3 „ 17 „ 7. The most marked nosological character of these diseases, in their asthenic nature, requiring the exhibition, in many cases, of wine and stimulants. They are most prevalent in the commencement and termination of the monsoons. Great heat, combined with an atmosphere overcharged with moisture, precede or accompany their appearance. I have never treated any of the inhabitants of the bazaars, my experience being solely confined to the sepoys, who in this station live in wooden barracks, and not in lines, as is the custom in India; but from what I have seen, I consider the native portion of Moulmein as filthy to a degree. The exposure consequent on their duties, together with the non-nutritious nature of their food, which consists chiefly of rice and dhol, predisposes the sepoys to these diseases. 8. I think that the custom of the sepoys of sleeping on the ground, either in barracks or camps, in a great measure induces epidemic disease. 9. I have never seen small doses of quinine given, either to natives or Europeans, as a prophylactic against malarial diseases. 10. In order to the prevention or mitigation of epidemic disease at this station, I would recommend that cleanliness be enforced in the native parts of the town, a strict supervision of the condition of the barracks, protection, as far as is possible, from the noonday sun, a modification of the uniform to suit it better to the climate, and avoidance of very long parades, particularly in the hot weather.
V. Intemperance.	1. The soldiers at this station are generally temperate, and there are no confirmed drunkards. 2. I have had only two admissions into hospital in six months, resulting indirectly from intemperance. I am unable to give any statistics of the proportion of admissions caused directly or indirectly from intemperance, to the total admissions; but the regiment is a native one, and intemperance is the exception and not the rule. I think that the moderate use of fermented liquors is rather useful than otherwise to Europeans; but at the same time I consider the habit of giving men a dram in the early morning, on the march a bad one: give them rather a cup of coffee and a biscuit. In my own case, I have found it the best plan. Drunkenness is always punished as an offence. 3. No canteen: spirits are sold in the bazaar. Spirit forms no portion of the ration of a native soldier, but the quantity consumed by each man, and its quality, are unknown. The non-commissioned European officers attached to a native regiment are allowed 60 drams per mensem, which is generally drawn by them on indent from the commissariat stores. To the best of my belief, no drinks other than intoxicating drinks are sold in the canteen or bazaar which are injurious to health. 4. As far as natives are concerned, the use of spirits is so trifling that I have never found health injured, or the efficiency and internal discipline of the corps impaired by it. 5. Spirit forms no part of the ration of a native soldier; but, so long as there are licensed shops in the bazaar for the sale of spirits, it is impossible, I think, to restrict the use of it. 6, 7, 8. These queries are only applicable to European soldiers. 9. It would certainly be better to permit only the sale of coffee, tea, &c., in the canteens and bazaars as spirituous liquors are, if taken in any quantity, deadly in an Indian climate. 10. I would advise the prohibition of the sale of spirituous liquors in the canteens; but then the arrack shops should be well looked after, as the men will go there, and, if they must drink spirits, better for them to drink it at a canteen where it is unadulterated, than to poison themselves with bazaar arrack, which often consists of bad spirit, rancid cocoa-nut oil, and sometimes drugged with bhang and chillies. 11. There is no regimental bazaar maintained at this station.
VI. Diet.	All the questions under this head refer to European soldiers; but the native soldiers at this station have excellent cook-rooms, clean and well ventilated; the different castes have a defined portion of the cook-room allotted to them, and bheesties furnish an ample supply of water from the neighbouring wells.
VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the 32nd regiment are according to the regulations on the subject for a native regiment in the Madras army. The men are allowed to convert old coats into jackets, which, with the boat cloak, is used as a guard dress, with cloth or linen trousers, according to the season. The guard accommodation at this station is generally good, and the dress well adapted to the climate.
Duties.	1. Not applicable to native soldiers. 2. From the 15th of May to the 15th of October little or no drill can be carried on at this station on account of the rain. For the other portion of the year there is drill or roll call every morning, and evening drill during November and December (setting up drill). The drills commence as soon after daylight as possible, and from five to six o'clock in the evening, which I consider the best time; they last little more than an hour at a time. The troops enjoy better health during the drill season. They have one holiday in the week,

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References to Subjects and Queries.	REPLIES.
VII. Dress, Accoutrements, and Duties —*Duties.—cont.*	besides Sunday (General Regulations, page 152, para. 6), and five nights in bed during the week. 3. The furthest guard is about one mile from the barracks. Day and night guards last 24 hours, night guards from sunset to sunrise; sentries are relieved every two hours. There is a roll-call by day. At 10 o'clock every night it is ascertained that the men are all present in barracks (absentees are punished), and at a later hour the officer of the day frequently visits the barracks to see whether the men are all then present or not. Night guards at this station I do not consider particularly prejudicial to health. The men are allowed to shelter themselves from rain, and are taught to move about briskly at other times.
VIII. INSTRUCTION AND RECREATION.	The questions under this head are applicable only to European soldiers.
IX. MILITARY PRISONS.	1. The solitary cells at this station are properly constructed, and well adapted for the purpose required.
X. FIELD SERVICE.	1. I am not aware that any local regulations for field medical service exist. 2. I conceive that the opinion of the medical officer, as regards the conduct of the line of march of troops, camping, bivouacking, &c., would seldom or never be at variance with that of the commanding officer, and I am of opinion that in these respects the voice of the medical officer should be attended to as far as possible. 3. Encamping grounds are generally marked by fixed boundaries, but where this is not the case the highest and best ground, with a due regard to the supply of water, is selected by the commanding officer, the medical officer having the power to object to such ground should he see fit. The commanding officer would, I conceive, if possible, attend to the opinion of the medical officer. Horses, cattle, &c., are invariably kept in the rear or on one side of the line of tents of both officers and men. 4. I am unable to answer this question fully, but conceive that one rule, as regards field hospitals, ambulances, and transport of the sick, &c., is applicable to all the regiments in the Madras army.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1, 2. Plan of hospital forwarded. It is placed at about 30 yards in the rear of the barracks, and about half a mile from the bazaar and houses of the civil population generally. The site is open and healthy, and the ventilation free. There are some trees, but they do not interfere with the free passage of air. 3. The water supply, which is derived from a well close by the hospital, is abundant and good. 4. The ground about the hospital is drained by open trenches, which run all round the building, and empty themselves into the ditches on the roadside. The outlet into those ditches is about 18 feet from the hospital. 5. The height of the hospital wards from the ground is four feet two inches, the air having a free passage beneath, as the building is raised on wooden supports. The roof water falls into the before-mentioned drains, by which also the surface drainage is effected. These means are sufficient. The hospital is built of wood; the roof and walls are single, but quite thick enough to keep the wards cool; and the ventilation is ample. There is a verandah on either side of the hospital, nine feet in breadth, and sufficient for shelter, but it is never used for the accommodation of sick, except the wards are full. The hospital consists of one flat. Table of Accommodation. Total number of wards - - - - 3. Total regulation number of beds - - - 30.

Wards, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Inches.	Inches.		Feet.	Feet.
3	10	39¼	20	18¾	14,718¾	1471¾	87 by 31⅓	18½	6	3	3

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows of the hospital open in the centre, and the ventilation is thorough.

6. The wards are ventilated by the windows and doors, and there is always a free passage of air through them. The jhilmils are the same that are always seen in India.

7, 8. Thermantidotes and tatties are not used in Burmah. There are no means either for cooling or heating the air of the hospital, nor are any such required. The walls and ceilings of the hospital wards are cleansed and limewashed every three months.

9. The privies are distant about 15 yards in the rear of the hospital, and are cleaned out daily. I never heard of cesspits to privies either in India or Burmah. The task of cleaning privies is deputed in Bengal to Mehters, and in Madras to Toties.

10, 11. The native sick always (if able) wash themselves, but when a man is not, one of his own caste does it for him. There is a well in front of the hospital, and plenty of chatties filled with water at the men's disposal.

12. The hospital linen is washed by the commissariat department.

13. The storage is sufficient and dry.

14. The cots are of wood, with bottoms of wood. The sepoy always brings his own bedding (a sutringi) with him into hospital.

15. There is a small kitchen in the rear of the hospital, but it is only used for cooking such extras as are ordered for the sick, such as chickens, mutton, &c. Properly speaking, native sick are not dieted in hospital, but provide their own food, which is cooked in the regimental cookhouses by men of their own caste. The hospital kitchen is a square wooden building, with brick fireplaces raised in the centre, and is ample for what is required.

16. Principal forms of diet tables used in a native hospital are forwarded.

17. Every patient who requires it is provided with an orderly of his own caste. An hospital havildar is appointed monthly.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	18. I am of opinion that the sanitary condition of the present hospital of the 32nd regiment native infantry is good. There have been no cases of hospital gangrene or pyæmia. 19. I have no complaints to make of sanitary defects or deficiencies. 20. There is plenty of ground about the barracks and hospital, in which convalescents may take exercise. The roads are sheltered by trees, but there are no benches. 21. Native troops do not bring their families to Burmah with them. I consider the present hospital arrangements satisfactory. 22. I am not aware of any special local hospital regulations. Every medical officer is guided by what is laid down in the Madras medical code. 23. With respect to the sanitary state of this hospital, repairs to buildings, change of diet, medical comforts, &c., the medical officers have ample powers. They furnish indents for what is required, which indents, on being countersigned by the Deputy Inspector-General of the division, are then passed and acted on. 24. There are no wards or hospitals for convalescents at this station. When a sepoy is put on the convalescent list, he lives in the barracks, and presents himself daily at the hospital for inspection.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is at the north-east angle of cantonments on the seaside. Its area is about three acres, and is very carefully kept. The drainage is good, and decomposition rapid. 3. There are no regulations as to distance between graves; the directions received at this station from Bengal on the subject of graveyards being to the effect that this and all matters connected with burials shall be left to the discretion of the chaplain. Graves are generally dug about five or six feet deep; they are never re-opened, and one body only is buried in a single grave. There are no rules for interment after death. Epidemics have never prevailed in this station. 4. The graveyard is never offensive. Bodies are generally buried the day after death. 5, 6, 7. The bodies of deceased camp followers and bazaar people are removed by their friends. No injury accrues to the public from the present practices, nor are any improvements to be suggested.

(Signed) H. W. Blake, Lieut.-Colonel,
Commanding Moulmein.
Robert Gordon, Major,
Commanding 32nd Regiment Native Infantry.
J. N. Forlon, Captain,
Executive Engineer T. Provinces.
James T. J. Doyle,
Assistant Surgeon 32nd Regiment Native Infantry.

2nd November 1861.

CUTTACK:—BENGAL CIVIL STATION.

Accommodation—Native Troops. { Artillery - - 1 company.
Infantry - - 1 full regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is situated on a narrow tongue between the Mahanuddy river and its arm, the Katjooree; its immediate vicinity is flat, but a range of low hills extends north and south, approaching within five miles westward of the station. Beyond these are hills of greater height, covered entirely with jungle. The soil of the station is light alluvium, the rivers which bound it presenting in the dry season vast surfaces of sand. Between the elevated banks of these rivers and the hills is low ground, which here and there is diversified with swamp. The hills above mentioned are thickly overgrown with low jungle, but contain no large timber. The volume of water, whether in the rivers, tanks, or elsewhere, is excessive during flood season, but, though ample for practical purposes, during the remainder of the year does not cover any very large extent. 2. The elevation of the station above the sea varies between 75 and 80 feet, but is, generally speaking, on the same level as the adjacent country. It is 25 to 30 feet above the low water level of the rivers bounding it, but is very little above their high flood level; indeed, parts are below that level, and but for protective works would be inundated during extraordinary floods. About 8 miles from the station, in a north-east direction, is a plateau of laterite ground, 30 or 40 feet higher than the station, but which, owing to the heat given off by the rocky soil, and the difficulty of procuring water, could not be pronounced a more healthy situation for a cantonment. 3. A range of mountains, of which several summits reach the height of 2,000 feet above the station, extends within 20 miles of it. The sides of these mountains are steep and rocky, and they contain little or no table land. Megaseni, in the Nilgurh range, situated about 120 miles N.N.W. from Cuttack, is topped by a table land 3,800 feet above the level of the sea. 4. As stated before, the station is bounded by two arms of a river. It is situated about 50 miles from the coast of the Bay of Bengal. The station itself, and its immediate vicinity, is protected from inundation by embankments and revetments. The neighbouring plains are, however, peculiarly liable to inundation from July to October, and are in ordinary seasons overflowed for short periods during those months. Down the centre of the tongue of land, on part of which the cantonment is situated, lies a flat drainage line, which is a mere swamp during the rainy season, and has been known to produce fever. 5. The station is, generally speaking, fully exposed to the winds, and though interspersed with trees, hedges, gardens, &c., is not so encumbered as to impede ventilation. The buildings are, for the most part, surrounded by trees, but where they are open the reflected heat may,

CUTTACK. MADRAS.	References to Subjects and Queries.	REPLIES.
	I. Topography—*cont.*	to some extent, increase the general temperature of the station. The station is exposed to a land wind during the north-west, and to a sea breeze during the south-west Monsoon. The latter, by modifying the temperature during the hot season, has a salutary effect on the health of the station. The former has been thought to produce the sickness which occasionally occurs during the rains. 6. The neighbourhood is for the most part under cultivation. There are no works of irrigation which in any way affect the health of the station; indeed the district is remarkably devoid of useful works of this character. The cultivation of rice is not prohibited, and in many localities comes up to the very boundary line of the cantonment; but there is no cultivation of indigo or flax. 7. Cuttack, a large town of about 35,000 to 40,000 inhabitants, is situated in the immediate vicinity of the cantonment, occupying one bank of the tongue of land already referred to, the other bank of which is occupied by the cantonment. The extreme width of this tongue is two miles. 8. The district consists of an alluvial delta resting on hills of gneiss, the bases of which are surrounded by platforms of laterite. Cuttack having been the capital of the province of Orissa under former governments, and a very important city, it is probable that the ground covered by the present station was formerly occupied. Indeed the most conspicuous object within the cantonments is the Old Mahratta Fort. 9. Water is usually found at a depth of from 25 to 30 feet below the surface, the rise and fall being chiefly dependent on the rise and fall of surrounding rivers, during the dry and rainy seasons respectively. 10. The drainage water flows off pretty readily, but owing to the permeability of the soil, a considerable quantity must pass off through the subsoil. It does not ooze out near the station, as it finds its way into the adjacent rivers. A portion of it also drains into the numerous tanks which cover the surface where it undergoes evaporation. There is no higher ground adjacent the drainage from which passes into the subsoil of the station. 11. The water supply is derived from the river and wells, and is also stored in open tanks, the larger of which are for the most part full throughout the year. The tanks abound in confervæ, and the usual water plants; most of them contain fish, but there is no peculiarity worth noticing in their fauna or flora. The tanks are generally used without distinction for drinking, bathing, and other purposes, with the exception of those in the cantonment, in the immediate vicinity of the hospital, one of which is used for drinking and the other for bathing. Especial care is taken that these tanks suffer no pollution from leaves or other impurities falling into them; but such precautions are not used with reference to other tanks. A ditch surrounding the fort is believed to produce occasional malaria. The means of removing the nuisance is at present under contemplation. Various tanks not under the military authorities become offensive during the hot season. 12. The water supply is sufficient; that from the river and wells is limpid, and devoid of any offensive qualities. It is hard, owing to the admixture of saline matter, &c., but no analysis having been made, its chemical composition and microscopic character cannot be stated. There is at all seasons a sufficient supply of pure and good water, and no measures are required to increase the supply or improve the quality. 13. No reply to this query. 14. The formation of new cantonments in this district has not for many years occupied the attention of the authorities on any large scale. The station of Sumbulpore was occupied as an important military position without reference to its sanitary conditions, and the amount of sickness has, as might have been expected, been considerable.
	II. CLIMATE.	1. A thermometer and rain gauge are supplied by Government for conducting meteorological obvervations; but the only barometer in the station is the private property of the civil surgeon. 2. No reliable record exists in the office of the civil surgeon for any lengthened period from which any trustworthy data could be drawn to prepare a meteorological table. 3. The climate of Cuttack, judging from the health of the residents for a period of nearly six years, may be considered on the whole healthy, the sickness witnessed among Europeans being for the most part traceable to fevers, &c., contracted in the neighbouring hills on duty. For two weeks during the hot weather in May the heat is excessive. The cold weather is very pleasant, the lowest range of the thermometer being between 55° and 60°. No admixtures, such as dust, &c., affecting the atmosphere, are experienced in the vicinity. No extraordinary precautions regarding diet, shelter, clothing, drill and duty are required at this station. The most healthy months are December, January, and February, and the most unhealthy May and June in the dry seasons, and when the pilgrims to Juggernauth are numerous, during which period cholera and small-pox rage, and September and October during the rains when fevers prevail. 4. Pooree or Juggernauth, 53 miles due south on the sea-coast, is more healthy than the station, but only in the hot months, March, April, May, and the first 10 days in June, owing to the south-west monsoon. It is not, however, adapted for a permanent residence, owing to the relaxing nature of the climate. 5. I have served at Pooree and Cuttack, but the latter station is superior in a sanitary view, owing to the reasons above given.
	III. SANITARY CONDITION OF STATION.	1. 2. A map of the adjacent country and plan of the station are transmitted. 3, 4, 5. There are no barracks in use at the station; but in the vicinity there is a low range of dome-roofed buildings, formerly occupied by European cavalry, and now made over to the military police. 6. The Madras sepoy sleeps on the bare ground, sometimes with a mat, and his coat between it and him; now and then he provides himself with a country cot—in Burmah and the Straits invariably. 7. The Madras private native tent is a very simple structure; a cross pole on two uprights in the centre, from which fall the folds in oblong form, containing by regulation 25 men and their arms. Their length is 22 feet by 12 feet broad along the ground inside; the height of the upright poles is 10 feet, and length of the cross-pole 10 feet. 8. The tents are open all round below and at the entrance, and cannot be sufficiently shut down in wet weather. Huts and guard-rooms are well ventilated both by day and night. The ventilation of the tents is always sufficient, and at times too great.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	9 to 16. No barracks at Cuttack. The native hospitals are reported by the medical officer to be dry. The station is considered particularly free from foul ditches or other receptacles of noxious matter, with the exception of those noted (Question 11, Topography). 17. Defects in the state of the surface cleansing of the cantonment have been lately considerably removed, and, unless at very great expense, little more could be done. 18. The surface of the cantonment is kept particularly free from vegetation; hedges are kept at the regulation height, and neither these nor brick-walls interfere at all with ventilation. 19. The cantonment bazaar occupies the highest ground in the station, and therefore possesses facilities for drainage. It is thought, however, that the most has not been made of these, and that the sanitary condition, with reference to ventilation and crowding, is not so perfect as it might be. The water supply is abundant. No written bazaar regulations are found existing at this station. Some simple regulations, as far as lies in the power of the commanding officer to frame, will be made for the preservation of cleanliness, the prevention of crowding, and for the general conservancy of the cantonment. Upon the whole, however, the abodes of the natives are as cleanly as may be seen in any Indian town. 20. About 15 sheep are daily killed near the bazaar; this is certainly a nuisance, and a more desirable spot will be selected as soon as possible for a slaughtering place. 21, 22. There are no bazaar horses, nor artillery nor cavalry stables. The Karkhana bullocks have a good shed, and are kept very clean and sweet. The manure is sold. 23. No reply to this query.
Officers' Quarters.	1. The officers' quarters consist of ranges of thatched bungalows, situated in spacious compounds on the high banks of the river. The drainage is natural, and the ventilation free. No improvement in them can be suggested.
IV. Health of the Troops.	1. I am of opinion that the station district and adjoining native population are on the whole healthy; and when cholera and other fatal epidemics appear, they are traceable to the numbers of pilgrims who pass through this district on their road to Juggernauth. 2. The most prevalent diseases among the native population are cholera, elephantiasis, and enlargement of the spleen, dependent on fever. 3. The cheapness of the necessaries of life, proximity to the sea-coast, and abundance of good water throughout the year, make the district healthy. 4. The native infantry regiment at present in this station came from Russelcondah, where they had been about one year and ten months. The regiment left for Cuttack on the 1st December 1859, and arrived on the 19th of that month. The most prevalent diseases at Russelcondah were fevers and rheumatism; but there appears to have been no unusual amount of sickness. On arrival at this station they were in good health, and the principal diseases since that time have been fevers, rheumatism, and bowel complaints. I am not aware of any portion of the accommodation here being more unhealthy than others. 5. The troops are not camped out. 6 to 17. No experience of hill stations. 18. I have not had sufficient experience to say which is the healthiest class of surface and subsoil for stations. 19 to 24. No replies to these queries.
Diseases.	1. Inspection parades for the discovery of incipient diseases are not usual among native troops. 2. No scorbutic disease has been seen by me at this station. 3. Very few cases of hepatic disease come under treatment here, and those which do occur are chiefly secondary to fever, and therefore, the prophylactics adapted to the latter would be best. 4. Dracunculus is not seen at this station. 5. The average of venereal diseases usually under treatment is about 3 per cent. of the total in hospital. It would be highly advantageous in my opinion to have lock hospitals at every military station. 6. At this station diseases of the endemic or epidemic class, with the exception of fever and rheumatism are not frequently met with. Intermittent fevers are most prevalent; dysentery cases are few in number, and small-pox seldom prevails among the troops, as they are generally protected by vaccination. Cholera is rare, only one case having occurred among the troops during the last two years. There are no statistics available from which to furnish the proportion of admissions and deaths from these diseases to the total of admissions and deaths. 7. Intermittent fevers, the only zymotic diseases generally prevalent at this station, present no unusual nosological character. These diseases are usually most prevalent after the commencement of the rains, and in the cold seasons, and are usually preceded and accompanied by cold and dampness of the atmosphere. The sanitary condition of the bazaar is good in every respect, and I am not aware of any personal habits among the troops or native population which appear to predispose to these diseases. 8. This query is chiefly applicable to European troops of which I have no experience. 9. Quinine is not usually used as a prophylactic against malarial disease. 10. Ordinary attention to drainage, cleanliness and other sanitary requirements, appears to be all that is necessary to prevent, or mitigate epidemic disease at the station.
V. Intemperance.	1. The native soldier is very temperate in general; there is not a confirmed drunkard among them, nor among the drummers and band men. 2. A sepoy is occasionally drunk and is punished for it. It must be confessed that when separated from their families across the water, a considerable number of sepoys take to drinking, but not inordinately,—though occasionally brought to a court-martial for drunkenness on or off duty. 3. No shop for the sale of arrack or toddy now exists in the cantonment limits. 4 to 11. These queries are left to men more experienced in European troops to answer. It is of no use to add to the immense quantity of opinions that will be forthcoming from other quarters.
VI. Diet.	No information under this head.

References to Subjects and Queries.	REPLIES.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. This question has evident reference to European soldiers. The dress of the sepoy cannot be altered for the better, taking all things into consideration. His commanding officer sees that he is clothed suitably to the season of the year, and still according to the regulations. The sepoys' carpet and greatcoat improvise sufficient protection against sudden changes of weather by day or night.
Duties.	1, 2, 3. At this station, as regards drill, the natives are out mostly in the morning, with parades for inspection, &c. in the evening. As respects duty, the sepoy here has four nights at home, and the night guards have no particular effect upon him. The treasury guard is two miles from the lines commanded by a native officer.
VIII. INSTRUCTION AND RECREATION.	1. Cricket is somewhat affected by the sepoys, and much encouraged by some of the European officers. An English school for the sepoys has just been commenced. The master is a certificated one and 2nd master of the Cuttack Government school. 2, 3. No reply to these queries. 4. The native troops are well furnished at this station with sheds for exercise, and shaded by trees.
IX. MILITARY PRISONS.	1. The solitary cells (three in the fort) are clean, well ventilated, with nothing in them to prejudice the health of the sepoys placed in confinement, which is never for more than seven days at a time.
X. FIELD SERVICE.	1. There are no special local regulations for field medical service. 2. Although the medical officer is of the greatest importance on the line of march, and in the field as regards his professional duties, yet his powers do not go far, because in a line of march the course is stereotyped, and there is no room for change. In the field everything depends on the commanding officer. As regards the appearance of epidemics in the camp, the advice of the medical officer may be said to be authority. 3. In India, it is difficult to find any other than the encamping grounds where regiments, year after year, have pitched their tents. These have been selected with the greatest care, by the quartermaster-general's department, with reference to openness, sufficiency of space, and supply of water. The medical officer can do no more than call upon the commanding officer to keep the camp clean; which is enjoined by regulations with ample detail of instructions. 4. No reply to this question.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information on this subject.
XII. HOSPITALS.	1, 2. The hospital is situated at some distance from the bazaars, on an open and somewhat elevated site. It is freely ventilated, favourably situated as to drainage, and free from sources of malaria. 3. The water supply is abundant and wholesome. 4. The drainage and sewage from a native hospital are small. 5. The ward is raised about 2 feet from the ground; but has no arrangement for the perflation of air beneath the floor. The roof water is carried off and sinks into the subsoil. The drainage is amply sufficient to carry off the fall of rain. The hospital is pucka building, with a thatched roof, which, as well as the walls, is single. They do not admit of ventilation between them; but the walls are sufficiently thick to keep the hospital cool. It is surrounded on all sides by broad verandahs amply sheltered from the sun by bamboo tatties; these are occasionally used for the accommodation of sick and convalescents.

TABLE of Hospital Accommodation.

Date of construction, 1833.
Total number of wards, 1.

Total regulation number of beds, eight per cent. of the strength of the corps: in case the sick exceed this number, the men are allowed to bring their own cots (*vide* D. P. W. Code.)

Wards, Number.	Regulation Number of Sick in Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
One long apartment, measuring 118 feet in length and 22½ feet in width.	Can accommodate 40 comfortably.	118 feet.	22½ feet.	Between floor and ridge plate 20 feet. No ceiling.	42,762 ft.	1069	92	16 inches	16	7 feet	4 feet

The prevailing winds blow over the hospital. The windows afford fair ventilation and open by an upper and lower compartment.

6. Ventilation is effected by means of the doors of windows which surround the hospital, and also by means of openings in the roof which are sufficient to preserve the purity of the air in the ward. There are no jhilmils.
7, 8. There is no apparatus for cooling or warming the wards. The walls of the hospital are whitewashed twice a year.
9. There is one privy situated close to the hospital on the west side; a pucka building, with openings in the walls for the admission of fresh air. There is proper drainage, and it is flushed with water several times a day, by which means it is kept pure.
10. No lavatory arrangements exist in native hospitals.
11. There is a tank for bathing in front of the hospital, and an abundant supply of water for warm baths when required.
12. The means for washing and drying hospital linen is provided for by the commissariat agent.
13. No storage at this station.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	14. The bedsteads used in hospital are the common wooden charpoy of the country. The bedding is sufficient; but the number of cots allowed is insufficient for the hospital at this station. 15, 16. These questions apply to European hospitals only. 17. There is an hospital havildar for attendance on the sick, and orderlies are supplied by the commanding officer on the requisition of the medical officer. 18. The sanitary condition of the hospital is on the whole good, and no epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19, 20. Nothing to suggest in reply to the queries. 21. The sick wives and children of soldiers are attended by the medical officer, whenever Sepoys make the request. 22. Only the Presidency Medical Regulations are enforced as a general rule;—special ones are issued when necessary. 23. Medical officers as a rule have the full co-operation of the commanding officer in regard to matters appertaining to the sanitary state of the hospital, to repairs of buildings, &c. 24. There is no ward or hospital for convalescents; but such provision for convalescent patients would be highly advantageous at all stations.
XIII. Burial of the Dead.	1. The cantonments burial ground for the use of the European community is situated on the bank of the Mahanuddy, half a mile to the westward of the cantonment. The prevailing winds do not, however, blow over this ground in the direction of the station. 2. The area of the burial ground is 62,712 square feet. The soil and subsoil are light alluvium, and the drainage is effected naturally owing to the position on the high river bank. The ground is carefully kept in order, under the superintendence of the chaplain. 3. The usual space allowed for graves is 3 feet by 9 feet; but more is generally taken; the interval between them is 3 feet, and the required depth not less than four feet. Graves are not reopened unless vaulted, and no bodies have been interred above previous interments. There is no compulsion as to time of burial; but it generally takes place at ordinary times within twenty-four hours after death, and during epidemics as soon as preliminaries can be effected. In native burial grounds the corpse is interred within three hours of decease, often sooner, such is the custom of the Mahommedans. 4. The graveyard has never been found offensive. 5. The Hindoos burn their dead at the river far from the cantonment—the Mahommedans bury their dead at once, four or five feet below the surface, in a burial ground within the cantonment, used under the Mahratta government. 6. Notwithstanding that the Mahommedan burial ground has been buried over four or five times, no injury has accrued to the public. They (the Mahommedans) do not disturb ground in which bones can be found. 7. The government and no other authority might regulate burial grounds. All burial grounds should be at a distance; but this cannot easily be effected in the case of Mahommedans. However, the Mahommedan burial ground in the cantonments, and also that appropriated to R. C. native Christians are being closed, and new sites considered for them at a distance.

(Signed) C. M. Macleane, Colonel,
Commanding troops, Cuttack.
John C. Harris, Captain,
Superintending Engineer, Cuttack circle.
R. Pringle, M.D., Assistant-surgeon,
In medical charge, Civil station.
Thomas Croudace, Assistant-surgeon,
In medical charge, Military station.

May 31st, 1860.

LABUAN.

Accommodation. Native Troops { Artillery. 2 Jemidars, 10 rank and file.
Infantry. One company of a native regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country to the south of the station consists of clay hills intersected by ravines, forming a fine natural drainage, while to the north and east is a sandy flat covered with thin vegetable soil, below which is sandstone. The barracks and hospital are built at the edge of the sandstone plateau. The lines themselves comprise a space of cleared ground of about 40 acres, surrounded by jungle and forest, the former of which abounds in the settlement; the other portion of the island being covered with large forest. Some of it is 300 feet high. 2. The elevation of the station above the sea is 108 feet. The ground on which the lines stand is the highest of a series of undulations, which, gradually diminish in height until half a mile distant, to the south and south-east, where they terminate at a plain which occupies the remaining extent towards the harbour and bay. The plain varies from 10 feet to 2 feet above the sea bed, and is in some parts submerged at high tides. To the north and west the primeval forest overtops the cantonment from 50 to 200 feet on all sides. A tolerably large river extends down the centre of the island from north to south. The low land forming the northern boundary of the harbour was originally almost entirely swamp, a considerable portion of which has been reclaimed between the lines and harbour, but much yet remains to be done. There is no higher or healthier ground in the immediate neighbourhood of the cantonments than that on which the station stands.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	3. The highest ascertained elevation on the island is merely a narrow ridge, 300 feet high, at the north-east end of Labuan. It is distant about six miles from the station. 4. The island of Labuan which is about 30 miles in circumference contains numerous streams flowing to the sea, which overflowing their banks, form numerous swamps in the interior. The harbour to the south and south-east of the lines is distant about 1½ miles by the road. The sea approaches to within a mile and a half to the north and north-east, the intervening space between it and the station being filled with jungle and forest. The vicinity of the station is not liable to overflow. The ravines which exists near the lines have been lately cleared from secondary jungle, and the health of the troops has been thereby materially improved. 5. The station is generally open. The forest referred to approaches to within about 800 yards of the lines to the south and west, but as the forest is very close, and consists of trees averaging 200 feet high, which effectually prevent any dense undergrowth, its proximity is probably an advantage as it does not inconveniently intercept ventilation, yet prevents the approach of malaria from the swamp beyond. The temperature of the station is not raised by the buildings being exposed to reflected sun-heat. The north-east monsoon which blows for three months, and the south-west monsoon which lasts for six months, are the prevailing winds to which the station is exposed. These breezes refresh the European resident, and contribute essentially to the coolness of the climate, but the Indians, from want of proper clothing become chilled by them, and they often cause a recurrence of fever and ague. 6. There are no works of irrigation near the station, and there is no cultivation of either rice or indigo on this side of the island. 7. The town of Labuan, principally inhabited by Chinese and Klings, is situated close to the harbour about two miles from the lines. 8, 9, 10. No replies to these queries. 11. The water supply of the station is derived from wells, no tanks of any description existing in the settlement. 12. The water obtained at the station is good, but in the dry season there is sometimes difficulty in procuring sweet water, as deep wells have not been dug near the lines; good water is, however, procurable at a short distance. [*N.B.* Since the above was written, a deep well has been sunk at the lines, which it is expected will give a never-failing supply of water.] The water at all seasons is wholesome. It is raised from the wells for distribution by buckets. 13, 14. No replies to these queries.
II. CLIMATE.	1. The instruments available for meteorological purposes here are a common thermometer, and a rain gauge at the hospital. 2. The following is a table of meteorological observations and irregular remarks extending over a period of nine years. The partially correct remarks are made from 1st May 1858 to 30th September 1858; the more correct observations being from 1st January 1860 to 30th April in the same year.

Months.	Barometer Mean.	Mean Temperature at Noon.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
Jan. -	None in the station.	82°	10°	87°	77°	All observations have been made here by the dry bulb as just given.	Not used here.		*3·25	N.E.	Moderate occasional high winds during 3 months.	Rain generally falling at night. Sun is seldom observed for a whole day.	An entirely cloudless sky is seldom seen here, although the days of entire observation are comparatively rare—heavy rain generally falls at night, so much as 4 inches have been known to fall in as many hours. The monsoons are steady and strong, frequently interfered with by the land and sea breezes during the early part of the day; towards afternoon the monsoon generally resumes its force; thunder storms are frequent and severe about the season when the monsoons change, and occasionally at other times, attended with heavy squalls of rain and wind, but seldom lasting more than an hour at a time.
Feb. -		83½	9½	88	79				4·75	N.E.			
March		83	14	90	76				3·5	N.E. and variable.			
April		83	12	89	77				12·5	Variable.			
May -		83½	17	92	75				4·0	Variable S.W.			
June -		Mean during the year may be taken at 84°.	Mean during the year may be safely taken at 12°.	Mean maximum during the year may be taken at 88°.	Mean minimum during the year may be taken at 77°.				14·80	S.W.	Brisk monsoon.		
July -									13·4	SW.			
Aug. -									2·43	S.W.	Occasionally high squalls from South.		
Sept. -									6·47	S.W.			
Oct. -									7·22	S.W.			
Nov. -									8·89	Variable N.E.			
Dec. -									17·97	N.E.	Typhoons to the North, seldom more than the "tail end" reaches Labuan.		

* This fall of rain is unusual for January, which in some years has been so dry that water was with some difficulty procurable, but when such has been the case December or some other month has made up the difference, so that the yearly average holds good, viz., 130 to 200 inches a year.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. Like all equatorial regions the climate is moist, and the air for the greater part of the year much saturated with moisture, but while the north-east monsoon blows the air is dry and the general health of the inhabitants and troops materially improve. At all seasons vegetation is rapid and the grass evergreen. The great amount of sickness amongst the troops for the last few years has caused the duties to fall heavy on the remaining few, who were themselves debilitated by the same disease, so that extra drills or duties, except those absolutely necessary, would be injurious at a very unhealthy season when upwards of 70 men were unfit for duty. The guards were obliged to stand for two or three consecutive days without relief. On such occasions, which happily seldom occur, the necessary parade of arms cleaning is all that can be expected. The troops at Labuan receive sea rations, which are forwarded by the Commissariat at Singapore, salt fish has not been received lately, the voyage spoils it; and the compensation received is not sufficient to buy fresh fish daily. The experiment was tried of introducing a breed of goats on the personal responsibility of the Commanding Officer, but on account of the great price and small number procurable it failed to be of much benefit. Warm clothing is most essential to the climate, and it has been found most conducive to health that the men should mount guard in their red jackets; but what is in my opinion most essential is a more substantial ration. If fresh fish was issued to the men daily, and the men enabled to purchase goats at a reasonable price the object would be attained. There can be no doubt that a body of men not hampered by caste prejudices are the best for service at Labuan. The most unhealthy months at this station are July, August and September, the months of November, December, January, and February being the most healthy. The returns for the last eleven years show that no reliance can be placed on any data which affix a healthy or unhealthy character to any particular months. The months which one year have been most healthy have proved directly the reverse in another, but, so far as a rule can be laid down, the period of the south-west moosoon is said to be the most healthy. I should say, however, that any season which affords just enough rain to keep the pools and puddles damp is the most unhealthy, excessive rain or heat being both healthy. Fever is the prevailing disease during the unhealthy months and is attributable to the miasma of the marshes adjacent. I cannot say whether there is any more healthly district than that of the station in the neighbourhood, but I believe a residence at any of the points marked respectively 1, 2, 3, 4 and 5, (on the sketch accompanying the original) in their order of merit would during the season when the wind comes off the sea in the particular directions be perfectly healthy. Four of these districts are entirely uncleared at present, but the extent of forest is small. No. 1 (north) would be best in the north-east monsoon; No. 2 (south-east) in the south-west monsoon, and both would have the full advantage of the land and sea breezes, which blow nearly north-west and south-east. All except No. 5 (south-west) present sandstone cliffs of 30 to 50 feet in height at the sea beach, rising gradually inland. No. 5 rises gradually from the beach to about 80 feet in a central ridge. 5. Assistant Surgeon Fraser was at St. Thomas' Mount for three months, the climate of which is moderately healthy. He was in the Indian navy for two years; at Singapore four months for native troops; Labuan 13 months. This station has been extremely unhealthy as regards the prevalence of fever, but I attribute this entirely to the fact that a large portion of the settlement is covered with dense secondary jungle, decaying (felled) forest trees and swampy ground. Immense improvements have, however, been made within the last three years, and the works this last year appear to have overtaken (so to express it) the deleterious influences; and should they progress as rapidly as I have no doubt they will do, a year or two years more will see the settlement perfectly healthy, the climate being the most salubrious I ever have experienced.
III. SANITARY CONDITION OF THE STATION.	1, 2, 3. A plan of the cantonments showing the position of the various buildings, &c. is transmitted. 4. TABLE of Barrack Accommodation. Date of construction, 1850. Total number of rooms - - 4. Total regulation number of men - 161.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Doors and Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Ft.	Ft.					Ft.		Ft.	Ft. in.
1 -	42	100	16	Centre 16 ft. Sides, 10 ft.	20,800	495	39	3	8	7	3 6 With a small window at each end of the building 3 ft. by 4 ft.
2 -	42	100	16	Do.	20,800	495	39	3	8	7	3 6 Do. do.
3 -	42	100	16	Do.	20,800	495	39	3	8	7	3 6 Do. do.
4 -	35	100	16	Do.	20,800	594	46	3	10	7	3 6 No windows.
Total 4 -	161	—	—	—	—	—	—	—	34	—	
Guard Room	One guard-room for 12 men.	25	12	10	3,000	250	25	None.	4	Doors. 7	3 6
Prison Cells	One solitary cell.	10	10	10	1,000	1,000	100	None.	1	Door. 7	3 6

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of the Station—*cont.*	5. There is one small window at each end of each building, and four doors on each side opposite to each other. Verandahs are placed on either side of the barracks, but they are never used as sleeping quarters by soldiers or other persons. The buildings are supplied with properly constructed jalousies and jhilmils. 6. Broad cots are used for sleeping purposes in the barrack. 7. There are no tents in use at Labuan. 8. The barracks, &c., are ventilated by the doors and windows, which are sufficient to keep the air pure by night as well as by day. No artificial means are in use for the purpose of cooling the barrack rooms. 9. The barracks are constructed of attap and boarding. 10. The floors, which are boarded, are raised 5 feet from the ground, and admit of a free passage of air beneath. 11. The materials used in the construction of the barracks, &c., are suitable to the climate. The buildings in the cantonment are kept in repair by the government of Labuan, through the Colonial Surveyor. The Commanding Officer is responsible for the general sanitary state of the cantonment. The barracks have walls of kadjung (leaf of palm); but since the above was written boarding has been fastened round the barrack rooms, and the old walls removed. 12. There are no lavatories or washing places for the men. 13. The cook-houses are under one roof, the building being constructed of attap and bamboo with kadjung roof of attap or leaf of palm. The water for culinary purposes is procured from a well close at hand. There are no places erected for washing and drying linen. Native dhobees or washermen wash the clothes at the streams in the usual Indian fashion, and dry them on clothes lines or bushes. So long as the dhobies are not sick and do their work, the wants of the station are supplied; but often the men are sick, when much inconvenience is then experienced by the troops. 14. 15. There are no privies or urinals attached to the barracks, nor are the latter buildings lighted at night. 16. There are no arrangements for draining or sewering the barracks, except to take off the water from the roof, the natural drainage being sufficient for the purpose. No part of any building used as a barrack or hospital is at all damp. The ditches which existed near the station have been lately cleansed and cleared, and the government are about to thoroughly drain and cleanse the vicinity of the lines; at present, and heretofore, the rain has remained on the surface. 17. The surface cleansing within the cantonments is performed by working parties, who are employed, while the state of the health of the men will permit, to cut down all rank grass and weeds from the parade ground. The latter requires draining in order to permit the growth of good grasses. 18. The surface of the cantonment is kept clear of all vegetation with the exception of grass. It is desirable that cattle should be allowed to graze on the cantonment to keep the grass short. There are no old walls, thick hedges, &c., to interfere with the ventilation of the station. 19. There is no bazaar or native houses at the station. 20. Fowls are killed at the cook-houses, but no nuisance is experienced therefrom. 21, 22. There is no stabling or picketing ground at Labuan. 23. No quarters for married Europeans exist at the station; and natives leave their families in India when on foreign service.
Officers' Quarters.	1. There are no officers' quarters at the station.
IV. HEALTH OF THE TROOPS.	1. Labuan when first settled in by the British, in 1846, was an uninhabited island, covered with a dense forest, and the low country adjoining the harbour was a brackish swamp. Remittent fever of a deadly character prevailed for a long time, gradually becoming milder and assuming an intermittent character, as drainage and clearing progressed, until in 1850–1–2 the station became very healthy. From that time, however, secondary jungle sprung up rapidly, and the large timber which had been cut down in former years became rotten; fever supervened, and increased yearly in severity and extent until in May, June, July, and August 1859 it reached its maximum, since which time the sanitary improvements have overtaken the disease, and give rise to a prospect of the station becoming a healthy one. The native population is healthy. 2. The disease most prevalent amongst the natives is short and mild attacks of intermittent fever, generally accompanied in chronic cases by enlargement of the spleen. In one case (a Chinese) I found the spleen weigh after death 2¾ lbs. (avoirdupois). Fever amongst the Malays is however by no means prevalent, but it is common with all new arrivals, Chinese or Indian. 3. The healthiness of the native population is to be attributed chiefly to the peculiar genial climate, and the almost constant prevalence of a cool breeze, the temperature seldom rising above 83°, nor falling below 76°. The nights are always cool, and the houses, which are all raised on posts from 2 to 4 or 5 feet from the ground, are airy and well ventilated. The floors of these houses are composed either of rough open boards or "lantees" (*i.e.*, stout laths made from the hard nebong palm,) admitting air freely. The frequent extremely heavy showers which carry off the refuse very quickly, also materially contribute to the healthiness of the population, and it may be safely said that life is never shortened by hard work or sedentary employment. The lower class of Chinese inhabiting the greater portion of the town of Labuan are a dirty set of people, and although their houses are for the most part more commodious than those of the Malays, they are not raised nearly so high from the ground as the latter. Quantities of filth also accumulate underneath the former, which the Chinese are very loath to remove when ordered to do so by the police. 4. The troops here were previously stationed at Penang for 18 months, during which time their health was very indifferent. The present detachment arrived here on the 24th April 1859 in an average state of health; several of the troops had had previous attacks of fever, and about four suffered from ill-conditioned ulcers, which, however, soon yielded to treatment. The prevailing diseases among the troops since their arrival have been intermittent and

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	remittent fevers. During the process of clearing certain ravines in their vicinity, the artillery barrack and hospital were, in May, June, July, and August last, very unhealthy; but since then, they have been very healthy. A considerable amount of jungle and waste land remains to be cleared, until the completion of which fever must prevail more or less; but when that time arrives, I believe the station will be probably the most salubrious one in the foreign service of the Madras presidency to all persons who do not purposely visit the swamps in the interior of the island which are now separated from the settlement by an extensive forest, thus effectually preventing the spread of malaria. 5. The troops at the station are never camped out. 6, 7, 8. I have no experience personally of hill stations, but, from the opinion of others, and personal connection, I believe hill stations highly desirable for Europeans, but of questionable utility to natives of India, unless recruited from hill districts. Their utility will also in the case of Europeans depend greatly on age, length of previous residence in the plains, and predisposition to certain diseases, as dysentery, diarrhœa, &c., which in old Europeans, resident for many years in the plains, might be aggravated. To the young and vigorous recruit, however, I believe they would ensure a higher range of health than even a residence in England. 9. The diseases peculiar to hill stations with which troops are liable to be attacked on going to them are coup-de-soleil from incautious exposure to the sun, which some are apt to forget is still tropical; and an aggravation of certain diseases contracted on the plains, as some forms of diarrhœa, dysentery, bronchial affections, &c., but even some of these are benefited by hill residence where the constitution is good. 10. Proper and suitable protection to the head, and avoidance of undue exposure to the sun are the precautions necessary to be observed on going to hill stations in the first case, and in the latter, the use of comfortable clothing, especially over the abdomen and vital organs; moderate exercise, and avoidance of night chills when sleeping are essentially necessary. 11 to 15. No experience of hill stations personally. 16. The range of elevation most suitable for hill stations will depend greatly on the proximity to or distance from the sea, as well as on the local amount of exposure to the prevailing winds. At Penang the hill rising 1,250 feet above the level of the sea, has been found extremely beneficial in many cases of tardy convalescence from tropical diseases, and as a restorative in all cases suffering from climate without real disease. 17. There is no higher or healthier ground near the station in the British territory which could be advantageously occupied as a hill station, but there is a splendid range of hills on the Borneo coast, about 30 miles inland. The country is only inhabited by wild tribes, Kyans, Dyaks, &c. No roads exist, but river communication extends to the foot of the ranges, which rise to about 8,000 feet. The climate has been described to me as excellent. 18. I believe the light sandy loam which prevails over the greater part of this settlement to be very healthy for stations, so soon as it is properly cleared and becomes covered with a firm turf of grass, but in a state of nature it is covered with from three to six inches of loose spongy partially decomposed vegetable deposit, principally roots of ferns and rushes, which retaining moisture emit unhealthy exhalations. 19. British soldiers proceeding to India should be from 20 to 26 years of age. Those destined for Madras should land there from the end of August to the beginning of November, and those for Calcutta in October. With regard to the best period of the year for landing in Bombay I have no experience to speak from. 20, 21. A previous residence at some intermediate station, or at an Indian hill station, would be beneficial before coming to India. 22, 23. A soldier of good constitution may serve 25 years in India, but 10 years with a change to a temperate climate would be better. As a rule 12 years of uninterrupted service ought to be the maximum period. 24. Invalids leaving India for home, if they leave by first-class vessels of 1,000 tons and upwards, such as those of Messrs. Green, Smith, Wigram, and Co., should depart from Madras on the 1st February; in smaller vessels at the end of December; the object being to pass the Cape of Good Hope in summer, and arrive in England by the end of April. Many lives are however lost by having to wait until the detachment embarks, which might have been saved by immediate embarkation, without reference to the time of year; but as this might often be impracticable, even if sanctioned, I am of opinion that an hospital ship stationed in the Bay of Bengal, to receive at all times cases recommended for such change of air, would be of incalculable benefit. She might cruise about occasionally and proceed to pick up patients at Madras, the Sand-heads (Calcutta), and Rangoon, avoiding bad weather, which from the known regularity of the atmospheric phenomena in the Bay of Bengal can be confidently achieved. Many cases would thus be cured without sending them to England, and such as were not might be sent in the regular seasons at a time stated. During nearly two years' service in the Indian navy in a vessel constantly carrying sick and effective troops across the bay, I was often struck with the remarkable improvement in many cases, even in a week's voyaging, both in Europeans and natives.
Diseases.	1. No regular inspection parades for the discovery of incipient diseases are held at the station, there being no necessity for them. 2. I am not aware of any case of scorbutus having occurred at this station. 3. Hepatic diseases (as are almost all others except fever) are rare in Labuan. Congestion of the liver occurs in the cold stage of intermittent fever, but rarely becomes serious. As fever disappears with the progress of the sanitary improvements under operation, these cases will become very rare. For several months last year, when I had no quinine, I was obliged to use indigenous remedies of little value, and cases continued to have daily paroxysms of fever, in many instances for six weeks, the liver and spleen becoming seriously implicated; but in cases where quinine is available to cure them in five or six days, such complications are rare and seldom serious. 4. Dracunculus is unknown in Labuan, and, I believe, also in this part of Borneo. 5. Venereal disease is very rare at this station, no case having occurred during the past year. In stations where it does exist I would recommend attention to the very earliest symptoms to be enforced on the men, the non-compliance with which should subject the patient to hospital stoppages during his treatment, but no stoppages should be exacted from such as

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	apply for medical aid immediately on the discovery of the disease. The establishment of a lock hospital *for females* would, I believe, be most advantageous; but some coercion or inducement to enter would be requisite in most cases. Free ration and careful seclusion might be sufficient incentive in many instances, but they would have to be invited or ordered to enter. 6. The troops at the station suffer from diseases of the following class:— *Fevers.*—Remittent fever in unhealthy seasons; intermittent fever, more or less severe, all the year round, but principally amongst such as have had previous attacks. It also attacks all new arrivals. *Dysentery* is rare, and generally occurs as a sequel to fever in debilitated subjects. *Cholera* is unknown. *Small-pox* is unknown. Vaccination has been frequently attempted, but never succeeded. *Rheumatism* is much less common than would be expected in so damp a climate, and where it does occur it generally yields to treatment. 7. Fever in unhealthy seasons generally attacks natives from one to three months after their arrival in Labuan, the attack being ushered in by languor or lassitude, pain in the back and limbs, and often rigors, followed by heat of skin, usually lasting from four to six hours, terminating in a perspiration more or less profuse. The type varies from the severe remittent form, with urgent head symptoms, &c., to mild ague, generally quotidian. These attacks usually recur monthly where quinine is not available in the treatment, and even in obstinate cases where it has been used, the disease often re-appears for several months in succession. The intervals between the extremely dry and wet seasons are the most unhealthy, generally at the changing of the monsoons in May and November; but these phenomena are very irregular and uncertain in Labuan, the land and sea breezes from the Bornean coast often modifying both monsoons. The troops live in four roomy and well-ventilated barracks, which are kept clean. The drainage is imperfect on the immediate area on which the buildings are erected, but deep ravines adjoin, and water soon percolates through the loose sandy soil. The water supply is obtained from streams and shallow wells; that from the former is generally coloured brown from passing through the fern roots, but is wholesome. The habit which all natives of India have of denuding themselves of clothing when cooking their food, &c., is, I believe, prejudicial to the health of the men here, where the climate is so much colder than in India; and the wind, especially towards the evening, is positively cold, making even Europeans glad to put on a woollen coat. At such times the native is often exposed with only the smallest possible vestige of clothing, which practice is likely to bring on fever in predisposed subjects. They are warned against it, but it is difficult to make them understand that a practice which they have adopted with impunity in India all their lives can be injurious here. 8. Native commissioned officers and others exempt from duty enjoy a marked immunity from fever; but the soldier, of course, cannot be so exempted, and the night duties, doubtless, furnish most of the fever cases. 9. I have rarely, until lately, been able to procure enough quinine for the sick, so that I had no opportunity of trying it as a prophylactic against malarial diseases; but I am informed that the late Lieut.-Governor took a dose daily, and escaped fever at a time when no other European in the island escaped, and when the cases were often fatal in three days. In my case it has always checked premonitory symptoms where taken early. 10. I would recommend the adoption of a local corps, recruited from the same class of men as the Madras Sappers and Miners, to be sent here, with their wives and families, on whose presence the comfort and health of the Indian soldier generally depends. These men would in from one to two years become perfectly acclimated; and, as the settlement becomes thoroughly cleared and drained, disease will become exceedingly rare. Under the present system men have been so debilitated and worn out with fever as to necessitate their being relieved every 10 or 18 months, with great inconvenience and expense to the service. Peons, coolies, and others, natives of India, are resident on the island for years, and enjoy excellent health, showing the justice of the above opinion. With such a corps of picked men, and with a due supply of quinine, which has been hitherto sparingly available, as it was supplied with reference to the strength of the detachment and not to the number of fever cases, I should not dread a comparison with the hospital return of any foreign service station of the Madras army.
V. INTEMPERANCE.	1. I believe a large number of the present detachment to be addicted to the use of narcotics, and, for natives, a somewhat large amount of drunkenness prevails; but not to a serious extent. There are, however, no confirmed drunkards among them. 2. Since no amount of irregularity or exposure will *per se* produce true intermittent or remittent fever without the presence of malaria, none of the cases admitted to hospital in Labuan can be with certainty attributed to intemperance; but it is obvious that a drunkard or opium eater is a bad subject for fever, especially the severe remittent type, when head symptoms are so serious, and may predispose to its invasion. Drunkenness is always punished as an offence. 3. Spirits are sold at the bazaar and arrack farms, but there are no means of judging of its quality or the amount consumed by each man. Cases of drunkenness are not common except about pay day. Spirit is no part of the soldier's ration here, either at the station, on the march, or in the field. It is never given as a ration to convalescents, although it is sometimes (but very seldom) given medicinally. No drinks other than distilled spirits are sold at the bazaar, but opium and ganjah (cannabis indica) are vended there. 4. The consumption of spirits by troops and convalescents is, as a rule, injurious. 5. It would be beneficial to abolish the spirit ration for soldiers, and to restrict the sale in the canteens and bazaars. 6. The use of good malt liquor to persons taking regular exercise is tolerated by the system, and may sometimes be beneficial, especially to persons habituated to it: but any tendency to hepatic congestions or redundancy of bile is aggravated by its use. Wines, if good, would be comparatively harmless, but being generally spirituous adulterations I consider them bad.

References to Subjects and Queries.	Replies.

V. Intemperance—*cont.*

7. I have no means of knowing whether tea, coffee, lemonade, soda water, and similar drinks, are much used at the station, but the first four are plentifully procurable, and limes may be had for the plucking. These are all most beneficial in their influence on health, efficiency, and discipline, whereas spirits and malt liquor are often positively injurious.
8. This query does not apply to Labuan.
9. The encouragement to the sale of beer, coffee, tea, lemonade, &c. would probably work beneficially without the absolute prohibition of the sale of spirituous liquors as men naturally desire most what is prohibited, and generally find means to procure it.
10. The only recommendations which I have to make on these points are given in the preceding replies to queries, but as at present constituted the whole of the remarks on this subject are scarcely applicable to Labuan.
11. No bazaar or canteen regulations exist at this station.

VI. Diet.

1. "Sea rations" are issued to natives as per table following. On arrival of the stores at the station the Commanding Officer appoints a committee to examine them, and report on their condition and quality.

Table of Daily Rations for Native Troops (Public and Private Followers) on Foreign Service.

Articles.	Quantity.			Amount.			Remarks.			
	lbs.	oz.	drs.	rs.	ans.	p.		lbs.	oz.	drs.
Rice - - -	1	8	0	0	0	$9\frac{1}{4}$	* Chillies -	0	0	6
Dhole - -	0	3	0	0	0	1	Pepper -	0	0	$2\frac{1}{4}$
Salt - -	0	1	0	0	0	$0\frac{3}{4}$	Turmeric -	0	0	$1\frac{1}{2}$
Ghee - -	0	2	0	0	0	$6\frac{1}{2}$	Coriander -	0	0	1
Tamarind - -	0	2	0	0	0	1	Cummin -	0	0	1
Curry stuff * -	0	0	12	0	0	1	Total -	0	0	12
Garlic - -	0	0	1	0	0	$\frac{1}{16}$				
Onions - -	0	0	4	0	0	$\frac{3}{16}$				
Beetle nut - -	0	0	8	0	0	$1\frac{1}{2}$				
Tobacco - -	0	1	4	0	0	$1\frac{1}{2}$				
Salt fish - -	0	2	0	0	0	$5\frac{1}{2}$				
Total -	—	—	—	0	2	$4\frac{1}{4}$				

The proportion of vegetables entering into the constitution of a ration is about four-fifths of the whole.

3. The substitution of fresh fish or meat for salt fish to the men at this station would be a great improvement. There are orders prohibiting the disposing of the rations by the troops.
4. There is here a commodious building, subdivided for the different castes, in which the men cook their victuals in their own way. A special cook-house has been erected for the hospital in lieu of the old one pulled down. These kitchens are well ventilated, and are plentifully supplied with water from an adjoining well and the river, except in the dry weather when it is obtained from a greater distance. The men cook their food as they please, and generally have it boiled or stewed with curry. When overworked, owing to a large number being in the hospital, the men have complained of not having time to cook their victuals, there being no one to do it for them. I have known instances of men stating they were without food a whole day, and I have seen rice very imperfectly boiled, which they had to eat. In India this could not occur, as their families would cook their food for them. (Vide answer to No. 15, "Hospitals.")
5. With a permanent local corps, soldiers' gardens might be very advantageously established in the vicinity of the lines, and the labour would be most conducive to the men's health. Seeds should be supplied by Government in the first instance. With detachments, however, frequently removed as at present, it would not be desirable to establish gardens.

VII. Dress, Accoutrements, and Duties.

1. The dress of the soldiers at the station consists of red cloth jacket, black cotton trousers, and pugree, which are suitable for the climate, and for the soldiers' duties by day and night at the different seasons. I have no experience to enable me to state what improvements in the soldiers' dress would diminish the effects of sun-heat, cold, malaria, &c.

Duties.

1, 2. The routine of a soldier's duties here consists of guard-mounting every second day. The men have on an average one night in two in bed during the week.
3. Guards are mounted from 1 to $1\frac{1}{2}$ miles distant from barracks. There is a roll-call at 8 o'clock, p.m.

VIII. Instruction and Recreation.

The queries under this head do not apply to Labuan.

IX. Military Prisons.

1. There is a well-constructed solitary cell in the cantonment, but not being often required, it is used as a store by the Ordnance department; prisoners are kept in the guard-room.

X. Field Service.

1. There are no local medical regulations in Labuan.
2. The medical officer has no power on the line of march in the conduct of the line of march, camping, &c., unless by courtesy.
3, 4. No replies to these queries.

XI. Statistics of Sickness and Mortality.

Not applicable to Labuan.

LABUAN.
MADRAS.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. The hospital is situated on a small hill continuous, on its western side, with the plateau on which the barracks are built, and sloping down on its three remaining sides into deep ravines. The artillery barrack and guard-room is about 150 yards to the westward, and the infantry barracks are about 300 yards further off in the same direction. There is no bazaar in the neighbourhood, and only one private residence—that of the Surveyor-General—about ⅛th of a mile off to the north. The site has been rendered, during the past year, by the removal of jungle, &c., open and well ventilated; and the hospital, outhouses, cook-house, &c., have been built on the side of the ravine at such a depth that the roofs do not intercept the ventilation, the ridges being on a level with the ground floor of the hospital. The ravines or nullahs were very unhealthy last year, but have been for the most part carefully cleared. What remains to be done is at some little distance to the east, which will be completed shortly; the site will then be as salubrious as possible. 3. Water is brought to the hospital daily by the bheesties. The supply is abundant, and it is wholesome in quality. 4. There is scarcely any refuse water or impurities, but a deep ravine immediately to the rear, about 50 yards off, carries away all the water that does not percolate through the sandy soil. 5. The hospital is a single flat building, the floor being of planks, having brick walls as a groundwork rising two feet above the ground. Openings are left at the intervals in the wall, whereby a free current of air passes under the flooring; gutters are dug all round the hospital for carrying off the water, which falls from the roof, but a good deal must, from the loose nature of the soil, sink into the ground, but producing, however, no inconvenience. The gutters immediately under the eaves communicate with larger drains before and behind, which again carry off the water rapidly into the before-mentioned ravine. The foundation and basement of the buildings consist of brick walls upon which to receive the beams and flooring. The framework and outside walls are of wood having the inner walls and ceilings made of lath and plaster whitewashed. The walls are consequently double with air between, and are admirably adapted for the climate. The roof is of attap, a species of thatch made from the leaves of the palm. There are verandahs 1 ft. 6 ins. deep nearly all round (the corners being occupied by small rooms, dispensary, guard room, store room, &c.,) and afford sufficient protection from the sun; I have been obliged to use the verandahs for the accommodation of the sick when the number of patients were too great for the wards to contain. The hospital consists of one flat divided into two wards, with dispensary and guard room, and two small store or spare rooms. TABLE of Hospital Accommodation. Date of Construction. First occupied, 21st October 1854. Total number of wards - - - 2 Total number of beds - - - 29

Number of Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Man.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		No. 1 Ward, 17 beds.									
		Ft.	Ft.	Ft.in.	Cubic ft.	Ft.		Ft.		Ft. in.	Ft. in.
2	The hospital is much larger than the strength of the detachment is entitled to, so that it cannot be said to correspond with any "Regulation." It holds conveniently 30 to 40 sick.	38	17	11 10	7,641	450	38	2	12 doors; no windows.	7 6	3 2
		No. 2 Ward, 12 beds.									
		28	17	11 10	65,225⅓	470	39⅓		A similar door between the wards.		

N.B.—It has frequently happened that the number of patients has far exceeded the number of beds, in which cases the extra men have slept on the floor between each bed and some in the verandahs. Upwards of 60 men have been thus accommodated. When the number has risen above this as many as were well enough were made out-patients, and lived in barracks. On one occasion last year half the artillery barrack was used as a supplemental hospital, the sick list amounting to 87.

The hospital is so placed as to receive the full benefit of the prevailing winds. There are no windows in the building; but in their place are doors, the upper half of which is fitted with jalousies made to open or close as desired. The arrangement is an admirable one and much better than windows.

6. No artificial means of ventilation are required for the wards, the 12 doors, which are only closed when the weather demands it, being ample, and keep the wards at all times freely ventilated. Each aperture in the door panel has 14 pieces of board, fitting into sockets at each end, so as to open and close (overlapping each other closely when shut), the motion being regulated by a central bar of wood attached by hinges or staples to each venetian.

7, 8. The employment of any artificial apparatus for warming or cooling the wards is not adopted at this station. The walls and ceilings of the building have been cleansed and limewashed twice within the year I have been in medical charge.

9. A privy is in course of erection for the use of the hospital about 15 yards from the wards. Hitherto, and at present the wretched system, too common in India, with natives prevails of going to the nearest secluded spot (or at night, any convenient place) for purposes of nature. The new privy will consist of a deep well, sunk into the ground on the edge of the hill, having a communication at the bottom with the side of the ravine from whence, at regular intervals the ordure will be removed in carts; quicklime also will be frequently thrown down the pit so as to obviate any offensive smell.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	10. There are no lavatory arrangements beyond the use of a pail or tub for the sick; caste prejudices rendering the erection of baths nugatory. 11. The only means of bathing here available is to order the patient to go and bathe, which he does in the nearest stream. In the case of a warm bath, he or his orderly, if one is required, pours warm water over his body instead of cold water. In bad cases hot pediluvia and fomentations are supplied in the ward by the hospital attendant. 12. Indents signed by the Medical Officer are sent in to the Commissariat Agent, who gets the hospital clothing, &c. washed, and returns it clean for re-issue. 13. The storage is sufficient. 14. Only a regulated number of beds are allowed for native hospitals, such allowance being based on the numerical strength of the regiment or detachment, but in Labuan the average amount of sick has usually so far exceeded that of even a full regiment that the local government have supplied several beds over and above the authorized complement. Of the beds in use some also belonged to a detachment of European artillery at one time stationed here. Thirteen of the bedsteads are of iron with boarded bottoms over the iron bands. Four are of wood with tape bottoms, the remaining 12 being entirely of wood, and answer every purpose desired. Indents have been sent in this month for new bedding, the old being worn out. It consists of palliasses made of cotton, fashioned exactly like large pillow cases, in which dry grass is put to form a mattrass; this grass is thrown away and changed as often as necessary, and the palliasses washed. A double pillow case, the inner one stuffed with grass, when required, so as to form a pillow, is also supplied, as also a cumblie made of coarse blue or striped cotton, lined with white cotton and quilted. These appear to answer the purpose very well. 15. To the north and about 25 yards distant from the wards a new cook-room has just been completed, built of wood, with attap roof, on a ground-work of brick. The men cook their food in their own chatties and vessels in the native manner. This system is, however, a very bad one, as every patient, unless absolutely unable to move, (in which case he has a friend or orderly of his own caste to do it for him), cooks his food as he chooses, in consequence of which that valuable adjunct to treatment afforded by regular, well-cooked, and suitable diet is almost entirely lost to the medical officer who treats disease in the native. In India this is not nearly so much the case, as the men's wives or relatives supply their wants; but on foreign service it is a most serious evil, for which the only remedy I can suggest is the appointment of high caste men as cooks, which is the practice on board a ship when native troops are embarked. The prejudices of caste would thus be met, as no native could refuse to take food cooked by a man of equal or superior caste to his own, and a little experience of the system would convince them of its advantages; for the native, although generally slow to afford assistance to the sick, is glad enough to avail himself of aid when sick himself. 16. Diet tables, &c., are forwarded. 17. The provision for attendance on the sick is as follows:—A havildar acts as hospital orderly, and is supposed to exercise general supervision, and to see that the internal economy of the hospital goes on properly; and in such cases as require it, an orderly is specially appointed to wait on them. Nursing, however, as understood in England, may be said to be unknown, it being rare (in my experience) to find an orderly who really attends to the patient, or who even understands how to do so properly. In many instances I have had to complain of shameful neglect, and in very rare cases have I had reason to feel that the orderly had done his duty. Owing to the system of caste I cannot suggest any plan for remedying this crying evil, other than the severe punishment of such orderlies as fail to do their duty. 18. With regard to diseases arising from the condition of the hospital. Four cases of fever occurred last year in patients under treatment for ulcer who could scarcely have contracted the disease out of hospital. One in particular was taken from the vessel in which he arrived at the hospital and never left it. I attributed these cases to the exhalations emanating from the adjacent ravines during the process of clearing, as since their completion no new cases have occurred. So soon as the yet uncleared portion of the ravine in the vicinity of the hospital is properly cleared, which it will be as soon as possible, nothing further can be desired as regards the building and its immediate sanitary condition. 19. The deficiencies felt in the medical treatment of sepoys may be summed up as follows:— 1. Want of means to ensure due attention to and nursing of the sick. 2. Want of means to regulate and supply proper diet and cooking. 3. Want of trustworthy military surveillance to prevent irregularities, such as indulgence of narcotics, introduction of unwholesome fruits and other articles of food improper for the sick patients, absenting themselves from hospital without leave, &c. 4. Want of sufficient authority on the part of the medical officer to punish trivial offences, and neglect on the part of the hospital attendants, &c. 20. The hospital havildar has orders to see that patients ordered to do so, take exercise for a certain time near the hospital every evening. Other convalescents are permitted to reside in their barracks and move about the lines, but they must not go beyond them. There are no special provisions made here for the purpose of affording exercise for convalescents such as walks, seats, &c., nor are any such required. 21. There are no soldiers' wives at the station. 22. All cases reported sick, about which there is the slightest doubt, remain one day in hospital for observation, and are detailed to inform the apothecary when attacks of fever come on, so that he may see them, and be certain they have it (*vide* rolls transmitted marked "Local"). 23. The medical officer reports officially to the officer commanding as to repairs or other sanitary matters, orders diet on his own responsibility, and medical comforts to the extent sanctioned by the Director-General, Army Medical Department, any departure from which in excess would involve special correspondence with his secretary or the commissariat officer, and, unless sanctioned, the expense charged to the medical officer. Since the 5th October 1858, the extent to which medical officers can supply such comforts to troops on *foreign service* has been liberal and sufficient in every respect. 24. A hospital for convalescents has been erected this year by H.E. the Governor, on my recommendation, made at a time when a very great amount of sickness prevailed; but since its erection such great and unexpected improvement has taken place in the health of

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	the troops as to almost obviate the necessity for its use, but as it is now complete (May 1st), I shall remove a few chronic cases, now in hospital, to it. The building is situated on a point of land jutting out into the sea, where it is almost entirely out of the direction of winds which pass over marshy places, the prevailing winds being off the bay.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is about a quarter of a mile to the eastward of the station, out of the direction of both monsoons and the land and sea breezes. Only four interments have taken place as yet. The old graveyard is close to the sea, at least half a mile from any European habitation, and two and a quarter from the lines. The Chinese still bury in that quarter. 2. The area of the burial ground is about two acres, the soil being a loose silver sand, with just enough vegetable deposit to enable the grass to grow, the subsoil gradually merging into soft sandstone. The drainage is indifferent, the situation being too level, but the ground is fenced in, well cleared of jungle, &c., and well kept. No opportunities have been afforded of judging as to whether decomposition takes place quickly or not. 3. There is no limit as to the space between graves or the depth of graves, but the latter is usually from five to six feet. They are never re-opened, nor can the necessity ever arise for burying two bodies in the same grave. Interments are rarely deferred beyond 24 hours after death; they generally take place within six hours. The native troops are interred by their comrades after their own fashion, usually in the uninhabited jungle within a quarter of a mile of the cantonments. 4. The graveyard is never offensive in any way; on the contrary, it is an advantage, as it is cleared of jungle. 5, 6, 7. The dead of camp followers, &c., are interred by their friends in the same manner as the sepoys. No injury arises to the public health from the present practice, and no improvements are consequently required in the way of regulation or otherwise in the disposal of the dead.

(Signed) W. KINCAID, Lieutenant, 22nd Regiment, N.I.
May 1860. J. J. FRASER M.B., Assistant-Surgeon.

"STRAITS SETTLEMENTS."—PENANG.

Accommodation
- Queen's Troops
  - Half an European Company, with a few Families.
  - For a Quarter Company, with many Married Men as now.
- Native Troops
  - Artillery - Two-thirds of a Company.
  - Infantry - Seven or Eight Companies.
  - Head Quarters.

References to Subjects and Queries.	REPLIES.
1. TOPOGRAPHY.	1. The surrounding country is level, with nutmeg plantations enclosed by hedges; a range of hills crosses the plain towards its western extremity north and south. It is sandy, dry, and flat, except towards the range of hills. There is not much wood on the plain except plantations and high hedges, but there is forest wood on the hills three miles from the fort, and one mile from the native infantry cantonment. Good water is everywhere scarce; it is conveyed from the hills to the town, and for the shipping in the port by an iron pipe with reservoirs. But there is a fine stream passing near the native infantry lines, which are supplied by an off-set from it running through them. 2. The elevation of station above the sea is generally but a few feet, and it is on a level with the surrounding country. The native infantry cantonment is about 25 feet above the sea, and a few feet above the canal and nullah. The only higher and healthier ground adjoining the station is the hills which would form an excellent location for Europeans. A good military post could be established on the hill far out of reach of an enemy's ship guns, and if well stored, with occasional communication from the sea, could be held against a superior force in time of an European war (the fort being useless, and only exposing men, treasure, stores, &c., to any enemy from the sea.) There is no much higher ground than this on the plain of the island, with reference to the rest of it, for field work with much command, which latter, however, is what the island requires for effective military defence in case of external attack. 3. There is a little table land on the hill 5 miles from the artillery fort, and 3 miles from the native infantry lines; its height is about 2,500 feet. 4. The sea is contiguous to the artillery fort, and there is a fine stream 200 yards from the native infantry lines. Neither the vicinity of the fort or native infantry lines is liable to overflow of water. To the west of George Town, but far from either of the above places, the level being low, the water percolates in through mangrove banks, and there is flux and reflux. There are no broken grounds or ravines near the station; there are a few wells, but they are not injurious to health. 5. The island would be pleasantly pervaded by the light sea breezes of the latitude, were it not for the plantations and the hedges which obstruct it. But it is now said to be healthier than when there was not so much plantation, probably from the latter retaining the deposit from dew, which makes the climate of the interior very refreshing in the nights and mornings. The temperature of the station is not raised by reflected sunheat, excepting in and about George Town. The station is exposed to the sea breeze only, which is generally light and healthy.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. There are several nutmeg plantations, and more inland a great deal of rice is cultivated. There are no works of irrigation. The cultivation of rice is not prohibited within certain limits, but generally it does not approach near. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on near the station. 7. George Town is contiguous to the fort (artillery), but is 3 miles off from the native infantry lines. 8. The geological structure of the district is alluvial, with a sandy surface; the subsoil is loam. The ground on which the native infantry lines are situated was never before occupied. It is now cleared of the sepoy huts, and airy barracks have been built; the site is unencumbered. 9. Water is found during the dry season at the depth of a few feet, and in the rainy season near the surface. 10. The rain fall and surface water does not flow readily away, the country being too level, but water sinks into the subsoil quickly after the cessation of the rains. The ditches retain the stagnant water more or less after rains from the dead level, which is rather objectionable. The municipality, however, attend much to this. No drainage from higher ground passes into the subsoil of the station. 11. The best water for the supply of the station is obtained by means of an iron pipe laid from the hill. There are some wells, but the water is not generally good. There is one fine stream of excellent water. There are no tanks for drinking purposes. There are some bathing tanks formed at the head of the native infantry lines by a duct from a stream near them, which afterwards flows through them in smaller streams, which is used for cooking purposes, and for washing clothes and utensils; but drinking water is mostly obtained from wells in the lines. At present different waters are used for drinking, cooking, and washing purposes. The water tanks and wells are not liable to pollution from any source. Malaria sometimes proceeds from the stagnant open draining ditches after heavy rains, the dead level rendering it difficult to keep them run off. The municipality attend to this better of late. Chinese garden cultivation, with deleterious manures (rotten fish, ordure, &c.), was much worse in the neighbourhood till prosecuted by the present commandant in the Recorder's Court, who also agitated the improvement of hedges and ditches with the municipality. 12. The water supply to the native cantonment is unlimited, and is sufficient for an European regiment down in, or near the fort. The water is excellent, and is colourless, inodorous, and without any marked taste. There are no means of obtaining an exact chemical analysis of it, being chiefly rain water. Softness is its predominant character; its quality is good, and not injurious to health. The supply for the troops is ample. No extraordinary means are required for raising and distributing it; no better supply could be obtained. The main and best supply is by 3 miles of iron pipe from the hill to the wharf, with intermediate reservoirs. 13. With regard to other topographical points, perhaps the interposition of the hills across the island north and south, barring off the westerly breezes may be disadvantageous to the native infantry cantonment, which is under the lee of it. 14. With regard to the inquiry and examination previous to the selection of new stations, the present native infantry station was selected long ago. There is no military sanitary station. The hill is capable of being rendered, at a small expense, one of the best stations in India, for a few European troops, and for sick from Singapore and China, but not for more than two companies with officers and establishments. Provisions could be obtained from below at first, and the streams of water should be reservoired.
II. Climate.	1. The instruments available at the station for conducting and registering meteorological observations are a barometer, thermometer, and pluviometers. The registry of the above is discontinued by order. 2. Table of meteorological observations from 1st January to 31st December 1859:—

Month.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain, Inches.
January - -	29·62	79·8	6·0	82·8	76·8	1·80
February - -	29·65	80·9	6·9	84·4	77·5	2·35
March - - -	29·60	83·7	6·4	84·9	78·5	5·70
April - - -	29·55	82·2	6·4	85·4	79·0	6·60
May - - -	29·60	83·2	6·4	84·4	78·0	10·5
June - - -	29·60	82·5	6·4	85·7	79·3	2·25
July - - -	29·55	83·9	6·1	85·0	78·9	4·35
August - -	29·55	83·0	6·0	84·0	78·0	1·6
September - -	29·60	80·3	7·1	83·8	77·5	11·9
October - -	29·50	78·7	5·6	82·5	75·9	22·6
November - -	29·55	79·8	5·9	82·7	77·0	7·0
December - -	29·60	78·3	7·8	82·2	74·4	5·6

3. It rains so frequently, though not constantly, all the year round (September, October, and November being considered the most rainy months) that there is always dew deposit on the great vegetation of the island, and being no dearth of water keeps the nights and mornings always more or less cool and invigorating; this, with the sea air all round and occasional light breezes, renders the climate a decidedly good one in comparison with India generally; the thermometer generally averaging 5 to 10 degrees less. These good effects are somewhat counteracted by the relaxing nature of the climate, owing to a powerful sun always converting its moisture into steam, and to the remarkable absence of motion in the air so near the equator, particularly in the evening, which makes less real heat than in India more felt. But the climate being favourable to healthy action of the liver admits of its evil effects being counteracted by diet. The native soldiery appear to suffer from its untoning effects to an average per cent. which virtually destroys nearly a whole regiment in dead and invalided in a three years' tour. Sentry duty, and the restraint of military clothing and accoutrements with extra labour, and the irregularity attaching to the preparation

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	and conveyance of food to their comrades on duty, in the absence of their families, as well as for themselves, combined with the almost entire absence of animal food, family separation, so unhabitual to the natives, nostalgia, and the unfavourable effect of the climate on them as compared with Europeans, and even the Indian coolies and convicts, are no doubt the probable causes of this destruction, and apparently can only be effectively dealt with by abandonment of Penang by the native troops. The tree-planting now subsisting affects the climate favourably by retaining dew; formerly there was much jungle, the malaria from which, owing to decomposing vegetation, without free passage of air, as in most Indian jungle tracts, made Penang fever somewhat proverbial. At present fever is almost unknown. There is no impurity from dust, but there is some locally here and there from rotten fish, ordure, urine, &c., in Chinese cultivation, which is, however too limited to affect the climate out of the town, or to be more than an occasional local offence. Shelter from the rain is desirable at all times, though the effects of wettings are not violent here. The great precaution never to be disregarded, is to sleep on a cot or raised flooring or boards, but never on the soil, the damp from which causing fevers, diarrhœa, rheumatism, &c. It may here be mentioned, as making this a somewhat distinguishing peculiarity of this soil and climate, that ponies of the hardiest kind, if not walked about to cool gradually, after heating work, are sure to catch violent fever and inflammatory complaints which destroy them. The men should, while lightly clothed, have the skin so protected as to guard against sudden cooling—thin flannel probably—the wearing of which by Europeans and not by natives possibly causes some part of the difference of the effect of the climate upon them. Beyond this it does not seem to call for any particular precaution as to amount, nature, and times of drill, duties, and exercises, which should never last too long at one time, nor be very violent. The early mornings are cool and refreshing; early rising and exercise should be insisted on. No part of the year is especially unhealthy. There are no prevailing diseases here except small-pox, which may be considered endemic. 4. There is no district near the station, the climate of which is more conducive to health except the hill before referred to. Possibly a location for natives might be adopted on the west side of the island, and where the hill would not keep so much of the sea breeze off as it does where they now are. But want of animal food and other causes, independent of local climate, chiefly affect their health more than the present site, which is good. 5. The commanding officer has served in all the eastern and western coasts, Madras Presidency, Mysore, Deccan, Tenasserim, and Goomsore. I consider the western coast positively injurious to Europeans, and Gobmsore of course much more so, and to natives also. The others are highly favourable, the eastern coast being the least so to Europeans. The climate of Penang reminds me very much of the western coast, more particularly of Travancore, but it is healthier in the long run. The following are the stations at which Captain Mitchell has served, Palaveram, Masulipatam, Berhampore, and Russelcondah, in the northern division; Nagode, Dumoh, and Mhow, and Secunderabad, Deccan, and Penang; they are all healthy. The medical officer has served at St. Thomas's Mount, Madras, Jaulnah, Nagpore, Bellary, Hyderabad (Sinde), Soukara, Concan, Kolapore, Trichinopoly, Cochin, Bangalore, Rangoon, Bassein, Hyderadad (Deccan), and Penang; all are healthy, with the exception of Hyderabad (Sinde), when I was stationed there, but which I believe has since been healthy.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A map of the station and adjacent country, and a plan of the station and barracks, are transmitted. There are no water tanks, nullahs, or canals in the station. The ditches are all open, and when stopped up are cleared by the municipal commissioners. There is no military cantonment, properly so speaking, the whole island being for the municipal purposes generally under the Commissioners. The Chinese cultivation is the only nuisance. Pucka privies for the infantry are about to be constructed. 4. Table of barrack accommodation. Date of construction; European barracks, 1817; Native Infantry barracks, 1860. Total number of rooms or huts, European barracks, 16 rooms. Total regulation number of non-commissioned officers and men. Europeans, 1 company; Native Infantry, 600 men; Gulaudauze, 1 company.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Heighth of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft.
European Artillery, 16 rooms	1 Married 4 Single	13	20	12	3,120	195	65	2 6	2	4 0	3
Native Artillery, 1 room	100	95	26	9	2,470	222 $\frac{8}{10}$	24 $\frac{7}{10}$	2 6	4	4 6	3
Native Infantry Barracks, 4 rooms	150	222	48	20	213,120	1,420 $\frac{13}{15}$	71	2 6	40	6 0	4
Guard Room	1	15	20	9	2,700	—	—	2 0	4	6 0	3
Prison Cells :—											
Native Artillery	2	12	10	8	960	—	—	2 6	—	—	—
European Artillery	2	11	10	16	1,760	—	—	1 6	3	2 6	6
Native Infantry	1	12	20	12	2,880	—	—	1 6	4	2 6	6

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides and open outwards; there is a verandah 6 feet broad all round each barrack, but they are never used as sleeping quarters by soldiers or others; there are neither jalousies nor jhilmils, but the windows open with bars and shutters. 6. The bedsteads in use are wooden, with the bedding as per regulations; they are periodically washed; iron would be better, as it is less likely to harbour vermin. No other alterations to suggest. 7. Tents are seldom used in Penang; they are, however, according to regulation; they are unhealthy from the peculiarity of the soil, which renders some interposition, such as flooring, &c. necessary, as before stated. 8. There are no artificial means of ventilation beyond doors, windows, and ridge ventilators. The ventilation of the native infantry hospital was very defective, and had, no doubt, greatly aggravated bad cases here from originally slight ones. Through the interposition of the commanding officer it has been remodelled. The ventilation is generally sufficient, except at the above hospital, where punkahs are kept working at close periods. That of the European and golundauze barracks is quite sufficient. No tatties or punkahs are used in the barracks or European hospital, the generally cool day, sea breezes, and night air dispensing with them. 9. The barracks are built of brick; those for the Europeans are tiled, and those for the native infantry leafed. The tents are of the usual description; no huts are used now. 10. The European artillery barracks are over the gun-sheds, and the floor is constructed of boards; there is a free passage of air below. The golundauze barrack floor is of chunam, but is not raised above the ground. A defect in the flooring of the native infantry barracks is in its not being under-arched, and as it is, the substratum is not even firm, but sinks, ill admitting of washing; this can easily be remedied. 11. The materials are suitable for the climate; but I think all floors here should be raised on archworks so as to admit a passage of air below, the contact of men or animals with the ground below producing fever and other diseases, so much so that no common pony is allowed to stand but on boarded floors. The barracks and cantonments are kept in repair by the executive engineer; the repairs are performed by convicts and executed as speedily as possible. The municipal board is as yet responsible for the general sanitary state; but when the cantonment just marked out is formed it will come under the Quartermaster-General's regulations in this respect. The floors of the new native infantry barracks are washed every Saturday. Limewashing has not yet been applied, but is about to be so, entry being scarce complete yet. In the European barracks it has since been applied; they are cleansed and whitewashed annually. 12. Baths have been formed for the native infantry, through which the water continually flows; there are also ditches full of running water in all directions. The Europeans have tubs in a washhouse supplied with water in a well in the same. The golundauze wash from a well. 13. Both European and native soldiers are supplied with cooking places of the ordinary description, in long rows. Dhobies wash for Europeans, and they themselves wash some of their linen in their tubs and dry them on the fort walls. For natives near the native infantry lines there are the usual "Dhoby pett," or washerman's quarters, situated on a large stream, and are quite healthy and open. The washing for the European troops is done in the fort. 14. The privy outside the fort is over the sea, and those inside the fort discharge themselves into a cesspool, which is emptied periodically. 15. These buildings are ventilated by windows. All barracks are lighted by globe lamps, with oil and wick. 16. One long drain with connecting pipes at intervals through the walls carries the drainage of the barracks into the fort ditch, the distance between the barracks and outlet for the drainage being about 30 feet. There are no sewers or drains to the native infantry barracks, they being scarcely wanted. The drainage is sufficient for conveying away all surface water from the men's lavatories, baths, &c. No part of the barracks or hospital is damp. With regard to foul ditches, *see* qy. 10, Topography. 17. Surface cleansing is carried on by the municipal commissioners at present, there being no regular cantonments; it is very inefficiently done. 18. Cantonment is not yet formed; but one has lately been marked out three miles from the fort, where the native infantry are. The future cantonment is in its centre, and where the regiment is, free from over vegetation, and is the airiest and coolest spot in that part of Penang. The boundaries will, however, be a belt of hedges and gardens with trees, which can hardly be removed, though, when the cantonment is formed, these objections can be brought as far as necessary under the Quartermaster-General's regulations. 19. The native infantry bazaar is very small, and under regimental surveillance. It is well drained and ventilated, with a plentiful water supply, &c. There is no regular regimental bazaar here, the Europeans and golundauze having none. The native houses, mostly Chinese, near the station are filthy, being literally dung-heaps and cesspits themselves; all filth is thrown under them, and there are abominable gutters in front. The stenches in the neighbourhood of the native infantry lines and officers' houses are sometimes very bad indeed, owing to the large amount of Chinese cultivation; it has been much mitigated, however, through the efforts of the present commandant. The nuisance could be prevented by forcing every householder to keep all the ground beneath and around his house clean, and by prosecuting every Chinaman for committing a public nuisance, or who makes use of human ordure, urine, or rotten fish for manure, and also by forcing them away from the vicinity of the habitations of civilized people. This would, however, discourage the desired populating of the island chiefly by Chinese. 20. The contractors' slaughter-house is full 1½ mile away from the troops. 21, 22. No bazaar or cavalry horses at the station. 23. There is separate accommodation for married non-commissioned officers and men, which is good and sufficient. Married people do not occupy barrack rooms with the men.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.* *Officers' Quarters.*	1. There are only two officers' quarters in the fort; they are on the ramparts, and are high, airy, and excellent. There are no officers' quarters, properly so called, in the native infantry lines; the officers occupy up-stairs bungalows belonging to the residents of the place, and similar to those occupied by them. Their sanitary condition is satisfactory on the whole, but the ventilation is somewhat interfered with by the plantations of nutmeg or cocoa-nut trees, which closely surround most of them. This could be improved by clearing away the trees, but these, as well as the houses themselves, are private property.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are healthy. 2. The most prevalent diseases among the native population are small-pox, with outbreaks of epidemic cholera; there have been no cases of spleen disease. 3. There are no circumstances very obviously adverse to the health of the native population. 4. The few European artillery here have been received at broken periods from Madras, Masulipatam, and Singapore. Since their arrival they have chiefly suffered from fevers, diarrhœa, and bronchitis. The detachment native artillery were at Sumbulpore from February 1857 to December 1858; while at that station they chiefly suffered from fevers and rheumatism. They arrived here in April 1859, in good health, and have since chiefly suffered from diarrhœa, dysentery, and dyspepsia. The native infantry were at Secunderabad from 18th February 1857 to 1st December 1857, where they chiefly suffered from fever, diarrhœa, and rheumatism. They arrived here on the 18th, 29th, and 31st January 1858, in good health, and have since chiefly suffered from ulcers, fever, diarrhœa, and rheumatism. Hitherto no one portion of the men's accommodation has appeared more unhealthy than the rest. The native regiment is now moving into new barracks. 5. The European artillery and golundauze are camped out during March and April, yearly, at practice, without any prejudicial effect to their health, but probably with more or less benefit. 6. The commanding officer commanded in the Neilgherries for two years, during great part of which European troops were stationed there. Unless carefully attended to as to exposure, checks after exercise and clothing, the effect was for some time so far prejudicial as greatly to produce diarrhœa and fevers. I cannot speak to the effects of more than a year; but I should say, that while there can be no doubt the same restorative effects must result to European soldiery as to the upper classes, *ceteris paribus*, the great obstacle to hill stations benefiting bodies of European troops is the impracticability of maintaining them altogether under the same cautious observances as individual officers, from their being all in one barrack, for one reason, where a temperature or exposure suiting some may not suit others, and from their being all at more or less liberty to indulge their own inclinations elsewhere, in the way of exercise and exposure, &c., where medical officers have a great difficulty in always restraining gentlemen residents for health from exposing themselves to the injurious effects of the climate. 7. Cannot say whether troops long resident on hill stations are more or less liable to attacks of febrile or other diseases on returning to service on the plain. 8. The commanding officer does not approve of selecting hill stations for troops, except for sick depôts (convalescent), from his experience of troops stationed in the Neilgherries. It does not acclimatize the higher grades, though it greatly favours convalescence in both. 9, 10, 11. No experience of hill stations; but the shortest period of residence which would enable troops to obtain the full benefit of such residence, would be probably not less than twelve months. 12, 13, 14. No experience of hill stations. It would probably be most conducive to the health of troops serving in India to locate them on hill stations, with short periods of service on the plains. Frequent change of station on the plains is beneficial. 15, 16, 17. No experience of hill stations. 18. No particular class of surface and subsoil either more or less healthy than others. 19. A soldier proceeding to India should not be under 20 years of age. The best period of the year for troops to land in India perhaps varies in different Presidencies; but in Madras the best time is November. European troops are never first landed from home at Penang; but recruits landing in India should be kept from exposure and intoxication. 20. Troops should be sent direct from home to India, and land with as large a stock of health as possible. They should avoid exposure and intemperance. 21. No transport from the port to the interior is required here. 22. The number of years a British soldier should serve in India is from 7 to 10 years, if in the plains. 23. It is not desirable to avoid an amicable difference of opinion in the manner of conducting medical boards, as regards individuals brought forward for invaliding. 24. Invalids should leave India for home, so as to land in England late in the spring.
Diseases.	1. There are regular inspection parades there once a week for the discovery of incipient diseases at this station. 2. There has been no scorbutus among the troops at this station. 3. Hepatic disease is rare among the natives. There has been none at this station. The few Europeans stationed here have, on the whole, been free from it. 4. No case of dracunculus has been contracted at this station. 5. The proportion which venereal disease bears to the total sick in the European artillery is 2·912 per cent.; in the native artillery it is 5·434 per cent.; and in the native infantry it is 2·253 per cent. Lock hospitals would be advantageous. 6. The diseases which the troops suffer are chiefly endemic. Fever, chiefly daily intermittent type. Dysentery, in both the acute and chronic form. Cholera. No case has occurred since the arrival of the troops.

References to Subjects and Queries.	Replies.

IV. Health of the Troops —*Diseases—cont.*

Small-pox always prevails in the island more or less. The troops have been free from it.

Rheumatism, chiefly chronic.

The proportion which admissions and deaths from these diseases bears to the total admissions and deaths is given in the following table:—

Admissions.

Diseases.	European Artillery, per Cent.	Golundauze, per Cent.	Native Infantry, per Cent.
Fevers	5·825	11·956	18·367
Dysentery	0·970	7·728	4·709
Cholera	—	—	0·068
Small-pox	—	—	—
Rheumatism	10·679	10·870	7·986

Proportion of Deaths to Admissions.

Fever	—	4·543	3·345
Dysentery	—	—	8·550
Cholera	—	—	100·000
Small-pox	—	—	—
Rheumatism	—	—	0·854

The above includes only the last 29 months, no records beyond that period being available.

7. The nosological character of the zymotic diseases is for the most part adynamic. These diseases do not seem to prevail in excess at any particular season. The native dwellings are deficient in cleanliness, there being no organized system of drainage; but the country is intersected by ditches through which the constant heavy rains carry all refuse matter into the sea. The water supply is defective: the ventilation is open. The native troops are addicted to the use of narcotic drugs, and also dispose of their rations. They appear to suffer from nostalgia. There is no particular predisposition to disease among the native population.

8. Epidemic disease is intensified by fatigue, intemperance, and exposure on the part of the soldier.

9. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease.

10. The station is not liable to epidemic disease, as far as can be ascertained.

V. Intemperance.

1, 2. The soldiers at the station are rather intemperate. Drunkenness can scarcely be said to exist among native soldiers. The Europeans are too few at this station to afford any reliable data as to the proportion of confirmed drunkards. Drunkenness is always punished as an offence.

3. Distilled spirits are not sold in the canteen here; they are obtained from the commissariat on payment; they can be had in the bazaar, although prohibited. The quantity allowed per man is two drams of arrack, at 1 anna per dram; the quality is good. Spirit is not, under any circumstances, a part of the rations for soldiers, but they are allowed two drams a day on payment. No dram is taken before morning parade. It is never given as a ration to convalescents, but is sometimes allowed by medical officers on payment. There is no canteen. No deleterious drinks, other than intoxicating drinks, are sold in the bazaar.

4. The consumption of spirits is injurious to men in health, but it is of service in certain cases to convalescents. It is scarcely conducive to efficiency and internal discipline, but only positively otherwise when taken immoderately.

5. It would be beneficial to abolish or restrict the sale of spirits in the canteen and bazaars.

6. Malt liquors or wines would be less injurious to health than spirits.

7. The men are in the habit of using lemonade, coffee and tea. Soda water is expensive and beyond their means. Their influence on health, efficiency, and discipline is beneficial, and they are preferable to spirits and malt liquors.

8, 9, 10. It would be beneficial to suppress altogether the spirit ration for men in health, and to substitute for it beer, tea, or coffee, &c. Spirits carefully administered in some cases of disease are at times of service.

11. There is no canteen. Spirits, &c. are sold in the bazaar, under the Excise Act, for the settlement of Prince of Wales's Island, Singapore, and Malacca, No. 14, of 1851, stated to be strictly enforced.

"XXX. Every spirit farmer, and also every keeper of a registered taking-house or spirit shop, who shall knowingly sell or deliver to any European or native soldier any spirituous liquor or arrack, without having an authority in writing so to do from the commanding officer of such soldier, shall for every such offence forfeit a penalty not exceeding 50 dollars.

"XLI. Every toddy farmer, and every keeper of a registered toddy shop, who shall knowingly sell or deliver any toddy or bhang to any European or native soldier, without having an authority in writing from the commanding officer of such soldier, shall forfeit a penalty not exceeding 50 dollars."

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References to Subjects and Queries.	REPLIES.
VI. DIET.	4. The ration for British troops and European troops in the Indian army is the same, and consists of 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ¾ oz. tea, 1 oz. salt, 1 lb. vegetables, 3 lb. firewood. No changes are made at this station. The rations are inspected by the officer commanding the artillery detachment at this station. 2, 3. A complete ration, including vegetables, but no fruit, is provided for the troops, the stoppage for which is 3 annas 4 pice per diem. The soldier takes three meals, breakfast at 8 a.m., dinner at 1 p.m., tea or supper at 5 p.m. The proportion of vegetables entering into the constitution of the ration is 1 lb. No improvement suggested. Europeans do not dispose of their rations, no one being allowed to take any portion of them out of barracks. The sale of rations by native troops is a serious evil. I have officially represented it as calling for legislative prohibition. 4. Cook-houses are attached to the barracks, and utensils are supplied by Government; the cooks are paid by the men. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is roasted, boiled, fried, curried, or stewed at the men's option. The cooking is properly done and sufficiently varied. No refreshment is provided before a march, but half-way the men have coffee. 5. Gardens for the cultivation of vegetables could not be established at Penang, there being no ground fit for that purpose.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress and accoutrements for native and European soldiers at the station are as yet those generally in use in the British army; they are certainly not suitable to the climate; nothing could be less so. The dress on the plains in hot weather should be loose, of light material, dark coloured, with a light helmet covered, a cloak for night duty. On the hills a similar dress, of warmer materials, should be worn, also body flannel. The soldier's neck (European and native) is now freed from the deadly stock and Prussian collar. The sepoy wants, more than anything, a rational head-dress, such as his own cloth turban, neatly and uniformly worn, with some cover and regimental number, or else the Kilmarnock bonnet. The present thing is worse than the knapsack was to him. On guard the men have verandahs, sheds, and sentry boxes to protect them from the sun and wet.
Duties.	1. No advantage would accrue from drilling the men at home before being sent to India. The occupation and exercise of learning duties is good for the young soldier at first in India, keeping him from vast evils. From my 40 years' observations of European soldiers in India I cannot concur in the theory that the advantages of their having learnt all their duties at home would be such as to countervail the above vital considerations. Unemployment is the European soldier's bane in India, especially the "griffin" soldiers, and being kept out of harm's way at first, with ample morning and evening open air exercise, must be better for these latter than being at once only sent on sentry duty, to be idle and comparatively without morning and evening exercise in the open air at other times. 2. There are so few troops at this station that there is very little drill. The earlier the hours for drill, parades, and marches the better. On a march, if a soldier sleeps from 7 p.m. till 12 or 1, he can then gently perform any proper march before the sun is up; this is the plan I adopt. The average number of nights the men have in bed during the week is seldom more than 3; latterly it has been less. The troops here are too few for the sentry work. 3. The European guards are mounted at no distance from the barracks; but the natives so far off as to distress them. Guards last 24 hours. I tried to get the native infantry regiment placed nearer to town. The roll calls are at 5 a.m., and 8 p.m. for Europeans, that at 5 p.m. was instituted by my order to keep the men from going about the bazaars from 3 to 6. The roll calls for natives are 2 p.m., 8 and 9 p.m., and 5 a.m. Without their families, the check is required upon their further wearing themselves out here by undue resort to the town, &c. The effect on the health of night guards is no doubt prejudicial, being unnatural, and tells even more on natives than on Europeans. But the duty is unavoidable, and I do not think more precautions could be taken. Two hours is a long tour, but one hour would tell worse on the whole guard.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at the station:—There is a good skittle alley in the fort, and also a good library for Europeans There are no ball courts, schools, soldiers' clubs, day rooms, soldiers' garden, workshops, theatre, or gymnasia. There are too few Europeans for sustaining more means for these purposes than the above, and the native infantry and golundauze have too much to do to require any other. Europeans are restrained from exposure to sun and rain out of barracks when off duty, no doubt with negatively the best results to health. 2. Were there many Europeans here, workshops and boating should be provided. Gymnastics are too heating, followed by insufficient precaution. Gardening is good, but partial. Mental and handicraft employments would be best for Europeans in India. 3. Soldiers' savings' banks are advantageous, and work some good here. 4. There is sufficient shade from trees and other means for Europeans, but not for natives. The Bengal "bells of arms" here are wretched, compared with the Madras places of arms. I have moved for the latter.
IX. MILITARY PRISONS.	1. The solitary cells and prisoners' rooms are roomy and sufficiently ventilated; they are too little numerically used to need suggestion.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. The medical officer has no direct power as regards the conduct of the line of march, troops, &c. 3. The most eligible available ground, as far as circumstances will permit, is selected for camping, agreeable to the general regulations. It is kept free from all matter of a nature injurious to health. When troops are halted in the same locality for any length of time, the camp, if practicable, is shifted every 3 or 4 days. The tents are open and well ventilated; water is supplied by bheesties both to the tents and hospital. The

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	medical officer can only suggest or recommend; he has no power beyond, decision being vested in the commanding officer. There should be a sanitary officer attached to every force in the field, with full power in these matters. 4. I am not aware of the existence of any regulations regarding field hospitals; there used to be a heavy ambulance, quite unfit for field service, attached to regiments on the march. It is reported that a preferable one is about to be substituted. The sick are carried in doolies; the hospital supplies in a field medicine chest and in portable medicine boxes. Other boxes are at times used, when conveyed on carts. All carriages supplied by the commissariat.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The European hospital is built over gun-sheds. It is open to the sea face, but has the noisy golundauze barracks immediately in the rear, and has the full benefit of the noise and nauseous odours peculiar to natives and their cooking. The native town also is immediately in rear, and the houses of the civil population are all round in close proximity. There are no stables, and the barracks are in the fort, distant about 200 yards. The golundauze hospital is over the same range of gun-sheds, and I consider the situation extremely bad, even for natives, but much more so for Europeans. The sites of both artillery and native infantry hospitals are, I consider, most excellent, being both open and freely ventilated. There are some nutmeg trees near the golundauze hospital; but they do not interfere with ventilation. The sites are healthy with respect to elevation, drainage, &c. 3. The water supply is abundant and wholesome. 4. The drainage is carried outside the golundauze hospital wall by means of open side and cross drains, and eventually into the sea. 5. The wards of the native infantry hospital are on a basement 2½ feet high, which is filled in, and no current of air passes beneath. The golundauze hospital is on the ground-floor. The European artillery hospital is an upper story. The roof water sinks into the subsoil. The surface drainage and gutterage is quite sufficient to carry away the rain-fall rapidly. The native infantry hospital is constructed of bricks and mortar, and tiled roof with ridge ventilators and windows above. There is a verandah on three sides 10 feet wide, but they are never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat. Table of Hospital Accommodation. The date of the construction of the native artillery and European hospital is not known. The native infantry hospital was erected in 1860. Total number of wards, 5. Total regulation number of beds, 46.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Fee per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. In.		Ft. In.	Ft. In.
Native Infantry Hospital, 3	14 7 7	80 39 39	18 15 15	19 19 18	49,590	1,771	93	2 6	27 12	2 6 7 0	5 0 5 0 ventrs.
European Artillery, 1	10	38	19	10	7,220	722	72⅕	2 6	5	5 0	3 6
Golundauze, 1	8	27	18	10	4,860	607½	27	2 6	4	5 0	3 6

The artillery hospital is only open on the N.E. side; on the N.W. the wards are, both European and native, attached to gun-sheds, and on the S.W. only a narrow yard and high wall interpose between it and the native artillery barracks. The site of the native regiment hospital is open and detached; it is situated 150 yards to the N.W. of the barracks, and like them is shut out by the range of hills from the sea breeze. They are provided with Venetian windows with hinges, which open outwards.

6. In the European artillery male ward there are windows on all sides. The female ward is indifferently ventilated, the windows on two sides being five feet from the ground, and on the other two sides there are no windows, but four doors, two opening into adjacent rooms which are occasionally used as convalescent wards, one opening into the bath-room, and the fourth on the landing-place at the head of the stairs. The native artillery ward is on the ground floor; it has a single window on the S.E. side, looking into the street, and two on the S.W. opening on the yard. In the native infantry hospital there are 16 doors, 22 windows, and 27 ventilating windows above.

7. There is no apparatus for cooling or warming the wards, none being required. The whitewashing of the wards is performed annually unless required oftener.

9. The hospital has a privy of ordinary construction over a cesspool; it is not offensive.

10. With regard to lavatories in the hospital, it is a matter for the medical officer's arrangement, there being no particular conveniences for this purpose.

11. The European artillery have a bathing room attached to both the male and female wards, which are supplied with water by the bheesties. The supply is sufficient, and the arrangements convenient. The natives are supplied in the same way, but have no bathing rooms.

12. In the European artillery and native hospitals, all foul linen is removed by the washermen, and returned when washed and dried; the means are amply sufficient.

13. The storage is sufficient and dry.

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	14. The hospital cots are of wood. The bedding is supplied by the commissariat, and consists of two quilts, one blanket, and two pillows. The cots should be iron; the bedding is good. 15. The kitchen is merely an open shed. It joins the native ward at right angles, and is immediately below, not under, that of the Europeans. Cooking utensils are supplied by the cook himself. The cooking is tolerable; there have been no complaints with regard to it; nothing but beef and poultry are available. 16. Diet tables according to regulation. 17. At this station there is no hospital serjeant, and no nurse, attached to the European artillery hospital; the men, when requisite, have a comrade to attend on them. To the native hospital there is an hospital havildar, who is relieved once a month, and the men have a comrade to attend on them when necessary. There are also two standing orderlies always in attendance. There should be a nurse at least for the European artillery female and children's ward. 18. The artillery hospital is badly situated, and indifferently ventilated; it is, however, undergoing alterations to some extent. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards for at least the last two years; there are no available records at the station for any period anterior to that time. No native infantry hospital at present exists, but one is building. 19. The artillery hospital was it appears condemned long ago; it has now, however, been determined to repair, and in some measure enlarge it. Such being the case it only remains to recommend an improved system of ventilation. 20. There is no provision whatever made for convalescents taking exercise; nor any fenced ground, shady walks, or seats, for their use. 21. The female ward of the artillery hospital is indifferently ventilated. 22. There are no special local hospital regulations. 23. With reference to the powers of the medical officer, change of diet and the issue of medical comforts are at his discretion, subject to the approval of the superintending surgeon,—or in the Straits of the director-general. With regard to the sanitary state of an hospital, &c., the medical officer can only suggest improvements. 24. There are no convalescent wards; but such accommodation would be an advantage.
XIII. BURIAL OF THE DEAD.	1, 2, 3. The burial ground is too far from the military station for any ill effects to be felt. The present ground is condemned by a municipal board, and another is under adoption. There is no cantonment or military burial ground at Penang. Native soldiers are burned or buried in various places at a distance. I have had to call for police check upon burning civil dead sometimes too near the native infantry. There are no particular burial rules here, there being no cantonments yet formed. 4 to 7. The general burial ground, has, I believe, been municipally pronounced overcrowded, and is offensive sometimes. Another yard is in course of adoption.

(Signed) DAV. BABINGTON, Colonel, Commanding Troops, Penang.
W. S. MITCHELL, Captain, Officiating Executive Engineer, Penang.
W. H. S. BURN, Surgeon, 22nd Regiment Madras Native Infantry.

31st August 1860.

(The answers, according to the subjects, are initialed by the commanding officer, the medical officer, and the executive engineer.)

SINGAPORE.

Accommodation:
- European Troops - Artillery - 1 weak Company.
- Native Troops - Artillery - 1 weak Company.
- Native Troops - Infantry - 1 Regiment Madras Native Infantry, minus a Detachment of 105 at Labuan.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is undulating and the vegetation profuse. It consists of low hills rising from a plain; in some parts it is sandy, but mostly consisting of a dark tenacious clay mixed here and there with vegetable mould, and penetrated in many places by salt tidal swamps. There is a good deal of planting, but the primeval forest is distant about 1½ or 2 miles; there is plenty of water. 2. The elevation of the station above the sea is about 25 to 35 feet, and the adjacent country is not so high as the cantonment, with the exception of the hills. There are two nullahs within a short distance of the place, and there are several perennial streamlets and many wells, mostly of rude construction. The neighbouring hills rise from 100 to 200 feet above the station, probably higher. Bukel Timer, five or six miles off, is about 530 feet. 3. Several of the hills in Johon on the coast nearest to the north side of Singapore, rise to a height of about 1,200 feet. 4. The open sea is more than a mile from the station, but tidal swamps or inlets of the sea extend to the station. The nullahs before alluded to are in the station. The neighbouring

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	low ground is much overflowed at every spring tide. There is little or no broken ground except the tidal swamps, which do not appear to have any prejudicial effect upon health. 5. The station is open and freely exposed to winds; gardens abound and hedges are in many places much too high near the station to admit of free ventilation. Military limits are, however, not yet defined. The temperature of the station is not raised by reflected sun heat. A gentle breeze almost daily moderates the heat; the land or jungle wind is the coldest; the sea breeze being sensibly warmer, and often produces lassitude and sometimes fever. 6. The surrounding country is chiefly planted with spice and fruit trees. Catechu is also extensively cultivated, under the name of gambur. There are no works of irrigation near the station, and no rice is grown on the island. Indigo is not cultivated except in minute quantities, nor are flax or hemp in the island of Singapore. 7. The town of Singapore, with a large mixed population, adjoins the east side of the station. 8. The geological structure of the hills consists mostly of a firm clay soil, containing masses of laterite or ironstone, mixed in some parts with silicious sand. Few of these hills rise above 120 feet. The plains are of a uniform level, covered, for the most part, with a superficial vegetable mould more or less friable, under which there is a dark blue plastic clay, containing numerous remains of shells, all of existing species, also corals. Various cuttings have been made from 20 to 30 feet deep, and in all the subsoil is of the same description. The site of the present station was never previously occupied by natives or others. 9. Water is found near the base of any of the hills, and is readily procured good at the depth of a few feet at any season of the year. 10. For the most part rain water flows readily away, though doubtless the very frequent and heavy rains tend to keep up the supply of water as already described. There is no drainage from higher ground which passes into the subsoil of the station. 11. The water supply is derived from wells and natural streamlets. It is not at present stored in open tanks. Tanks for bathing purposes are much required for the use of the troops, and have often been applied for. One is to be constructed, but two or three are necessary. Sources of impurity are pretty well guarded against here, but all wells used for drinking ought to have a wall round them, which at present many have not. 12. As there is more than one perennial streamlet the supply of water available may be increased indefinitely; the water is generally clear and good, but after heavy rains is tinged with clay. It is soft, good, and abundant, but has not been tested chemically or microscopically. It is raised by buckets and carried by men in leather skins; good pumps are most desirable, and would save much labour. Tanks for bathing purposes are much required and could be easily constructed. 13. From the temperature being so uniform throughout the year Europeans are remarkably exempt from the sudden and severe attacks of disease common in Hindoostan, but owing to the absence of a cold season the climate is not well adapted to men who are much reduced in health and strength. 14. Her Majesty's Government having recently determined that permanent barracks for a European regiment of full strength should be erected, considerable discussion arose as to the most eligible site procurable. Finally the selection became limited to the Balestiers property in an open cleared champaign country, on which sugar-cane had been growing for some years about two miles north-east of the town, and to a range of higher ground with a plateau of from 60 to 80 feet elevation in the Tanglin district about three miles north of the station. Ultimately the preference having been given to the latter locality, all the rules prescribed in the Bengal Code of Public Works, p. 166, were adhered to, and a favourable report was obtained from the committee. In this particular case, where there were many European residents and others from whom the valuable ground had to be purchased, there was no occasion for particular inquiries as to disease and sanitary condition.
II. Climate.	1. At present the only instruments available at the station for conducting meteorological observations are, thermometers, aneroid barometers, and rain gauge. 2. The following are the only observations registered for the year 1859:—

Months.	Mean Temperature.	Rain, inches.	Months.	Mean Temperature.	Rain, inches.
January - -	80	15·14	July - - -	82¼	7·5
February - -	80¼	9·5	August - -	81¼	13·15
March - - -	82	7·6	September - -	82	5·13
April - - -	81	3·17	October - -	81¼	9·19
May - - -	82¼	3·18	November - -	80	8·10
June - - -	82¼	6·10	December - -	81	7·6

Satisfactory information as to the climate can be gained from Capt. Elliott's able magnetic survey of the Eastern Archipelago, no available means being here at present.

3. The climate is healthy. It is moist, moderately hot, not variable, and is damp from the constant rain and proximity to the sea. Vegetation is rapid; there is little or no irrigation; dust is seldom troublesome, and the only nuisance known to affect the air prejudically is the manufacture of sago, and in the country, the burning of the manure used by Chinese cultivators. The sago nuisance is being gradually got rid of. Provisions of all kinds are very dear, and the Europeans and natives suffer, doubtless, not from the climate, but bad living. The duties are too hard upon the native troops, and they suffer from being exposed to the dews during the nights, being every third day on duty. It has been already observed that there is very little variation in the weather,

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	but occasionally there is rather more continuous rain towards the end and the beginning of the year. When such is the case parties suffer from intermittent fever. 4. Probably the site selected by the committee for the location of the European regiments at Tanglin, distant about three miles from the station, which is situated on higher ground, will be more conducive to health. This is, however, only a supposition, as barracks are only *now* being erected there. 5. The following are the stations on which the different members of the committee have served, placed in the order of their salubrity. Col. Burn has served in Neilgherries, Belgaum, Dharwar, Bangalore, Singapore, Kulladgee, Cuttack, Vellore, Madras, Bellary, Kolapore, French Rocks, Vizianagrum, Masulipatam, Nagpore, China, Chittledroog, Goomsore, Manantoddy. Col. Faber has served in Mhow, Singapore, Penang, Jaulnah, Saugor, Madras, Secunderabad, Negapatam, Tanjore, Trichinopoly, Kamptee, Madura, Manantoddy. Dr. Rose has served in Penang, Singapore, Cawnpore, Jhansi, Dumdum, Chinsurah. Dr. Traill has served in Malacca, Singapore, Vizigapatam, Madras, Labuan, Cuttack, Russelcondah, Hong Kong.
III. SANITARY CONDITION OF STATION.	1. A map of the station is not obtainable at present. 2 and 3. Plans. 4. The following Table shows the barrack accommodation. Date of construction, for Europeans, 1844; for natives, 1859. Total number of rooms, for Europeans, 1; for natives in the four barracks, 4, with end rooms for native non-commissioned officers. Total number of non-commissioned officers and men, Europeans, 60; native, 160 in each hut.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				Feet.		ft. in.	ft. in.
Temporary European Artillery Barrack, 1 -	60	97 6	58	24	135,720	2,262	87	2	14	13 6 8 6 11 4	6 4 5 6 7 4
Guard Room, 1 - -	13	24	21	20	10,080	775	39	2	4	10 3	4 10
Prison Cells - - -	1	6	13 8	10 9	780	780	130	2	—	—	—
Native Barracks, 4 - -	160	220	54	16	176,000	1,100	74	2	44	5 9	3 5

5. The windows are on opposite sides, and open outwards. There is no verandah.
6. The cots are wooden ones, and ought to be of iron for the native troops. The Europeans have iron cots.
7. No tents are in use at Singapore, the climate being too damp.
8. The ventilation of the barracks is good. There are also punkahs for the Europeans. The ventilation is quite sufficient in every public building in the station. Punkahs are pulled during the hot weather. The cost of each is about 10 or 14 dollars.
9. The barracks have brick and chunam walls, with tiled roof, for Europeans, and for natives attap roofs.
10. The floors are of tiles, raised about 2 feet. There is no passage for air below.
11. The materials and construction are very suitable to the climate. New barracks are being built for the Europeans; for the natives no improvement is required. The barracks are kept in repair by the engineer department, and the walls and ceilings are cleansed and limewashed once in six months.
12. The only lavatories at present are a few unfinished wells, which are supplied with water by the rains, and may be springs. There should be one good well per company, and drains from each to carry off the water, bathing once or twice a day being essential for health in this climate.
13. The cooking means are bad. The buildings being temporary only, others are being built. There are no means whatever of supplying water, excepting by one of the water carriers or bheesties, two being allowed to a full company, which is quite insufficient. There are no drains whatever for draining off the refuse water from the present temporary buildings. There is no convenience for washing linen but the open air, which is well enough in dry weather. A drying shed would be most useful, and the holes containing water in which they now wash might be greatly improved at very little expense.
14. Privies are now being built, but since troops have been stationed here the men have gone wherever they could find a place, generally in the neighbourhood of Her Majesty's jail, which has never been cleansed or taken away.
15. The barracks are lighted at night with oil, in globe lamps.
16. The four native barracks are on the summit of a small hill, from whence the water runs off; there are no drains constructed. The barrack for the Europeans, on Pearl's Hill, is not well drained; an application has been forwarded to the executive department to have this very essential work performed immediately. The drainage from the temporary cook-houses is very indifferent. New cook-houses and privies are only now being erected. Urinals have never been in use with natives, and for the Europeans chatties and buckets are in use, which are emptied and cleansed by natives. No part of the buildings is damp. The drainage is generally sufficient for the barracks, and

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	will be attended to when the new cook-rooms are given over. The fluid refuse runs off, but what may remain occasionally is carried away by servants. There are no cesspits. Water is to be had within 50 or 60 yards from the new cook-rooms. The barracks are swept daily, and thoroughly cleansed once a week, as is also the hospital. The tidal nullah near the new privies is often very offensive, and is distant from the north barrack about 200 to 300 yards. The ditch in rear of the European barracks will be repaired, shortly; it being of earth only, it has become choked up. 17. A few prisoners, under the officiating barrack master, attend to the cleansing of the cantonment, but is not efficiently done, from the paucity of hands. The refuse and manure are carried away by the prisoners in baskets; a hand-cart has, however, been applied for. 18. The neighbourhood of the cantonment is surrounded by thick low brushwood, which ought to be removed. Applications have been submitted, but up to this period have been unattended to. The bazaar might be improved; the roads being very bad all over the station. Applications for having them repaired have been submitted, but have hitherto been very much neglected. The little bridges over the watercourses are all in a dangerous state for want of repair. 19. The bazaar is very small, and at this station is of very little use to the men, all going to the general bazaar. The troops are nearly altogether dependent for supplies on the shops in the town, which are altogether under the control of the municipal authorities. The native houses near the station have all more or less refuse, and dung-heaps near them; it being the custom of the Chinese to have them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Animal food is seldom or never used by the native soldiery. All use it in their own country, but from its excessive dearness in Singapore, none are able to purchase it; goat mutton being nearly 2*s.* a pound, and good mutton 2*s.* 6*d.*; therefore, no animals are slaughtered except for the gentry. 21. The officers only have horses or ponies. These are all kept in stables near their houses; the manure being generally used for garden purposes. 22. There are only eight ponies attached to the mountain train guns. These are kept in stables at some distance from the barracks, and the manure is carted away. There are no picketing grounds. 23. There are only four houses in the cantonment for officers, hence they are compelled to take quarters wherever they are to be had, at an expensive rate. The officer commanding generally occupies the house of an absent merchant, which he is compelled to vacate on the merchant's return. The native soldier has no family with him, and for the few Europeans who have families there is sufficient accommodation.
Officers' Quarters.	1. The four houses before alluded to are in very bad repair, and their owners are unwilling to lay out on them more than is absolutely necessary to prevent their falling into ruins. Houses out of the lines are let far beyond the means of regimental officers, the rents ranging from forty to eighty dollars. No fault is found with their drainage and ventilation. Two of the officers of the European Artillery have good public quarters assigned to them. It would be a real boon if Government were to build suitable quarters for all commissioned ranks, and charge house-rent for them, as officers, from their short stay at Singapore and ignorance of Malays, are unable to build for themselves.
IV. Health of the Troops.	1. The station and district are healthy in a marked degree. 2. Cholera very seldom visits the Straits. Small-pox occasionally occurs, but is seldom very virulent. A tendency to skin diseases is observed; and among the Chinese ulcers of the legs are rather prevalent, attributable in part to their gross feeding, the fattest pork and salted vegetables forming an important part of their diet. Diseases of the spleen seldom occur. 3. I attribute the healthiness of the native population to the good climate and the facilities of earning a livelihood. The troops suffer from being deprived of animal food, and the severe duties they are called upon to perform, as also, absence from their families. 4. The 40th Madras Native Infantry were nearly three years in Cuttack, during which time however they were employed against the rebels at Sumbulpore, when the regiment was prostrated and almost disorganized by jungle fever in a few months from active employment during the unhealthy season of the year. They left Cuttack on the 26th December 1859, and arrived here in rather a weakly state on 22nd January 1860, and being without their families, became depressed and rapidly filled the hospital with cases of diarrhœa, rheumatism, and ulcers, which in many cases proceeded from itch pustules, indicating a very low tone of health. The barracks are very good quarters for the men, but owing to the sudden arrival of the 11th Punjab Regiment, the men are too much crowded at present. 5. They are not camped out, nor would it be advisable in this damp climate. It would be moreover very expensive, as a new tent only lasts a very few months. 6. I have never been in charge of troops at hill stations. 7. I have not observed whether troops are more or less liable to disease on returning to the plains. 8. I approve highly of selecting hill stations for troops. 9 and 10. I am not informed whether there are diseases peculiar to hill stations, nor whether any special precautions are necessary as to diet, clothing, &c. 11. The hot seasons are best adapted for residence in hill stations, and six months at least is the shortest period in which benefit to health can be obtained. 12 and 13. No information. 14. It would appear to be highly desirable to locate troops on hill stations. A residence at the hills during the hot season is most desirable for an officer, and is generally attended with benefit, and therefore would appear to be equally conducive to the health of the soldier. 15 and 16. No information. 17. There is no higher ground near this station of sufficient extent to locate troops on.

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	18. Much difference has not been noticed as to the effect on health of surface or subsoil, provided the climate is good, the site elevated, and the soil not too retentive. A gravelly soil is of course to be preferred. 19. The best age for soldiers proceeding to India is from 18 to 24; and the best period in Madras and Bengal is about the end of October, and in the Straits about the middle of December. We have no experience at Singapore how troops are disposed of on first landing. When a detachment of Europeans or a regiment of natives arrive, they are invariably located in the buildings vacated by the relieved corps or detachment. The precautions to be observed on first landing in India are, avoidance of excessive sun-heat, exposure to the dews at night, indiscriminate eating of fruits, but above all, the drinking of spirits, especially that procurable in the bazaars, which in most stations, but especially at Singapore, are drugged. 20. Stations known to be healthy ought to be selected for Europeans on their first arrival in India, and until they get acclimated, long marches, or indeed any extra fatigue, ought to be avoided. They should be sent to hill stations or others known to be healthy. 21. We have no experience here of the transport of troops from the port to the interior, the barracks being within one to one and a half mile of the place of disembarkation. 22. Soldiers should serve in India from 20 to 25 years. 23. Medical boards are generally conducted with impartiality and sound discretion. No suggestions to make. 24. Invalids should leave India for home about the end of February at the latest, by the Cape route.
Diseases.	1. There are inspection parades once a week for the discovery of incipient disease. 2. There has been no scorbutic disease at Singapore. 3. Amongst the natives hepatic disease is little known. 4. Dracunculus does not occur here, except when an occasional case has been imported from Hindoostan. 5. The proportion of venereal cases amongst natives is about one per cent. Were a local corps formed, so that the men could have their familes with them, this would be diminished. A lock hospital is scarcely necessary at Singapore. 6. Epidemics are scarcely known, and endemic diseases are rare. The troops suffer occasionally from intermittent fever and rheumatism, rarely from anything else. Cholera is scarcely known; small-pox very seldom; rheumatism is rather common. The Director-General's records can alone supply the statistics of disease and death, as the present regiment has only been here a few months, and other regiments carry their records with them when they leave. 7. Small-pox is the only infectious disease observed, and that very rarely. Itch, in an aggravated form, is, however, too common; more so than in most Indian stations. There is no particular season when these diseases are most prevalent. The personal habits of the natives are not cleanly, and this, with the want of proper lavatories, predisposes to itch. 8. Epidemics are not prevalent in this station. 9. Quinine is not necessary as as a prophylactic. 10. No recommendations are necessary as to the prevention of epidemic disease.
V. INTEMPERANCE.	1. The soldiers at the station are temperate. There are one or two confirmed drunkards in the detachment of Europeans, which consists of about 50; there are none amongst the natives. 2. The proportion of diseases occasioned directly or indirectly by intemperance cannot be given, the medical officer with the detachment of Europeans being changed every five or six weeks, and the statistics of the native regiment having been taken away with the relieved regiment. Drunkenness is invariably punished as an offence. 3. Distilled spirits are sold at the canteen and are good; those in the bazaar are of a bad description, often, it is to be feared, drugged. The average amount consumed per man is about a dram per diem. Spirit is no part of the ration, and none are ever issued before noon. It is never given as a ration to convalescents. No other kinds of drink injurious to health are sold in the canteen. 4. The consumption of spirits in moderation is not injurious to health; it is certainly not conducive to efficiency and discipline. 5. There are no spirits issued as rations; and, if not sold in the canteen, many men would purchase inferior liquor in the bazaars. It is to be feared, therefore, that the sale in the canteen cannot now be abolished. 6. There can be no doubt that malt liquor is preferable to spirits; wine is too expensive. 7. Tea and coffee are issued as a ration to the Europeans and are much used by the native soldiery. Every inducement should be given for the men to drink malt liquor, as conducive to health. 8. The suppression of the sale of spirits cannot be done, for after a man is accustomed to spirits he will not be contented without them. 9. Many men would not be contented with beer or any less stimulating beverage than the spirits they have been accustomed to. 10. A good supply of malt liquor should be always available for European troops, to induce them to avoid drinking spirits. 11. Rules for the management of canteens, G. O. 17th August 1855 and G. O. 13th March 1857.
VI. DIET.	1. The ration for British troops consists of 1 lb. of bread, 1 lb. meat, 1 lb. vegetables, 4 oz. rice, $\frac{5}{7}$ oz. tea or $1\frac{3}{8}$ oz. coffee, $2\frac{1}{2}$ oz. sugar, 1 oz. salt, 3 lb. firewood. The rations are inspected by the commanding officer. 2. A complete ration, including 1 lb. vegetables, is issued daily by Government, for for which there is no actual stoppage. There are three meals a day, breakfast at 8, dinner at 1, supper at 6. 3. Europeans in the Straits never have mutton served out to them, it being considered too expensive, but it is most desirable they should have it once or twice a week.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	Europeans never sell their rations, and every discouragement is given to prevent the natives doing it. 4. The cooking is performed in copper and iron vessels provided by the Government. The kitchens are the ordinary native buildings, and water is supplied by water carriers. The meat is neither boiled nor roasted, it being generally beef, which is either stewed or curried. The beef is too tough to be roasted; in other respects it is properly prepared. The men have never marched at Singapore, all movements taking place by water. 5. Gardens might be advantageously established both for Europeans and native soldiers, and should be under regimental arrangements.
VII. Dress, Accoutrements, and Duties.	1. There being no cold weather, the khakee is usually worn by the Europeans and by the natives, with the exception of the months of December and January. The khakee is at present cotton; thin woollen would be preferable both for Europeans and natives. I would recommend the woollen khakee of a dark grey colour and the felt helmet for Europeans and natives with a due regard to the prejudices of the latter. Cotton khakee jackets and trousers and wicker helmets is the present dress for Europeans; the white jacket and dark cotton trousers with the Madras regulation pugree for natives.
Duties.	1. It would certainly be advisable that Europeans should be drilled at home, and natives before being sent to the Straits ought to be thoroughly drilled and fit to join the ranks before being sent from India. 2. There are parades or drills five times during the week in the mornings and twice in the afternoons. The best hour for drills is half an hour before and after sunrise and sunset. The orders are that no regiment is to be under arms between 8 a.m. and 4 p.m. Europeans have three out of four nights in bed; natives, two out of three. 3. The European guards are mounted quite close to the barracks. Natives at various distances up to three miles. There are no roll calls after 8 p.m. except as a punishment. Night guards are very prejudicial to health, and on this account it is most desirable men should not be on duty more than once in five or six days.
VIII. Instruction and Recreation.	1. The only means of recreation and instruction at the station are a skittle ground and a library and reading room, which is kept up by the men. A little assistance from Government would be very acceptable. There are no schools, ball courts, day rooms, gardens, workshops, theatre, or gymnasia. There is sufficient to keep the men occupied if so inclined, the library being good. There is no restriction on the men confining them to barracks when off duty, and the plan appears to work well. 2. Gardens are most desirable, also fives' court and cricket. 3. Savings' banks are established, and would be made more use of if the interest were better. 4. There is no shade from trees, verandahs, &c. to enable the men to take exercise during the day.
IX. Military Prisons.	1. There is no military prison at Singapore. There are three cells which might be improved.
X. Field Service.	1 to 4. Not applicable to the station.
XI. Statistics of Sickness and Mortality.	1. Statistics are only to be procured at the office of the Director-General, Medical Department, Madras.
XII. Hospitals.	1 to 4. No replies. 5. Both the hospitals are on hills, and are in consequence naturally well drained, the water falling from the roof into trenches which lead to outlets in the compound wall, whence it is rapidly carried off. Both the hospitals are built of brick and chunam, with tiled roofs and single walls. They are very well ventilated and both are very cool. They are supplied with verandahs on both sides, which afford sufficient shelter from the sun and rain. Convalescents occasionally occupy the verandahs when the sick list is large, but they are further protected by an outer verandah of palm leaf supported on poles, a very useful adjunct to all Indian hospitals. The hospitals consist only of one flat. The following table gives the hospital accommodation:— Date of construction, European, 1845; native, 1831. Total number of wards, 1 European, and 1 native. Total regulation number of beds, 65 in the native hospital, and about half that number in the European.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
Native, 1 - -	65	90	30	15	40,500	623	41	2	10 and 9 doors 9 ft. by 4½ ft.	6	4
European, 1 - -	60	60	35	22	47,300	945	43	2	12 and 4 doors 10 ft. by 5 ft. with 16 ventilators.	10	4½

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	There is no obstruction to the wind from any quarter, but low hills moderate the effect of the sea breeze, which is rather an advantage than otherwise at this station, where the wind from the sea is often hot, if not injurious in some degree. There are no glass windows, but venetians that open like folding doors, and conduce much to ventilation. 6. There are large square openings in the ceiling of the wards, which are excellent means of ventilation in hot climates and ought to be more general, and air has free access above and below the floor, enough to keep the wards free of odour *if not overcrowded.* The jalousies are of venetian, like folding doors. 7. No means of cooling the air are in use at the native hospital. In the European hospital there are punkahs suspended. 8. No means of warming are required. The walls and ceilings are limewashed once in six months, and oftener if required. 9. The privies are sheds built of brick and chunam and tiled. They are situated at the two corners of the compounds, with compartments in which there are perforated seats with buckets. They are properly drained and supplied with water, and are not offensive, means being taken for the removal of all filth. 10 and 11. The lavatory arrangements consist of bathing tubs, besides a bath room containing a fixed bath of masonry, in which the patient can have either hot or cold water. The European soldiers seldom and the native never use washhand basins. 12. Regimental washermen are paid for washing and drying the hospital linen, and are generally found sufficient. 13. The means of storage are sufficient. 14. The bedsteads consist simply of two or three planks, when put together being 6 feet by 2¼, and supported by trestles. Each bed for a European has a mattress stuffed with straw or cocoa-nut fibre, and the native has his carpet or cumbly. 15. The cook-houses are in the hospital compound. They have no apparatus beyond what is furnished from the bazaar, which has hitherto been found sufficient. The diet is ordered by the medical officer, and is on a liberal scale for the sick. 16. There are no diet tables, diets being furnished as daily directed by the medical officer. Statistics of sick are not kept here, all reports being sent to the Director-General. The medical officer in charge of the Europeans is generally changed every two or three months, which is against the internal economy working well. 17. There are hospital serjeants for attendance on the sick at all the hospitals, and orderlies are furnished at the requisition of the medical officers. 18. The hospitals are well constructed, but on the arrival of the 40th Madras Native Infantry with numbers of weak men, they soon became overcrowded and hospital gangrene began to show itself, but on immediately removing a number of the sick to a temporary building, the disease rapidly disappeared. 19. No sanitary defects have been observed beyond the want of extra accommodation on emergencies. 20. The convalescents are allowed to walk out on the public roads, which are very dirty and always dusty. Shady walks and seats are unknown at Singapore. 21. The wives and children of soldiers are attended in their own dwellings. Shady walks and seats would be a great boon to the sick; even the esplanade where the bands play has not a single seat. 22. There are no special local hospital regulations. 23. Any reasonable suggestions of the medical officers are invariably complied with. They can also obtain on indent wine, meat, and bread and milk for extreme cases. 24. There is no hospital or ward for convalescents. Such an accommodation would be an advantage to the station. Empty buildings have usually been given for the use of convalescents. At present, from the unexpected arrival of another native regiment, there are none available.
XIII. BURIAL OF THE DEAD.	1. The burial ground used by British troops is about a mile east of the station, which is no inconvenience. Chinese burying grounds abound in every direction, and require to be better controlled. 2. The British burial ground is carefully kept, and being on a hill, is well drained. A new one is under the consideration of the Government, the old one being close under the walls of Fort Canning on the Government Hill. 3. In the burial grounds for Europeans sufficient interval between graves is always allowed, and all natives are buried under municipal arrangements. It has not been necessary to reopen graves for Europeans, and is not practised by the natives. At all times in this country burial takes place a few hours after death, or as soon as arrangements can be made. Natives bury at several places, the nearest being close to the parade ground. 4. The European grave-yard is never offensive, but those of the Chinese are very often so. This is under municipal arrangement, and no complaints have been made for the past year, attention having been called to the nuisance. The Europeans are buried in the Government burying ground. 5. The dead of camp followers and bazaar people are disposed of under municipal regulations. 6. No complaints of injury to the public health have been made to the municipal authorities. 7. We would suggest as an improvement that all the burial grounds should be removed to a distance, many being too near dwelling houses.

(Signed) GEORGE BURN, Colonel.
CHARLES EDWARD FABER.
WILLIAM TRAILL, M.D., Assistant Surgeon, 40th Regiment Native Infantry.

Singapore. No date.

REPORT BY PRINCIPAL INSPECTOR-GENERAL PEARSE.

PRINCIPAL INSPECTOR-GENERAL PEARSE'S REPORT on the MADRAS STATIONS.

STATIONS.	REPLIES.

1. The Principal Inspector-General of Hospitals, Madras Medical Department, has the honour to transmit the following report, in reference to section 14 of the list of queries issued by the Royal Commission appointed to inquire into the sanitary condition of the Indian army.

TOPOGRAPHICAL REPORTS.

2. Between the years 1842 and 1845 a series of reports compiled under the direction of the Madras Medical Board, by the then secretary, Dr. Pearse, now Principal Inspector-General, Medical Department, were published by the local Government, comprising a medical topographical account of every station in the presidency occupied by European or native troops. Copies of these reports are herewith forwarded for the information of the Royal Commissioners. Although many alterations and improvements have been carried out in hospitals, barracks, &c., subsequent to the date of these reports, still the topographical descriptions of stations are very complete, and may be consulted with advantage in the framing of a general report on the sanitary condition of the various military stations within the Presidency.

Since the date of publication several new stations have been occupied in the province of Pegu, but as a topographical account of each station will reach the Commission through the local military and medical authorities, it will not be necessary to enter into the subject here.

3. Below will be found lists of all important stations occupied by European and native troops, arranged according to their order of salubrity. It is necessary, however, to offer some general remarks with regard to these tables. They have been compiled for a period of ten years—from 1847 to 1856–7; and during this period the Madras army was not employed in the field, with the exception of a portion thereof engaged in the second Burmese war, in 1852–3. The death-rate of each station does not of course show the actual mortality resulting from disease contracted thereat. Many of the stations show a higher rate of mortality than is attributable to the particular locality, occasioned by casualties amongst invalids transferred from other stations. The cantonment of Saint Thomas's Mount, occupied permanently as the head-quarters of the Madras Artillery, is an example of this. It is considered a healthy station for Europeans, and yet the mortality is very high, consequent on the transfer of sick from foreign service and up-country stations to head-quarters.

No. 1.

TABLE of PRINCIPAL STATIONS occupied by EUROPEAN TROOPS, arranged according to their Order of Salubrity, calculated on the average of 10 Years, from 1847 to 1856–7.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
1. Wellington (*3*)	1,001	1. Jaulnah	10·3	1. Jaulnah	9·3
Bangalore	1,417	Cannanore	17·9	Bellary	13·2
Cannanore	1,514	Bellary	18·0	Bangalore	15·4
Tonghoo (*5*)	1,534	Bangalore	19·0	Trichinopoly	17·4
5. Rangoon (*5*)	1,630	5. Trichinopoly	19·7	5. Cannanore	17·7
Bellary	1,761	Secunderabad	24·5	Secunderabad	24·0
Saint Thomas's Mount	1,761	Kamptee	28·6	Kamptee	25·1
Trichinopoly	1,814	Madras	29·6	Madras	27·1
Secunderabad	1,825	Wellington (*3*)	34·1	Wellington (*3*)	31·2
10. Madras	1,834	10. Saint Thomas's Mount	38·6	10. Rangoon (*5*)	35·1
Kamptee	2,015	Tonghoo (*5*)	42·8	Saint Thomas's Mount	37·3
12. Jaulnah	2,368	12. Rangoon (*5*)	48·2	Tonghoo (*5*)	40·7

The *Italic* figures indicate the number of years for which average has been obtained.

No. 2.

TABLE of STATIONS occupied by NATIVE TROOPS, arranged according to their Order of Salubrity, calculated on the average of 10 Years, from 1847 to 1856–7.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
1. Malacca	374	1. Quilon	6·8	1. Hurryhur	4·9
Kurnool	547	Jaulnah	7·3	Vellore	5·6
Cannanore	598	Bellary	7·8	Bellary	6·1
Kamptee	611	Cannanore	8·4	Jaulnah	6·4
5. Penang	647	5. Secunderabad	8·5	5. Quilon	6·5
Mangalore	650	Paulghaut	9·1	French Rocks	7·01
Vellore	660	Hurryhur	9·6	Secunderabad	7·1
Samulcottah	693	Bangalore	10·1	Madras	7·2
Jaulnah	727	Mangalore	10·2	Paulghaut	7·6
10. Hurryhur	748	10. Masulipatam	10·2	10. Cuddapah	7·6
Bellary	772	Vellore	10·4	Trichinopoly	7·8
Secunderabad	772	Madras	10·5	Kurnool	8·0
Palamcottah	774	Kurnool	10·5	Cannanore	8·4
Quilon	787	Malacca	10·8	Palamcottah	8·6
15. French Rocks	787	15. French Rocks	11·6	15. Malacca	8·7
Madras	807	Kamptee	11·9	Bangalore	9·1
Berhampore	824	Cuddapah	12·04	Kamptee	9·7
Cuddapah	837	Samulcottah	12·2	Masulipatan	9·8
Paulghaut	839	Mercara	14·4	Mangalore	10·2

SPECT.-GEN. PEARSE'S REPORT. MADRAS.

STATIONS.

Topographical Reports—*cont.*

REPLIES.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
20. Trichinopoly	858	20. Palamcottah	15·9	20. Mercara	10·9
Bangalore	900	Trichinopoly	16·1	Samulcottah	11·3
Vizianagrum	966	Vizagapatam	16·3	Berhampore	13·5
Masulipatam	972	Penang	17·2	Meaday (*1*)	15·1
Mercara	985	Singapore	17·3	Vizagapatam	16·1
25. Singapore	1,035	25. Rangoon (*4*)	17·7	25. Vizianagrum	16·8
Rangoon (*4*)	1,358	Meaday (*1*)	19·6	Singapore	17·1
Vizagapatam	1,383	Vizianagrum	19·8	Penang	17·2
Moulmein	1,512	Berhampore	20·2	Rangoon (*4*)	17·6
Tonghoo (*4*)	1,831	Tonghoo (*4*)	21·9	Tonghoo (*4*)	19·5
30. Henzada (*2*)	1,996	30. Moulmein	22·8	30. Moulmein	20·8
Meaday (*1*)	2,504	Labuan (*8*)	29·1	Labuan (*8*)	29·1
32. Labuan (*8*)	2,714	32. Henzada (*2*)	29·2	32. Henzada (*2*)	29·2

The *Italic* figures indicate the number of years for which average has been obtained.

4. In remarking upon the different stations occupied by European troops, it may not be amiss to begin with the station which shows the lowest death-rate of all, viz., Jaulnah.

JAULNAH.

5. Jaulnah is a considerable town and military station in the Hyderabad country, situated in north latitude 19° 0′ 50″, and east longitude 76°. It has for many years been occupied as a station for a troop of European horse artillery, a native cavalry corps, and one or more of native infantry. The elevation of the cantonment is 1,652 feet above the sea. The climate is that common to the Deccan. The hot season begins in March, and terminates usually in the beginning of June. The thermometer in the middle of the day, at this period of the year, ranges from 90° to 100°, but the mornings are generally fresh and comparatively cool. This is stated to be the healthiest season. The rainy season extends from the middle of June to October, the average rain-fall being 32 inches. The cold season extends over the following months:—November, December, January, February. The variations of temperature are very great at this season, the thermometer often ranging from 40° to 80°, and in the early mornings ice has been known to form on plants or evaporating surfaces. The prevailing winds are northerly or easterly, and are particularly cold and piercing. The Medical Board in 1844 thus remarked on the climate of Jaulnah:—

"The climate is considered to be one of the most salubrious and pleasant in Southern India. During the greater part of the year a fresh invigorating coolness is experienced in the mornings, yet convalescence from serious attacks of disease is almost invariably slow and imperfect, and a change of air, especially to the sea coast, is generally found requisite for the restoration of health."

As before observed, the only European force stationed here was a troop of horse artillery. In the beginning of 1857 the station was abandoned as a military post, but after the breaking out of the mutinies it was again occupied, and the wing of a European regiment was quartered there, in addition to the troop of horse artillery. The barracks and hospital accommodation for the limited number of men comprising a troop of horse artillery are good and ample. The buildings occupy the highest ground in the cantonment, and the natural drainage is good. For the ten years ending 1856–7 the admissions to hospital were 236 per cent. to strength, but the mortality scarcely exceeded one per cent. (*per annum?*). Jaulnah is so far away from any sanitarium that no men seriously ill could be transferred, especially during the rainy season, when the roads in the Nizam's territories are almost impassable.

The low death rate, therefore, cannot be accounted for on any other grounds than the great salubrity of the climate, and its suitability to the European constitution. With such wide variations in temperature, it is but reasonable to expect that colds and slight febrile attacks would be common, and these, in fact, with bruises, contusions, &c., to which all mounted soldiers are liable, appear to have occasioned the large proportion of sickness, compared with the deaths. The climate of Jaulnah appears to suit the native soldier equally as well as the European; the admissions, to strength, being at the rate of 727 per thousand, and the deaths 7·3 per 1,000 (*per annum?*). It will be observed that the mortality from cholera has been slight, both amongst Europeans and natives. In the whole Madras army cholera causes one-fourth of the mortality.

Epidemics of small-pox and cholera occasionally visit the station, but the former must always be looked for in a part of the country where vaccination is almost unknown. The latter is of comparatively rare occurrence. The very agreeable climate of Jaulnah, the extraordinarily low death rate—the lowest, it is believed, of any station in India, and considerably below that of the same class of men in garrison towns at home—would seem to point it out as a desirable spot for the permanent location of a European regiment, should military considerations permit of the suggestion being carried out.

His Excellency the Commander-in-Chief, on his late visit to the station, selected a piece of ground admirably adapted for barracks, and Dr. Macpherson, Inspector General of Hospitals, who accompanied his Excellency, reports most favourably of the site. The 3d Regiment Madras Europeans has lately occupied the station, but there are no proper barracks for their accommodation.

CANNANORE.

5. *Cannanore.*—The town of Cannanore is situated on the western coast in the province of Malabar. For a minute topographical account of the station it is requested that reference may be made to the "Medical Board's Report on the Medical Topography and Statistics of the Provinces of Malabar and Canara" (pp. 2, 15). The salubrity of this place and its appearance as second in the list of healthy stations, appears to depend in a great measure on its remarkable freedom from epidemics of cholera as regards the European and native military forces.

Cholera sometimes prevails amongst the towns-people, whose habits are filthy, and who live in dirty ill-ventilated houses and narrow streets, but it rarely attacks a European or native soldier. The Medical Board stated in 1844, that cholera had never been known to appear in Cannanore until 1838, when it proved very fatal to the poor in the town and cantonment bazaars, which were very filthy, but in the sepoy lines, "which are on open ground, and kept remarkably clean," scarcely a single case of the disease occurred. For the ten years

STATIONS.	REPLIES.
Cannanore—*cont.*	to which this report refers, only two deaths occurred from cholera amongst the European troops, and not one in the native force, the aggregate strength being respectively 9,338 of Europeans, and 14,504 of natives. It is a remarkable fact, and which will be noticed more particularly hereafter, that European and native military on the western coast of the provinces of Malabar and Canara enjoy almost an immunity from cholera. The subject was noticed in the annual report on the health of the army, European and native, for the year 1856–7. It is there shown that for a period of 15 years, during which the aggregate strength of the European force was 14,441, only 15 deaths from cholera occurred, and the native troops, numbering in the aggregate 49,389, lost only 61 men from this cause. This immunity of the troops is not easily explained, for the native population generally suffer severely during cholera epidemics. In the latter part of 1859 the disease prevailed throughout the provinces of Malabar and Canara, destroying large numbers of the population. In the gaol of Calicut, a well-ventilated and commodious building, in which 400 prisoners were confined, cholera in a few weeks swept away more than one-fourth of its inmates. A detachment of European infantry, numbering 100, during the same visitation, escaped with the loss of one man. It will be seen that Cannanore does not rank so high in the list of healthy stations if the cholera cases are excluded. The climate is undoubtedly relaxing, and a prolonged residence therein conduces to deterioration of health. Dysentery is a common and often fatal disease. Malarious fevers are infrequent. Venereal diseases are common, and chancres are apt to assume a phagedenic form in weakly or unhealthy men, but as lock hospitals for the reception of diseased women have lately been established, it is hoped that fewer admissions from these diseases will occur at this and other stations occupied by European troops. There is a tendency in almost all cases to assume a scorbutic form after a prolonged residence on the western coast. This was very marked in the case of Her Majesty's 25th regiment, which, after five years residence on the western coast, returned to Madras in 1849, enervated and worn out by the debilitating effects of the climate. Soon after their return the men began to suffer from scorbutic dysentery, and the mortality from this cause alone exceeded the average mortality of European troops at Madras from all diseases. It is noticed, moreover, that no fewer than 12 men died of tubercular phthisis in the same year, most of whom had been from 8 to 10 years in the service, and the medical officer attributed the excessive mortality from this disease to the depressed health induced by five years' residence in the moist warm climate of Malabar. It would therefore appear desirable that the relief of European troops stationed on this coast should always be effected at somewhat shorter intervals than is generally the case, and with this precaution there is no reason to suppose that the residence at Cannanore or other stations in these provinces would permanently impair the efficiency of regiments.
BELLARY.	6. *Bellary.*—For a topographical description of this station see the "Medical Board's Report on the Medical Topography of the Ceded Districts." Since the report was written a Sanitarium has been established on an isolated little hill 40 miles north-west of Bellary (Ramandroog), which will, however, be more particularly referred to in the list of Sanitaria for the Madras Presidency, and new and commodious infantry barracks have been built at Bellary to accommodate an entire regiment. But for the occasional outbreak of epidemic cholera in Bellary, the station would stand very high in the sanitary list. It has, however, been visited from time to time very severely by that dreadful scourge of our Indian plains. From the medical board's report above referred to, it is observed that the death rate of Europeans stationed in the ceded districts from 1829 to 1838 was 31 per thousand, and of native troops 16 per thousand. For a later period of 14 years, viz., from 1842 to 1856–7, it was 34 per thousand in European troops, and the native mortality remained exactly the same, viz., 16 per thousand. The diminished value of European life in the later period has been due entirely to losses from epidemic cholera. This will be more easily seen from the following table:—

—		Aggregate Strength.	Total Deaths.	Deaths from Cholera.	Per-centage of Cholera Deaths to whole Mortality
From 1829 to 1838	European - -	9,000	285	62	21·75
	Native - - -	35,999	581	283	48·7
From 1842 to 1856–7	European - -	10,400	359	201	55·9
	Native - - -	56,437	937	488	52·08

Although the station of Bellary itself does not show the above high rate of cholera mortality, yet for the 10 years to which these remarks and the foregoing tables refer, the cholera deaths were 26·6 per cent. of the whole, a very high rate for any cantonment or station. It is observed that troops passing through the ceded districts often suffer very severely from cholera epidemics. Thus, in 1854, a detachment of recruits for the 3rd Madras European Regiment was attacked when within one stage of Bellary, and in a few hours some 30 or 40 men were prostrated, and the medical officer in charge (the late Dr. Cheyne) was seized with and died of the disease. On this occasion the recruits were panic-struck, and many of them hurried off to the cantonment, where fortunately very few cases occurred after the men had been comfortably settled in barracks. From 1854 until the beginning of 1859 the district remained comparatively free from cholera, in fact, no cases occurred at Bellary; but at the latter period the epidemic was general throughout, and the civil and military stations of Kurnool, Cuddapah, Ghooty, and Bellary suffered severely. It is not easy to account for the greater mortality of troops from cholera in the ceded districts than in other divisions of the army. Various explanations have been attempted, but none of them are satisfactory.

A more minute acquaintance with the laws regulating the progress of this mysterious disease will probably lead, at some future time, to a satisfactory explanation of the facts noted. In the meantime, it would be well to bear in mind the following remarkable statistics of two districts or provinces, differing widely in point of geological formation, elevation, temperature, moisture, rain-fall, &c.

Insp.-Gen. Pearse's Report. Madras.	Stations.	Replies.
	Bellary—*cont.*	The per-centage of deaths from cholera to the total mortality for a period of 15 years in the Malabar and Canara provinces was— " - Europeans - - - - 4·6 " - Natives - - - - - 12·4 Ceded districts - Europeans - - - 55·9 " - Natives - - - - - 52·8 If the mortality from cholera is excluded, the deaths in Bellary for the 10 years to which the tables refer amounted only to 13·2 per thousand of Europeans, and 6·1 per thousand of native troops. The station has the great advantage of an isolated hill sanitarium within 40 miles, to which weakly men, or those convalescing from acute disease, are often advantageously transferred. With new barracks, and recent sanitary improvements in the bazaars, which formerly were hotbeds of cholera, and with a railway now in course of formation, by which troops can hereafter be moved to and from the station without exposure to the choleraic poison, often so prevalent in the district, there is every reason to hope that the mortality will be found to be considerably lessened in the returns for the next decennial period.
	Bangalore.	7. This station has for many years been occupied by the head-quarters of the Mysore division of the army. Situated on a high table land, at an elevation of 3,000 feet above the sea, it possesses perhaps the most agreeable climate for Europeans of any station in India. (For a minute description of the topography of Mysore, see Medical Board's report.) Although this admirable climate is highly appreciated by European troops, yet it is found that much sickness often prevails amongst them. There is no doubt that many men, forgetting that they live in a tropical country, expose themselves too much in the daytime, and suffer in consequence from fevers, hepatic affections, dysentery, &c. Cholera has been known to prevail seriously in many parts of the Mysore country of late years, and the troops at Bangalore enjoy no immunity from this disease. The number of admissions to hospital according to strength is lower at Bangalore than at any other station, excepting Wellington (the new military station on the Neilgherries), but as regards the mortality, Bangalore stands fourth on the list. The present barrack accommodation for the European dragoon regiment is not sufficient, but spacious barracks, possessing every advantage in site, ventilation, and sanitary requirements generally, are now in course of erection, and when completed will be second to none in India. A lock hospital, for the reception of women affected with venereal diseases, has been for the last four or five years in operation at this station, and although no coercion is used to bring them to hospital, it is satisfactory to know that these diseases are abating in virulency and frequency. If the European soldier could be kept from imprudences in eating, drinking, and solar exposure, Bangalore would be probably the healthiest, as it is certainly the most agreeable, residence in India.
	Trichinopoly.	This is the principal military station and head-quarters of the southern division of the Madras army. It is situated in north latitude 10° 50′, and east longitude 78° 44′, on the southern bank of the river Cauvery. This is perhaps the hottest station in the presidency, the mean temperature for the year being 85°, as ascertained by accurate observation. The temperature ranges between 102°, in the hottest part of the year, and 68°, the minimum in the cold season. The troops at this station generally consist of one regiment of native cavalry, one battalion of artillery, one regiment of European infantry, and two or three of native infantry. It is noticed by the Inspector-General of Hospitals, D. Macpherson, M.D., in his late report on this station, that the wet cultivation which has sprung up of late years in connexion with irrigation works on the Cauvery river, has, to a certain extent, changed the dry arid heat of the atmosphere during the hot months of the year to a temperature much more bearable, and the salubrity of the station appears to have been improved by it. The artillery barracks are spacious and well ventilated, but the European infantry barracks are somewhat deficient in these respects, although the latter have been improved of late years. There is a project now under consideration by the local government to build new barracks, arsenal, magazines, &c., within a fortification, on a site lately selected and approved of by his Excellency the Commander in Chief, as Trichinopoly is a position of great military importance. Although hot, the climate is generally not considered unhealthy, and of late years there has been a manifest improvement in the sanitary condition of European troops in the southern division, for which the only permanent station is Trichinopoly. Thus the death-rate per thousand from 1829 to 1838 was 39. ditto, from 1842 to 1856–7, 29. The later years of the report show a reduced rate of mortality, so that for the period noticed in the tables it amounted to 19·7. During the official year 1858–9, a period subsequent to the foregoing tables, the 2nd Madras European Light Infantry was stationed at Trichinopoly, average strength 699, 10 men only died in hospital, three from cholera, two from disease of the heart, not the result of climate, four from dysentery and hepatic disease, and one from sun stroke. For the whole official year, the death rate in this regiment did not exceed 14 per thousand. Trichinopoly, like most other stations in Southern India, is liable to epidemic outbreaks of cholera, commencing generally after the north-east monsoon rains, which usually fall in October and November. On looking over the monthly returns of the various regiments, European and native, for the 10 years under notice, it is remarkable how regularly the cholera season sets in with the cold north-easterly winds, which blow regularly from November to March in each year. Occasionally a few cases are found in the returns for the hotter months, but these are evidently sporadic. The disease does not prevail in the epidemic form during the hot weather. In Central India, the North-west Provinces, and Bengal, it is usually found that cholera prevails, and causes the highest mortality in the hottest months of the year. In Southern India the reverse of this is the case, and here is another peculiarity, not generally known, connected with this mysterious disease. Why it should spread readily and with rapidity at one time of the year in one place, and at a different period in another place, is strange, and in the present state of our knowledge, inexplicable.

STATIONS.	REPLIES.

SECUNDERABAD.

This important military post in the territories of his Highness the Nizam has for many years past been occupied by a large force of European and native troops.

Prior to the mutinies of 1857, the following number of corps, &c. were located there:—

1 troop Horse artillery.
Head-quarters and 2 batteries of a battalion of European artillery.
1 regiment native cavalry.
1 regiment European infantry.
5 do. native do.

Since the great influx of European troops subsequent to the mutinies, the force at Secunderabad has been as follows:—

2 batteries Royal artillery.
1 battery Madras European artillery.
1 regiment European cavalry.
1 do. native do.
2 do. European infantry.
4 do. native do.
1 company Sappers and Miners.

The medical topography of Hyderabad, and the station of Secunderabad, will be found fully described in the Medical Board's reports previously referred to. Since the date of these reports, many additions and alterations have been effected in the barrack accommodation. The infantry barracks and hospital have undergone many improvements in a sanitary point of view. The surrounding native buildings have been cleared away from the neighbourhood of the hospital, and the ventilation and drainage of the barracks and privies have from time to time been improved. Large sums of money have been spent with the view of rendering these barracks more healthy for European soldiers, but hitherto with only temporary good effects. Great improvements were made in them about 23 or 24 years back, as regards ventilation, drainage, and better protection from heat and glare, and they subsequently proved healthy for some years. Epidemic dysentery and fever, however, again broke out, which led to the Medical Board expressing an opinion in 1844, that the site of the buildings was irremediably bad; their abandonment was recommended, and the new barracks in Trimulgherry were in consequence erected. The garrison, however, having been increased by an additional European regiment, the old barracks continued to be occupied, and contrary to expectation, the 3rd European regiment from 1854 to 1857, during which they were located in these very buildings, was a particularly healthy corps. The men improved in health and appearance, and in the last year of their sojourn at the station the mortality fell as low as 12 per thousand.

In the year 1853 a medical committee, by order of Government, reported on the barracks and condemned them, and fixed upon a site for new buildings. In the end of 1854 the new barracks at Trimulgherry were commenced, and in the beginning of 1857 were occupied by a wing of Her Majesty's 12th Lancers, and subsequently they have afforded accommodation to Her Majesty's 1st battalion 1st Royals, and two batteries of Royal Artillery.

The new barracks and hospital are considered the best, in point of ventilation, cubical contents, situation, &c., of any in the presidency. The water supply is good, but it appears that no special provision has been made for drainage from the privies, cook-rooms, &c., but as the "dry system of conservancy" is most applicable to all Indian cantonments in the plains, the omission is not of very grave importance. Arrangements are now in progress for carrying off spare water and liquid sewage.

The artillery barracks are situated on high ground to the north of the parade ground, one of the best sites which could be found in the neighbourhood. The buildings are not lofty, having arched, bomb-proof roofs, but capable of ventilation by open doors and windows. They are never overcrowded. A remarkable difference in the rates of mortality of the artillery and infantry at Secunderabad has been noticed, and this chiefly from the comparative exemption of the former from the peculiarly bad type of dysentery, which often prevails in the old infantry barracks. On the examination of the returns of sickness and mortality of Europeans stationed at Secunderabad for a period of 20 years, some very curious facts have come to light. It is shown distinctly that the mortality amongst the infantry regiments of Her Majesty's service has *nearly doubled* that of European regiments of the East India Company's service, *occupying the same barracks*, but at different periods. The following simple table has been constructed, with the view of showing this fact in a clear light.

Year.	Queen's Regiments.	Death Rate per Cent. to Strength.	Year.	East India Company's Regiments.	Death Rate per Cent. to Strength.
1838	H. M. 55th Regiment -	7·49	1840	1st Madras Fusiliers - -	4·97
1839	Ditto - - -	5·95	1841	Ditto - - -	3·67
1843	H. M. 4th Regiment - -	10·92	1842	Ditto - - -	4·15
1844	Ditto - - -	6·24	1850–1	2nd European Light Infantry	2·55
1845	Ditto - - -	2·98	1851–2	Ditto - - -	6·27
1846	H. M. 63rd Foot - -	6·71	1852–3	Ditto - - -	0·52
1847	H. M. 84th Regiment -	3·52	1853–4	Ditto - - -	1·33
1848	Ditto - - -	2·64	1854–5	3rd Madras European Regiment.	5·65
1849–50	Ditto - - -	2·63			
1858–9	H. M. 1st Battalion 1st Royals	9·64	1855–6	Ditto - - -	2·11
			1856–7	Ditto - - -	1·23
	Average for 10 Years -	5·87		Average for 10 Years -	3·87

Thus in the 20 years the mortality has been as follows:—

Queen's regiments located in the infantry barracks 58·7 per thousand.
Honourable Company's ditto 38·7 do.
Do. Artillery in artillery barracks 27·6 do.

The occurrence of the lower mortality rate in the artillery is explained by the fact that the men of this corps never suffer to any great extent from attacks of epidemic dysentery, as do

STATIONS.	REPLIES.
Secunderabad—*cont.*	the troops located in the infantry barracks. Dysentery is by no means uncommon amongst them in the unhealthy seasons which now and then prevail, but it is generally more amenable to treatment than the same disease in the European infantry. The artillery, however, are not so much exposed to night duties, and are better sheltered than the infantry; they, in fact, have only their own regimental guards to take, and this, as well as their having seasoned men, is doubtless the reason why they suffer less from climatic diseases than the other troops. The marked difference in the rates of mortality of the infantry of Her Majesty's and the Honourable Company's service respectively, is not so easily explained. The men of both services were exposed to unhealthy seasons, and as a rule suffered more in the first year of occupation than at any subsequent period. This is particularly marked in the case of Her Majesty's 4th King's Own 63rd Foot, and 1st battalion Royals in the years 1843, 1846, and 1858–9. Some Queen's corps have maintained a fair ratio of health in these barracks. Her Majesty's 84th, for instance, lost very few men during the three years of its occupation of the barracks. It does not appear that the difference of mortality is attributable to greater overcrowding in one class of regiments than in the other. Her Majesty's 55th regiment lost 7·49 per cent. when the average strength of the corps was only 694. Her Majesty's 84th, on the other hand, with an average strength of 1,100, lost in the year 1848 only 2·64 per cent. Again, the 2nd European light infantry in the year 1851 lost 6·27 per cent. of its average strength, which was 988, but in the following year, the strength remaining nearly the same (964), the regiment lost only five men, or 0·52 per cent. Her Majesty's 1st battalion, 1st Royals, arrived at Secunderabad in the beginning of 1858, about 1,200 strong. The regiment was composed for the greater part of young lads under 20 years of age, with but a few soldiers; it occupied the old infantry barracks, and it is calculated, allowing for men on duty, sick in hospital, and two companies stationed elsewhere, that the ten barrack rooms must have accommodated about 880 men. Deputy Inspector General Cole, in his report for 1858–9, calculates that at this rate each man must have had about 1,200 cubic feet of space. Still with this amount of space, the season being an unhealthy one, the regiment lost nearly 10 per cent. of its strength, chiefly from dysentery of a malignant type, and hepatic abscess. In an endeavour to account for the very marked difference in the rate of mortality in the Queen's regiments and in those of the East India Company, as shown by the foregoing table, something, it is believed, may fairly, and it is hoped without its appearing invidious, be ascribed to the fact that all the medical officers who have been in charge of the East India Company's regiments have been men of great experience in the treatment of Indian diseases, and selected on account of peculiar fitness for these particular charges, and likewise to the circumstance that every medical officer of the Madras service is required to undergo a probationary course of hospital attendance on first arriving in India, for the purpose of becoming acquainted with tropical diseases and those peculiar to the country. Whereas, in the other service, the medical officers have not these advantages, and it sometimes happens that the surgeons of newly arrived regiments who have never served in India, have all their experience of Indian diseases to gain, their men besides being equally unacquainted with the climate, until by dear-bought experience they learn to fall into the ways and habits of the country. The wing of Her Majesty's 12th Lancers, occupying the new barracks at Trimulgherry during the same period suffered severely, though in a less degree than the 1st Royals, from the epidemic. The average strength for the year was 310, and the deaths 25, of which number 21 resulted from dysentery and hepatic abscess, the deaths to strength being 8·06 per cent. The general idea amongst medical and military officers was, that the new barracks would be exempt from the epidemic visitations which have proved so destructive to life in the old locality, but the experience of the last year goes far to show that in certain malarious seasons, no matter where the troops are located, or how favourably they may be placed as regards sanitary requirements, dysentery and hepatic disease will always be fatal to the European soldier at Secunderabad. The new barracks are at present occupied by the 1st Royals and two batteries Royal Artillery, and the old infantry barracks after undergoing many alterations and improvements, are occupied by Her Majesty's 17th Lancers. It remains to be seen whether with the comparatively small body of men of a cavalry corps, the old will be inferior to the new buildings in a sanitary point of view. Compared with most other stations, Secunderabad cannot be considered a healthy residence for Europeans. For a period of 15 years, ending 1856–7, the death rate of the European portion of the Hyderabad Subsidiary Force, the greater portion of which is stationed at Secunderabad, was 34 per thousand, and for the last 10 years of this period, which were comparatively healthy, the deaths at the station of Secunderabad were at the rate of 24 per thousand, as shown in the preceding tables.
KAMPTEE.	This station, distant about 10 miles from the capital of the Nagpore province, is occupied by the European and native troops of the Nagpore Subsidiary Force. The force consists of a troop of European Horse Artillery, a battery of foot artillery, an European infantry corps, one regiment of native cavalry, and three of native infantry. The peculiarities of the situation, in a sanitary point of view, are the great extremes of temperature which prevail in the hot and cold seasons. In the hot season, deaths from insolation, or heat asphyxia, are not infrequent amongst the Europeans. Cholera and small-pox epidemics occasionally visit the station. Remittent and intermittent fevers are common, especially after the setting in of the rains. These forms of fever are often obstinate, recurring periodically for years, and rarely leaving the patient while continuing to reside in the malarious locality. It has been observed of late years that these fevers have been more amenable to remedial measures, but this is probably the result of an improved method of treatment. It appears from the Medical Board's topographical description of the station, which will be found in the volumes herewith transmitted, that the death rate at Kamptee from 1829 to 1838 amongst Europeans was 39 per thousand. For the 15 years ending 1856–57, the mortality had somewhat diminished, the death rate being 37 per thousand, and for the last 10 years of this period, as shown in the table, it was only 29. European invalids at Kamptee labour under the great disadvantage of being cut off for many months of the year from the possibility of change to a sanitarium or healthier station. The geographical position which it occupies

STATIONS.	REPLIES.
Kamptee—*cont.*	makes a long and tedious land journey necessary to reach either coast, and in the wet or hot seasons it cannot be accomplished without considerable risk or injury to health. The Chiculda range of hills have been resorted to by European officers and their families during the hot months, and as they rise to an elevation of 3,800 feet, the change of temperature is found to be very agreeable, but it has not been practicable hitherto to send the invalids of the force thither. Another range of hills, the Muthoor, near Chindwarra, about 70 miles north-west of Kamptee, has now been visited and reported on by a committee of military and medical officers from the force, who were accompanied by a small party of soldiers, with a view to fixing upon a suitable site for a sanitarium. These hills are easily approached and appear to have a large extent of table land on their summit, supposed to be between 3,000 and 4,000 feet above the sea level. From all that we know at present concerning them they appear to be admirably suited for the Kamptee sanitarium.
MADRAS.	The European troops stationed at the Presidency town are located in barracks in Fort Saint George. There is accommodation for one regiment of European infantry, and about two companies of artillery belonging to the veteran battalion. Considerable improvements have been made of late years in the barracks, which are two-storied, and now furnished with verandahs all round. It is not very easy to account for the low position of Fort Saint George in the sanitary list. Situated close upon the sea, and enjoying the purifying influence of the sea breeze all the year round, the barracks in the fort ought to be a healthy residence for European troops. They have, however, been faulty in some respects. The lower story being on a level with the ground, and the fort wall and other buildings facing the sea keeping off the sea breeze from the lower rooms. It has been noticed by some of the medical officers of regiments occupying these barracks that a larger proportion of sick came from the companies inhabiting the lower rooms than from the upper story. The sea wall of the fort has lately been lowered, and the ventilation has been considerably improved thereby, even in the lower story. The medical officer of the regiment (43rd) thinks that the strong sea breeze now blowing through the buildings, causes an increase of pectoral disorders in the men. Sporadic cases of cholera occasionally occur in the fort, but the number of deaths from this cause have never been large. In the 10 years under notice, cholera prevailed during 4 of them, and in the year 1854, 9 men died from this disease. In the above period 19 deaths from cholera occurred out of a total of 226 cases treated. In the late severe epidemic of cholera which visited Madras, in 1860, the European troops in barracks almost entirely escaped, and there is no doubt that the improved buildings and the larger amount of space available has had a very satisfactory influence on the health of the corps at present stationed in Madras, viz., Her Majesty's 43rd Light Infantry.
WELLINGTON.	The next station was formerly known as Jackatalla (now called Wellington), on the Neilgherry hills, at an elevation of 5,840 feet above the sea. With reference to the low position of this station in the general list, it may be briefly explained that the period for which the average has been deduced was only three years, that the regiment which occupied the station, Her Majesty's 74th Highlanders, was indifferently housed on its first arrival, and that fevers and bowel complaints were very severe and fatal. The new barracks are now sufficiently complete to accommodate the 3rd battalion, Her Majesty's 60th Rifles, 1,200 strong, and this corps has been very healthy during the two years it has been stationed at Wellington. There is no doubt that further experience will show this station to be very well adapted for the location of European troops, and to preserve them in good health. One great advantage of the situation over all low country stations is the difficulty which the soldiers have of procuring deleterious liquor, or of indulging at all in intoxication. On this account, probably the hill station will not be a popular one with the men.
SAINT THOMAS' MOUNT.	The head-quarter station, Saint Thomas' Mount, of the Madras Artillery, situated 8 miles to the south of Fort Saint George, enjoys a similar climate and temperature to Madras. The heavier rate of mortality arises from the transfer of sick men from distant stations to the head-quarters for change of air or invaliding, and not from any preventible source of disease.
STATIONS IN BURMAH.	Rangoon, Tonghoo, Thyetmyo. } It will be observed that the Burmese stations show in the accompanying table the heaviest death rate of all. It must be explained that the averages were drawn for a period of five years, which included, moreover, the second Burmese war of 1852–3. At the period referred to none of these military stations existed, and on the first occupation of the Pegu provinces the troops, European and native, suffered very severely from dysentery and fevers. The stations now occupied by European troops have been getting healthier year by year, as the surrounding country has become cleared, and suitable accommodation provided for the men. For the last three years the death rate of Europeans in Burmah has not exceeded 17 per 1,000. There has been very little cholera amongst European troops since 1853. Dysentery and hepatic affections are the principal diseases, but these have diminished greatly of late years. Considering the great improvements which have taken place in the last three or four years, there is every reason to hope that the station in Burmah will be less injurious to the health of European troops than the majority of those in the Madras presidency. Native troops do not thrive well in Burmah, and measures are about to be taken to replace them, so far as possible, by police and local corps.
EXISTING SANITARIA IN THE MADRAS PRESIDENCY. 1. *Neilgherry Hills.*	1. Neilgherry Hills, including the Stations of Ootacamund, Coonoor, Kotagherry, and Wellington, the latter containing barrack accommodation for a regiment of 1,200 men, and a convalescent depôt. These sanitaria are so well known and appreciated that they need not be particularly described here. (*Vide* Topographical Report for southern division.)
2. *Ramandroog.*	2. A hill, distant 40 miles in a north-west direction from Bellary, elevation 3,400 feet above the sea. There is barrack and hospital accommodation here for 80 men. Invalids are sent here from Bellary and from Secunderabad, the latter station being about 200 miles distant. Cases of debility after bowel complaint, fevers, &c., usually do very well at this elevation. The locality is free from malaria.

INSPECT.-GEN. PEARSE'S REPORT. MADRAS.

STATIONS.	REPLIES.
3. *Gallicondah.*	3. A hill region called Gallicondah, in the northern division, about 50 miles west of Vizagapatam, has recently been experimented upon as a sanitarium. The result of the first year's trial in a locality called Harris Valley was not satisfactory, but the failure probably may be attributed to the faulty nature of the situation and construction of the buildings erected for the accommodation of the trial party. It is intended during the approaching hot season to erect better buildings at a somewhat greater elevation, on a hill known as Grant's Range, and to give this a trial before deciding for or against the suitability of the Gallicondah range as a sanitarium. The presidency of Madras is particularly favoured in the number and extent of its hill ranges, suitable for the location of European troops or independent settlers. The chief of these hill ranges, with the peculiar advantages or disadvantages of each, will be here briefly noticed.
4. *Shevaroy Hills.*	4. This hill range is situated about five miles to the east of the town of Salem, and within the Salem collectorate or district; elevation 5,400 feet. They were originally explored in 1822, and visited by several European officers stationed in the adjoining low country; but some fatal cases of fever having occurred amongst the earlier visitors, they ceased to be resorted to by invalids. Of late years Europeans and East Indians have settled on the Shevaroys for the cultivation of coffee, and they, for the most part, enjoy good health. These hills are occasionally unhealthy during the months of May, June, and July; and on this account they have never been recommended as suitable for the location of European troops. The climate is, however, most delightful, and preferred by many persons to that of the Neilgherry Hills; and, railroad communication being now open to Salem, there is no doubt that the number of settlers and visitors will largely increase. Probably with increase of coffee cultivation on the hill slopes the periodical outbreaks of fever may be averted or diminished in severity, and this range may ultimately be found suitable for the location of troops.
5. *Pu'ney Hills.*	5. These hills are situated in the southern division of the presidency, between latitude 10° 10′ and 10° 44′, and longitude 76° 21′ and 77° 22′. Elevation of the higher plateaus about 7,000 feet. Climate very similar to that of the Neilgherries, but milder and less rainy in the south-west monsoon. The collector of the district and a few American missionaries have houses on these hills, and the climate is perfectly suitable for Europeans. At present very few, if any, European settlers have resorted to this range, although the soil and climate are considered to be favourable to the cultivation of tea and coffee. The nearest military station occupied by European troops is Trichinopoly, 80 miles distant.
6. *The Anamullays.*	6. The upper ranges of these hills, which attain an elevation equal to that of the Neilgherries, are entirely uninhabited. The temperature is much the same as that of Ootacamund, but the higher peaks being much exposed to the south-west monsoon, the rains are very heavy for six months of the year. In fact, it is doubtful whether the climate during these months would be at all suitable for the residence of Europeans. The lower ranges, from 3,000 to 4,000 feet above the sea, are visited by the forest department for a few months in each year in search of teak-wood, but they can only be occupied during the rains, being at other seasons very feverish to strangers. The natives of these hills, a race termed "khaders," curiously enough, never suffer from fever, unless they go to the low country. The higher ranges of these hills appear to be well adapted for the growth of tea and coffee; but the difficulty of approach and want of labour on the spot will prevent settlers from occupying them. With so many more favourable situations for European troops in the southern division, these hills will never be required for a sanitarium.
7. COORG.	7. *The mountain regions of Coorg* are very well adapted for the residence of Europeans, but no European troops are now stationed in that country. Independent settlers are, however, becoming every year more numerous, and the cultivation of coffee is carried out on a large scale in various localities.
8. MYSORE.	8. *Mysore.*—Several hill ranges, varying in elevation from 4,000 to 5,000 feet, exist in this country, but it is doubtful whether any of these are so well adapted for European troops as the military station of Bangalore, the climate of which has already been noticed.
9. NAGPORE.	9. *The Muthoor range of Hills in Nagpore* appears to be well adapted for a sanitarium for the military station of Kamptee. Plans and estimates for the necessary buildings were lately submitted to the Supreme Government, but it is understood that the experiment cannot at present be proceeded with on account of the expense it would entail.
10. BURMAH.	10. *Burmah.*—It is reported that hill ranges exist in the Pegu provinces, and within reasonable distance of some of the stations occupied by European troops. These, however, have not as yet been sufficiently explored, to permit us to arrive at any conclusion as to their salubrity. The papers named below will give in detail most of the particulars required regarding the known hill ranges of this presidency.*
REMARKS ON PRINTED QUERIES—Clause 4.	Troops usually arrive from England between the months of July and December, or after the termination of the hot season. Recruits for the artillery and local European regiments are usually landed about 4 P.M., and marched off at once under escort of a European officer with a sufficient number of non-commissioned officers and men to keep them together, either to the artillery barracks at St. Thomas' Mount, distance 8 or 9 miles, or to the European depôt at the same place. Of late a depôt has been established at Arcot, distance 60 miles from Madras, to which place infantry recruits proceed by the railroad. Supper is provided for the men on arrival at the mount, cots, bedding, &c., being all prepared for their use under the usual barrack arrangements. The sick are conveyed either in doolies or sick carts to the artillery or depôt hospitals, and bad cases which cannot be moved to the mount or Arcot are at once admitted into the general hospital at Madras, within half a mile of the beach. Drafts of men for the British regiments are under similar arrangements marched to Poonamallee, distant 14 miles, to the depôt for that branch of the army.

* Proceedings of Government, dated 22nd November 1859, 15th March 1860, and 28th March 1861.—Report on Ramandroog Sanitarium, by Dr. Eyre.

STATIONS.	REPLIES.
Remarks on Printed Queries—*cont.*	Regiments on arriving, and intended to garrison Fort St. George, are at once marched into barracks on landing. As a general rule all European soldiers are restricted to barracks from a certain hour in the forenoon, usually from 8 A.M. till 4 P.M., this being a regimental arrangement which rests with commanding officers. The men are not allowed to go at large, and reading or coffee rooms, skittle alleys, &c., are attached to all European barracks for the amusement and recreation of the men. A staff of police peons accompanies detachments of troops marching to the depôts to keep off natives who would otherwise provide them with smuggled spirits, cigars, &c., and without some such arrangement, no doubt, the greater portion of the men would become intoxicated before reaching the end of the march. As it is only an occasional case of drunkenness occurs in those who escape the vigilance of the escort. There can be no doubt but much preventible disease arises from intemperance in European soldiers, the remedies for which undoubtedly are in the hands of the military authorities. They are chiefly the adoption of measures for preventing deleterious liquor being smuggled into barracks, providing wholesome spirits, malt liquor, &c., at the regimental canteens, restriction as to the quantity and encouraging men to habits of temperance by suitable rewards and advancement in the service, and lastly, by providing suitable amusements to lessen the tedium of a barrack life. Under ordinary circumstances, newly arrived drafts remain at the depôts until a sufficient number of men is collected to proceed to join a particular regiment or station; when no emergency exists, the batches of recruits, &c., leave the depôts between the end of October and the early part of the year according to distance. Proceeding from Madras towards Bangalore, and such stations as can be reached by that route, advantage is now taken of the railroad, open for about 120 miles westward of the Presidency. Since the year 1857, a system of moving troops by transit carts, instead of marching, has been adopted with the best results, many lives having no doubt been saved by escaping outbreaks of epidemic cholera, fevers, and other diseases incidental to long marches in India. These arrangements have been carried out between Madras, Bangalore, and the Neilgherries; also between Masulipatam, on the coast, and Secunderabad, and between Tranquebar, on the coast, and Trichinopoly. In other cases the reliefs between the several stations on the coast, such as Cannanore, Vizagapatam, Masulipatam, Madras, Tranquebar, &c., are carried out by means of steamers or transport ships. Recruits are always accompanied on the line of march by experienced non-commissioned officers and soldiers under one or more commissioned officers, and all possible precautions are adopted for preventing liquor being smuggled into camps. The hour of marching is usually about 3 A.M., so as to arrive at the new encamping ground about an hour or so after sunrise. Coffee is now always provided about half way on the line of march, and partaken of during a half hour's halt. Doolies and sick carts are provided for the carriage of the sick and foot-sore men, &c., in the proportion laid down in the quartermaster-general's regulations, and likewise tents in sufficient number according to strength, straw being allowed for the floors on which the men place their carpet or bedding.
Clause 5.	1st. It has long since been shown by Dr. Ballingall, professor of military surgery, University of Edinburgh, that seasoned soldiers are much less obnoxious to the injurious effects of a tropical climate than newly-arrived recruits, and all subsequent experience seems to establish the correctness of Dr. Ballingall's views and statements. Plethoric European young men arriving in India are not only more liable to fall into vices and habits in some measure incidental to their period of life, and contract syphilitic diseases, but suffer from the excitement occasioned by high temperature, without actual exposure, more than seasoned men. I should therefore say that from about 24 to 30 years of age is the best period of life for a soldier to land in India. 2nd. The amount of previous service before arriving in India should, under the view just stated, and supposing a recruit to be enlisted at the age of 18 years, not be less than six years. 3rd. In Southern India there is no doubt but the climate of Bangalore is the most suitable for newly-arrived Europeans. It is intermediate between the extreme heat of the plains and the cold of the hills (Neilgherries). Men become acclimatized and experienced in the many peculiar ways, and the mode of life in India, so different from previous habits. I would therefore prefer having a large depôt sufficient to accommodate the newly-arrived drafts of each year, established at Bangalore, than any other place or station I could name. The experiment of sending a newly-arrived regiment to Wellington on the Neilgherries proved a failure in one (the first) instance in which it was tried, the mortality from dysenteric complaints having been great, partly no doubt owing to suitable accommodation not being then available for the entire of the regiment. Every allowance being made for imperfect arrangements, I am still of opinion, that men passing the first year or two of service in the climate of Mysore would be more efficient for general service in whatever part of India they might be called on to serve, than if they had passed the same time in the Neilgherries or other hill stations. 4th. From the Mysore country the recruits or drafts may at the end of a year or two be sent to any other part of the Presidency where their services are required. As to the length of time a soldier should serve in India, instances are frequent of men being invalided as worn out at as early an age as 34 or 35 years, but many such have arrived in the country much under 20 years, some perhaps not more than 17 or 18; whereas had they arrived at the age of from 24 to 26 they would be in the prime of life and full vigour of manhood at ages when now often invalided as worn out and unfit for further effective service. Under a different system from that which has heretofore obtained, there is, I conceive, no reason to doubt but that most men arriving in India at the age, say, of 25, could serve with perfect efficiency from 12 to 15 years, and then return to their native land still effective soldiers. 5th. As regards the marriage of soldiers, I possess no information which would enable me to express an opinion on the subject.
Clause 6.	The general remarks above recorded as regards the protection of health on landing, transport to the interior, &c., will be found to contain nearly all that is requisite to be said on this subject. But there is one point not alluded to which I think of very great importance. It has been found that recruits joining the different European regiments of the local army very soon become acquainted with the ways and habits of the older soldiers, who, with the one exception of being unable to resist the temptation of drink, know well how to make themselves comfortable either in barracks or in the huts of the married soldiers, and to avoid the

STATIONS.	REPLIES.
Remarks on Printed Queries—*cont.*	injurious effects of unnecessary exposure; whereas newly-arrived European regiments have everything to learn of themselves, and are all alike inexperienced regarding the effects of climate or Indian mode of life, from the colonel to the drum-boy. Medical officers have arrived in India in charge of regiments and drafts of soldiers during the late mutinies who were wholly unacquainted with the diseases of a tropical climate or those peculiar to India, and some had never previously seen a case of acute dysentery, hepatitis, or cholera. Still, though thus inexperienced, and having everything to learn, they were entrusted with the charge of hospitals full of all descriptions of Indian diseases, requiring for their proper management the experience of years. Fortunately the excellent staff of Madras medical subordinates was available in large numbers to do duty with these newly-arrived regiments, and the medical officers of Her Majesty's service have one and all borne ample testimony of the invaluable aid they received from the apothecaries and native dressers of the Madras army during the late field service in Bengal.
Clause 7.	*A List of Hospital Equipments.* 1 painted iron or wooden cot, with tape, and stone troughs. 1 palliasse of straw when marching or in the field. 2 quilts of gingham, both lined, one of them quilted with cotton—*clean once a week.* 1 blanket. 2 pillows. 1 bed-gown—*twice a week.* 1 pair of trousers, ditto. 1 cap of gingham, lined, ditto. 1 white cotton shirt—*every second morning.* 1 flannel banyan. 1 pair flannel drawers. 1 pair short worsted stockings or flannel socks. 1 flannel waist-band. 1 cap lined with flannel. 2 cotton shirts. Proportion of the above kept as stock for every 100 men. 60 shirts. 40 quilts. 30 gowns. 30 caps. 30 banyans. 30 pairs long drawers. 150 towels. 150 suttringees for each regiment of infantry. 100 ditto ditto dragoons.

Office of Principal Inspector-General, Medical Department,
Fort Saint George, 12th April 1861.

GEO. PEARSE, M.D.,
Principal Inspector-General,
Medical Department.

ADDENDA.

1.—MILITARY DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Papers:—From the ADJUTANT-GENERAL of the ARMY, Fort Saint George, 1st November 1859, No. 1171, to the SECRETARY to GOVERNMENT, Military Department.

I have the honour, by order of the Commander-in-Chief, in forwarding for submission to the Honourable the Governor in Council, the accompanying extracts from Reports by the Inspector-General of Hospitals, on the Pulney, Neilgherry, and Annamullay Hills, with the remarks of the Director-General Medical Department appended thereto, to submit the following observations.

2. *Pulney Hills.*—The Commander-in-Chief quite concurs in the observations of the Director General, as per margin, and for other reasons also, his Excellency would not think of recommending that effect should be given to the suggestions of the Inspector-General for the location of a European corps on the Pulney hills instead of at Trichinopoly.

States that the Pulneys are described as possessing an agreeable and bracing climate, well adapted to preserve the health and efficiency of European troops—that they are only healthy for about nine months of the year; during the remaining three months, viz., from April to June inclusive, decidedly unhealthy, and that he is unable to concur in the recommendation of the Inspector-General for the erection of the proposed barracks for a European regiment on the Pulneys instead of at Trichinopoly for various obvious medical reasons, and as it is not probable that Government would incur the double expense of providing barracks at Trichinopoly as well as the Pulneys, which must be the case if the latter are occupied for removal of the troops during the three unhealthy months, which embrace the hottest part of the year.

3. *Neilgherry Hills.*—As both the Director and Inspector-General see reason to object to the rule for assembling annual committees on sick officers on the Neilgherries, his Excellency thinks that paras. 9 and 10, G. O. G. No. 178, dated 10th August 1847, should be abrogated or modified.

4. *Jackatalla.*—The Commander-in-Chief quite agrees with the Director-General that regulations adapting the dress of the troops to the climate should be issued by officers commanding regiments stationed on the hills, that white jackets and trousers, except worn at mid-day, are unsuited to the climate, and that want of attention to this particular is a fruitful source of disease in persons newly arrived on the hills. His Excellency has accordingly caused a communication on this subject to be addressed to the officer commanding southern division.

5. *Annamullay Hills.*—So far as concerns military purposes, the Annamullay range is quite useless, while we have abundance of ground available on the Neilgherries, the salubrity of which has been proved by the test of experience.

EXTRACTS from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

The Pulney Hills.

Series No. 2, dated 7th September 1858. Southern Division.

"The increasing interest taken by Government in all hill stations in India which are adapted as a residence for our English soldiers induced me, when on inspection duty at Madura, to visit the Pulney hills in company with Mr. Colebrook, the Zillah surgeon of the station, who has resided on them at intervals for many years past.

2. "It is now 22 years since Captain Ward of the Surveyor-General's Department first visited and reported on these lofty mountains. *Vide* 'Madras Literary Journal, Volume VI.

3. "Two years after the date of Captain Ward's visit, Dr. Wight, of the Madras Medical Department, reported

on their vegetable products. *Vide* 'Madras Literary Journal,' 1837.

4. "The Society for the Propagation of the Gospel established a mission on the table land of the Pulney hills ten years since, which they denominate 'Mount Zion.' In their Journal for 1851–2 there are a series of interesting letters descriptive of the country and its inhabitants, and of the silent, yet steady, introduction of Christianity amongst them.

5. Mr. T. Clarke, of the civil service, whose family resided on these hills for a long series of years, in his report to Government dated May 1853, treats on the same subject; and Captain Horsley, of the corps of Engineers, in August 1855, drew the attention of the chief engineer to the expediency of improving the communications between these hills and the plains.

6. In the following remarks I propose submitting the results of my personal inquiries, and also such particulars of interest as I have been able to glean of these elevated regions, as yet little frequented or known except to those who reside in their immediate neighbourhood.

7. "Thornton's Gazetteer" gives the latitude of the Vurragherry and Kunnundaven mountains, now commonly called Pulney, from their vicinity to the famous temple of that name, between 10° 10′ and 10° 44′, and the longitude 76° 21′ and 77° 22′.

8. They are distant from Trichinopoly, the head-quarters of the southern division of the army, about 80 miles, and about half that distance from the civil station of Madura. They lie west of Dindigul, south of Pulney, and north of Periacolum. According to Captain Ward, the elevation of the plateau land is 7,000 feet above the level of the surrounding plains, some of the peaks and ridges having a still higher elevation. The superficial area of the hills is calculated at 800 square miles; their length from east to west is 54 miles, and their medium breadth 15 miles.

9. *Passes.*—"The principal passes from the low country are—1st. On the north, from the village Pulney to Poombaray, a hill village to the west, and Veelputty, a hill village to the east. 2nd. On the west from the village Rutteambady to Maravanoor, a hill village to the west. 3rd. On the north-east from the village Periacolum to Kakakanal, a hill village to the west. 4th. On the south-east from the Davedunaputty to Palamalay and Sambanoor to the north-east. The slope by each of these passes seldom exceeds 1 in 12.

10. *Topography.*—"The hills are divided by the hill-people into two distinct portions, viz., the *Mel and Kel Malai*—the high and low, or eastern and western ranges.

11. "To the west, the table land reaches 7,000 feet, and gradually descends to the east, forming distinct plateaus at intervals of about 1,500 and 1,000 and 500 feet, until the plains are reached. The ranges are connected to the Travancore and south-west mountains by an isthmus about eight miles wide, being isolated on every other side. To the south the hills are excessively steep, presenting at their summit a magnificent wall of granite. To the north and east they slope downwards towards the low country in extensive broken ridges, and to the west the hills fall gradually and form at their base the valley of Ungeenad, from which the ground again rises abruptly to the south-west.

12. "The higher lands are free from wood and are covered with grass. The spurs which run down in every direction are intersected with deep ravines covered with dense luxuriant forest, resembling the sholas on the Neilgherries, and affording a greater variety of timber the nearer they approach the open country.

13. "In the heart of these mountains are situated rich and fertile valleys, which, intersected by numerous streams of various magnitude, picturesquely contrast with the bare and rugged heights which surround them, and in some spots present a view in the highest degree sublime."

Streams.—There are upwards of 30 large streams on these hills, which uniting form 11 respectable rivers. From the summits of the higher peaks overtaking the plains, these rivers are seen meandering through dense forests, down deep ravines, and over cultivated valleys, and finally pass down to irrigate the rich districts of Madura and Dindigul.

14. "The chief of these is the Nankosi river, which rises in the Puchamally hills, precipitates itself down to Kotalvilly, in a perpendicular cataract of 150 feet, into a deep basin worked by the force of the fall into the rock below."

15. *Villages.*—"The sites of the villages are generally selected with much taste. The houses are irregular clusters, built of mud and stone, and thatched. They have each a fire-place, and sheds for cattle are attached. The slopes in the vicinity of the villages are formed into terraces, on which are cultivated garlic, mustard, barley, wheat, and a grain similar to oats. As we descend rice fields gradually rise in a succession of terraces, irrigated from above by artificial canals.

16. Mr. T. Clarke, who from his long residence on the Pulney hills is the best authority we possess, states that they may be divided into seven grand divisions, being so many portions of their length and breadth, principally marked off by large and prominent ridges or by rivers running across the hills, as follows:—

1st. *Yettoor*, or the eight villages (sometimes called Manavanoor, from the largest of the eight), at the extreme west is of a parallelogram form. The river Ambravutty, after running a course of a few miles from its source to Munjaputty, where it receives the Tennar, forms the western boundary of these villages, and separates them on that side from Travancore and Coimbatore to the south, the zemindars of Bodmaikanoor and Vadagherry border their limits, and on the north the village of Poombaray with its hamlets intervene between them and Pulney, and on the east the same village divides Yettoor from Vilputty.

2nd. "Poombaray, bounded on the north by Balasamoodrum and the Rethumbody Zemindary, on the south by Yettoor and the Vadagherry Zemindary, on the east by Vilputty, and on the west by Travancore and Coimbatore.

3rd. "Vilputty, separated in the west from Poombaray by the high and marked ridge which forms the Tennavaray peak, and on the north from Cowanjee and other hill villages belonging to the Aycoody Zemindary, by the no less remarkable ridge which runs along the base of the highest point on these hills known as Perumal Malai. The ridge continues on the east side of Perumal Malai, and separates Vilputty from Tandygoody; on the south, Vilputty is bounded by the hill villages appertaining to the Vadagherry Zemindary, and the exterior ridge of the hills.

4th. "*Cowanjee*, embedded in high rocks, is bounded on the north and west by the villages of Balasamoodrum and Aycoody, on the east by Putchaloor and Tandygoody, and on the south by the village of Tandygoody.

5th. "The *Pareyoor Hills* are very extensive, covering an area of about 90 square miles, and are in the form of an isosceles triangle, decreasing to a point on the north side. They are bounded on the south by the Tandygoody hills, on the east by the Andaloor hills and by the Patchamaly range, on the north and west by the villages of Virupatchy on the plains and the villages of Cowanjee.

6th. "*Candimalai*, *Andaloor* and *Manaloor* hills form the eastern boundary of the hills, and are bounded on the north by Pulkanooth and Cunnivady; on the east by Durmattooputty and Ahtoor, on the south by Narasingapooram and Ayempolliem, and on the west by Tandygoody and Patchaloor."

7th. "The Tandygoody hills are bounded on the south by Davadunaputty; on the west by the river Ambavy and Permal Malai, on the north by Pereyoor, and on the east by Manaloor."

17. "Of these divisions, the 4th and 6th belong to the Zemindaries of Ayacoody and Cunnivady; and the 1st, 2nd, and 3rd form the upper range, and the 5th and the 7th the lower range of the hills."

18. *Inhabitants.*—"The inhabitants of these hills are supposed to number about 4,000 of both sexes. The villages have a mixed population. Some, who live by plunder, have a savage and ferocious look, but the majority are a mild and inoffensive people. They are divided into the following tribes:—*Paliars*, *Korravours* (or Mountaineers), *Asariers* and *Chetties*."

19. "There are also a few scattered families of a wild tribe of Polyars, who dwell in the woods, and subsist chiefly on honey, roots, &c. They live in caves or on flat forms erected on trees in the heart of forests. Their habits are very erratic, and they are shy of strangers."

1st. "The Paliars are supposed to be the aborigines of these mountains, and according to their traditions they date their possessions as far back as four or five centuries ago. They are a people perfectly distinct from those of the plains, in habits, feelings, and dialect, being free from many of their prejudices and superstitions."

2nd. "The Korravours profess to be the hereditary masters of the hills, but this is evidently a convenient tradition of their own, for there are other traditions extant, which show that they took possession in violation of the more ancient claims of the Paliars. To judge from appearance, they are a mixed race, descended probably from different castes, whose fathers emigrated from below. They are the chief landed proprietors, and hold the Paliars in a kind of

serfdom, exacting from them every menial species of labour, in return for which they permit them to cultivate land in the most sequestered parts of the mountains, grant them liberty to eat the flesh of dead animals, and to make use of such fruits and herbs as are found in the woods—notwithstanding their degraded position, the Paliars possess a considerable influence as priests and physicians. They alone understand the use of medicinal herbs, and the virtue of their incantations, as well as of their medicines, are highly extolled and deemed equally efficacious."

3rd. "The Asaries are the carpenters and blacksmiths of the hills."

4th. "The Chetties are the most recent emigrants from the plains. They deal in the principal products of the hills, lend money on exorbitant interest, and are in fact the capitalists. They are gradually acquiring the whole of the landed property of the mountains, and they keep up a close connection with the Chetties of the low country.

20. *Vegetable Products.*—"There is a vast extent of forest land in the valleys and glens, but a rapidly increasing cultivation, the effect of a proportionate increase of population, has led to the destruction of many valuable forest trees; some trees that still remain are of surpassing height, and conceal from view, by their dense foliage, the little villages which they surround.

21. "Lieutenant Beddome, assistant conservator of forests, who has lately explored those mountains, states that the grass on the plateau on the top is everywhere dotted with beautiful orchaedrous plants, and many others peculiar to a high altitude. The rhododendron, the lime, and the orange are indigenous, and there is an inexhaustible supply of gentiana and other medical plants.

22. "There is every probability that coffee will be extensively cultivated on these mountains, the luxuriance of the shrub and the flavour of the berry grown there, having attracted the attention of the late Madras exhibition.

23. *Wild Animals.*—"Elephants frequent the sholas. There are bison and elk in abundance. Bears are numerous, as are also the tiger and the cheetah. The mountaineers exhibit a great fondness for hunting, and they destroy the tiger by poison—when a tiger kills a bullock, a poisonous compound of roots and herbs mixed with sugar is rubbed into the fleshy part of the carcase—when the tiger returns to his prey, he eagerly devours this portion—the poison produces a powerful thirst, the first draught of water quickens its operation and kills him in a few hours. The death of the animal is then celebrated with public rejoicing.

24. *Climate and Seasons.*—"In referring to the important subject of climate, I can only speak of my personal experience during a limited stay on these hills in the end of the month of March. I had shortly before then made a similar short stay on the Neilgherries, (this being my first visit there also) when *en route* to Calicut; I was therefore well able to contrast the climate of both places. Although a month further advanced in the season at the date of my visit to the Pulneys, the temperature felt lower, the frost having just disappeared, and the air seemed even more exhilarating than it was at Ootacamund in the end of February. In the early part of the day, the wind blew steadily from the north-east, but towards the afternoon it veered round to the south, bringing up the sea breeze. The climate appeared to me quite equal to the Neilgherries, admirably adapted for the unimpaired European constitution and for the valetudinarian.

25. "Four circumstances naturally affect the climate of these hills.

First.—Their elevation.

Second.—Their isolated position.

Third.—Their situation between the east and west coast, the distance being about 60 and 80 miles respectively.

Fourth.—Their position near the line of demarcation of the two monsoons: on this subject, I am favoured by Mr. Magrath, director general of the medical department, with the following observations:—

"Over the peninsula of India, the winds make an *annual tour* as regular almost as clock-work. To commence, say from the eastern coast—they blow direct from the east about the end of February and beginning of March, then from south-east gradually going south, until by the middle of April they blow from south, veering round towards the west; these winds bring up moisture from over the Indian Ocean, and rain falls on the highlands of Ceylon, and extend usually over the southern part of the peninsula. Towards the end of May, the winds blow from the south-west and west, bringing up large banks of clouds towards the western coast, which in the end of that month and beginning of June, burst on the coast; the highlands of the ghauts receiving the great bulk of the fall.

"The rain falls heaviest at the western end of the Neilgherries, on the 'Koondas,' which are the highest parts of the line of ghauts, and in Coorg. On the coast it is lighter towards the south, increasing opposite the Neilgherry range to about 120 inches, which is the average fall at Calicut, and continues about the same up to Mangalore, opposite the higher parts of Coorg, where 180 inches fall, after which it decreases at Bombay; the fall of rain is not more than about 80 inches. It goes on decreasing as it passes into Guzerat, until it is lost altogether, there being no monsoon in Sinde. The rain passes inland from the western coast over the Mysore and the Deccan, and goes northward and eastward. In September and beginning of October, the winds veer round to north and north-east, and then occurs our north-east monsoon with its accompanying rains.

"The south-west monsoon sets in and prevails in Pegu at the same time as on the western coast, and the fall of rain diminishes as it goes inland north and east, just as it does on this peninsula.

26. "It will appear from this, that the Neilgherries on their western side receive very heavy rain, and which extends very much to Ootacamund, whereas the hills to the south-east of the Neilgherries, such as the Pulneys, which are so much more inland, receive a lighter fall at the same time that they share in the earlier rains of April, and again in the latter rains of the north-east monsoon, thereby giving them more the character of the climate of Kandy and Newera Ellia, and a greater freshness throughout the year, and in a measure a freedom from the aridity which prevails on the Neilgherries for three or four months."

27. "I extract the following remarks regarding the seasons from the 'Missionary Journal,' above referred to:—'The coldest season is from October to January. The thermometer then ranges from 35° to 65° at mid-day. The weather continues cold to the end of February, during which time there are thick fogs and occasionally heavy falls of rain. April, May, and June are dry months with heavy night dews. The thermometer during the day rises as high as 80° degrees, and the sun's rays are powerful. From the middle of June the climate is delightful. The occasional showers which fall, replenish the streams and give life and vigour to everything around."

28. "Mr. T. Clarke, an excellent authority on these matters from his long residence on the hills, observes:—

"The year is divided into two seasons, the cold season similar to the autumn of the south of France, may be said to set in from December and terminate in March, whilst the monsoon season, resembling a mild autumn in the south of England, occupies the remaining months.

"With reference to the climate of the higher hills in particular, the following, as far as I am able to learn, may be considered a pretty fair estimate.

"January is uniformly fair, clear, and dry. The nights are very cold, and attended with frost in the valleys. The same remarks will apply to February, except that frost is stronger, and in March it disappears, when the weather becomes milder, and there are a few heavy showers. Towards the close of April, the wind begins to vary from north-east, and finally settles in the south-west, when the air becomes mild and balmy. May is the warmest month, but the heat is often relieved by the fall of rain in torrents, intermingled with hail, ushering in the south-west monsoon, which occurs in the early part of June, and continues with greater or less constancy through July and August, when the weather on the lower hills is comparatively dry and fine. September and October are uncertain months, depending on the state of the south-west monsoon, which if begun early and exhausted, renders the weather fine, warm and pleasant, but if deficient in previous rain, a good deal of mist and drizzle generally prevails. Towards the end of September, the wind again begins to shift round to the north, when the weather becomes suddenly colder, mists and fogs are common throughout the year; some gales of wind occur once or twice a year, generally about the changes of season, but thunder and storms are of rare occurrence. The changes of temperature are sudden.

"On the lower ranges, the village of Tandygoody is situated about 18 miles distant from Vilputty, and about 26 from Poombaray on the eastward. It is about 5,600 feet above the level of the sea. The climate is here much milder than on the upper plateau. The air is moister and the nights less cold. In June, July, and August, the weather is clear, bright and fair, while on the upper hills there is much drizzle or rain. This difference arises from the former place being less subject to the influence of the

south-west monsoon. Less rain falls at this place, and it is often dry here when it rains to the west.

"The Virupatchy villages are situated on a plateau between Tandygoody and the plains. Its elevation varies; the higher villages being from about 5,000 to 2,500 feet above the sea; its temperature is higher than on the west range and Tandygoody."

29. *Geological formation.*—The rocks on the hills are gneiss, over which is generally found a stratum of clay, white and yellow of different tints, the whole covered with a coat of vegetable mould. On the tops and slopes of the hills the soil is seldom found more than a foot or two in thickness, but in the valleys it sinks to a greater depth, and towards the rivers and creeks a rich alluvial soil is found, containing a large portion of silicious sand, mixed with mica. In some parts a ferruginous and calcareous kunker prevails, but the former predominates. Both are in some places on the surface, whilst in others some feet below the black earth.

30. The whole of the elevated lands of the west division is uncultivated. In the valleys, near the villages, cultivation is more extended,—here the red soil is intersected by rivulets and rivers, and in some places by large morasses. The eastern parts are more productive than the western, having a considerably large portion of fine rich loam, and being less exposed.

31. *Salubrity.*—The higher ranges are decidedly salubrious, and the inhabitants are a robust and healthy people. The most unhealthy seasons with them are the cold months, when coughs and colds and occasional fever from exposure are met with. Small-pox of a fatal character has of late carried off many of the natives—with Europeans there is a predisposition to catarrhal affections from April to June. In the lower ranges to the east, from March to July, it is decidedly unhealthy; the inhabitants there suffer much from fevers, enlargement of the spleen being also common.

32. But it were difficult to find a climate more congenial to the feelings, more calculated to preserve health, or to restore the invalid, than this elevated area affords—I believe it calculated to promote recovery in all, save the exceptional cases of diseases of the heart and some affections of the lungs, where the stimulus of the rarefied atmosphere would be injurious.

33. Already, at a place called Kadakarnal, some of the civilians of the district of Madura have built houses, to which their families resort. But these hills deserve to be more frequented by Europeans, who, with their superior knowledge, would speedily introduce comforts, and preserve their constitutions against the diseases incidental to a prolonged residence on the plains.

34. With telegraphs to the summits of our mountains and railways, or even good transit communications to their base, many of our healthy European corps might be located on them; rather with the view to maintain health than to renovate it—and still be as available for duty as if they occupied the posts they do now.

35. It is in contemplation to build barracks for our European soldiers at Trichinopoly; I trust before this step be decided on, the advantages of placing them on this attractive region may be considered. The additional expense incurred would be fully counterbalanced by the favourable results which might be confidently anticipated.

Remarks by the Director-General.

The foregoing report gives a highly interesting account of the Pulney hills, although it does not contain much that is new, or that has not already been known and in part published in the "Madras Literary Journal." *Vide* No. VI.

The Pulneys are described as possessing an agreeable and bracing climate, well adapted to preserve the health and efficiency of European troops. They are, however, only healthy, as far as is known of the parts inhabited, for about nine months of the year. During the remaining three months, *i.e.*, from April to June, both inclusive, they are decidedly unhealthy, and the natives of the lower ranges, (for it does not appear from the report that the higher parts said to reach an elevation of 7,000 feet have any native inhabitants) suffer much from fever and disease of the spleen.

The Inspector-General, notwithstanding, recommends that instead of the proposed barracks for a European regiment to be built at Trichinopoly, barracks should be erected on the Pulney hills.

In this recommendation I am unable to concur, for the following obvious reasons:—

To station a regiment on the Pulneys during the sickly season it is evident would be to destroy its efficiency. For it is a well-established fact that Europeans, or even natives of the low country, suffer more severely from malarious diseases than the acclimated denizens of the mountain ranges and ghauts of Southern India. There is, it may further be remarked, no form of Indian disease of a more obstinate character, or one that undermines the constitution so much, or is so difficult to eradicate, as malarious hill fever. It seems to me, therefore, that unless barrack accommodation should be available at Trichinopoly or elsewhere, to which the troops could be removed for the three unhealthy months, which embrace the hottest part of the year, that it would be setting at defiance all previous experience and knowledge of these hill regions, to select the Pulneys as a site for the new barracks.

As it is not probable that Government would incur the double expense of providing barracks at Trichinopoly as well as on the hills, I do not see how the Inspector-General's proposal can be carried out. This is, however, the less to be regretted, as table land at a higher elevation, and in localities known to be healthy, is available on the Neilgherries to any extent required, should it be found necessary at any time to provide more accommodation for European troops on the hills of Southern India.

EXTRACT from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

NEILGHERRY HILLS.

Series No. 3, dated 4th October 1858.

29. "For some years past it has been the practice to hold annual committees on public servants under the Madras Government, who happen to be resident on the hills for a period of upwards of 12 months, with the view to ordering them back to their duties, if sufficiently recovered.

30. "This rule does not affect public servants of the other presidencies resident on the hills on medical certificate, nor does it bear on officers proceeding to England or elsewhere than the hills on sick leave. The latter enjoy full advantage of the leave originally recommended for them by the medical officer who attended on them during the illness which made it necessary for them to proceed on leave, and which a medical board on the spot confirmed. Unless there be some good reason why this rule should not be done away with, I am of opinion it should be abolished; it appears to me to operate injuriously, both to the patient and the public service."

Remarks by the Director-General.

I perfectly agree with the Inspector-General in his remarks, that annual committees on sick officers on the Neilgherries are unnecessary. It is, I know, considered a hardship by sick officers to be obliged to appear before such committees, and I am not aware of any benefit resulting from them, except that one or two invalid officers who had taken up their residence on the hills for years were obliged either to proceed to Europe or join their regiments.

It was the opinion of a medical officer of great experience, Dr. Birch, formerly resident at Ootacamund, that many patients did not begin to derive permanent benefit from the climate of the hills until they had been about a year resident on them, and he recommended his patients always to remain a second year before returning to the low country.

Jackatalla Barracks.

39. "The strictest attention is now required to sanitary matters, while so many people are at work on the buildings, for there is some danger of the place becoming so polluted as to establish a malarious atmospheric taint which may hereafter become an incidental source of disease. Indeed the effects of this neglected conservancy has already begun to exhibit a noxious influence on parties residing there.

40. "The great difficulty at Jackatalla is, the removal of the sewage from the barracks, &c.; four plans have been proposed.

1st. "The formation of one or more lakes in the ravine and valley through which the Coonoor river flows, into which the night soil conveyed by pipes would pass."

2nd. "The removal of the night soil (deodorized by peat charcoal) by means of carts to a distance from the barracks.

3rd. "The removal of the sewage by means of pipes into the Coonoor river, from whence it would be carried onwards by the streams.

4th. "The removal of the sewage by pipes into the ravine but not into the stream, and from thence on by a closed main conduit to a point beyond the station of Coonoor, a distance of two miles, there to discharge its contents into a cascade. The river from this point flows by a steep decline down the ghaut through an uninhabited country, a distance of 12 miles, receiving in its course several tributaries, and finally empties itself into the Bowanee."

41. "To adopt the first plan would be merely to create endemic sources of disease, for the proposed lakes would speedily become cesspools."

42. "The difficulty of removing the night-soil by carts to a sufficient distance, and the dangers of impregnating another position by impure exhalations, are sufficient reasons for not putting the second plan into force."

43. "The third plan would pollute the pure mountain stream, which alone affords a water supply to hundreds of followers in the bazaar of Jackatalla, and to the inhabitants of Coonoor. This plan has been already sanctioned, and to a certain extent carried out."

44. "The fourth of the above plans is without doubt the only perfect system to adopt, consistent with sanitary considerations. By it the night-soil will be received into a closed main conduit by a system of intercepting pipes from the barracks, hospital, sanitarium, depôt, married men's and officers' quarters, and will be forced by the pressure of water from above through a long culvert, to a point beyond the reach of doing injury by contaminating the stream or the atmosphere." *Vide* Minutes of Consultation, No. 1,431, dated 23rd July 1858.

45. "Nothing can be more noxious or offensive than the present system. There have been nearly 3,000 people at work daily at Jackatalla for many months past. There is no permanent officer in command or commissariat officer. There have been no fewer than 15 since May 1854, so that there has been no local responsible supervision; the consequence is that the cantonment and neighbourhood is tainted with a fœcal atmosphere. Go where you will, in the unfinished buildings, in court yards—even in the very rooms, human ordure is found. Already the result of this neglected conservancy is exhibited in low fevers in European children and grown-up people. The coercive interference of Government is therefore required to preserve the character of the station for salubrity."

53. "Some of the convalescents now there, are dressed in their white jackets and trousers, others in their regimentals. I think it would be attended with advantage if a supply of clothing suitable to the climate, such as the ordinary shepherds' plaid or some other pattern of Scotch tweed were at all times kept in store and issued to the men on arrival at this station."

74—3rd. "That latrines be dug to which the natives should be forced to resort, peat charcoal and earth to be thrown into these two or three times a week.

4th. "That immediate measures be adopted for clearing out the privy for Europeans, and,

5th. "Finally, as all these measures are but make-shifts until the great plan for the removal of the sewage by pipes is carried out, that the executive engineer be instructed to procure immediately from England the length of piping already sanctioned, and in the meantime proceed with the construction of the channels so that the piping can be laid down on arrival."

47. "There are other two measures which I would earnestly urge for the consideration of the Director-General, with the view to the hygiene of the station.

First. "The enclosure of the extensive ravine situated to the southward of the barracks, and lying between the barrack hill and that selected for the convalescent depôt (which is at present the most offensive spot in cantonment) with the view to its conversion into a soldiers' orchard and vegetable garden. Captain Campbell the engineer in charge, who takes the warmest interest in the improvement of this important sanitarium, and who has already accomplished so much in the formation of a forest in the neighbourhood, informs me that if vested with authority and furnished with a small monthly sum to expend on the place, from 150 to 170 rupees per mensem for twelve months, he will undertake to convert this piece of waste land into an orchard and garden intersected with paths and fountains.

Second. "That the bazaar now in course of formation contiguous to the barracks should be erected on a distinct plan, with houses as much as possible of an uniform pattern, and with streets so formed as to permit of free ventilation and drainage, in order that we avoid the usual teeming sources of disease, which so closely and fatally encircle our wretched Indian bazaars. The space allotted for the bazaars is too circumscribed; but it is capable of being extended on a piece of waste land situated to the west of its present site."

48. "In the centre of the barrack square two rows of trees with a path between and a fountain in the centre, would induce the soldiers to leave their barracks and take exercise under their shade, where seats would be placed.

49. "In conclusion, I would submit that all sanitary arrangements be vested in the resident engineer, in counsel with the resident medical officer so long as the station is under construction and public works going on; giving the former the means and holding him responsible for the efficient conservancy of the cantonment, and giving him also control over the roads, watercourses, and channels."

Remarks by the Director-General.

The suggestions of the Inspector-General and of the engineer officer for the improvement of the station, and purifying the offensive places of resort for natives, are considered deserving of the consideration of Government.

The plan for carrying off the sewage, para. 44, is well suited to preserve the cleanliness and salubrity of the cantonment.

Regulations regarding the dress of the troops being adapted to the climate, should be issued by officers commanding regiments stationed on the hills. White jackets and trousers (except worn at mid-day) being unsuited to the climate, want of attention to this particular is a fruitful source of disease in persons newly arrived on the hills.

EXTRACT from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

ANNAMULLAY HILLS.

Series No. 4, dated 9th October 1858.—Para. 1. "The eastern Ghauts are intersected by several deep valleys, but in only one place are they completely divided. This opening is shaped like a funnel with its narrowest end towards the east, and is almost in a direct line between Trichinopoly and the Travancore country. So soon as the west winds begin to prevail on the coast, a free and full passage is thus granted into the province of Coimbatore, where it exercises a very beneficial influence."

Paulghautcherry.—2. "Until lately a regiment of native infantry and a detachment of artillery garrisoned the Paulghaut pass; now it forms the head-quarters of a sub-collectorate, and the fort, which is placed on a somewhat elevated ridge in the centre of the pass, is occupied by a detachment of native infantry under an European officer."

4. "The hills on each side of this pass present a rugged and bold outline. Running nearly parallel with the sea, is the Annamullay range; and the general direction of the higher ranges, viz., the southern side of the triangle of the Neilgherries and the Annamullays is nearly from west to east, while that of the more important smaller ranges is from north to south; still smaller spurs and partly detached branches run off from these in every direction, and their occasional confused and clustered masses have, from a distance, an exceedingly picturesque appearance."

5. "The sides of these hills are usually covered with jungle, but this is fast disappearing, as is also the belt of wood which formerly extended round their base, in many places from five to ten miles broad, the ground on which it stood having been let to the cultivator for a long period of years on favourable terms."

6. "In many places, although every tree and shrub which formed this dense forest has been removed, the ground still remains a barren waste, and I quite concur in the opinion of Doctor Cleghorn, the conservator of forests (who accompanied me on this tour) that this indiscriminate removal of the trees has already exercised a prejudical effect on the climate of the locality; the soil having now lost the benefit of the moisture which their foliage attracted, and the evaporation which it checked."

7. "On the Annamullay range of hills about twenty miles from the Paulghaut pass, and five or six from the plains, at an elevation of about 3,000 feet above the level of the sea, Lieutenant Beddome, the assistant conservator of forests, has fixed his head quarters. The ascent to this place is through a straggling forest of teak, blackwood, and other jungle trees, many of which are of very large dimen-

sions. The timber on being cleaned or cut into planks, is carted or dragged by elephants to the base of the hill, from whence it is either removed for Government purposes, or sold by auction to the public."

8. "Fever of a very severe character is usually present at the base of the mountain, but at Soonocuddoo and in the forest it is less prevalent. The working season extends from July to January; during the remaining six dry months of the year the forest is altogether abandoned; the fatal character of the fever which then appears in all its intensity, rendering this course necessary."

9. "Fever of a milder type prevails at all seasons, and some valuable lives have already been lost. The strength of the party who work under Lieutenant Beddome, averages with axe-men, elephant attendants, &c., from 400 to 500, among whom are three European overseers and some Indo-Britons."

14. "The forest department only occupies the western and lower portions of the Annamullay mountains. The more lofty, or as these are usually denominated the Delhi range, have hitherto been unexplored. An unsuccessful attempt was made in 1850, by Captain Michael, of the 39th regiment native infantry, to reach the summit, and he arrived at an elevation of 7,000 feet above the sea. In his report he adverted to a valley of some extent about that altitude, and of still higher ranges which he was unable to arrive at, which appeared to rise twelve or fifteen hundred feet beyond this. Considering it a matter of interest as well as of importance to ascertain the extent of this valley, and the capabilities of the hills generally, as a place of residence for Europeans, in company with assistant surgeon Cleghorn, Cornish, and some other friends we commenced the ascent on the 15th September."

15. "We selected this period, as there appeared to be a favourable break in the weather between the passing away of the south-west and the advent of the north-east monsoon."

16. "The night before our ascent we slept at Kotoor, a village six miles from the foot of the hills; to have encamped closer would have been dangerous, fever being always present at the base of these mountains. We reached the Annamullay river at daylight, and crossed it in boats. This is a rapid stream 30 to 40 yards wide, formed by the confluence of the Toracuddoo, Ponachee, and other mountain torrents. About a mile from the river we arrived at the foot of the ghaut leading to the village of Ponachee, passing on the road elephant pits and tiger traps long in disuse. This pass which is a mile in length is too steep and rocky for horses to ascend, so we sent them back to the plains, performing the rest of the journey on foot. Four miles further on we came to the village of Ponachee, containing 15 houses. This spot was ascertained to be 3,000 feet above the level of the sea. Descending from this village, we arrived at the Toracuddoo river, which at this spot is a broad rapid stream three to four feet in depth, and to judge from the water marks on the trees, its depth must at times exceed six feet."

17. "Following up the course of this stream, and about ten miles south from the village of Ponachee, we reached a succession of cascades and a waterfall of considerable magnitude near the foot of two remarkable conical peaks of bare rock which are observed from a great distance in the plains, called the "Ukkah and Thungachy Mullay," or the elder and younger sisters."

18. "The height here proved to be 3,500 feet, the ascent from Ponachee being very gradual. Our course up to this point was south-west, and led through a thin forest of teak and other jungle trees, a good deal of bamboo and open glades with grass five to six feet high. To judge from the appearance of the banks of the Toracuddoo river after it passes Ponachee, it is not improbable that a much easier pass into the hills might be made from the plains by following this stream, thus avoiding the precipitous ascent by which we reached the village, and shortening the distance fully one half."

19. "From the waterfall the ascent was sudden, in many places over steep rocks and through dense sholas; still up the course of the Toracuddoo river, until we arrived at a beautiful undulating valley between the Ukkah and Thungachy Mullay and Payratmullay. In extent this valley is nearly equal to that of Ootacamund, and it varies in elevation from 6,000 to 6,800 feet above the sea."

20. "The general appearance and character of these high lands resemble very much that found on the Neilgherries. Here are the same rounded eminences and dense sholas extending continuously for miles, their edges ceasing abruptly. Conical hills and slopes covered with short rich grass abounding with medicinal plants, such as Ophelia elegans (gentian) and Hymenodyction excelsium (a species of cinchona) and vegetation precisely similar to that found there.

21. "The heavy rain which fell continuously during the period of our stay on these upper regions, evidently the breaking up of the south-west monsoon, the want of shelter, for there are no inhabitants in the higher altitudes, and the difficulty of procuring supplies from the low country, put it out of our power to proceed to the more lofty parts of the range, which is apparently about 12 miles off in a south-eastern direction, from the extreme point we reached, where, from the large streams of water which still descended to the north in cascades and water-falls to form the Toracuddoo river, and the occasional glimpses which we had through the mist, I have little doubt that similar valleys or table land would be found. We, therefore, reluctantly returned to the low country without attaining our object, having been absent eight days.

22. "The best period to prosecute inquiry into the upper ranges of the Annamullay mountains would be after October, or in the hot season. From their position, they are necessarily considerably under the influence of the south-west monsoon, but less so than the Koondahs at Sespoora, and I think it is worthy of inquiry to ascertain whether here also may not be found a climate as bracing and welcome to the enervated constitution of the European invalid as is found to exist on our better-known hill stations.

23. "Three distinct tribes inhabit the Annamullay hills. They are denominated—

Kadars,
Poliars, and
Mulcers.

"The Kadars will perform no menial labour; as their name implies, they are the lords of the hills. They will carry a gun, and are expert at stalking game, but they are deeply offended if they are called coolies. They are a truthful, trustworthy, and obliging tribe, and exercise some influence over the Poliars and Mulcers. Small in stature, their features resemble the African, and they have his curly hair tied by a knot behind, and they file the four front teeth of the upper jaw to a point as a marriage ceremony.

24. "The Poliars are chiefly herdsmen and mechanics, while the Mulcers are cultivators of the soil. None of these tribes reside at a higher elevation than 4,000 to 5,000 feet above the sea.

25. "All deal in the rich produce of these hills, and barter with the people in the plains their cardamums, turmeric, ginger, honey, wax, rosins, millets, soapnuts, gallnuts, &c., &c., for rice, tobacco, &c.

26. "They are very expert in climbing trees and the precipitous face of rocks in search of honey. To accomplish the former, where there are no boughs, they drive short bamboo spikes into the tree, and thus form a ladder, by means of which they ascend the highest forest trees; and they reach the latter by means of chains formed by rings made with rattan, which, being secured to a point above, drops down the face of the rock. We observed some of these chains full 50 and 60 feet in length.

27. "The upper ranges are in undisturbed possession of wild beasts. We saw a herd of bison, elk, and ibex in numbers, and also tracts of wild elephants. The latter I encountered in the lower plateaus towards Poonacuddoor.

28. "I have now completed my report on the chief mountains under this presidency, all of which I have personally inspected. The importance of the subjects treated must be my apology for having dwelt so long on them.

29. "It is evident that the European race must henceforth be dominant in this country. Now that the old confidence between them and the native troops is in some measure destroyed, we can no longer rely upon the latter as our principal defence. The drain upon the youth and vigour of England to support an army which will hold a population of 18,000,000 in subjection by the force of arms alone, would speedily impair our national strength.

30. "I firmly believe that on the mountain regions which I have described, independent of a location of our soldiers there, the establishment of small communities of Englishmen would be attended with the happiest results upon the native mind. It would add at once to our military strength, and, in course of time, it would give us the means, to a certain extent, of recruiting our army."

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The following TABLE exhibits as correctly as I have been able to ascertain, the mean temperature of each month, the height and the average fall of rain on the several mountains and hill stations already occupied or brought to notice in India.

	Names of Hills or Hill Stations.	Mean Temperature in January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Ascertained Height.	Average fall of Rain per Annum in Inches.	Remarks.
Bengal Presidency.	Darjeeling - -	40	41	51	55	61	62	63	64	63	55	50	44	8,008	125¼	
	Simla -	40	44	53	61	66	80	75	78	70	67	52	46	8,000	70	
	Mandour - -	35	40	51	0	0	0	0	68	64	49	46	46	7,300	0	
	Murree - -	0	0	0	0	0	69	68	66	62	62	0	0	6,786	0	
	Kussowlie - -	42	47	58	64	77	73	70	70	72	66	0	0	6,400	70	
	Naynee Tál -	42	46	56	61	69	69	67	69	65	61	50	47	6,200	82½	* Situated in the Southern Division.
	Dugshai - -	42	47	57	64	69	71	72	68	66	62	54	53	6,000	70	
	Subathoo - -	0	0	0	77	81	84	79	77	0	0	0	0	4,000	70	
Madras Presidency.	*Ootacamund -	54	56	60	61	61	57	63	63	63	56	54	53	7,361	60	† Situated in the Southern Division.
	*Kotagherry -	59	60	61	63	63	64	65	65	64	62	60	59	6,100	55	
	*Jackatalla - -	59	61	67	68	68	64	70	70	70	63	61	60	5,840	50	
	*Coonoor - -	60	62	68	68	68	65	70	70	70	65	62	62	5,761	50	‡ Situated in Centre Division.
	*Pulneys - -	51	53	60	61	Averages 25° under that of the plains.								7,000	0	§ Situated in Ceded Districts.
	†Annamullays -	0	0	0	0	0	0	0	0	66	56	0	0	6,800	0	
	‡Shevaroys - -	65	65	68	71	71	68	68	68	67	66	66	65	5,260	40	‖ Situated between Secunderabad and Nagpore.
	§Ramandroog -	70	76	80	80	75	73	71	70	70	71	71	67	3,400	46	
	‖Chiculdah - -	60	60	70	83	83	71	0	0	0	0	71	71	3,600	0	
Bombay Presidency.	Mahableshwur -	63	65	72	74	72	67	63	64	64	66	64	63	4,700	239¾	These hills are not occupied during the rains. There is, therefore, no record of the fall of rain.
	Poorendhur -	67	73	77	78	73	70	67	65	67	71	69	64	4,200	72¼	
	Matheran - -	0	Temperature throughout the year about 10° under that of Bombay.											2,500	0	
	Mount Aboo -	61	61	69	77	77	77	69	69	69	69	69	61	4,015	78¼	

Remarks by the Director-General.

The report on the Annamullay hills is forwarded to the Commander-in-Chief and Government, as forming a part of the general account of the hill ranges of Southern India, which have been visited by the Inspector-General of Hospitals.

There is but little to notice in this paper which can be turned to a practical or profitable account, considering the imperfect knowledge of the more lofty and as yet almost unknown parts of the range.

These hills are surrounded by an extent of forest, at all times feverish; but for six months of the year, including the dry season, so very unhealthy as to be deserted by the conservator of forests and his establishment, on account of the deadly nature of the fever which prevails at such season.

The Annamullay range, it is stated, rises to an elevation at some points of more than 7,000 feet, and the late conservator of forests, Captain Michael, reported that a valley of some extent existed at an elevation of nearly 7,000 feet above the sea level, with still higher ranges in the distance, which he was unable to reach. These ranges the Inspector-General and his party also failed to ascend in an attempt made in September 1858, owing to heavy rains setting in, the want of shelter, and difficulty of obtaining supplies.

As remarked on another occasion, the extent of land available on the Neilgherry hills, either for settlers or for locating troops, their easiness of access, and well-known salubrity, render this failure, except as a matter of general and geographical interest, a cause of no great regret.

A very interesting table is annexed to this report, showing the elevation and temperature of the principal hill stations throughout India, with the average fall of rain, compiled with much labour and research.

ORDER, No. 4,149, *22nd November* 1859.

The Governor in Council has perused with much interest the reports* submitted with the foregoing letter, which are highly creditable to Dr. Macpherson's professional zeal and energy.

* *On the Pulney, Neilgherry, and Annamullay Hills.*

2. The Governor in Council observes that orders† have already been passed by Government on the principal points remarked upon by the Inspector-General of Hospitals with reference to Jackatalla, through the Quartermaster-General of the Army, to whose department the general subject of these reports appears more properly to belong.

† *Mins. of Cons. Military Department, No.* 1,266, *dated 4th April* 1859. *Mins. of Cons. Public Works Department, No.* 893, *dated* 15*th, and No.* 923, *dated* 19*th April* 1859.

3. With reference, however, to the particular points brought to notice in the Adjutant-General's letter, the Governor in Council proceeds to pass the following orders:—

1st. His Excellency the Commander-in-Chief, the Director-General and the Inspector-General of the Medical Department, are unanimous in recommending the abolition of the annual medical committees on the Neilgherries, which are pronounced by competent medical authority "to operate "prejudicially both to the patients and the public service." The Governor in Council accordingly directs that paras. 9 and 10 of G. O. G. No. 178, of 1847, be cancelled, corresponding alterations being made in the general regulations,‡ and notified in G. O. by the Commander-in-Chief.

‡ *Paras.* 11 *and* 12, *Part II., Section XVIII.*

2d. The subject of clothing adverted to in para. 58 of the Report, as worn by convalescents at the depôt on the hills, appears to have met the attention of the Commander-in-Chief, with whom its disposal properly rests.

4. The foregoing correspondence will be forwarded to the Government of India for transmission to the Right Honourable the Secretary of State for India, with reference to Despatch No. 73, dated 15th December 1858, accompanying letter No. 1,429, of the 24th January 1859, from that Government.

(True extract.)
(Signed) H. MARSHALL, Colonel,
Acting Deputy Secretary to Government.

To the Adjutant-General.
" Director-General, Medical Department.
" Quartermaster-General.
Exd. J. DAVIS.

2.—PUBLIC DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from Major DOUGLAS HAMILTON, late on special duty Military Hill Ranges, to T. PYCROFT, Esq., Chief Secretary to Government, Fort St. George, dated Negapatam, 1st March 1860.

1. Having joined my regiment proceeding on service to China, I have the honour, agreeably to instructions received from His Excellency Sir Charles Trevelyan, to report the progress I have made in carrying out the special duty to which I was appointed.

2. I proceeded from Trichinopoly to the Pulney mountains, which I reached on the 9th of October. Soon after my arrival the north-east monsoon set in with unusual severity, lasting till the end of November. This was a great hindrance to my sketching, but by taking advantage of every opportunity that offered, I succeeded in obtaining 18 large drawings, of which three are panoramas.

3. As soon as the monsoon was over and the weather became settled, I proceeded on a tour of the hills, but had only been out four days when I received information that my regiment was under orders for service in China, and that I should be directed to join immediately. I therefore returned to Trichinopoly, but shortly after my arrival the march of the regiment was deferred until the end of February.

4. On his Excellency Sir Charles Trevelyan visiting Trichinopoly, I had the honour to show him the sketches I had made, and his Excellency acceded to my proposition that I should at once return to the Pulneys, and complete the series of views of the upper range. I accordingly returned without delay, but had not been a week on the hills when the news reached me that my regiment had received a "forthwith" order to march to Negapatam for embarkation. I therefore rejoined.

5. Though my second visit to the hills was of so short duration, yet, owing to the fineness of the weather, I was enabled to add considerably to my sketches, and visit several localities I had not previously seen.

6. I have now 26 drawings, four of which are panoramas, and the greater portion of the remainder are of large size. Although the series is not so complete as I could wish, yet, I trust when finished, I shall have, as far as the high range of the Pulneys is concerned, sufficient to carry out the intention of Government in deputing me for this duty.

7. Many of my sketches are unfinished. I am taking them with me to China, and hope to complete them during my leisure hours, when they will be forwarded to Government with a report.

8. As it is so uncertain when I shall find time to complete these drawings, I deem it advisable now to mention some of the results of my observations and inquiries during the time I was on these mountains.

9. I wish particularly to remove an impression that the Pulneys are unhealthy for three months of the year, and consequently not a fit locality for European troops; more especially as this opinion has lately been officially laid before Government by a high authority. The greater portion of the eastern or lower Pulneys, it is true, is most unhealthy during the hot months, but this is decidedly not the case on the western or upper range. Several European families belonging to the American mission have been for years in the habit of residing at Kudaikarnal during these months, and those I met spoke most highly of the salubrity of the climate, as also did Mr. Clarke, the collector of Madura, whose family, I believe, passed two hot seasons in the hills without returning to the plains. Some of the natives at the settlement of Kudaikarnal have resided there continuously for years. One who had been a resident upwards of eight years told me he had never heard of a case of jungle fever contracted at Kudaikarnal.

10. I may mention that though I was not on the Pulneys during the supposed unhealthy months, my servants were much exposed in the monsoon to the inclemency of the weather, yet, with the exception of one case of cold and slight fever, they were perfectly healthy, which I have found by experience would not have been the case at Ootacamund under similar circumstances.

11. As far as I could judge during my sojourn on the hills, I am of opinion that the climate of the settlement of Kudaikarnal is milder and more even than that of Ootacamund, though the average elevation of the houses is within a few feet of that of the Ootacamund lake.

12. The present ghaut, viz., Pereacolum to Kudaikarnal, is the only made one; it is little better than a bridle path; the upper portion is very steep, and during the rains is at times dangerous. It is questionable whether a feasible ghaut for carts could be ever made up this pass, but a ghaut passable for carts could be constructed up the old Daradaunputty pass. From the precipitous nature of the upper part of the mountains, a cart road from any other point would be an exceedingly difficult undertaking.

13. From the formation of many of the vallies on the upper Pulneys, large supplies of water might be advantageously stored.

14. An artificial lake at Kudaikarnal might be constructed at a moderate outlay.

15. Horned cattle thrive well at Kudaikarnal, and at the different hill villages. I have no doubt sheep would thrive equally well if kept at night in a warm building with a boarded floor. Horses are apt to get out of condition, the grass being too rank.

16. The grazing ground on the upper Pulneys is very extensive.

17. The introduction of the Toda buffalo on these hills would be a great benefit to the natives, as also would an improvement in their breed of cattle.

18. There is good coffee ground on the slopes of the mountains of the upper range near Colacurry and in the vallies to the westward.

19. I had not an opportunity of visiting the lower Pulneys, but, from all I could hear, the best coffee ground is in that direction. Mr. de Fondclair has a plantation near Perryoor, the only coffee estate on the Pulneys. The owner informed me that the plantation was in a very flourishing condition.

20. Dr. Cleghorn, the conservator of forests, on his visit to the Pulneys, left some tea seeds to be sown at Kudaikarnal; when I left the hills the plants were an inch or two above ground, and appeared fresh and healthy.

21. The wheat and barley grown on the hills is of very inferior quality. Good English or American seed might be introduced with considerable advantage, but, as Mr. Clarke, the collector of the district, informed me, that on one occasion the hill men, previous to sowing some superior wheat he gave them, *pounded it*, under the impression that if it grew and thrived they would be extra taxed, some precaution may be necessary in introducing better grain amongst the ignorant hill tribes.

22. All European fruits and vegetables that grow on the Neilgherries would succeed either at Kudaikarnal or at Shembayanoor. Excellent potatoes, in small quantities, are now produced, and I have no doubt these mountains could supply the whole of India with this important esculent.

23. The Australian acacias and gum trees in the gardens at Kudaikarnal flourish equally as well as they do at Ootacamund. Should there be any prospect of these mountains attracting European residents, it might be advisable to commence planting these trees at once. A considerable supply of young plants and suckers might even now be obtained from the gardens of the settlement, and as these trees are very rapid in their growth, the deficiency of firewood now existing in the immediate neighbourhood would be remedied.

24. In conclusion, I beg to state that, in my humble opinion, the high range of the Pulney mountains would be a most healthy and suitable location for European troops. There is ample room for barracks and plenty of water near Kudaikarnal, on the undulating plateau to the south-west, between the most western house of the settlement and the precipitous detached cliffs called the "tower rocks." There is indeed a scarcity of wood on the plateau itself, but there are large forests on the slopes of the mountains near at hand, down to which passes might be cut. Peat of good quality is found in the swamps.

25. There was no person on the hills during my visit acquainted with the quality of clay necessary for brick-making, but as it abounds on the Neilgherries, it is in all probability to be found also on the Pulneys.

26. The gentlemen of the American mission have built some of their houses of stone, which is found in abundance in the neighbourhood of the settlement, in blocks from the size of an ordinary brick to that of one or two cubic feet. It is easily squared, and is considered by them a good building material, though it is stated by others to absorb too much moisture, and never to dry thoroughly.

ORDER THEREON, 15th March 1860, No. 372.

The Honourable the Governor in Council has read with interest the brief account above given by Major D. Hamilton of the progress which he has made in carrying out the special duty to which he was appointed by the order of 29th August 1859, No. 1326. It is to be regretted that circumstances should have occurred to interrupt the prosecution of the work, and it is trusted that Major Hamilton may be able to resume it on his return from foreign service.

2. Major Hamilton will be so good as to forward to Government his sketches and report when they have been completed.

3. Resolved that a copy of the report be furnished to the Director-General, Medical Department, in reference to paragraphs 9, 10, and 11.

4. Resolved also that it be communicated to the Military Department, the Revenue Department, and Department of Public Works.

(True extract.)
(Signed) T. PYCROFT,
Chief Secretary.

To Major Douglas Hamilton.
To the Director-General, Medical Department.
" Military Department.
" Revenue Department.
" Public Works Department.
Exd. F. Cartledge.

3.—MILITARY DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letters from the ACTING QUARTER-MASTER-GENERAL of the ARMY, Fort Saint George, 18th March 1861, No. 84, to the SECRETARY to GOVERNMENT, Military Department.

I have the honour, by order of the Provincial Commander-in-Chief, to submit the following reply to the order of Government, No. 873, dated 6th instant, respect-

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ing the reports on sanitaria called for by the Government of India.

2. On the 28th March 1859, in a letter No. 142, a detailed account of every place in use or desirable for use was submitted to Government; and further, on the 11th April last, in letter No. 112, I communicated to Government all that was in my power at that date.

3. Since then the station proposed for the Nagpore force, namely, Moothoor, has been reported on, but its adoption has been negatived * by the Government of India on the ground of its expense at the present moment. Consequently, Chindwarra, formerly a detachment station for European troops, is now occupied as an invalid station; and in my letter to Government, dated 8th January 1861, No. 9, the officer commanding the Nagpore force solicited that a trifling further outlay might be sanctioned.

* *Proceedings of Government, No.* 3733, *dated* 18*th October* 1860.

4. Gallicondah was reported on, and orders passed by Government as per margin, and steps are now being taken for preparing estimates and plans for buildings on a higher site; the former experiment having failed on account of the injudicious position selected for the barracks.

29*th April* 1859, *No.* 1575.
24*th August* 1860, *No.* 3065.
14*th February* 1861, *No.* 584.

5. There therefore only remains to be determined a sanitarium for Jaulnah. In my letter dated 11th April, Poona and Mahableshwur were both recommended for adoption until a fixed station could be found. Meanwhile the subject of the abandonment of Jaulnah by the troops of this Presidency has been considered, and the prosecution of the inquiry for a sanitarium was discontinued. Chiculdah, however, appears to possess great advantages. Respecting it, the officer commanding Hyderabad subsidiary force states, "Dr. Cole further stated that Chiculdah seems to be the only place within the Hyderabad territories of sufficient elevation to offer the requisite conditions for a sanitarium. Dr. Cole has since, however, proceeded on privilege leave to Bangalore, without having contributed any of the useful information he had promised, but, from information he had obtained from the Assistant Quartermaster-General, I have no hesitation whatever in stating that to whichever place the abandoned cantonment of Jaulnah may be removed, whether Roza or Aurungabad, Chiculdah would form a most excellent sanitarium for the troops from October to June, but that from the excessive damp and fogs prevailing there from June to October, the place is not habitable by Europeans during those months. There is at present a scarcity of water, except close to the fort of Gowel; inside the fort there are enough stones already cut to build the barracks. There is a very good road from Ellichpore for about 10 or 12 miles, after which to the bottom of the ghaut is rather stony. There is no cart road up the ghaut; conveyances are carried up by coolies. To take advantage of this place as a sanitarium for the troops henceforth to be stationed at Aurungabad or Roza, it will be necessary that the road should be put in order, or that the opening of the railway to Oomrowtie, as suggested by Colonel Davidson, be awaited."

6. In conclusion, I am to add that for stations in the south of the peninsula full use is made of Wellington; for Bellary and Secunderabad, Ramandroog is sufficient; for the northern division a site already fixed, on Grant's range, on the Gallicondah hills, is available; for the Nagpore force, Moothoor and Chindwarra; and for Jaulnah, Poona, Mahableshwur, or Chiculdah. These stations suffice. But as long as money is not forthcoming to take advantage of the climate at Moothoor and Gallicondah the troops at Nagpore and Waltair must continue to be destitute of the means of restoration accessible at other stations.

From the PRINCIPAL INSPECTOR-GENERAL, Medical Department, Fort Saint George, 22nd March 1861, No. 53, to the SECRETARY to GOVERNMENT, Military Department, Fort Saint George.

With reference to proceedings of Madras Government, No. 873, dated 6th instant, I have the honour to remark briefly that reports on the hill ranges of this Presidency, named in the margin, by Dr. Macpherson, Inspector-General of Hospitals, have been duly communicated to Government.

Shevaroys.
Pulney.
Anamallay.

2. Government are also in possession of the facts connected with the recent experiments as to the value of the Gallicondah range in the northern division as a sanitarium for Europeans.

3. The Moothoor range of hills in Nagpore were last year visited and reported upon by a committee of officers, and a site chosen for a sanitarium. The Government of India, however, in letter No. 69, of date 2nd October last, decided not to undertake the experiment on account of the expense it would involve.

4. There appears to be no elevated land in the immediate neighbourhood of Jaulnah or Secunderabad suitable for sanitaria, but in all other commands of the army hill ranges exist, some of which are believed to be more or less suitable for European troops.

5. The sanitaria at Wellington and Ramandroog are already well known. The former, now that the railway is approaching completion from the eastern to the western coast, will be more widely available for invalids from the Presidency, or those brought thither by seaboard.

6. Kamptee is almost the only station destitute of access to a hill sanitarium, and it is a subject of regret that the site fixed upon in the Moothoor range cannot for the present be made available.

ORDER, No. 1159, 28th March 1861.

Ordered to be forwarded to the Government of India, with the letter * marginally noted.

* *From the Principal Inspector-General, Medical Department,* 22*nd March* 1861, *No.* 53.

To the Secy. to the Govt. of India, Mily. Dept.
Here enter 28th March 1861, No. 1160.
(True extract.)
(Signed) H. MARSHALL, Colonel,
Deputy Secretary to Government.

To the Quartermaster-General.
" Principal Inspector-General, Medical Department.
Exd. G. Rodrigues.

4.—REPORT of the RAMANDROOG SANITARIUM, in the CEDED DISTRICTS, MADRAS PRESIDENCY.—By E. W. EYRE, Esq., Superintending Surgeon.

A range of hills within a short distance of Bellary, that might be made available for a sanitarium for sick soldiers, having become known to the authorities, a medical committee assembled there at the latter end of 1846 to investigate and report on their suitability. From their report I will make some extracts prefatory to the present one.

General Description.—"The hill of Ramanmullay (or Ramandroog) is one of the most elevated of the Sundoor range of hills, and bounds the valley of Sundoor on the west. Its distance from Bellary is considered 37 miles. The road from the village of Yettunhutty leads through the Sundoor pass, the first three or four miles being beautifully wild; the valley now opens out, and through it the road leads to the village of Bovihully, at the bottom of the hill. The approach to the hill from this village is through a low scrubby jungle with a pretty tolerable road; as it ascends the hill it gets very steep and winding, but on the whole is of sufficiently easy access for foot travellers and horses.*

"The platform is of limited extent, being but 1½ miles in length, and varying in breadth from half to three-quarters of a mile. The general aspect of the surface is undulating, having its higher edge towards the east and sloping gradually toward the west, where in many places it falls precipitously to the plains. The slopes of the hill on both faces are covered with jungle wood of no great size, intersected with numerous wooded ravines. The hill runs nearly N. and by E. and S. and by W. The view towards the W. and N. embraces extensive plains, which in their seasons are covered with abundant crops, dotted with many villages and tanks, and having the meanderings of the Tomboodra seen in the distance. That in the E. and S. looks into the valley of Sundoor."

The barometrical section makes Coomerasawmy, on the same range and about equal height with Ramandroog, 3,400 feet above the sea, and 1,825 feet above Bellary.

Geological Features.—"The rock of which the hill is formed is hornblende, some of the detached pieces of which were found to affect the magnet. On the east, or higher edge of the hill, the rock is seen projecting bare and rugged, but it is broken and disintegrated on its western edge, and the lateritious earth accumulated on it, from the decomposition of the hornblende, is sufficiently abundant to admit of cultivation there. On the northern end of the hill, near the Hospett road, the laterite is most plentiful, and it there almost conceals the underlying rock, which is only here and there seen projecting." * * * * On the western face of the hill the hornblende is stratified, and lower down schistose, and the latter contains a sufficient quantity of iron to render it valuable in the arts, and the villagers

* Captain Walker, of the Engineers, has constructed a road from the foot of the hill to the summit, of so gentle a slope that conveyances can easily ascend; it is four miles in length, and makes the distance from Bellary to the Ramandroog 38 miles.

quarry it there and extract the ore. The soil at the lower part of the platform is considered well adapted for the cultivation of all European vegetables during the season. The trees of any size consist of tamarinds, banians, bur, or Indian fig trees, and mangoes, with a variety of other smaller trees, and during the rains the hill is covered with a profusion of wild flowers and creepers."

Water.—An examination of the water procured from springs on the western side of the hill proved it to be of excellent quality; the supply plentiful, but inconvenience and expense being incurred in bringing it up, the sinking of a well on the summit was considered very desirable. An attempt was made to bore above one of the springs, but the rod broke and there remains. A chalybeate spring was brought to notice by Colonel Henderson, of the Engineers, and some who have used it have thought they derived benefit, but the taste of the water being vapid, and often containing vegetable matter, has not tempted many to drink it.

Climate.—"The general effect produced by the climate has been pronounced by all Europeans to be agreeable to the feelings and most salubrious, giving elasticity and health to the European constitution. The seasons partake of the ordinary divisions in this part of the country, but while the plains are burned up with the hot land winds, no such thing is experienced here. The natives state that the winds are occasionally hot during the hot season, but never uncomfortably so, and to them the hot winds of the plains are unendurable.

"But this statement of the hot winds is not confirmed by the European residents. During the months of March, April and May,—while, at Bellary, the heat is both constant and oppressive, with the thermometer ranging from 96° to 100° in the shade,—it has never been observed to rise higher than 84° in the houses at Ramanmullay during the hottest part of the season, which comprehends the latter end of April and the earlier parts of May. The ordinary heat in these months is about 84° at the maximum in a house, rising a few degrees higher in a tent, and this only for a few hours in the day. During that part of the year, the mornings and evenings are always cool and delightful to the feelings, and all agree in one sentiment, that, even when the temperature rises higher than ordinary, no inconvenience is experienced, as it is generally attended with a delightful cool breeze. Towards evening, in the earlier parts of May, occasional lulls are observed, but they do not last long."

Barracks.—The committee proposed an elevated site for the barracks, but I think a preferable one, as being less exposed, was selected. It was to be of ample dimensions, sufficient to accommodate 25 men, to have a spacious verandah all round, enclosed with glass windows, and a stove was to be provided; a library was recommended, and carpenter's tools to find occupation for the men. A part of the barracks was to be appropriated to a hospital, of sufficient space to accommodate six or eight, for it was well remarked, "that the patients proposed to be sent to Ramanmullay will not often require medical treatment." The medical establishment to consist of a well qualified apothecary, which, under the occasional visits of the superintending surgeon, is considered sufficient." * * * "The men being in the barracks should be dieted as in garrison, and live under military discipline."

"It may not be irrelevant to state that sanataria have been established for many years on the Neilgherry and Mahableshwur hills in Southern India, and at Landour and Darjeeling, Musoorie and Simla, on the lower range of the Himalayas. Mahableshwur is 4,500 feet above the level of the sea, the others mentioned are at elevations varying from 6,000 to 8,000 feet. Ramanmullay 3,000, and the experience acquired at these stations gives some grounds to show the diseases likely to be benefited by a residence at Ramanmullay, only the analogy is not complete, from the lower elevation of this hill."

"The committee consider medical officers, whose duty it may be to select cases, should be reminded of the importance of this duty; that, while some of the diseases which are contracted in the country are cured, or curable by a residence in hill climates, yet, for other diseases, no benefit is derived, and to some the climate proves positively injurious."

The committee summed up by expressing their opinion that the climate of the Ramandroog is favourable for the preservation of health of Europeans, and calculated to restore the energy of such European officers and soldiers as have suffered either from the effects of residence in India, or from disease, more particularly functional. The establishment of a sanitarium was recommended. To the judgment exercised by the committee, ample testimony will be borne in the results obtained during the last ten years.

The Ramandroog from its comparatively low elevation compared with other hill sanitaria, would not lead to great expectations being formed of it by those who regard elevation as the chief object in selecting the site of a sanitarium; but we shall find that, while it possesses decided advantages, it has also claims to preference over more lofty localities. No hill diarrhœa infests it as at the Bengal sanitaria; and while Mahableshwur cannot be occupied during the rains, Ramandroog may be throughout the year. It is not from mere elevation that salutary effects follow; we must ascribe a large share to other causes, such as purity of atmosphere, which is found on the Droog without the rarity which, on higher elevations, often leads to congestion of the internal organs. A sudden change from the plains to the Droog has never produced any bad effects; indeed, if benefit is promised, it shows itself in a very short time; there is no intermediate stage of seasoning. Added to pure atmosphere, how great must the effect be of a change from the bed of sickness, and that within a hospital, to picturesque scenery, hill and dale, the eye resting upon verdure on every side.

I shall now give the tentative steps that led to the establishment of a Sanitarium for European soldiers; and these I extract from reports made by me when in medical charge of the 1st Madras Fusiliers.

1849.—"At all times but during the rains,* the Ramanmullay would seem to offer a desirable sanitarium to the European regiment stationed at Bellary. A trial was made last year; 18 were sent in April and returned in June. Half the number derived decided benefit, the remainder did not; perhaps their diseases were not adapted to a hill climate. It must be borne in mind, too, that the accommodation provided was but of a temporary, and therefore, indifferent, description in tents; in a more suitable building still further benefit might have resulted. A favourable report was furnished for the information of Government after the return of the party, and an application has been submitted for permission to send more invalids this year. After a second trial the character of Ramandroog as a sanitarium will, I trust, be so fully established as to lead to a permanent establishment there. During eight months of the year it might be resorted to by the sick; they could be transferred there without delay, with little or no fatigue, be always under supervision, and be returned to duty when their health admitted of it. A building to accommodate 35 or 40 would be large enough. I believe such a sanitarium would supersede the necessity of sending many cases of disease to the coast."

1850–51.—"As regards the sanitarium at Ramandroog, I can report satisfactorily: marked benefit was derived in cases mentioned in last year's report as the most eligible, viz., where there was constitutional or acquired debility. The epidemic fever in 1850 furnished just such cases; the men left Bellary 9th December 1850, pale and debilitated; after a fortnight's residence they had made a decided improvement, and after from one to two months' sojourn, returned stout and fresh coloured as though just landed from England. The few cases that derived no benefit did not disappoint; they had very chronic ailments, were constitutionally unhealthy, and there being sent was in the way of trial. Sufficient proof has now been afforded, I conceive, that Ramandroog is a most desirable sanitarium for European troops at Bellary. I am persuaded that many of the cases transferred to the Mount would derive more benefit on this hill.† Besides climate, other advantages may be pointed out: 1st, one, two, or at most three months would be sufficient on the hill.‡

Men sent to the coast are away six months at least, 12 months' absence is common enough, and even 18 months not very uncommon. 2d. The march to Ramandroog is performed easily in three days;§ an officer is in command, who remains with the sick party. The march to the Mount occupies 32 days, is under a non-commissioned officer, who cannot control drinking, and this sufficiently accounts for some of the patients arriving at their destination worse than when they left the regimental hospital. 3d. The sanitarium at Ramandroog permits of a great amount of liberty being allowed, a circumstance which aids in no small measure a salubrious climate to the invalid's recovery. At the coast (St. Thomas' Mount) liberty must necessarily be more restricted. In regard to accommodation, the convalescents have been more favourably circumstanced this year than last, for instead of tents they have occupied a building, indifferently, however, adapted to the requirements. A greater amount of benefit than what has already been obtained, might reasonably be expected if a substantial building constructed to resist the cold and damp, at the same time well lighted and ventilated, was erected."

* This opinion underwent a modification afterwards.

† *Vide* Table in Appendix 2.

‡ For some cases a longer residence is desirable.

§ Four marches would be preferable. 1st, Coortany, 2nd, Yetenhutty, 3rd, Bovihully, 4th, Ramandroog. It would be desirable if the 2d march could be divided as it is a long one, between Coortany and Yetenhutty.

INSPECT.-GEN. PEARSE'S REPORT. MADRAS.

A third party of invalids went to the Droog in the latter part of September 1851, remaining till 30th July 1852, with much benefit to all but cases of pulmonary disease. They returned then in consequence of the regiment leaving Bellary for foreign service.

"When the duty devolved upon me to send sick to the Droog in 1849, I was not aware of the existence of the report of the Committee in 1846, and had therefore to exercise my own discretion in the selection of the cases with a view to test its sanitary effects. By attentively watching the progress of each case, I felt myself warranted in giving the opinion I did in my report to the Medical Board. Several cases were sent by me then which I should now avoid sending. But, while experience points to those who have derived decided benefit and those who have not benefited at all, there remains a class to occupy a doubtful place, of which it cannot be predicted with certainty whether benefit or not will result. There are cases, however, though not coming under the head eligible, which might be sent to the hill as a measure of necessity, to escape the heat of Bellary in April and May. The table appended, No. 1, exhibits a striking feature in regard to the effects of the Droog on disease. It will be seen that this is decidedly favourable or unfavourable for the middle place. "Partial benefit," is in very small proportion to the "Recovered," and "No benefit." The deduction is important as regards the due selection of cases to send. When it is found that all who have been sent on account of debility, constitutional or acquired, nervous palpitation of heart, the effect of the former, and some local diseases, such as ulcers, maintained by a weakly constitution, have recovered, there is ground to maintain that the Droog will fully answer the expectation that was first entertained, provided care is taken to select the cases, and in an increased measure when the building now in progress shall ensure requisite shelter and comfort for the invalids."

In consequence of the favourable reports made, and the warm support afforded by General Steel, then commanding the ceded districts, Government sanctioned the erection of a barrack and a hospital detached; the former to accommodate 80, and the latter 10. Both have ample space and are in every respect commodious. They have fire-places, which are needed in wet boisterous weather. Experience has corrected some errors, and also established the opinions first entertained as to the adaptation of the Droog for a sanitarium. It has been proved that for many cases it may be inhabited throughout the year. The rains are not heavy enough to preclude this; they rarely fall for any length of time continuously, and the water rapidly drains off. Fogs prevail at that season, coming on at sunset and lasting till 9, 11, or 12 o'clock in the day; but though the mist clears off, the sky above is loaded with vapour, so that during the monsoon the sun is rarely visible; but these fogs are not found at all injurious, if active exercise can be taken and there is a due amount of vigour in the constitution to resist the effect of damp; where this is not the case, another season should be chosen for the invalid. September and October are delightful months; the atmosphere is no longer saturated with moisture, but is clear and bracing; and, while occasional showers maintain the verdure that covers the hill, a profusion of wild flowers adds to the beauty of the scenery. During the cold season the easterly winds are at times strong and unpleasant, but the prevailing character of the weather is remarkable equability of temperature, the thermometer ranging but a few degrees throughout the 24 hours. This gives the Droog a great advantage over the low country, where the range, during the cold season, is so great and trying to delicate constitutions. Although, during the hot season, from March till the setting in of the south-west monsoon, which varies from the middle to the end of June, the Droog loses much of its charms in regard to the scenery; it is then that its great benefits to the invalid, and its advantages in maintaining health, are most striking. This is well shown in the case of children; the pale face assumes the rosy hue of health; the appetite that in the plains had been falling off there acquires a keenness that it is pleasurable to witness. At this season a westerly wind blows in the morning, when exercise is much enjoyed. At about 11 a.m. the breeze dies away, and the day becomes warm, at about 3 or 4 o'clock so much so that a punkah is grateful, but it is comparative heat only, for, after what is felt at Bellary, it is not to be regarded. At 7 or 8 p.m. the sound of the westerly wind is heard coming across the plains; soon it reaches the Droog cool and balmy, and under its influence the nights are passed in sound refreshing sleep. It is to be regretted that no full or accurate meteorological observations have been kept from the first occupation of the hill; but the temperature, amount of moisture, and fall of rain are now being registered so as to ensure accurate results. The table appended gives the observations for 12 months. I think it will be found that there is a difference of 10°, at least, between the Droog and Bellary, this from sunrise to sunset. Were the observations taken throughout the 24 hours, there would be a much greater difference; but it is on the Droog as elsewhere, the index of the thermometer is not the test of sensible heat, I mean appreciable by the sensations. I have seen the thermometer stand as high as 90° indoors, but there was a cool westerly breeze blowing, and no heat was felt. In support of the deductions made at the close of my report of 1850, further experience enables me to add that the sanitarium is especially suited to cases of constitutional debility, chiefly found in lads who were ineligible when recruited (and some of whom will never, under the most favourable circumstances, turn out as physically efficient as soldiers should be); also where disease has weakened the general powers, there being no organic lesion present. For debility or morbid sensibility manifesting itself under the form of "nervous heart," the Droog is equally efficacious. For rheumatism, a modified opinion must be given, as this troublesome affection shows itself under very different characters, often associated with other diseases, as syphilis. Rheumatism excited into action, or maintained by atony of the digestive organs, would be benefited; not so the marked rheumatic diathesis. Syphilis, primary or secondary, scrofula, ulcers, or other local affections dependent on depraved habit of body, are ranked in the table under "No benefit," but I would modify this opinion by saying that diseases depending on vitiated blood cannot be expected to be *cured* by a mere residence in the best climate. Time must effect the cure, yet it is of great importance to aid by every means available, and there can be no question that cases of secondary syphilis, scrofula, constitutional ulcers, &c., will be under more favourable circumstances for time to work a cure, on the Droog, than if confined to a hospital in the plains. To expect a perfect cure, as the result of mere residence at any sanitarium in such cases will in most instances meet with disappointment. Some of such cases have ultimately recovered, after prolonged residence, others have not, but have had to be transferred to the presidency for disposal. But there is a third class of diseases to be considered, for which the hill climate proves decidedly injurious. This comprises pulmonary affections of all kinds, and diseases of the liver and bowels, when the morbid process is still in operation. When this has been subdued, then, for the subsequent debility, and the effects of long confinement to hospital, the Droog decidedly benefits.

Not only is judgment needed in selecting the suitable cases; but I consider there should be a selection of the seasons in which to send them. Invalids suffering from general debility, constitutional or acquired by disease, of the effects of high temperature, may be sent at any season; but where a choice can be made the cold season should be selected, and the invalids should remain till the termination of the hot weather, about the middle of June. Cases of chronic rheumatism, particularly if associated with secondary syphilis and scrofula, had better not arrive at the sanitarium before February, and should leave at the end of June.

I would, in conclusion, offer the following remarks:—To preserve the sanitive influence of the Ramandroog, it is essential that the woods should not be cut down, as was done extensively at one time, and still is, though to a less extent. Strip the hill of trees, and a large mass of rock and ironstone would be left, and its salubrious character would depart. It would be well to replace the trees on the plateau that have been cut down; this would cool the surface and obviate glare in the hot season, and break the force of the strong westerly winds. Highly advantageous as sanitaria are for restoring health to the invalid, great care is needed that they do not become detrimental to the morale of the soldier, by fostering idleness, slovenly habits, &c. Hennen thus writes of a convalescent depôt in the Mediterranean:*—"I would recommend the convalescents should be made to perform duties of an easy description, and which would not expose them to the sun or night air. This would both tend directly to improve their health and obviate idleness, which is the greatest enemy to their recovery. As their health becomes re-established, they should be returned to their respective corps by every favourable opportunity." Easy drill, short marches, and any employment, even the construction of roads, the cultivation of gardens, where everything is so favourable for it, a library for such as derive pleasure from reading—these, and other means which an active interest on the part of those concerned would lead them to adopt, greatly promote the sanitary effects of the Ramandroog sanitarium. Nowhere should the "*nimia diligentia medici*" be more avoided than at a sanitarium. The restorative effects of change of climate and of scene should be allowed full scope, yet it is difficult to get young medical practitioners to appreciate this; even amongst the seniors it is not easy to dispossess some minds of the per-

* Medical Topography, Ed. 1830, page 560.

suasion that every deviation from health should be met by a course of physic.

Bellary, 8th June 1858.

Note.—The invalids have latterly been weighed on arrival and departure. Had I fully appreciated the value of this test of health, I should have adopted it from the first establishment of the sanitarium. I am indebted to Dr. A. Thomson, Her Majesty's 58th Regiment, who has written on the subject, for my knowledge of its great use in hospital practice, so obvious that a weighing machine should be found in the receiving room of every hospital.

Table III. gives the result of weighing 20 men.

TABLE I.—Showing the NUMBER of INVALIDS sent to the RAMANDROOG SANITARIUM, their DISEASES and RESULTS, from 1848 to March 1858 inclusive.

—	Sent of each Disease.	Recovered.	Partial Benefit.	No Benefit.	Died.	Remarks.
General debility, constitutional, or consequent on fever or deranged health, without local disease -	129	127	2	0	0	
Nervous palpitation of heart - - -	7	6	*1	0	0	*Health improved, but continued subject to palpitation.
Rheumatism - -	7	7	0	0	0	
Secondary syphilis and rheumatism complicated with syphilitic taint - - -	30	13	5	10	2	
Primary syphilis in unhealthy constitutions -	6	2	1	2	1	
Impaired health consequent on venereal chiefly, and long confinement to hospital -	45	43	1	1	0	
Scrofula - - -	18	4	0	3	1	
Bowel complaint - -	10	5	2	3	0	
Ditto ditto convalescents from - - -	6	6	0	0	0	
Pulmonary affections, { Pneumonia, 2; Bronchitis,* 8; Phthisis, 1; Asthma, 1 } -	12	0	*2	9	1	
Hepatic affections - -	14	4	0	8	2	
Ulcers and eruptions connected with depraved habit of body - -	12	2	0	10	0	
Disease of kidney and bladder - - -	3	0	0	2	1	
Ophthalmia with impaired health - - -	2	0	†2	0	0	†Health benefited, but not the local disease.
Total - - -	300	218	18	56	8	Nearly all the deaths in men very ill when sent.

Per cent. of recovered to number sent	-	72·66
Ditto, no benefit, ditto	-	19·45
Ditto, of partial benefit ditto	-	6·
Ditto died ditto	-	2·74

TABLE II.

—	—	Recovered.	Partial Benefit.	No Benefit.	Died.	—
Invalids sent to Ramandroog - -	a60	38	8	12	2	a Accommodated in tents or a temporary building before the present barracks and hospital were erected.
Ditto to the Mount.	b60	24	9	14	13	b The cases not selected, but taken consecutively as they stood in the books.

TABLE III.

	st.	lbs.
2 Gained - - -	1	9 each.
5 Ditto - - -	1	0 ditto.
13 Ditto - - -	about ½	0 ditto.
20		

The MONTHLY and ANNUAL MEANS of the METEOROLOGICAL REGISTER kept at BELLARY, and at the RAMANDROOG SANITARIUM for the Year 1857.

—	Bellary.					Ramandroog.				
	Dry Bulb.	Wet Bulb.	Per Cent. of Moisture.	Sun's Rays at 4 P. M.	Rain.	Dry Bulb.	Wet Bulb.	Per Cent. of Moisture.	Sun's Rays at 4 P. M.	Rain.
January -	75	68	64	100	0·0	70	62	68	87	0·0
February -	84	73	67	105	0·0	80	63	43	95	0·0
March - -	87	78	73	102	5·17	80	70	53	94	0·5
April - -	93	78	62	122	0·12	80	65	47	99	1·10
May - -	87	82	79	99	2·29	76	79	67	92	9·6
June - -	83	79	77	94	3·22	72	69	86	79	5·0
July - -	82	76	73	91	0·77	70	69	70	73	11·5
August - -	80	70	65	89	0·0	69	69	90	72	1·0
September -	81	73	69	91	0·98	70	68	74	79	2·10
October - -	76	72	70	93	7·62	63	67	78	91	8·18
November -	75	66	61	103	1·10	69	63	72	89	3·30
December -	73	62	56	114	0·0	67	61	72	89	0·0
Average Annual Means -	81	73	68	100	21·27	73	66	71	87	44·0

INSPECT.-GEN. MACPHERSON'S REPORT. MADRAS.

REPORT OF INSPECTOR-GENERAL MACPHERSON.

REPORT by INSPECTOR-GENERAL of HOSPITALS, Dr. MACPHERSON, H.M. Madras Establishment, in answer to the Questions of the Commissioners.

(Chiefly, but having reference to sanitary details generally affecting all India).

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PREAMBLE.

During the past three years my duties have led me over the entire area of this Presidency, to inspect our Military Hospitals and Medical Establishments, to inquire into the sanitary condition of our garrisons and cantonments, and to report on everything affecting the health of the army, European and native. I have visited our sanitaria and hill stations, and also examined such elevated ranges contiguous to our military posts as appeared to be suitable for troops, and now, in obedience to the commands received, I proceed to record the result of my inquiries into the different subjects submitted in the foregoing questions.

My observations will appear in the order of my inspection, as shown in the index, which also exhibits the sickness and mortality at the Civil and Military Establishments throughout the Presidency during the twelve months prior to the date of my visit to each station. Some of these will be passed over with a few brief remarks; others, where for instance European troops are located, will be treated more in detail, and finally, in accordance with clause 14 of the Royal Commissioners' queries, I will submit my views on other important subjects which bear essentially on the sanitary condition of the country and the Indian Army; as—

The beneficial effects of change to the soldier in health and sickness, from the arid plains to the coast, to elevated mountain ranges, or to the lower summits of solitary hills; the length of time a soldier should serve on hills and plains; a description of the existing sanitaria in the Madras Presidency, and of places where others might be advantageously established as a residence for the preservation of health, and in convalescence from disease, to the soldier serving in Bengal and Bombay as well as in this Presidency.

The destructive effects of debauchery and of venereal disease on the health of the soldier, and the loss of efficiency resulting therefrom; the precautionary measures necessary to preserve them from these irregularities, and to protect them from epidemic disease; the best age and season for a soldier to land in India; the best mode of disposing of him on landing and during his first years of service.

The importance of the removal of surface filth before it accumulates; observations on barracks, hospitals, and outhouses; defects in their site, aspect, and construction; importance of superficial and deep drainage; remarks on furniture, beds, dress, diets, &c.; necessity for medical inspections, and for the introduction of instruction, trades, and other recreations as part of a soldier's duty in quarters; position and regulation of burial grounds.

The necessity for the introduction of efficient ambulance arrangements for the conveyance of hospital equipments and the transport of troops in health and sickness; simplification, assimilation, and reduction of hospital records and returns; the want of returns to exhibit the sanitary condition of the soldier's family and the civil European population throughout India; remarks on the duties of medical officers, and the qualifications necessary for administrative appointments.

These are the chief points adverted to by the Royal Commissioners. It would be a work of supererogation in me, however, to do more than generalize on the subjects, as special reports are called for from officers resident at each station relative to their respective localities.*

STATIONS.	REPLIES.
I. CHINGLEPUT.	1. This station is 35 miles south-west of Madras, on the great military road to the southern division of the army. The general aspect of the country surrounding the station is little above the level of the sea. The surface soil is sandy, covered with scrubby jungle, or bare and interspersed with barren hills and detached masses of granite. The town of Chingleput lies about half a mile south-east of the station. It is clean and airy, the Palar river running close to it. An artificial lake, which, when full, is two miles long and one broad, lies within half a mile of the station; but in the dry season, when the water becomes low, a strong odour arises from the decay and decomposition of the weeds on its bed. 2. The collectorate and zillah of the district occupies this station. The troops † consist of a strong native guard over a large body of prisoners incarcerated within the fort. The hospital for the reception of their sick is low, surrounded by walls, shut up on the rear, and entirely without roof ventilation. Here, as at most of our stations throughout the Presidency, civil hospitals and dispensaries have been established by the local community, assisted by a grant in aid from Government, to afford relief to the poor and diseased inhabitants of the station and country around. Government supplies the medicines and provides professional aid to the sick. Some idea of the good effected by these establishments may be formed by referring to the index. But as neither this topic, nor that of jails, form any part of the subject of the present inquiry, I will not swell my report by again referring to them.
II. CUDDALORE.	3. The zillah of Cuddalore, the capital of South Arcot, is situated on the coast, 112 miles south of Madras. Its elevation is not more than 5 feet above high-water mark. The soil around is sand, with clay beneath. There are patches of rich cultivation, but no jungle or hills in the neighbourhood. The climate is very equable, relaxing in its effects, but favourable to convalescence from acute attacks. 4. Until lately Cuddalore has been the depôt for European pensioners and invalids from all parts of the Presidency, who were compelled to reside there. But now they go where they please, consequently the number at Cuddalore has been much reduced. Calculated for a period of nine years, the admissions into hospital averaged 60 per cent. on the strength, and the deaths 10 per cent. on the treated. The hospital and the pensioners' lines are situated close to the muddy bank of a river or swamp, which, when not flooded by the tide, emits odours most injurious to health. The hospitals for the European invalids, as well as that for the native guard of sepoys ‡ over the gaol, are without ventilation or conveniences; and, everything considered, Cuddalore appears to me to be a most improper place, in a sanitary point of view, to select as a final resting-place for the old and worn-out soldier.§ 5. I may here observe that, at the French settlement of Pondicherry, a few miles to the east of this station, the diseases of India, dysentery and hepatic affections, are almost unknown. This exemption to diseases so fatal to English residents in India may be attributed to the admirable system of drainage and other complete conservancy arrangements enforced within the town and in its environs.
III. TRICHINOPOLY.	6. This cantonment, the head-quarters of the southern division of the army, is distant from Madras 207 miles. It is placed on an extensive plain, interspersed with numerous insulated masses of rocks, which either rise in irregular shapes to a great height, or are dispersed in large detached tabular masses. The predominating surface rock is the secondary or transition granite, the lower being trap and greenstone. The soil around the cantonment and town is sandy and gravelly, or a rich black loam; where there is a sufficient supply of water

* The foot notes in the Report are by his Excellency Sir Patrick Grant, Commander-in-Chief, who permitted me to submit it to him prior to sending it in officially.

† The military guard has been withdrawn, and the duties are now taken by the police.—P. G.

‡ The duties are now taken by the police, there are no sepoys at Cuddalore.—P. G.

§ The selection is their own entirely.—P. G.

STATIONS.	REPLIES.
III. Trichinopoly—*cont.*	it becomes remarkably productive. The climate for eight months of the year is exceedingly sultry. In March, April, and May the country is entirely burnt up. The mean annual temperature is 86°; the greatest heat in the shade is 102°; the lowest, 68°: but when exposed to the sun the thermometer rises to 140° of Fahrenheit. The average fall of rain varies between 30 and 40 inches per annum. 7. It is computed that the native population in the town of Trichinopoly exceeds 100,000 souls. The streets are rather regular and clean, and there is tolerably free ventilation through the dense mass of low, closely-packed huts. But the suburbs of the town and environs of the military cantonment are resorted to by the natives for the purposes of nature. The offensive odours and injury to the public health from this excessive accumulation of surface filth will be apparent to all. Added to this, the burial grounds are close to the public roads, or in crowded parts of the cantonment, and the soil is daily disturbed to deposit bodies, which are now being piled one over the other. This great sanitary error might easily be remedied by the erection of public latrines, by closing the present burial and burning grounds, and selecting other spots at some distance. 8. By means of artificial irrigations from the river Cauvery, the cultivation of rice is brought close up to the station; but this does not appear to exercise a prejudicial effect on the health of the troops. Indeed, it has been observed that a marked change for the better takes place in the climate of Trichinopoly when there is a sufficient supply of water to cover the face of the country, and when the dry sultry atmosphere and intense radiation of heat, the usual characteristics of the station, give place to vegetation. 9. The space occupied by the barracks and officers' houses covers an area of between six and seven miles. The established military force for the station consists of— 1 light field battery.—P. G. 1 company of European artillery. (Reserve).—P. G. 1 regiment of European infantry. 1 regiment of native cavalry. (Which is to be withdrawn).—P. G. 4 regiments of native infantry. (To be reduced to 2 Regts. N.I.)—P. G. The European artillery are quartered on raised ground, in a lofty, well-ventilated building near a good stream of water. There is a mango tope contiguous to the barrack, where the men amuse themselves in the shade. The quarters allowed to the married men and families are defective in size and ventilation, and the hospital for both is too small, having also the great objection of being under the same roof as the barrack. 10. The barracks for the European regiment have long been condemned as habitations for human beings. They form a quadrangle, one portion being tiled and the other bomb-proof. In breadth they vary from 5 to 6 feet, and their height does not exceed 12, having no adequate roof ventilation; in fact they are not equal to the horse stables now constructed. The men are at present closely distributed in temporary well-raised barracks, and it is in contemplation to erect new accommodation for them on the most eligible spot which the vicinity affords. 11. In a military point of view, necessity may render the erection of European barracks for 1,000 men at this station imperative; but, sanitarily considered, I am opposed to the measure. True, the climate of Trichinopoly does not present a marked death rate much in excess of what occurs at other stations. But, independent of the actual mortality, there are other considerations which have to be considered, and the chief of these at this station is the depressing climate, which enfeebles the nervous energy and disposes to relaxation of the muscular fibre, causes which must operate directly and indirectly on the efficiency of the European soldier. I will hereafter show, when I come to treat on hill stations, how this may be remedied by locating a portion of the European force on certain elevated ranges within the division, so as to admit of a wholesome interchange from the plains to the hills, with much advantage to the health of the soldier, and possibly without disturbing existing military arrangements to a great extent. 12. The hospital for the sick of the European regiment is a well-ventilated, commodious, and lofty building capable of accommodating 100 beds. Each ward is provided with punkahs, and there is an air of comfort throughout. A wall 10 feet in height encircles the building within a few yards; this is a great objection, for the powerful heat of the sun is necessarily absorbed by or reflected from it during the day, and it impedes, especially during the night, the free circulation of air within the court. There is a female ward in the centre of the court, which is also objectionable. It is in too close proximity to the men as they pass and repass to the privy. A lavatory and bath-room is urgently required, there being but one bath-room for men, women, and children. 13. Amongst the Europeans of the force, venereal affections form the largest number of admissions into hospital. Thoracic and hepatic affections and bowel disorders being the prevailing diseases. During a period of 15 years prior to 1856–57, 14,221 European soldiers served in this division of the army. The following table exhibits the sickness and mortality amongst them during that period as contrasted with 1857–58, when the number on duty did not exceed 491, from the under-mentioned diseases:—

	Cholera.		Fevers.		Liver.		Diarrhœa and Dysentery.		Venereal.		Rheumatism.		Thoracic Diseases.	
	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died
Admissions and deaths from 1842 to 1856-57 - - -	201	101	6,270	58	936	36	3,151	103	33,133	5	1,388	3	1,048	30
Treated to strength per cent. -	1·4		44·09		6·5		21·12		22·03		9·7		13·10	
Deaths to do. do. -	0·7		0·4		0·2		0·23		0·03		0·02		0·20	
Admissions and deaths in 1857-58	7	2	95	—	49	2	115	1	133	—	53	—	38	5
Treated to strength per cent. -	1·4		19·3		9·9		22·13		27·08		10·07		7·7	
Deaths to do. do. -	0·4		—		0·4		0·2		—		—		0·10	

Stations.	Replies.
III. Trichinopoly—*cont.*	14. The native portion of the force are accommodated here, as they are at all other stations of the army, in huts built of mud, roofed with straw or tiles. In the construction of these due precautions are taken to form the streets of sufficient width, and open to the prevailing winds. Officers commanding regiments being responsible that proper conservancy arrangements are enforced. The climate of Trichinopoly is very favourable to the health of natives. The native town is seldom altogether free from sporadic cases of cholera. But fever, venereal, and rheumatic affections form the large proportion of their sick.
IV. Tanjore.	15. The town of Tanjore is 33 miles east of Trichinopoly. The district around comprises the delta of the river Cauvery. The climate is considered salubrious, free from miasmatic exhalations, and the inhabitants are reported to attain a great age. The Cauvery usually fills in the months of June and July by the south-west, and again in November by the north-east monsoon. The distribution of water is regulated by anicuts or dams across the river, the water being then conducted by irrigating channels, thus converting what otherwise would have been an arid and barren plain into perhaps the most fertile, rich, and populous district in this Presidency. The military force at this station at the period of my visit consisted of one company of Europeans and one of natives, detached from Trichinopoly and relieved at short intervals of time. The troops were healthy, and the arrangements made for their accommodation were satisfactory in every way.
V. Comboconum.	16. The district around the station is a continuation of the rich delta watered by the Cauvery, and is equal in salubrity to Tanjore. A detachment of sepoys from Trichinopoly garrison the station. They are very healthy. But the jail, which occupies a low sandy piece of ground near the river, is perhaps the most unhealthy jail in the Presidency, although every attention is paid to cleanliness, &c. The fact is, we have here a striking instance of the evil effects directly and distinctly traceable to defects in the site, aspect, and construction of this building. The drainage is bad and cannot be improved; the privies are close to the wells. The space around the cells is too circumscribed by high whitewashed walls, which throw out great reflected heat during the day and retained heat at night; the cells are badly ventilated, and finally the walls and floors have become so polluted by miasmata that the jail pestilence pervades every quarter of the building. Strong healthy men no sooner enter the precincts of the jail than they droop in health. Diarrhœa rapidly runs on to ulceration, anasarca and death; ulcers are common, and the smallest abraded surface assumes an unhealthy action. Since the date of my visit to the place praiseworthy attempts have been made to improve the sanitary condition of the building by scraping the walls, renewing the floors, improving the ventilation, and altering the position of the privies. But the good that resulted was only temporary.
VI. Negapatam.	17. This seaport will ere long become a place of importance as the terminus of the Trichinopoly railway, which passes through the rich district of Tanjore, and not far from the base of the lofty Pulney hills, which in elevation and climate vie with the Neilgherries. At this port troops disembark and proceed to Trichinopoly, which is 100 miles inland. It possesses an equable and moderate temperature, and enjoys considerable immunity from disease. A small detachment of sepoys from Trichinopoly garrison the place.
VII. Tranquebar.	18. Tranquebar was until lately a Danish settlement. A detachment from a native regiment at Trichinopoly now garrisons it. On account of its salubrity and the buildings in the fort appropriate for the purpose, it was at one time in contemplation to make it a coast sanitarium. But although well adapted as a residence for people in health, it has been found to retard rather than promote convalescence after acute attacks.
VIII. Madura.	19. This zillah lies 83 miles south of Trichinopoly. A small detachment of native troops garrison it. The district is subject to periodical visitations of cholera. But the inhabitants are prosperous, and the land, which is watered by both the south-west and north-east monsoons, is highly productive. The native town is a pattern for cleanliness, and the streets are spacious. A chain of mountains taking a south-east course divide the district from Travancore; a continuation of the same chain extends in a north-east direction to within 20 miles of Trichinopoly. I will reserve my observations on these hills until I come to treat on the subject of mountain ranges generally.
IX. Tinnevelly and Palamcottah.	20. The former is the civil and the latter the military station of the district, both being contiguous. The general aspect of the country is a level plain extending for many miles, interspersed with rounded stony hills. The land is fertile and extensively irrigated by cuts from the Tambaravary river, which deposits a quantity of alluvium annually on the rice lands. The soil on the higher grounds is a red sand strongly impregnated with iron, forming a clay which produces good cotton crops. A detachment of European artillery were formerly stationed at Palamcottah, now a regiment of native infantry garrisons it. The barracks and hospital occupied by the artillery are spacious, well-aired, and lofty buildings. The men are very healthy, and a judicious system of conservancy is kept up in the native town.
X. Quilon.	21. Is a military post on the coast within the territories of the Rajah of Travancore. The surface of this country to the east is mountainous, elsewhere it is varied with hill and dale, and well watered. Some of the hills attain an altitude of 4,700 feet, with table land on the summit, and being not far removed from the sea, the climate is admired by those who resort to it. Quilon is famed for its salubrity. Cholera rarely visits it. A prolonged residence at the station relaxes the system; indolent ulcers, cutaneous diseases, and elephantiasis being the prevailing diseases.
XI. Cochin.	22. A detachment of native troops garrison this town, which, in a commercial point of view, is one of the most flourishing on the coast. The climate is never cool or bracing. There is always a degree of moisture in the atmosphere, and the temperature throughout the year is very equable, a continued drought being almost unknown. The maximum thermometer is 85°, and the minimum 78°. Venereal disease in its worst form is the curse of the town.

INSPECT.-GEN. MACPHERSON'S REPORT.

MADRAS.

STATIONS.	REPLIES.
XII. CALICUT.	23. A detachment from the European and from a native regiment at Cannanore garrison this place, to overawe a dense population of fanatic Moplahs who inhabit the town and country around. The town is a little above the level of the sea, but by judicious arrangements the surface water does not lodge, but is carried away by stone channels. The great sanitary defect in the place are the burial-grounds in the centre of the dense population; but I will reserve my observations on this subject until I come to treat on the subject of the burial of the dead. Cholera at times makes terrible inroads amongst the population. Bowel disorders terminating in anasarca and cutaneous affections, being the prevailing diseases of this place. The European portion of the garrison are accommodated in commodious private houses.* They have every comfort, and their sanitary state is satisfactory. The native soldiers are also well cared for.
XIII. MALLIAPOORUM.	24. At this outpost, which is 36 miles inland from Calicut, a detachment of Her Majesty's 66th Regiment soldiers are stationed. The men have been very healthy. I found only two men on the sick list; their barracks and hospital occupy an elevated ridge of ground, are well raised, lofty, freely ventilated, and sufficiently commodious. The men have a small library, and the officer in command encourages them to amuse themselves on the skittle and cricket ground, and in private theatricals.
XIV. TELLICHERRY.	25. A detachment of native infantry garrisons this very picturesque station on the western coast. Low hills clothed with wood and interspersed with valleys approach to within a short distance of the sea, and its salubrious climate is generally acknowledged. The annual fall of rain averages from 120 to 140 inches; the soil is amazingly productive; the low lands yield three crops of rice annually, and on the higher ranges the culture of spices and coffee is rapidly extending. The men of the detachment are in excellent health.
XV. CANNANORE.	26. The provinces of Malabar and Canara form part of the Mysore division of the army, and Cannanore is the head-quarter military cantonment. It has a seaport, which is embraced inland by a succession of low hills, composed of a gravelly laterite. On the edges of the cliffs along the sea face, which vary from 30 to 50 feet in height, the officers' houses are placed. A little inland, but fully under the influence of the pure sea breeze, are barracks for one European regiment, and still closer to the sea the regimental hospital is placed; these are commodious buildings, well elevated, and tolerably ventilated. There are quarters for three regiments of native infantry considerably to the north of the European barracks. The surface soil around and in cantonments is entirely composed of the debris of laterite, chiefly of a gravelly nature, forming a shallow covering to the rock itself. From the porous nature of this substratum, water is rapidly absorbed and drained off; the surface, even after heavy rain, speedily becomes dry, and there are no accumulations of stagnant water. The town is situated nearly a mile from the cantonment; it is very populous and very filthy. 27. To Europeans in health the climate of this station, after a lengthened residence, has a most relaxing effect. It is unfavourable to convalescence under all circumstances, and patients but slowly and imperfectly regain their wonted health and strength after an acute attack. The temperature is remarkably equable, the maximum being 88°, and the minimum 68° of Fahrenheit. The ordinary fall of rain is 120 inches, and it is not unusual for 6 inches to fall within the 24 hours. 28. Cannanore stands high in the scale of healthy stations for European troops within this Presidency. Cholera is rare, but diarrhœa and dysentery prevail. Taking a cycle of 15 years prior to 1856–57, the admissions into hospital from these diseases average 22 per cent. on a strength of 14,441. In 1857–58 the average was 19 per cent. on a strength of 722. But syphilitic affections are of all others the most prevalent amongst the European soldiers.† In the first of the above periods 3,666 are registered, or 25·3 per cent. on the strength, and in the second 213 or 29·5 per cent. of strength were treated, independent of a large percentage of rheumatic affections, concurrent on the primary syphilitic. But I will reserve my observations on this disease until I come to treat of it as it affects the army generally.
XVI. MANGALORE.	29. Mangalore is the principal military and civil station in Canara. The native town stands in the immediate vicinity of the sea. The free circulation of air is here impeded by the dense wood and high walls which surround almost every little hut.‡ The ground occupied by the cantonment is indulating, with a gravelly laterite subsoil, resembling much in character that around Cannanore. Immediately beyond cantonment the hills rise to some elevation; at first rugged in aspect, and covered with bare jungle and scanty grass, but finally attaining considerable height. One portion, denominated the Kudray Mook (Horse's nose), attains an elevation of upwards of 4,000 feet, and is resorted to by Europeans during the hot months of March, April, and May. The burst of the south-west monsoon compels them to resort to the plains in June. Two native infantry regiments § garrison the cantonment of Mangalore; its climate does not differ from the other stations on the coast, having a relaxing and depressing influence on long residents.
XVII. COIMBATORE.	30. Two companies of native infantry garrison this civil station, which is 20 miles from the foot of the ascent to the Neilgherry mountains. It is 1,480 feet above the level of the sea, and the climate is agreeable and healthy.
XVIII. SALEM.	31. The civil station of Salem is garrisoned by a detachment of native infantry. The native town is placed in the lowest part of the district in a saucer-shaped valley. Fever, a prevailing disease throughout the district, is seldom absent from the town. Cholera also appears in epidemic forms. But of late considerable improvement in the sanitary condition of the place has been effected by the removal of surface filth and by judicious drainage.
XIX. VELLORE.	32. A detail of European artillery and two regiments of native infantry compose the garrison of this military cantonment, which is 80 miles west of Madras. In close proximity to the station are several rough detached rocky hills, some attain an elevation of 2,000 feet, and are resorted to by the officers of the garrison during the hot season. The soil in the neigh-

* The European detachment is now quartered in the houses transformed into an excellent barrack. The situation is admirable, and the change in every respect a vast improvement.—P. G.

† I may observe here, that on my repeated representation, Government has now sanctioned lock hospitals being established at every station in the Madras Presidency occupied by European troops. Commanding officers have received authority to expel from a cantonment any women suspected of being diseased, who may refuse to submit to be examined.—P. G.

‡ The site of the cantonment has now been changed, on my recommendation, to a fine clear elevated spot, open to the sea and with the freest ventilation.—P. G.

§ To be reduced to one regiment N. I.—P. G.

STATIONS.	REPLIES.
XIX. Vellore—*cont.*	bourhood of Vellore is a rich dark brown mould, which is very luxuriant. Formerly this station was not surpassed in salubrity by any in the country, more especially to the native constitution; but it is not so now. Fever is never absent from the station, and cholera is too often endemic; the cause of this is the crowded and overgrown state of the cantonment. Within the last 20 years the population within the military limits has doubled without its area being increased; houses, and high walls, trees, and hedges, now obstruct the free circulation of air, and conceal much surface filth. The hospitals are very inferior, low, badly ventilated and situated.*
XX. CHITTOOR.	33. A small detachment of native troops garrison this civil station, which is 1,100 feet above the level of the sea, on the borders of the Mysore table land, and bears a good reputation for salubrity.
XXI. ARCOT.	34. The military cantonment of Arcot, 70 miles from Madras, placed in an open bleak plain, with here and there inconsiderable bare hills of granite in a decaying state; the subsoil is a whitish gravel, with little or no vegetation for several miles, and no jungle whatever for many miles around. Formerly the force stationed at Arcot was one European and two native cavalry regiments; now it is unoccupied, save by European non-effectives and invalids, and by recruits, who are drafted there on arrival from England. This European infantry depôt occupies the buildings erected for the dragoons in former days. The hospital is a lofty well-aired building, but the construction of the other barracks is defective, and as regards site and aspect all sanitary considerations appear to have been overlooked at the period of their erection. In construction they are not sufficiently raised from the ground, and with one exception they are wanting in elevation, in width, and in ventilation; finally, the position they occupy is the most unsuited, sanitarily considered, that the country around affords. 35. The climate of Arcot is exceedingly oppressive and exhausting. I was stationed there for some years, and I have not in my military career experienced in myself or in my professional attendance on others equal nervous exhaustion and inability to exertion. Cholera of a low and fatal type is endemic in the native town, and when it extends to cantonment, the results are usually most disastrous. I have not in any other part of the Presidency seen a body of European soldiers look so bloodless and cachectic as at Arcot. The fresh recruit and the old soldier, whether in hospital or in barrack, wore the same wan look.† 36. Within comparatively recent times this station has been periodically scourged by cholera. Her Majesty's 13th Dragoons suffered most severely, losing many officers and men. The 25th K. O. B. in like manner were severely visited. The 1st Madras Fusiliers likewise suffered severely, and 18 months ago the depôt of European recruits was nearly decimated by the same disease. The neighbouring station of Arnee has an equally bad reputation, and has been finally abandoned as a military cantonment. These frequent visitations of this most destructive pestilence to the cantonment of Arcot, and its terrible ravages on the enfeebled constitutions of those who garrison it, are powerful reasons for the adoption of a system which is more likely to economize the life of the soldier on first entering on his career in India.
XXII. POONAMALLEE.	37. This depôt for recruits, time-expired men, unfits, and invalids of Her Majesty's regiments of the line, is 13 miles west of Madras. The cantonment is a little above the level of the sea, the land in the vicinity, though sandy, is much under rice cultivation. The climate is salubrious, and cholera has rarely visited the locality. The barracks for the accommodation of the men are the worst I have seen anywhere; they are almost level with the ground, the walls are only 10 feet high, and the pent tiled roof only five above this; the doors are solid, if closed no fresh air can enter, there is darkness within, and but litle egress for the foul air above. I found the men crowded to an intolerable extent. In the enclosed verandahs as well as in the body of the building, the men lay on boards and trestles, with barely space to pass between each other's beds. Their clothing and kit was placed over their heads, and they partook of their meals where they lay.‡ 38. The hospital is placed within the fort, and it is even a more objectionable building than the barracks. It is low in the roof; great buttresses have been raised at short distances, both outside and inside; the verandahs, and centre walls have been erected inside the sick wards to keep the building from tumbling down. This ward is only 16 feet in breadth, it slopes from the centre to the sides (probably from the sinking of the foundations) to such an extent that the legs of the sick man's cot at the head are obliged to be raised on bricks, so as to place them on a level with the floor on which the foot part rests. The building is utterly devoid of roof ventilation, and the space on which it stands is encircled by the fort walls, the houses attached to the hospital, and by a shallow ditch, overgrown with weeds at one season, and at another by an offensive swamp giving off mephitic exhalations. Heat apoplexy, diarrhœa, dysentery, and hepatitis, are the great diseases of the place. Here also are observed the destructive effects of syphilis on our European army, and the loss to the State consequent thereon. 39. If it be desirable to remove the infantry depôt for the local European army from Arcot to a more unobjectionable situation, humanity demands that the drafts from home for Her Majesty's regiments of the line serving in this Presidency, the sick and wounded, &c., should find also a more favourable locality than Poonamallee. I will reserve the consideration of this subject for a separate section.
XXIII. PALAVERAM.	40. This military cantonment is the chief depôt for all native sick details from regiments serving beyond sea and out of the Presidency. Atrophy, rheumatism, beriberi, and bowel disorders form the majority of the ailments of the men. The heat of Palaveram is great. But the station is reported healthy, and cholera seldom visits it.
XXIV. SAINT THOMAS' MOUNT.	41. The head quarters of the artillery arms of the Madras army occupy the military cantonment of Saint Thomas' Mount. It is only four miles in a direct line from the sea, and eight from Madras. The soil on which the cantonment stands is a red clay or gravel, and although the heat for six or eight months of the year is very oppressive, the station enjoys a favourable reputation for salubrity. The barracks are very good, the hospital is a

* The fort of Vellore is to be dismantled, and the station abandoned as a military quarter.—P. G.

† Government has now consented to withdraw the European Recruit Depôt from Arcot to the Mount; a measure urged by me three years ago.—P. G.

‡ This depot is also to be established at the Mount, and full time it is that Poonamalee should be abandoned; the public buildings of every kind are, I really believe, the worst in the world occupied by British soldiers.—P. G.

STATIONS.	REPLIES.
XXIV. Saint Thomas' Mount—*cont.*	first-rate building, there are skittle sheds, fives court, and library for the use of the men.* The barracks are provided with punkahs, and during the hot land winds with other appliances to moderate the overpowering heat; yet cases of heat apoplexy are not unfrequent when the thermometer ascends beyond 95°. Fever assuming typhoid symptoms, with much gastric derangement, prevailed amongst the men from July to December 1857; and it is worthy of observation that fevers of this character are on the increase at some of our large military stations. Dysentery and liver complaints, and an unusually large number of venereal cases are the ordinary admissions into hospital at the Mount. Reckoning for a period of 16 years, or from 1842 to 1857–58, out of an aggregate strength of 21,458 Europeans who served within this, the centre division of the army, the following exhibits the admissions and deaths from the under-mentioned diseases:—

—	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
From dysentery and diarrhœa	4,933	250	54·16	0·21
" rheumatism and venereal	5,800	42	0·18	0·8
" cholera	335	191	2·12	0·13
" fevers	4,460	50	77·14	0·10
" hepatic affections	1,345	74	13· 9	0·10
" thoracic diseases	1,291	22	16·40	1·6

In the year 1857–58 the number of fevers treated were 58·6 as compared to 19·8 for the 15 years peceding, that for 1859–60 being only 10·21 per cent. to strength.

XXV. MADRAS.

42. The European troops at the Presidency have quarters assigned to them in Fort Saint George. Although the mortality is not equal to what we find at other stations of the army, the number of non-effectives from sickness is fully as great. Until lately this was easily accounted for by the crowded state of the men's barracks, and the impure atmosphere around them, from bad drainage, improperly constructed privies, confined space, &c. Now all this is in process of being remedied. A large amount of additional accommodation has been secured to the men; ventilation is to be thoroughly considered; the drainage and the privies are undergoing great improvement; verandahs are being placed all round the barracks, and free admission will be given for the pure sea breeze to permeate all parts of the buildings. When all the improvements are carried out, it is calculated that the upper story of the barracks will accommodate 600 men, affording upwards of 1,200 cubic feet to each man, and the important principle of providing for constant change of air in each space will also receive attention. There will be equally spacious accommodation on the ground floor; but I would strongly urge that this portion of the building should never be occupied by the soldiers as sleeping apartments. From the level nature of the soil and the small rise of tide, the drainage of the fort at best can never be thoroughly controlled, and this alone is an insuperable objection to a large body of men sleeping on the lower basement. I would recommend that the lower rooms be set apart altogether for non-commissioned officers' quarters, orderly rooms, workshops, lavatories, refectories, &c., &c. The great sanitary defect in Madras is its very imperfect drainage, and the difficulty of remedying this defect. But the condition of the fort is being much improved in this respect. A plentiful supply of water is to be introduced, and raised sufficiently high to ensure complete flushing of the drains; the sea rampart has been lowered, and now admits the pure and refreshing sea breeze which prevails eight months of the year; and the present obstructed ventilation within will be rectified by the levelling of walls and buildings.

43. There is still one point, however, which calls for reform, namely, the quarters for the married men. A man with his wife and family occupy an apartment averaging 10 feet by 18, with walls 11 feet in height, having a low pent roof above, and the windows and doors opposite, so that a current is kept up in the small apartment, always a source of danger to health in India, but without which it would be unendurable as a residence. In short, these apartments are quite unsuited for Europeans in a tropical climate.† Prior to their conversion into married men's quarters they were used as stables for the officers of the garrison, partition walls being thrown up to separate them into rooms, and on an average five souls occupy each apartment, some of the females being marriageable. The building forms nearly a square, its dimensions being 50 yards by 70. It has two rows of buildings across its centre, and privies, bathing, and cook-rooms in close proximity. The square is under cover of the ramparts, and many of the dwellings are lower than the surface outside. On sanitary, moral, and social grounds, I may earnestly urge that more ample provision be made for the family men of the garrison, outside the fort, if there be found to be no accommodation within.

44. The sick of the regiment are now treated in the general hospital. This building is half a mile from the fort. In it are treated,—

1st. The sick of the European regiment of the garrison (usually 10 per cent. on the strength), and women and children of the regiment.

2nd. The sick of the European and Eurasian (male and female), of the public departments, of the shipping, and the community of Madras generally.

3rd. The sick of all denominations at the Presidency head-quarters attached to public departments, as below.‡

4th. The sick of detachments of troops, European and native, temporarily residing at Madras.

5th. European and native sick and wounded soldiers returning to the Presidency from service beyond sea.

45. The general hospital at Madras has long been a reproach to the Presidency. Erected as a Dutch factory 135 years ago, it is wanting in ventilation, drainage, and in conveniences of every sort, and it will be apparent from the above that there are too many elements at work to admit of the successful organization and administration of a purely regimental hospital

* Quarters for the married men were greatly wanted at the Mount, and have at last been sanctioned, and are now under construction. I applied for them four years ago.—P. G.

† The unsuitableness of these married quarters was brought prominently to notice four years ago, they have been improved since then, but to make them what they ought to be, they must be entirely rebuilt on a better plan.—P. G.

‡ Gunpowder Manufactory; Artillery Veteran Company; Time-expired and discharged men; Camp Equipage Department; Ordnance Department; Gun Carriage Manufactory; Commissariat Department; Quartermaster-General's Department; Pay Department; Engineer's Department; Public Works Department; Pension Establishment.

Stations.	Replies.

XXV. Madras—*cont.*

within its walls. Extensive improvements are about to be carried out on the building, so as to meet the pressing wants of the place, and to render it more suitable for the sick. Advantage will be taken of this favourable opportunity to separate the two establishments, and thus put an end to the conflicting causes which mar the successful administration of both the general and regimental hospital discipline. The building is well situated, and exposed to the prevailing currents of air, and remote from permanent sources of malaria. In this neighbourhood a site might be secured for the erection of quarters for the married men of the regiment.

46. The European artillery of the garrison are quartered in low bomb-proof barracks under one of the bastions. They are of massive thickness, and double-casemated, with a narrow verandah in front, having cook-rooms and latrines in close proximity.* It is customary to call these quarters the coldest in the fort, and to be best liked by the men; but on what principle this is said it is difficult to understand. They are very low in the roof, badly ventilated, and cramped in on all sides. On lately inspecting them at 8 a.m., I found the men off duty, almost in a state of nudity, and the married men were bare to the waist, seated at breakfast with their wives and children; a fact which does not tend to substantiate the general opinion. It is well to have such secure quarters to resort to and afford protection to the garrison in case of siege, but certainly under ordinary circumstances they are not fit abodes for European soldiers.

47. The garrison of Fort Saint George is well supplied with good water, which is brought by pipes a distance of two miles. The extreme purity of the water in this direction is found to depend on a bed of sand in which the streams take their rise. The sand consists chiefly of quartz, and is perfectly white in colour. The extent of the bed is limited, and runs in a line south from the Pulicat Lake to the enclosure where the waterworks are placed, where it appears to terminate. The breadth of the bed in no place exceeds a few hundred yards. In some places it approaches the surface, but its usual depth varies from 10 to 15 feet beneath the surface. Should the bed of sand be passed in sinking wells, an inferior or brackish water is the result.

48. The native portion of the force quartered at Madras occupy lines at convenient localities in the neighbourhood. One set of these lines has been erected by Government, and are made over to each relieving regiment, an arrangement which answers admirably, and one which I should like to see adopted at every station of the army where native troops are quartered. Reckoning for a period of 16 years, or from 1842 to 1858, out of an aggregate strength of 16,065 European soldiers who served at the Presidency, the following exhibits the sickness and mortality from the under-mentioned diseases :—

Diseases.	Ad.	D.	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
From dysentery and diarrhœa - - -			3,079	119	20·23	0·14
„ rheumatism	1,681	3	5,484	6	72·19	0·02
„ venereal	3,803	3				
„ cholera - - - - -			129	77	0·8	0·4
„ fevers - - - - -			3,413	25	84·9	0·1
„ hepatic affections - - - -			1,202	42	8·9	0·5
„ thoracic diseases - - - -			1,203	69	14·7	0·7

XXVI. Bangalore.

49. The general aspect of the Mysore country is an undulating table land, varying in elevation from 600 to 3,269 feet above the level of the sea, interspersed with isolated hills, detached ranges, and continuous chains of mountains, some of considerable altitude. The rock forming the base of the whole country is of primitive formation; masses of granite, gneiss, and laterite, usually in vast rounded masses, rising above the table land. The general character of the surface soil is the black cotton, a rich red earth on the heights, and a clayey mould in the valleys.

50. Bangalore is the head quarter station within the division. The force garrisoning it consists of—

European horse and foot artillery.
1 regiment of European cavalry. 1 regiment of native cavalry.
1 „ of European infantry. 3 „ of native infantry.

The station is 3,000 feet above the sea, and 205 miles distant from Madras, to which it will ere long be connected by a railway. It is considered one of the finest climates in India. Many parts of the Mysore plateau are liable to severe visitations of epidemic fever, but at Bangalore these are almost unknown. The climate is particularly congenial to the European constitution. Disease can always be traced to imprudence in some shape, and convalescence is usually rapid. Thermometrical observations during a series of years afford the following results :—

Annual mean temperature in the shade, 76° Fahrenheit.
„ „ highest range, ditto, 81° „
„ „ lowest „ ditto, 69° „
„ „ variation in 24 hours, 10° „

51. Until lately, the barracks at Bangalore for the accommodation of the Europeans of the garrison were very indifferent buildings, both as regards position and construction. Indeed, the beneficial effects of perhaps the finest climate in India were in a great measure lost to the soldier and his family, who laboured under the counterbalancing disadvantage of having to reside in perhaps the worst constructed barracks, and provided with the worst conservancy in India, although the site they occupied was elevated and capable of good drainage.

52. Now a vast and beneficial change for the better is already far advanced towards completion. Most spacious accommodation has already been erected for the artillery on an admirable spot. The hospital is the only building that remains an opprobrium to us here. It is deficient in elevation in basement and roof, in width and ventilation, in conveniences and arrangements, &c. It has in its close proximity the troop horse sick lines and the privy, kitchen, &c. The accommodation is also unsuited and inadequate to the wants of the establishment.

* The quarters are quite infamous.—P. G.

STATIONS	REPLIES.
XXVI. Bangalore—*cont.*	53. Splendid barracks are in progress for the accommodation of Her Majesty's dragoon regiment, on the highest and airiest space in the vicinity of the cantonment. These will consist of eight blocks of buildings, each to accommodate 80 men, having four serjeants' quarters attached. Each man will have 144 square feet, or about 3,000 cubic feet of air. The blocks have terraced roofs; the dimensions of the centre wards are 240 ft. in length, 24 in breadth, and 24 in height. An inner verandah 12 feet in breadth runs along each side of these, which serves for a refectory, and beyond this is another verandah, 10 feet in breadth. Privies, urinals, lavatories, cook-houses, &c., will be conveniently situated to each block. The hospital will be constructed on the latest and most approved style. A portion of the buildings are now ready for occupation, but the entire range will not be completed under four years. It is to be hoped that the important matter of surface and deep drainage will not be overlooked, and that an adequate supply of water will be secured for the flushing of these. 54. As the dragoons are enabled to take possession of their barracks the European infantry will enter those now occupied by them. These, too, are being converted into admirable buildings; in fact, are nearly completed. They occupy a space gently sloping to the north, so that all surface water runs off. Formerly the floors were flush with the ground, and the walls did not exceed 12 feet in height. Now the basements are raised, and the walls ascend double their former height, judicious perflation and ventilation being secured throughout the building. Admirable married men's quarters are also lately constructed here. Improvements are also in progress in the hospital; its former contracted and cramped-up space, low basement and roof, rendered the building unwholesome and unendurable to the sick. As much money is now being expended on the building as would have raised a first-class hospital. The space has been extended, and the apartments for the sick are raised and ventilated; but it would have been far better to have rebuilt the new hospital from the foundation * than to have repaired the old structure. A separate hospital for women and children, commodious out-houses for stores, &c., which until now were within the already too contracted space allotted for the sick soldiers, are also to be erected. 55. Large numbers of European pensioners have resorted to Bangalore since the period when the restriction regarding their permanent place of residence has been withdrawn. Including families, their number now exceed 1,100. Plots of ground are secured by them, on which they erect comfortable cottages, and these have already extended into a clean-looking village of considerable extent. I may here state that during the mutiny in Bengal, when it was necessary to send from Madras every available European, these pensioners were all enrolled, and protected this very extensive cantonment. I take the liberty to urge, for the consideration of the Royal Commissioners, that liberal encouragement be held out to European pensioners to take up their abode here. It has been already shown that they are a stay to the State in trouble, and, were free grants of land given them for garden purposes,† they would in course of time produce fruit and vegetables sufficient to supply a ration to the European soldier residing at Madras as well as Bangalore. 56. Bangalore cannot be said to be a healthy station for the native soldier who has just come to reside there. Indeed the same remark is applicable to the whole of the Mysore plateau, so far as the native is concerned. They are prone to attacks of fever, more especially if they have come from beyond sea or from a coast station, and they do not become acclimatized under a residence of two years. During the year ending 30th April 1858, 102 per cent. were treated to strength, and the deaths have been 1·7 per cent. to strength. For the 15 years preceding the per-centage of sick has amounted to 78·3, and the deaths to 1·8 per cent. to strength. 57. Amongst the European troops the death rate during the year 1857–58 has been as low as 0·8 per cent. to strength. From 1842 to 1858, embracing a circle of 16 years, 26,517 soldiers served in the division. The following table exhibits the sickness and mortality amongst them from the under-mentioned diseases :—

Diseases.	Ad.	D.	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
Fevers			1,403	53	30·11	0·21
Dysentery	2,225	117	3,930	135	33·2	34·12
Diarrhœa	1,705	18				
Rheumatism	2,589	4	11,681	17	96·23	3·06
Venereal	9,092	13				
Thoracic disease			359	157	1·6	0·6
Cholera			1,742	213	13·16	0·9
Hepatic disease			1,735	63	9·10	0·07

It has been observed that the force of disease is greater at Bangalore than at most other stations, especially amongst fresh arrivals, and children who have resided at stations having a much higher temperature. This is in most cases accounted for by carelessness in clothing, a subject which is now becoming better understood. Venereal disease is the great scourge to the soldier here, and in the phagedænic form, which it frequently assumes, it works terrible destruction.

58. The drainage of the cantonment is on the whole good. The extensive ridge it occupies slopes on the sides, and thus all surface filth is removed. But the greater body of this sewage passes into the tank or reservoir of water, which during the dry season affords a supply for not only the cattle of the force, but also to the dense native population.‡ There are also offensive open sewers running down these slopes, obstructed in their progress by walls or cross buildings. These, as well as the tank, emit most fœtid odours during the dry and hot weather.

* A new hospital would have cost over rupees 80,000, the improvement will be completed for from 10 to 15,000.—P. G.

† The whole of Mysore, even the ground on which stands the military cantonment of Bangalore, belongs to the Mysore Rajah, and the British Government cannot appropriate an acre of it without the consent of the Rajah.—P. G.

‡ Aye, and to the European population also. Every obstacle has been thrown in the way of procuring a copious supply of pure wholesome water, but it is hoped they are now in a fair way of being overcome.—P. G.

Stations.	Replies.
XXVII. French Rocks.	59. A regiment of native infantry garrisons this post in the Mysore country. It is five miles from Seringapatam, and was formed when sickness compelled us to abandon the latter city. There are occasional outbursts of fever at the station; but otherwise it is very healthy. Its elevation above the sea is 2,300 feet.
XXVIII. Mysore.	60. This, the capital of the Mysore country, and the seat of the Rajah, was temporarily occupied by European troops at the period of my visit there; but usually a detachment of native infantry only are stationed there. It is 2,513 feet above the level of the sea.
XXIX. Hoonsoor.	61. At this station are the great Government works for the preparation of all army accoutrements. The public cattle-breeding establishments are also placed here. It is garrisoned by a detachment of native soldiers, and does not enjoy a high reputation for salubrity. Fevers are endemic, and cholera not unfrequently scourges the town and district. Its elevation above the sea is 2,970 feet.
XXX. Mercara.	62. This military cantonment is the capital of the Coorg country, and has an elevation above the sea of 4,500 feet. The Bittatoor table land adjoining has a still higher elevation. These grand mountains take their rise abruptly from the Mysore country below, and consist chiefly of a succession of lofty narrow ridges, running parallel with each other in a north-westerly or south-easterly direction. In some parts the hills are gently rounded, and alternate with sloping glades clothed with forest. In other parts the hills are closer, more abrupt, and intersected with deep ravines, covered with low, impenetrable jungle, while in other parts there are a succession of beautiful grassy downs and clumps of trees, resembling park scenery in England. Vegetation everywhere is rich and luxuriant, and altogether the scenery is grand and picturesque. The Tadianamool mountain, 5,781 feet above the sea, is the highest in Coorg. There is considerable extent of table land on these hills, but they can never be converted into sanitaria as a residence for troops throughout the year, being too much under the influence of the south-west monsoon, which continues with little intermission for six months. European colonists are, however, rapidly settling amongst these beautiful mountains, and reside in localities which were heretofore considered uninhabitable from pestilential fevers. The felled virgin forest is destroyed by fire, a proceeding which to a great extent appears to carry away the malaria; and as no vegetation is permitted to obstruct the growth of the coffee, which takes the place of the forest, extensive tracts are thus becoming habitable. 63. The climate of Mercara is very equable. The maximum thermometer in the shade is 79°, and the minimum 52°, the mean being 66° of Fahrenheit. The average annual fall of rain is 160 inches; yet there are no swamps or accumulations of water, for the surface water rapidly drains off into the cultivated valleys which intersect the hills, and from thence into the running streams. The rainy season is considered the most salubrious, and, if the head be well protected from the sun, exercise can be taken in the open air at all seasons with impunity. Catarrhal affections and bowel disorders are the prevailing diseases.
XXXI. Jaulnah.	64. A considerable military station in his Highness the Nizam's territories, 659 miles north of Madras, and about 220 from the sea on the Bombay side. The cantonment is situated on a gently sloping declivity, having a small range of hills, about two miles distant, in front. The surrounding country is hilly, and much intersected by ravines. The geological formation of the hills is chiefly trap rock in a state of decomposition. The surface soil varies from a red gravel of a lateritious character, the ordinary black regur or cotton soil, or tracts of white stony land covered with long grass. The native towns of Jaulnah and Khaderabad are upwards of a mile from cantonment. The streets are narrow, but clean; the houses are tiled, and many of them are of superior construction. A small river forms the boundary of the military limits, and as the natural slope of the ground comprised within these is towards the river, the drainage of all parts of the cantonment is good. 65. The climate of Jaulnah is one of the most salubrious in Southern India. During the greater part of the year a fresh coolness is experienced in the mornings, although the heat of the day from March to June is intense, ranging from 90° to 100°. From July till October the rains prevail. The average annual fall does not exceed 32 inches. During September and October there is a partial cessation of rain. These are the most insalubrious months of the year, from the deleterious exhalations from the soil causing fever. Although the variations of temperature in the 24 hours during the four cold months comprised between November and February are great and sudden, the thermometer ranging between 40° and 80°, it is considered by European residents the perfection of climate, being strengthening and invigorating, and favourable to the health of the troops. 66. For many years the force comprising the garrison of Jaulnah consisted of— European artillery. 1 regiment of native cavalry. 2 „ „ infantry. Now it has been increased by the addition of a regiment of European infantry and a corresponding reduction in the native infantry. The military cantonment is in every respect well chosen, the barrack occupying a gentle acclivity. When I visited the place in company with his Excellency the Commander-in-Chief the greater part of the troops were on field service; but as his Excellency had resolved to strengthen the European portion of the garrison, an unexceptionably situated site was selected for the new barracks, on high ground in the neighbourhood, sloping gently towards ravines on every side, with which the drainage from the barracks could be conveyed with ease to a distance. The cantonment of Jaulnah stands first on the scale of sanitary stations for European troops within this Presidency. In a period of 10 years, from 1847 to 1856-57, the ratio per 1,000 of sick to strength treated was 2,368. The ratio of deaths from all diseases was 10·3, and of deaths from all diseases, excluding cholera, 9·3.
XXXII. Nagpore.	67. Embraces the greatest portion of that part of Central India called Berar. There is perhaps no great native city in India that can be compared to Nagpore in meanness in appearance, in the accumulation of masses of filth and garbage, in the numerous offensive cesspools and open ditches, and in the total absence of drainage and roads. The sickness and mortality in this receptacle of filth is said to be very great, but we have no means of arriving at any correct data on the subject.

STATIONS.	REPLIES.
XXXII. Nagpore—*cont.*	

68. *Seetabuldee* is a military cantonment in the neighbourhood. The entire British force at one time garrisoned this position, but proving unhealthy it was abandoned. Now it affords accommodation to the Nagpore irregular native force, the fortress only being occupied by a detachment of Europeans from the large military station of—

69. *Kamptee*, which is 722 miles from Madras, 733 from Calcutta, 577 from Bombay, and 10 miles eastward of the city of Nagpore. The cantonment occupies an extent of nearly six miles along the right or south bank of the broad river Kunnav. The soil is the common regur or black cotton, interspersed with calcareous nodules. The surrounding country for many miles is flat, destitute of wood, and intersected by ravines, being cultivated only in the cold and rainy seasons. The position occupied by this military cantonment was selected without regard to the most ordinary sanitary considerations; built on the bank of a broad river, the channel of which is exposed the greater part of the year; the ground is intersected by ravines, which during the rains carry down quantities of alluvial debris and swamp the cantonment, and when the rains cease these ravines become receptacles for filth. Thus the physical conditions requisite for the production of malaria are present while any moisture remains on the surface, and also when the streams dry up, in consequence of the abundance of surface filth which accumulates in the exposed channels, and the alternating influence of heat and moisture on this surface.

70. I visited this cantonment in company with his Excellency the Commander-in-Chief. Sir Patrick Grant was quite of opinion that, sanitarily considered, nothing could be worse than the position of the station. Kamptee has long been notorious for a severe form of fever, and until lately the opinion prevailed that the sole cause of this fever was the deleterious principle of malaria evolved from a dense tract of jungle about 20 miles distant. But abundant cause for the production of the malady is now allowed to exist in and around cantonment.

71. An extensive ridge runs to the north-west of cantonment, and slopes in the direction of the river. It is quite free from the objections above detailed, and both sanitary and military considerations (for his Excellency has favoured me with his views on this subject) mark it as the most desirable position for the location of troops. It is on the great road from Nagpore to Kamptee, and is of sufficient elevation to secure a pure atmosphere, excellent drainage, and safe from all that renders the atmosphere noxious on the banks of the river, while a plentiful supply of water can be secured by storing the streams as they descend from the neighbouring heights before coming in contact with the impurities in the low ground below. To extend the cantonment, therefore, as has been proposed, following the course of the Kunnav stream would be merely to perpetuate the evil originally made. I beg earnestly to urge that every opportunity be taken gradually to withdraw the cantonment from the banks of the river and extend it in the direction indicated by his Excellency, and thus while one flank would rest on the river the other would ascend to the high and wholesome position pointed out.

72. The transitions of climate are usually very regular at Kamptee. The cold weather continues from the middle of October till the middle of March; the hot season from this period till June, when the rains come on and continue until October. The diurnal changes of temperature necessitate great attention to the precautionary measure of appropriate clothing. The mean temperature during the cold months is 68°; the minimum known has been 36°, and the maximum 110° in the shade, but in the sun the thermometer has been observed to rise as high as 140° of Fahrenheit. The average fall of rain per annum is 40 inches.

73. The force now garrisoning Kamptee consists of—

1 regiment of native light cavalry.
1 troop European horse artillery.
2 comp. do. foot do.
1 regiment European infantry.
3 regiments of native infantry.

The barracks for the European soldier are deficient in ventilation, and are without verandahs to protect the inmates from the direct rays of the sun, which strike directly on the buildings, and are also reflected from a high whitewashed wall which surrounds them. His Excellency Sir Patrick Grant has urged on Government the immediate necessity of introducing proper ventilation; he has recommended that the roofs be raised, that each barrack be provided with a deep verandah, and that the very objectionable prison-like walls which surround the square be lowered and surmounted by a rail.

74. The position occupied by the married men of the European portion of the force is most objectionable. It is on the bottom of the ridge above referred to, and level with the river's bank; thus it not only becomes flooded during the rains, but remains a swamp for months afterwards, and finally dries up, leaving much surface filth exposed to the sun. The arrangement of the buildings is also objectionable; they occupy a contracted space close on the barrack wall, the cook-rooms and privies being so placed that free perflation is quite out of the question. His Excellency condemned the site and quarters *in toto*, and suggested remedies in which I most fully concur. The introduction of these I beg to express a hope the Royal Commissioners may use their influence to expedite.

75. The number of deaths at Kamptee from apoplexy in former years was enormous. For 10 years prior to 1838 they amounted to 73¾ per cent. of the sick treated. The large majority of these cases would now pass under the name of "Insolation" or "heat apoplexy." Very many still report sick from this cause, but the disease is now more amenable to treatment, partly because it is better understood and partly because the soldier has better accommodation, and more space is allotted to him in barracks than formerly. The following contrasts the death rate amongst the European portion of the force during the past 10 years as compared with that which obtained 20 years ago:—

From 1829 to 1839.		From 1849 to 1859.	
Aggregate strength	9.574	Aggregate strength	3,216
Do. admissions	2,309	Do. admissions	6,212
Do. deaths	377	Do. deaths	72
Average per-centage of deaths to treated	16·32	Average per-centage of deaths to treated	1·15

76. Fevers have also been another source of great mortality to the soldier at Kamptee, and although the aggregate number of admissions from the several types of this disease is smaller than that of former years, there is nevertheless an increase of the more grave forms of the malady, viz., the remittent with cerebral and hepatic determinations, and not unfre-

STATIONS.	REPLIES.
XXXII. Nagpore—*cont.*	quently typhoid characters supervening, indicating that the producing cause, whatever this may be, is more intense now than heretofore. The average sickness from all diseases for a period of 15 years, ending 1857, has been 199·9 per cent., while in 1858 the number was 189·6 per cent. The mortality in the former period was 3·7, and in the latter 4·0 per cent. The following table exhibits the sickness and mortality at the station for a period of 16 years from the under-mentioned diseases:—

Period from 1842 to 1857–8. Aggregate strength, 8,786.	Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
	71	37	6,161	84	731	29	1,212	26	1,096	58	252	11	1,050	6	1,425	4
Ratio of strength to sick per cent.	0·8		127·7		18·2		27·7		26·12		11·8		19·13		38·7	
Ratio of deaths to strength per cent.	0·4		0·17		0·7		0·3		1·6		1·14		0·7		0·0	

	There is little to detail relative to the health of the native portion of the garrison. They reside in their own proper lines along with their families, and are subject in like manner with Europeans to the endemic disease of the station, viz., fever; but they are partial to the place, and, upon the whole, enjoy better health than at many other stations of the army.
XXXIII. SECUNDERABAD.	77. This is the most extensive military station within the Presidency of Madras, and is garrisoned by a force as per note.* It is six miles from the vast native city of Hyderabad, with a population estimated at 200,000. This city is surrounded by a high stone wall covering an area of seven miles. It has narrow ill-paved streets, and so exceedingly foul and offensive that it may be said to be a focus for disease at all seasons of the year. The cantonment is 1,800 feet above the sea. The general surface of the country is irregular and undulating, the greatest elevation of the table land being at Beeder, about 60 miles north of cantonment. On the higher grounds the soil is silicious, with decaying trap and granite rocks in isolated and large masses interspersed on the surface. In the plains and hollows the soil is a rich black loam, producing luxuriant crops.
	78. The seasons return with great regularity, and may be classed into the cold, from the middle of November to the middle of February, the hot from this period to the end of May, and the rains from the early part of June till the end of September. Although the heat is at times excessive, the mornings throughout the year are pleasantly cool. The mean temperature of each month is as follows:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
72	76	84	91	93	88	81	80	79	79	75	72

The average fall of rain per annum is 32 inches. The climate is considered as salubrious as any in India, and possesses a happy medium between the extremes of heat and cold experienced in the upper provinces of Hindostan. The maximum temperature reaches 110°; the minimum has been known down to freezing point. The daily range during the cold months varies from 20° to 30°. It is at this season that extreme caution is so necessary to protect the surface from sudden chills, which are so prone to engender visceral and hepatic derangements.

79. A residence of 14 years in the vicinity of this important military station, and a knowledge of almost every regiment which has visited it in that period, enables me to speak with some confidence on matters relating to hygienic details of the place. The military limits extend in a direct line east and west nearly five miles, one flank resting on an extensive tank, which irrigates a great extent of land running parallel with the station. There is a perpetual flow of water from this tank; what is not consumed in irrigation passes away by the natural drainage of the country, receiving in its course the sewage from the more elevated ground, from the native bazaars and European barracks, polluting the atmosphere in its progress, and finally becoming disembogued in the river a mile to the east of the barracks.

80. The entire area occupied by the cantonment is lower than the adjacent country, and the European infantry barracks are placed on the lowest part of this area. Masses of granite rock, bare from the base to the top and elevated ground, encircles the barracks themselves, except on one side in the direction of the tank. A superficial substratum of soil over rock tends to retain moisture and to make the space the focus of the surrounding drainage; the ground has thus become saturated with organic matter, and besides this there are two extensive grave-yards in close proximity to the buildings.

81. The barracks consist of a square of narrow, ill-ventilated, closely-packed ranges, and a detached range for the flank companies; close on one side of the square, in the direction of the prevailing winds, are privies and cook-rooms. A high prison-like wall surrounds the barracks, and the circulation of air within the enclosure is still further interrupted by blocks of buildings. The emanations from the earth, the fœtor from the privies and sewers, the imperfect perflation from the crowded buildings, and the vitiated atmosphere from the presence of a large body of men in far too circumscribed a space, has hitherto induced a morbific atmosphere, which rendered the soldier susceptible to disease on every change of the weather or other exciting cause.

82. I need not revert to the sad history of these barracks, and how regiment after regiment has been decimated within their walls. It is true that some seasons present a more favourable aspect than others, yet, taken as a whole, I think I am justified in asserting that a more unfortunate proof of the insalubrity of the position and structure of public buildings cannot

* 1 Regiment of European Cavalry.
1 Do. of Native do.
1 Troop European Horse Artillery.
2 Batteries and 3 Companies European Foot Artillery.
1 Company Sappers and Miners.
2 Regiments of European Infantry.
4 Do. of Native do.

STATIONS.	REPLIES.
XXXIII. Secunderabad—*cont.*	be presented. Deputy Inspector-General of Hospitals, Dr. Innes, when in charge of Her Majesty's 4th King's Own regiment in 1843, stated, "that the most anxious attention has "failed to discover, and, if possible, obviate, the causes in which this frightful pestilence "(dysentery) has originated, but only negative results were obtained. The men in the "patcherry and barracks, those who performed light duty and those who did not, those "who occupied barrack rooms exposed to the monsoon or sheltered from it, those of tem-"perate or intemperate habits, all suffered alike." 83. The barracks have repeatedly been condemned by Military and Medical Committees, composed of gentlemen of high reputation; but the exigencies of the service rendering it necessary that they should still be occupied, enormous sums of money have been expended on their improvement, with apparently little benefit to the health of the soldier, if we may judge from the terrible outburst of dysentery which carried off 10 per cent. of the 1st Royal regiment of foot during the past year, 1858–59. 84. While the men in these barracks suffer so dreadfully, both the officers of the regiment and the other European residents in cantonment are exempted from the same grave form of disease. The European artillery also, stationed at a distance of a mile and a half from the barracks, suffer comparatively little, although nothing can be more objectionable, sanitarily considered, than the construction of their barracks, but occupying a high and healthy locality, the disease, when it does attack them, usually yields to treatment. 85. That this exemption is not an occasional or accidental one is shown by the subjoined Table, exhibiting in contrast the sanitary condition of the European troops occupying the artillery and infantry barracks from 1837 to 1858, a period of 22 years. The artillery, it will be observed, lost on an average $2\frac{8}{11}$ per cent., and the infantry 5·0 per cent.; and while the artillery had $5\frac{7}{11}$ per cent. constantly sick, the infantry had $7\frac{3}{11}$.

	European Artillery.					European Infantry.				
Years.	Average Strength.	Average Sick to Strength.	Total Admissions each Year.	Total Deaths each Year.	Proportion of Deaths to Strength.	Average Strength.	Average Sick to Strength.	Total Admissions each Year.	Total Deaths each Year.	Proportion of Deaths to Strength.
1837	$120\frac{8}{11}$	$9\frac{1}{3}$	258	5	$4\frac{1}{3}$	851	$9\frac{1}{3}$	1,463	125	$14\frac{11}{16}$
1838	$96\frac{10}{11}$	8	204	5	$5\frac{1}{4}$	$728\frac{1}{2}$	$9\frac{1}{3}$	1,316	52	$7\frac{1}{8}$
1839	$96\frac{8}{11}$	$5\frac{3}{4}$	162	6	$5\frac{3}{4}$	$630\frac{1}{4}$	$9\frac{1}{4}$	1,172	37	$5\frac{7}{8}$
1840	$104\frac{8}{11}$	$6\frac{1}{4}$	169	0	0	$604\frac{5}{12}$	9	1,256	32	$5\frac{1}{2}$
1841	$115\frac{9}{11}$	4	153	4	$3\frac{1}{2}$	$855\frac{8}{11}$	$7\frac{3}{4}$	1,859	33	$3\frac{7}{8}$
1842	$104\frac{4}{11}$	$3\frac{13}{16}$	116	2	$1\frac{7}{8}$	$945\frac{1}{2}$	$7\frac{1}{4}$	1,773	49	$5\frac{1}{8}$
1843	101	2	77	0	0	824	$9\frac{3}{4}$	1,608	90	$9\frac{1}{8}$
1844	93	$4\frac{1}{3}$	108	6	$6\frac{1}{2}$	904	$7\frac{3}{4}$	1,526	58	$6\frac{1}{2}$
1845	80	$3\frac{1}{3}$	75	0	0	1,008	$5\frac{1}{2}$	1,445	30	$2\frac{9}{10}$
1846	159	$7\frac{1}{8}$	128	6	$3\frac{3}{4}$	924	$8\frac{2}{3}$	1,790	62	$6\frac{4}{3}$
1847	149	$7\frac{1}{2}$	212	6	$4\frac{1}{3}$	1,052	$7\frac{1}{2}$	1,749	37	$3\frac{3}{5}$
1848	158	$6\frac{3}{7}$	253	2	$3\frac{1}{4}$	1,099	$6\frac{9}{11}$	1,633	29	$2\frac{4}{5}$
1849	179	$5\frac{1}{3}$	264	4	$2\frac{1}{4}$	431	$5\frac{1}{3}$	85	0	0
1850	170	$5\frac{1}{3}$	252	8	$4\frac{4}{5}$	980	6	1,663	22	$2\frac{1}{4}$
1851	176	4	188	1	$\frac{1}{2}$	988	$7\frac{2}{3}$	1,958	62	$6\frac{1}{4}$
1852	186	$5\frac{1}{3}$	248	5	$2\frac{2}{3}$	964	7	1,781	5	$\frac{1}{2}$
1853	150	$5\frac{1}{3}$	206	0	0	905	$7\frac{1}{3}$	1,580	12	$1\frac{1}{3}$
1854	84	6	128	2	$2\frac{1}{3}$	637	7	1,659	36	$5\frac{2}{3}$
1855	$115\frac{3}{4}$	$6\frac{1}{11}$	196	4	$3\frac{1}{2}$	852	$10\frac{1}{4}$	1,961	18	$2\frac{1}{3}$
1856	175	8	311	5	$2\frac{2}{7}$	812	$5\frac{3}{4}$	1,302	10	$1\frac{1}{5}$
1857	134	$6\frac{3}{4}$	243	2	$1\frac{1}{3}$	1,067	$3\frac{1}{2}$	1,753	20	$1\frac{9}{10}$
1858	95	$6\frac{1}{3}$	140	3	$3\frac{1}{6}$	1,186	$9\frac{2}{3}$	1,161	110	$10\frac{1}{5}$
Average -	$131\frac{1}{2}$	$5\frac{7}{11}$	186	$3\frac{5}{11}$	$2\frac{8}{11}$	$888\frac{3}{11}$	$7\frac{3}{11}$	$1,523\frac{5}{11}$	42	5

The diseases which usually occasion this destruction to life amongst the European infantry soldiers are acute dysentery, of hœmorrhagic type, and hepatitis; and in some cases it runs its course in a few days. There is little premonitory warning; acute symptoms usher in the disease, and ulceration, sloughing, or hepatic abscess speedily supervene, rapidly destroying the patient.

86. The lines of some of the native portion of the garrison also occupy low and unwholesome localities, as compared with the more elevated ground around. The consequence is, that the average number of non-effectives from sickness exceeds what we usually find in native corps elsewhere. The types of disease which afflict them are fever and its concomitants, as well as bowel disorders, which speedily undermine the system and tend to increase the pension list.

87. In the formation of the cantonment of Secunderabad, therefore, I am compelled to admit that the importance of sanitary science, as bearing on the health and general well-being of troops, whether in the position of the buildings or their architectural structure, has not been sufficiently recognized. The skill of the medical man may relieve, but the removal of the cause must rest with the military authorities.

88. The extreme altitude of the cantonment above the sea, as has already been stated, is 1,800 feet. The positions occupied by the barracks, lines, and bazaar, average 100 feet under this. The height of the neighbouring table land, part of which is occupied by the artillery and part by the new infantry barracks, averages 1,900 feet above the sea, and the ground gradually rises from this for a distance of five miles north to a point where the watershed separates the drainage to the rivers Kistnah and Godavery, and here it attains an elevation of nearly 100 feet higher. His Excellency the Commander-in-Chief, in his recent tour to Secunderabad, personally devoted much consideration to the subject of the old cantonment, which has grown up to such enormous proportions that it covers an area of 20 miles, and necessitates a 10 mile march to some of the corps on an ordinary field day. I think I am correct in stating that, sanitarily and strategetically considered, he is of opinion that nothing could be more unsatisfactory than the present state of matters. Having made himself familiar with the high ground contiguous, he directed a mixed Military and Medical Committee to examine and report on its extent and capabilities. I was a member of the Committee,

STATIONS.	REPLIES.
XXXIII. Secunderabad—*cont.*	and we unanimously considered that the space is sufficiently ample for the transfer of all the troops scattered at present over so extensive a field; that as a military post it commanded all the country around; that a sufficient supply of water could be secured, and that, in a sanitary point of view, with judicious arrangements, such as the planting of trees and proper drainage, the site was in all respects admirable. The elevated ridge selected is about five miles in length and one in breadth. It possesses facilities for drainage on both sides, and is in all respects an incomparably better position for a military cantonment than the present locality. I beg respectfully to express my earnest hope that the influence of the Royal Commissioners may be exerted to expedite the views of the Committee, supported as they have been by the Commander-in-Chief.* 89. The new European barracks already occupies this elevated plain. There are 10 ranges for single men, one for each company, all freely ventilated, and calculated to afford a cubic space of 2,500 feet to each man. Serjeants' quarters are placed at the ends of the barracks, and on a gentle slope to the north of the buildings are admirable ranges for married men, each having a court-yard containing cook-room, bath-room, and privy; and the whole so arranged that each company has separate accommodation for single and married men. The hospital is a very superior building of two stories, and can accommodate 140 sick, affording 2,600 cubic feet of air to each man. Female and special wards, apothecaries and nurses apartments, store-rooms, bath-rooms, clothes-rooms, dispensary, and detached privies, communicating by a covered way, being also provided. In short, the whole is replete with every comfort, and are noble structures. 90. The cost of constructing these handsome buildings amounted to 135,000*l.*† Assuming that this money was borrowed at 5 per cent., it would yield 6,750*l.* per annum, or 18*l.* 9*s.* 10*d.* per diem. Taking, therefore, the cost of the barracks and family quarters, and supposing a complete regiment, 947 strong, is always quartered in these buildings, the lodging of each man would cost the State 4¾*d.*, or, if the families are considered in the calculation, the result would be, that each single man is lodged at an expense of 1¾*d.*, and each married man, with his wife (exclusive of children), at 3*d.* for a day of 24 hours, and this with every possible requirement for health, cleanliness, and recreation. 91. In a period of 16 years from 1842 to 1858, in an aggregate strength of 20,529 European troops who served with the Hyderabad subsidiary force, the following were the admissions and deaths from,—

Cholera.		Fevers.		Hepatic Affections.		Diarrhœa.		Dysentery.		Rheumatic Affections.		Venereal Affections.		Thoracic Affections.	
A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
125	50	7,585	56	1,707	91	2,048	32	4,210	297	1,768	16	6,711	9	1,193	41

XXXIV. MASULIPATAM.	92. A civil and military station on the coast, garrisoned by a regiment of native infantry under the officer commanding the northern division of the army. Formerly it formed the depôt for stores proceeding to the upper provinces; but difficulties connected with the port has caused it to be abandoned, and the depôt is now transferred to Coconada. The military cantonment occupies a sandy ridge, elevated a few feet above the sea. In spring tides much of the ground around is under water, and during the monsoon it is little better than a morass, but in the dry weather the swamp dries up by evaporation. A regiment of European infantry at one time garrisoned the fort, but the site has now become malarious in consequence of the low situation, the encroachments of the sea, the silting up of the fort ditch, and the impossible conservancy of the place from the enormous amount of surface filth kept in perpetual agitation by the ebb and flow of the tides, which caused fearful destruction of life and health in the ranks of the last European corps stationed there. Now the only Europeans sent to Masulipatam are a few invalids from Secunderabad, usually convalescents from visceral and hepatic disorders. Necessity alone compels the authorities to select this post for them, as being the nearest point to the coast. A temporary improvement is usually visible in the constitutions of the men, but there are frequent relapses; few of them become invigorated, and their recoveries are seldom enduring. Apart from the insalubrity of the site of the fort, the height of the barracks within, from floor to ceiling, is only 13 feet; the roofs are terraced, having no ventilation; the floors are barely raised above the ground; the windows are merely iron bars, with shutters folding inwards; the free access of air to the buildings is impeded by the high ramparts; and the drainage from the privies, &c., is obstructed beyond remedy by the accumulated mud in the ditch without. I have been thus particular in my description of the place in order to add my humble but earnest support to a measure urged by his Excellency the Commander-in-Chief, to establish a permanent communication by transit to the nearest point whence the invalid can be conveyed by water to Coconada, the newly established "*entrepôt*" for the upper provinces, and thence by water to Waltair, the recognized sea-coast sanitarium, and decidedly the healthiest spot along the Bay of Bengal.
XXXV. GUNTOOR.	93. Is a small civil station 40 miles from the sea, and garrisoned by a detachment of native invalid soldiers. The ground is flat and open to the coast, and, although the heat of the station be great, it is remarkable for its salubrity. The soil is black cotton.
XXXVI. NELLORE.	94. This civil station stands on lateritious soil, and is distant 18 miles from the sea. The district is copiously irrigated, and produces large crops. A detachment of veterans garrison the place. The climate is very equable, but relaxing to the European constitution.
XXXVII. BEZWARRA.	95. Great Government works have been in progress at this place for some years. A bund or "anicut" having been constructed across the Kistnah, with the view to direct the water of the river to diverge into canals on each side suitable for traffic and for the irrigation of the country. A detachment of Sappers and Miners form part of the workmen, and although the labourers amounted to many thousands, with the exception of accidents, there has been but little sickness.

* Remark by his Excellency the Commander-in-Chief. See my Inspection Tour Report of February 1859. Dr. Macpherson has described with perfect accuracy the conditions of the cantonment at Secunderabad.—P. G.

† Sixteen lacs was the cost.—P. G.

STATIONS.	REPLIES.
XXXVIII. DOWLAISHWERAM.	96. Here also similar extensive Government works have been in progress since 1846, in building an "anicut" across the great river Godavery, in order to extend irrigation and afford the means of communication by water over a delta of many hundred square miles between this spot and the sea. The head-quarters of the Sapper corps are stationed here. Fever is prevalent, but otherwise the locality is healthy.
XXXIX. RAJAHMUNDRY.	97. A detachment of native infantry garrisons this civil station, which lies on the left bank of the river Godavery, a few miles above the last-named place. Amongst the natives syphilis prevails to a deplorable extent, but otherwise the character of the place stands high for salubrity.
XL. SAMULCOTTAH.	98. A station for a regiment of native infantry about six miles from the sea. The ground on which the cantonment stands has not been well selected. It is quite in a hollow, while high and dry ground is available in immediate proximity to the present site. Fever is endemic amongst the natives, but to Europeans the climate is genial.
XLI. COCONADA.	99. This seaport promises to become perhaps the most important in the Bay of Bengal. Already vessels of considerable tonnage pass up the river, and the channel is being dredged and deepened. It is now the port of communication for the transmission of stores to the stations of the Madras army in Central India, by means of the Godavery or the canals in communication with that river and the Kistnah. The town is still in its infancy, but it promises to become a place of considerable commercial magnitude. I beg to urge the necessity for the early introduction into this rising seaport of judicious sanitary rules, while the place is still unformed. Houses should be built with uniformity, and great attention should be paid to surface and deep drainage. Unless some code of regulations be laid down on this important subject, evils are certain to spring up hereafter which it will be difficult to remedy.
XLII. VIZAGAPATAM AND WALTAIR.	100. A force as per note * garrisons Vizagapatam and Waltair. The former is the native town and fort, and the latter the position occupied by the European portion of the force and officers. There is no comparison between the climates at both places. Vizagapatam is hot, confined, and insalubrious, while Waltair is the most pleasurable and genial to the European constitution of any other of our coast stations. The European veterans garrison Vizagapatam. Their hospital is quite unsuited for the purpose to which it is applied. It was not constructed for a hospital, and the whole of its internal arrangements bear testimony to this. Its site also is very objectionable. Immediately in rear of a tidal swamp, from which at certain hours of the day and night the most insupportable odours proceed. Patients in such a wretched building and unwholesome position cannot be expected to derive much benefit from medical treatment. The house has been rented by Government for 18 years, at rupees 64 per month. A sum therefore of rupees 13,824 has been expended on this worthless building. The native troops occupy a position one mile from Vizagapatam; they are very healthy; and two miles further on up the coast is Waltair. The Europeans stationed here are accommodated in temporary buildings, but it is in contemplation to erect permanent barracks for them, and also for invalids of the European force throughout the Madras Presidency, for whom a change to the sea-coast is recommended.† When I come to treat of sanitaria generally I shall have some further observations to make on the best means of extending the benefits of the sea-coast sanitaria to European invalids from all parts of India.
XLIII. VIZIANAGRUM.	101. A station for a brigade of native infantry and artillery, 40 miles north of Vizagapatam. A succession of ranges of mountains rise in close proximity to the station. On the more elevated of these a site has been fixed on for a sanitarium. But a deadly fever is the almost certain result of a night passed in the lower elevations. The climate of Vizianagrum from September to March enjoys a high reputation for salubrity. April, May, and June are intensely hot. The rains then usually fall, and moderate the excessive heat.
XLIV. CHICACOLE.	102. A regiment of native infantry garrisoned this civil station at the period of my visit to it; but it has since been withdrawn, and its place is taken by a detachment. Chicacole is four miles from the sea, and it enjoys a high reputation for salubrity.
XLV. RUSSELCONDAH.	103. This is the most western station in the northern division of the army, and is distant 50 miles from the sea. A regiment of native infantry garrison it. Immediately beyond the station high hills ascend and extend for miles, but none of them possess the elevation or other requisites which would attract European colonists. They are bare, dry, and very unhealthy. Fever is the prevailing disease at the station. The climate is intensely hot in the summer, but during the winter the cold is very piercing.
XLVI. CUTTACK.	104. Is the most northern military post for Madras troops on the coast, and distant only 230 miles from Calcutta. The station is very healthy. A regiment of native infantry and a company of native artillery form its garrison.
XLVII. BELLARY.	105. The head-quarters of the civil and military departments of the Ceded Districts has a garrison as per note.‡ The aspect of the country is flat, barren, and treeless. Numerous isolated bare granite hills are scattered over it, composed of large boulders, grotesquely heaped up in irregular masses. Most of the open country is a rich black regur soil, which returns rich crops when there is a sufficient fall of rain; but this is very uncertain. The fall of rain is less here than in any other part of India, and the country is subject to severe droughts. Large rivers intersect the district, and measures are now in progress to turn these streams to advantage, by diverting the water from them over the district for the purposes of irrigation and navigation.

* 1 Horse Battery Artillery.
2 Companies European Regiment.
1 Regiment of Native Infantry.
European Veteran Company.

† Sanction has been obtained for the erection of barracks at Waltair for a Regiment of European Infantry, and two companies of artillery.—P. G.
Remark by his Excellency the Commander-in-Chief.
These buildings have been disallowed since the foregoing note was written, but I have again earnestly pressed upon attention the necessity of their being proceeded with.—P. G.

‡ 1 Regiment of Native Cavalry.
1 Troop of Horse Artillery.
1 Horse Field Battery.
1 Company of Foot Artillery.
1 European Regiment.
2 Regiments of Native Infantry.

STATIONS.	REPLIES.
XLVII. Bellary—*cont.*	106. The cantonment is 1,600 feet above the level of the sea. The characteristic peculiarity of the climate is the extreme dryness of the atmosphere, produced by the air passing over so vast an extent of bare surface. For two-thirds of the year the thermometer ranges from 88° to 100° in the shade, but during the winter months it falls to 50° of Fahrenheit. The station occupies about the most elevated spot in the district, and the ground slopes in all directions, so that no water lodges in the neighbourhood. The soil and the greater number of wells are strongly impregnated with muriate of soda and carbonate of lime; but in immediate proximity to these springs one of pure and excellent water is often found, ascribed to the almost vertical strata through which they rise. 107. Until recently the entire European force were accommodated in barracks within the fort; now the artillery alone occupy these, commodious and admirably constructed buildings having been erected on a high and dry plain for the European regiment. It is in contemplation to furnish the artillery with similar accommodation outside the fort,* and also to provide separate quarters for the married men, a measure which is very much needed. On the south side of the fort, about 100 yards from the ramparts, is a tank, which, when full, covers a circumference of about three miles; but from its extreme shallowness the water speedily subsides, and in its half-dried state noxious exhalations issue from it. The exposed bed of the tank is the place of resort for the natives for purposes of nature, and it also receives the refuse drainage from the bazaars. Add to this, some of the supply channels of the tank are overgrown with prickly pear, which conceals filth of every sort. Public latrines and other measures to secure a proper system of conservancy are much wanted at this locality. Cholera may be said to be endemic throughout the Bellary district, and when the malady visits the cantonment it is always found to begin and to end about this place. 108. The hospital now in course of erection for the sick of the European infantry is a magnificent building of two stories. It is calculated to accommodate 140 sick, besides women and children. In the construction of the building I fear that too much regard has been bestowed on appearances, and too little attention paid to the future comfort of the sick. My objections are— 1st. That, if carried out as explained to me by the Engineer officer in charge (who was directed not to swerve from the plan furnished to him), there will not be one spot in the entire building where the sick men can escape a current, for the only ingress for air is by the doors, and as there is no egress provided for the foul atmosphere generated within, save by these doors, some of them must remain open night as well as day.† 2nd. That much space is sacrificed in the inner apartments, by the introduction of spacious open arches in the wall separating this part of the building from the verandah beyond, and that the plan proposed of placing four beds around the circular pillars supporting the roof in the centre of the wards would be injurious to patients under the influence of sudorifics, or suffering from visceral disease, &c., from the constant current to which they would be exposed. In short, the great objections are, that while there is ample space and free admission of air, the means are wanting to guard against currents without checking the supply, and of providing for the ready escape of impure atmosphere generated within the building. 109. From 1842 to 1858, embracing a period of 16 years, the sickness and mortality from the under-mentioned diseases, in an aggregate strength of 10,969 Europeans who served within this division of the army, was as follows:—

Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.	
A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
467	201	3,816	21	776	26	969	14	698	38	551	17	1,565	3	4,249	2

XLVIII. KURNOOL.	110. This military cantonment is garrisoned by a regiment of native infantry. The civil establishments of the districts are also located here. The force is chiefly quartered in a deserted fort built on a narrow tongue of land, which separates the confluence of the rivers Hindree and Toomboodra. The station is 900 feet above the sea, and the surface soil is a dark superficial mould, 10 to 20 inches in depth, lying on limestone and trap. As regards sanitary considerations, no position could be worse than the present for the habitation of man. The population of the city may be reckoned at 23,000, all being massed together in a contracted space within the fort, part of which is actually beneath the bed of the adjoining rivers. The officers of the force occupy houses constructed over the bastions of the fort, beneath and around whom, on every side, are the dense population, amongst whom fever, ophthalmia, small-pox, syphilis of a most malignant type, and sporadic cholera are always present; when the latter disease bursts, as it were, from its trammels, it works fearful destruction. The last outbreak (May and June 1859) carried off four Europeans out of the small community, 41 out of the regiment, and 2,000 out of the town. From the peculiarity of the soil above described, the interment of the dead is a very unsatisfactory operation; and the odour proceeding from the cemetery on such occasions is dreadful.‡ The European community have always graves prepared beforehand, ready to receive the first unfortunate victim to the disease which hovers around them. Beyond the immediate confines of this locality there are several positions, in a sanitary point of view free from objection, to which the military garrison might be transferred; especially one, north-east of the town, an elevated ridge of red soil, which his Excellency the Commander-in-Chief selected for the military cantonment.
XLIX. CUDDAPAH.	111. Has long maintained a bad reputation for salubrity. Hitherto it has been garrisoned by a regiment of native infantry; it is also the head-quarters of the civil establishments of the district. It is placed quite in a cup-like hollow, surrounded by mountains of moderate elevation. There is usually a still oppressive atmosphere within, and the heat is increased by radiation from the neighbouring hills. All this exercises an injurious influence on the

* Barracks for the artillery and married quarters, in the immediate neighbourhood of the European infantry barracks, have been sanctioned, but they are not likely to be completed for years yet from lack of funds.—P. G.

† The plan of the hospital was furnished from Calcutta, with strict injunctions not to deviate from it.—P. G.

‡ I have frequently recommended that Kurnool should be abandoned as a military station.—P. G.

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STATIONS.	REPLIES.
XLIX. Cuddapah—*cont.*	health of Europeans and natives. Fevers of a severe type are common, and recurring attacks frequent; and cholera is usually an annual visitant. The station is now abandoned as a military cantonment, it being garrisoned by a body of policemen.

112. I have now completed a short description of each civil and military station within the Madras Presidency, and I hope I may be pardoned for the occasional mention I have made of the name of his Excellency the Commander-in-Chief in these observations. Throughout a long and interesting tour made in company with him, his Excellency conferred freely with me on all points having reference to the health and well-being of the troops, and gave me constant opportunities of stating my views on such subjects with freedom. For this I am grateful, both on public and private grounds: and I here record my opinion, that occasional tours of this description on the part of the chief military authority, attended by a competent sanitary adviser, cannot fail greatly to advance the important ends which it is the business of Her Majesty's Sanitary Commissioners to promote.

MOUNTAIN AND SEA-COAST SANITARIA.

OBSERVATIONS on MOUNTAIN and SEA-COAST STATIONS and SANITARIA for EUROPEAN TROOPS. The beneficial EFFECTS of CHANGE to the EUROPEAN SOLDIER in HEALTH, or in CONVALESCENCE from SICKNESS. LOCALITIES suitable for HILL STATIONS, and SANITARIA within the MADRAS PRESIDENCY.

113. In the following remarks I propose to describe the special peculiarities and characteristic qualities which, in varying degrees, are common to all climates on mountain ranges, and on sea-coast sanitaria; their physiological and therapeutical effects on the animal frame; the general principles which should regulate their practical application to the prevention or treatment of disease, and the precautions necessary to be observed by those who resort to them.

114. With the view to obtain information on the comparative advantages and the physical characters of mountain ranges in general, and their respective merits as residences for Europeans in India, I have, in the course of my professional tours, availed myself of every opportunity personally to inspect the several localities about to be described, and also such other places as came within my reach, both in my own and in the other Presidencies. I may further state, that for many years past I have devoted much consideration to the important subject I am now about to enter on; and I solicit the indulgence of the Royal Commissioners if they consider that I have entered too much into detail on a matter which continues to engage much of my thoughts.

115. 1st. *Physical Characters of Hill Climates.*—If we examine the question of temperature of the hill climates in India the result is very satisfactory, both as regards their coolness and equability. Their mean annual out-door temperature in the shade varies according to elevation from 45° to 75° of Fahrenheit. Their mean daily variation in the 24 hours ranges from 10° to 20° in the open air, while within doors it hardly exceeds half this amount. Their distribution of temperature throughout the year are equally removed from excessive heat or rigorous cold; and they thus secure to us a temperate climate, congenial to the feelings and conducive to health.

116. The following table exhibits the mean temperature of each month, the average fall of rain, and the altitude of the mountain ranges already occupied or brought to notice in India:—

	Names of Hill Stations.	Mean Temperature outside in Shade.												Ascertained greatest Elevation.	Average Fall of Rain in Inches.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
Bengal Presidency.	Darjeeling	40	41	51	55	61	62	63	64	63	55	50	44	8,000	132
	Simla	40	44	53	61	66	80	75	78	70	67	52	46	8,000	70
	Landour	35	40	51	—	—	—	—	68	64	49	46	46	7,300	—
	Murree	—	—	—	—	—	69	68	66	62	62	—	—	6,786	—
	Kussowlie	42	47	58	64	77	73	70	70	72	66	—	—	6,400	70
	Nynee Tál	42	46	56	61	69	69	67	69	65	61	50	47	6,200	83
	Dugshai	42	47	57	64	69	71	72	68	66	62	54	53	6,000	70
	Subathoo	—	—	—	77	81	84	79	77	—	—	—	—	4,000	70
Madras Presidency.	Ootacamund (Neilgherry range.)	54	56	60	61	61	57	63	63	63	56	54	53	7,361	60
	Kotagherry (Neilgherry range.)	59	60	61	63	63	64	65	65	64	62	60	59	6,100	55
	Wellington (Neilgherry range.)	59	61	67	68	68	64	70	70	70	63	61	60	5,840	50
	Coonoor (Neilgherry range.)	60	62	68	68	68	65	70	70	70	65	62	62	5,161	50
	Pulneys	51	53	60	61	—	—	—	—	—	—	—	—	7,000	—
	Mercara	53	56	61	64	44	66	65	65	64	65	63	56	4,500	100
	Annamullays	—	—	—	—	—	—	—	—	66	56	—	—	6,800	—
	Shevaroys	65	65	68	71	71	68	68	68	67	66	66	65	5,260	40
	Ramandroog	70	76	80	80	75	73	71	70	70	71	71	67	3,400	46
	Checuldah	60	60	70	83	83	71	—	—	—	—	71	71	3,600	—
	Sindwarrah	An average of 8° lower than the station of Kamptee.													
	Muthoor	Do. 11° do. do.													
Bombay Presidency.	Mahableshwur	63	65	72	74	72	67	63	64	64	66	64	63	4,700	240
	Poorandhur	67	73	77	78	73	70	67	65	67	71	69	64	4,200	73
	Mount Aboo	61	61	79	77	77	77	69	69	69	69	69	71	4,015	79

The mean annual temperature of the south-west of France is 58·2.
Ditto ditto south-east of France 58·8.
Ditto ditto Italy - 59·6.
Ditto ditto Cape of Good Hope - 63·5.
Ditto ditto Madeira - 64·5.
Ditto ditto Mediterranean - 67·5.
And the computed mean temperature of the globe is - 67·

STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.*	Thus it will be observed that within the range of climate indicated in the above table is to be found the estimated mean temperature of the globe, as well as the mean annual heat of the most temperate and healthy climates both in the northern and southern hemispheres.
	117. There is an unequal amount of atmospheric humidity on most hill ranges. On the occupied spots of the Neilgherry plateau, during the rains, there are fogs and occasional heavy falls of rain. At Darjeeling the rains are almost unabated, and the damp excessive. So at Mahableshwur, there the constant down-pours and excessive dampness render these hills uninhabitable for several months every year. During the dry months, on inland hill stations, the rapid cutaneous evaporation, produced by the rarified atmosphere, conveys unpleasant sensations unless brisk exercise be taken; but on elevated ranges, within the influence of the sea breeze, an agreeable softness is communicated to the atmosphere, which being thus equalized, the unpleasant dryness is no longer perceived. This is very perceptible on the Pulney range, which is fully within reach of the sea breeze, both from the Cochin and Tutacorin coasts.
	118. The most important character of a hill climate is the great rarity and lightness of the air, caused by a reduction of the superincumbent pressure, which secures the advantages of a cooler and more elastic, a thinner and more agitated, a purer and more bracing atmosphere than that of the plain below. Thus malaria is rarely met with on these elevated situations, unless generated by defective conservancy on the plateaus of the hills themselves. The thermometer falls one degree for every 200 feet of elevation; the range of temperature attains its minimum at an altitude of between 3,500 and 5,000 feet, and increases at inferior as well as superior situations.
Physiological Effects of Hill Climates.	119. 2nd. I would class mountain climates within the tropics under three distinct heads: *a.* The tonic and soothing, to embrace all elevations below 5,500 feet above sea level. *b.* The tonic and invigorating, to include all ranges from 3,500 to 6,000 feet above the sea. And, *c.* The tonic and exciting, embracing all elevations exceeding 6,000 feet above the marine level. It is a popular belief that the temperature under direct exposure to the sun's rays increases with elevation, but my observations do not enable me to corroborate this.
	120. The action of a hill climate on the European constitution is two-fold; one, the effect of atmospheric temperature, the other, the result of atmospheric pressure. The first effects experienced on a transition from the low country to a hill station by a healthy person, or by an invalid whose system has become debilitated or relaxed by climate, is an increase of appetite, an improvement in the digestive and assimilative functions, an increase of muscular vigor and mental energy. These are the usual invigorating results of a change from a high to a reduced temperature—from a low to an elevated altitude; but in rare instances a great degree of excited action is produced on the vascular system, which in certain conditions, according to circumstances, either aids the tonic influence of the climate, or produces undue vascular excitement, and may derange the balance of the circulation, and induce local plethora. But by proper precautions the system in due time harmonizes with the climate, and these unpleasant effects pass off.
Therapeutical Effects of Hill Climates.	121. 3rd. As an auxiliary agent in the treatment of particular diseases, the hill climates of India exercise a powerful effect. They are of acknowledged value in all functional diseases, as, *a.* Intermittent fevers. *b.* Convalescence from remittent fevers. *c.* Functional disorders of the digestive organs. *d.* Constitutional debility, the result of natural delicacy of constitution or tedious convalescence. *e.* Diarrhœa, dependent on a cachectic or strumous diathesis, unconnected with organic lesion of the intestinal tissues. *f.* Functional hepatic affections, characterized by a torpid action of the secretory function of the liver, or by an irregular or disordered biliary secretion. This class of disorders, which are aggravated by hot seasons in the plains, will, under proper precautions as regards clothing, food, exercise, &c., result in a cool hill station in warding off the exacerbation which would otherwise have been experienced below, and tend to a permanent improvement in the general health. *g.* Incipient phthisis. Although a tropical mountain climate is contra-indicated in the latter stages of pulmonary phthisis, the fact is indisputably established, that it is productive of marked benefit in the incipient stages of the disease, more especially during the hot months. According to Dr. Lombard, the disease is "very frequent" at elevations varying from 1,600 to 1,700 feet above sea level. It is "exceedingly rare" at the height of between 4,000 and 5,000 feet, and "entirely disappears" at an elevation of between 6,000 and 7,000 feet. *h.* Strumous and cachectic affections, especially applicable in cases of young persons of delicate constitution who are born and reared in India, and to those who come to India before their growth has been completed or their constitutions matured. *i.* Nervous and periodical headaches, unconnected with general or cerebral plethora, with organic disease or rheumatic diathesis. *k.* Diseases of infancy and childhood. There are few diseases incidental to childhood in India that do not derive benefit from a residence in a hill climate.
	122. The diseases in which a tropical hill climate are inapplicable or injurious are organic visceral affections, the result of non-inflammatory alteration of structure, or of pre-existing inflammation, whether seated in the brain, heart, lungs, liver, or spleen. A residence on the sea coast, or at salubrious localities within the softening and refreshing influence of the sea breeze, a sea voyage, or an extra-tropical climate, constitute the only safe and efficient remedy for this numerous and important class of visceral diseases which affect the European soldier in India to a large extent. For such persons a rapid change to the coast is especially desirable. It is attended with striking benefit, and should always be had recourse to. When convalescence has been thoroughly established, a change to hill stations, such as the Pulneys, which are fully under the influence of the sea breeze, would have a marked beneficial effect in restoring them again to health.

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STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.* *Precautions to be observed at Hill Stations.*	123. 4th. Vascular excitement and visceral plethora are experienced by all, more or less, on first attaining an elevated mountain range. This, exerted on a system already excited on first arrival, aided by an increased appetite, renders necessary the adoption of precautions, principally in reference to clothing, exposure, diet, and exercise, in order to counteract any injurious influence that might arise from a climate differing so materially in its constitution from that to which the individual had been habituated. This is themore necessary when the climate is resorted to simply as an auxiliary agent to aid the operation of other remedies in the cure of disease. Vigorous and robust individuals can scarcely use too much or too active exercise. But the invalid whose constitutional energies are below the healthy standard must be careful not to induce undue excitement or fatigue, and always bear in mind that however cool and agreeable the temperature may be, they are still under the influence of a vertical sun, and surrounded by an atmosphere whose rarity admits of more free and unobstructed passage to the solar rays. Clothing suitable to the climate should always be kept in store on hill stations resorted to by troops, to be issued to them on arrival, and deposited in store for the use of the relieving force when they descend into the plains. I have observed convalescents sent to the hills for the benefit of their health, going about in white cotton costume, when the temperature was so low that a woollen dress was barely sufficient to retain the animal heat of the frame without brisk exercise.
Acclimatization of European Troops and Prophylactic Effects of Hill Climates.	124. 5th. There is no climate in the habitable world which is not open to some valid objection, yet in the choice of a residence, with the view to prevent or to mitigate disease, there are governing principles to guide and direct us, viz., the constitution of the individual, and the nature of the malady he labours under.
	125. Sir Patrick Grant, in a Minute to Government on the subject of establishing convalescent depôts on hill ranges for European soldiers, states that a searching investigation in the Bengal Presidency, by a committee of highly experienced medical and military officers, established the fact that the ratio of mortality amongst them was fully 50 per cent. less on the hills than it had been in the plains. That very experienced officer, Sir Mark Cubbon, Commissioner of Mysore, who has much personal knowledge of the climates of India, fully concurs with me in the superior advantages of hill stations as a prophylactic remedy; and, further, I have his authority for stating that a general belief prevails amongst all classes of natives of India, that until our European soldiers are in military occupation of our chief mountain ranges, our possession of the country is not secure.
	126. Let us now inquire, in how far can hill climates be made generally useful as auxiliary agents for the preservation of health and for the prevention of disease.
	127. In deciding upon the proper stations for European troops in India, there are two material points for consideration which may be sometimes opposed to each other, but which it is necessary as far as possible to reconcile, namely, the military, or strategical, and the sanitary. That they are sometimes antagonistic arises from the fact that there are many places upon the plains which it is necessary to hold, at the same time that the climate there is injurious to the health of Europeans. The question to be decided, then, is, how far can we take advantage of the healthy hill ranges existing in various districts, upon which to concentrate our Europeans, without weakening our military provisions? and this in a great degree depends upon the geographical position of the hills, and upon the means of rapid communication into the plains.
	128. Before entering into this question, there is one erroneous idea which appears to be entertained by many persons, which it is necessary to dispose of. It is the notion that troops which are quartered in the plains gradually get accustomed to the heat, in fact, become acclimatized, and that therefore the hill stations need only be had recourse to as sanitaria, for places of recovery for sick and delicate soldiers. With regard to the supposed acclimatization, it is to be feared there is little in it. Doubtless many soldiers who come to this country young have acquired prudence by experience, and as their constitutions gain strength by maturity present, as a body, a fine, soldierlike, healthy, appearance. Acclimatization does a little, perhaps, in that way; but in looking at a regiment which has gone through the ordeal of a long residence in the plains, we must, in order to form a right conclusion, ascertain how many of the young, the delicate, the unformed, and possibly reckless youths that were in the ranks, have disappeared, either by death or invaliding. The men we see may be strong, but they are but exceptions; a few hundreds, perhaps, remaining out of thousands, who in a few years have been taken away. But our argument will go much further. There is very good reason for supposing that these very men who look so strong, and who are supposed to be accustomed to the climate, do not and cannot bear the heat as well as a regiment of the same age, and whose other conditions are the same, except that they have not been in a tropical climate.
	129. It is of great importance to ascertain this latter fact, because if the supposed acclimatization is a fallacy, if the regiments who are quartered in the plains begin to weaken and to deteriorate in physical condition day by day, gradually but surely, from the beginning, it forms a very strong argument in favour of the necessity of concentrating our European forces, to the extreme limits of military safety, upon the healthy hill ranges; and even if the hill stations have to be established at some distance from the main roads and communications of the country, it would be well worth while for Government to go to some expense in bringing them into contact by branch roads or railways, so as to enable the Europeans to live in a genial climate, with the power of moving at once to any threatened points of disturbance. If every soldier landed in India cost 100*l.*, it is not difficult to perceive that it is good policy to keep him alive, independent of considerations of humanity. The pecuniary saving to the state would speedily repay the expense of a railway to the foot of the hills.
	130. On the subject of acclimation, Sir Ranald Martin, F.R.S., gave evidence before the Royal Commission for the Re-organization of the Army as follows:—"The whole range of service in the plains of India is to the British soldier one unbroken course of physical degradation." * * * "A few years of residence in the hot and pestilential plains of India being of itself sufficient to spoil the blood and tissues of the European." Speaking of the necessity of removing the European troops to the mountain ranges, he says:—"It is impossible to overrate the importance of this measure, whether we regard the health and efficiency of the British army in India, its power to garrison and maintain the empire, or the capability of England, by voluntary enlistment, to fill up the muster rolls." He adds, "The eventual saving would be enormous." In answer to another question, he

STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.*	says:—"That the ratio of mortality increases in proportion to the length of residence in India, steadily and certainly." Again he says, "That all the formidable diseases of India are essentially diseases of the plains." Sir Alexander Tulloch produces returns to the Royal Commission to prove that the ratio of mortality steadily and rapidly increases with the age of the men, year by year, in India. In Madras he says the soldiers die annually at the rate of— 26 per 1,000 between 18 and 25 years of age. 59 per 1,000 „ 25 and 33 „ 70 per 1,000 „ 33 and 40 „ 86 per 1,000 „ 40 and 50 „
	131. Again, if young Europeans of delicate constitution who come to India as recruits, at the early age of between 16 and 18, before their growth has been completed, or their constitutions matured, be sent to a station in the plains within the first or second year of their arrival, while they are growing rapidly, they become pale, sickly, and emaciated, they are liable to a variety and succession of ailments which though individually of little severity, tend, by their combination and succession, seriously to impair the constitution and lay the seeds for future disease. Let such persons repair to a mountain station for two years, their constitution will then become matured and consolidated, and sufficiently seasoned to undertake a much larger amount of fatigue duty on the plains than it would otherwise have been.
Hill Stations suitable for European Troops contiguous to the chief Military Posts.	132. 6th. It being, then, an established fact that in point of health a residence on mountain ranges is highly desirable for European soldiers, let us now endeavour to ascertain how far this principle can be practically adopted in the Madras Presidency.
	133. As a general rule, the whole of the lower part of the peninsula held by the Madras army, south of the Kistnah and the Toomboodra, is in a complete state of subjection. There may be races of men in some parts of a turbulent character, but there is not one district whose inhabitants have military organization or means of aggression, and who, therefore, require the constant display of any large controlling force in the plains.
	134. With regard to disposition of the forces generally, we find that the Commander-in-Chief, Sir Patrick Grant, has over and over again recommended the withdrawal of the numerous small detachments hitherto scattered about the country, and their concentration at a few centrical points. Economy, efficiency, and discipline would all be promoted by such a plan. The Military Finance Commissioners, in their report just printed, strongly advocate the same on economical grounds. Medical men would only urge, in addition, that the concentration be effected upon healthy localities.
	135. The principal stations for European troops in the plains of this Presidency are Madras, Trichinopoly, Cannanore, Bellary, Vizagapatam, Secunderabad, and Nagpore. Contiguous to all of these, except Secunderabad, are easily accessible healthy hill ranges which secure a genial climate at all seasons to the European soldier. It would almost appear that an overruling Providence had specially provided the means of imparting vigor to the constitutions of the people of our nation, hitherto so highly favoured by Him, who are destined, we hope, to introduce a higher civilization into this land.
I. THE SHEVAROY HILLS.	136. *Madras*, as the capital and seat of Government, containing also an arsenal and manufactories for the material of war, will always require a certain proportion of Europeans as a garrison. If good barracks close to the sea were provided for this force, there seems no reason, when railways and other communications are completed, why the head-quarters of artillery and the depôt of Queen's troops at present stationed on those hot plains should not be moved altogether to a cooler climate, as Bangalore.
	137. The Shevaroy Hills are now skirted by the railway which passes across the continent. Troops leaving Madras by rail at 4 p.m. would be able to breakfast at an elevation of nearly 5,000 feet above the sea the following morning. These hills form one boundary of the Salem valley, their greatest altitude is 5,200 feet above the sea, that of Yercand the position on which the European community have erected their residencies is 4,500. Here the surface is broken, rocky, and jungly, and it has been subject to occasional severe visitations of fever, either from inattention to sanitary requirements or to the failure of the regular monsoon. But these visitations are of rare occurrence, the type of the fever is as much under control as that which is usually found to prevail all over our plains, and deaths are rare. The present situation I assert is not well chosen, and no troops should be placed there. The position for a military cantonment ought to be the "Green Hills," five miles west from Yercand. Here the villagers appear to be in the most robust health; the ground is regularly cultivated; there is an abundant supply of good water throughout the year, there is a beautiful plateau of about 200 acres of undulating grass land, and the jungle has entirely disappeared long before this position has been reached. Indeed it is hardly possible to meet with a more desirable site for a military cantonment, having also abundant space in the neighbourhood for a parade.
	138. Nothing can be more delightful to the feelings than the climate throughout the year. But from the property acquired by the residents on their ill-chosen position, they cling to the locality rather than abandon it to take up their residence on a more salubrious site. There are now 104 Europeans and East Indians (54 adults and 50 children) resident on these hills; some of these have not been on the plains for years, and the family of a missionary has been almost constantly on them for 18 years. One cannot but be struck with the healthy rosy complexion of the European ladies and children residing on these hills, to whose constitution the climate is peculiarly adapted.
	139. It would be of infinite advantage to the anæmic European soldier stationed at Madras and its neighbourhood, if military considerations would admit of a portion of them being always located on the summit of these mountains, so as to permit an interchange of a portion of the force from the plains to the hills, and *vice versâ*, at certain periods, irrespective of health or sickness. The experiment as regards these hills, which are certainly subject to fever on the lower elevations, might in the first instance be tried on a small scale. Their proximity to Madras makes them valuable, and it is not probable that fever exists *per se* at an elevation approaching to 5,000 feet on grass hills devoid of jungle.
	140. Ten per cent. is the usual sick in European regiments garrisoning Fort Saint George, and the majority of these come into hospital from fever. People have been accustomed to this

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STATIONS.	REPLIES.
I. The Shevaroy Hills—*cont.*	state of matters so long, that it ceases to excite surprise. But if the natural remedy of restoring to an elevated range with the view to vivify the anæmic and bloodless soldier and render him less liable to disease be proposed, there are not wanting men of sound judgment who join in the cry to condemn the locality, because of an occasional outburst of fever, forgetting altogether that the soldier is far more liable to fever and its concomitants and a host of other disorders besides at the station he is garrisoning. That in the one case he is equal to any emergency, and up to any amount of fatigue, but in the other he is so enfeebled by climate, so prone to imbibe disease, that he speedily breaks down on his first march from exposure, or succumbs to his first attack of illness.
	141. In attendance on the Right Honourable Lord Harris I visited the Shevaroy Hills, when his Lordship drew up the following Minute, dated Salem, 12th July 1858. "I have now had the opportunity of visiting the locality on the Shevaroy Hills mentioned in my Minute of the 29th ultimo, and pointed out by Dr. Macpherson as a suitable site for the depôts of Her Majesty's and the Honourable Company's European recruits. "I have no hesitation in giving a favourable opinion of the place, so far as to recommend that the subject be taken into immediate consideration by Government. "The advantages of the position are numerous, 1st, it is within easy access from Madras. Troops might be landed there in the afternoon, and travelling through the night, could be brought to the cantonment by 8 or 9 o'clock next morning. "2. The ground appears well adapted for the purpose, and a considerable space could be obtained without difficulty. "Dr. Macpherson mentions 100 acres, but 200 or 300 could, I should think, be procured. "3. The climate is very agreeable, and the temperature particularly equable, a great desideratum for persons just arrived in the tropics. During the four days of my residence, 8th, 9th, 10th, and 11th, the thermometer did not range in the house above 71°. "4. The water is good and abundant. "5. The soil, subsoil, and underlying rock, specimens of which were procured for me, were considered satisfactory. "6. The height above the sea about 4,600 feet. "But all these points require to be more fully weighed, inasmuch as the climate the Shevaroys has obtained some degree of disrepute. "There is no doubt that the inhabitants, European and natives, were attacked by a very severe fever in the years 1824 and 1854, and I have heard it stated that slight attacks of a similar kind, but much slighter in degree, were experienced in 1834 and 1844, and were it probable that a recurrence of such a malady were to be anticipated, serious doubts might fairly be entertained of the advisability of making any attempt of the nature proposed. "I cannot, however, think that there is any serious objection in this case, maladies of one sort or another will periodically appear in all situations, but they may generally be greatly modified, if not altogether prevented by precautionary measures. "I cannot but think that the Shevaroy Hills would prove most beneficial for a depôt for the families of European regiments on service. "The children of the residents at Yercand enjoy perfect health, and their general appearance, bright colour, and vigorous bodies, lead to a most favorable impression of the climate. "It might be advisable to make a trial in the first instance on a small scale without going to any great expense, but on such a plan as could be enlarged on at pleasure."
	142. In the month of February succeeding, his Excellency the Commander-in-Chief to whom my report on the hills and the Minute above quoted were referred, replied to Government through the channel of the Quartermaster-General as follows:—"I am directed by his Excellency to refer to my letter of 2nd September last, in the latter part of which Sir Patrick Grant recommends that a trial may be given to the Shevaroys as a station for invalids and time-expired men ordered for Europe, and for the families of corps absent on foreign service, a course his Excellency is still of opinion may be adopted."
	143. The railway is about to be opened to the foot of these hills. Ere long, therefore, this delightful locality will be brought within nine hours of Madras, so that the recruit on his arrival from England may land at the railway terminus in the afternoon and breakfast on the hills the following morning. The arrangement which at present obtains is to transport both him and the invalid whose constitution has been shattered on the plains, or from wounds or hard service, to Poonamallee or to Arcot, two of our most enervating stations in the Carnatic, and having the worst barracks in the Presidency. (Vide marginal note by his Excellency the Commander-in-Chief, paragraph 37).
II. THE PULNEY HILLS. *Topography.*	144. *Trichinopoly*, as has been shown, is the head-quarters of the southern division of the army, and has a considerable European garrison, for whom new barracks are required. It is about the hottest and most debilitating climate in Southern India. The Pulney Hills range from 10° 10′ to 10° 44′ lat., and 76° 21′ to 77° 22′ long., and are under 100 miles from Trichinopoly. The superficial area of the hills is calculated at 800 square miles, their length from east to west is 64 miles, their medium breadth 15 miles, and the elevation of the plateau varies from 6,000 to 7,000 feet above the surrounding plains, and they are 6,000 to 8,000 feet above the sea.
	145. The hills are divided into two distinct portions, the Mel or Western, and the Kel or Eastern ranges. The greatest elevation of table land is towards the west, and it drops in distinct plateaus eastwards at intervals of 1,500, 1,000, and 500 feet, until the plains are reached.
	146. The summit is free from jungle and forest, the surface being clothed with rich grass. The spurs which run down from the summit to the base are intersected with deep ravines and dense luxuriant forests, and amidst the undulating surface of the mountain are rich and fertile valleys, intersected by numerous streams of various magnitude, all picturesquely contrasting with the bare and rugged heights, broken ridges, and magnificent bare walls of rock which surround them, presenting a view in the highest degree sublime.

STATIONS.	REPLIES.
II. The Pulney Hills—*cont.* *Rivers.*	147. There are upwards of 30 large streams on these hills, which uniting form 11 respectable rivers. From the summit of the higher peaks ascending above the plateau these rivers are seen meandering through dense sholas down deep ravines, falling over precipices in beautiful cascades, and finally passing down to irrigate the rich districts of Madura and Dindigul.
Villages and Inhabitants.	148. Several villages are scattered over the surface. The houses are irregular clusters, built of mud and wattle, and thatched. All are provided with fire places and sheds for cattle. The slopes in the vicinity of the village are formed into well irrigated and richly cultivated terraces. The adult inhabitants are a well formed and healthy looking race, and the children are vigorous and show no symptoms of spleen affections.
Geological Formation.	149. Gneiss, over which is generally found a stratum of clay overlapped by a thick covering of rich vegetable mould. On the summit and slopes the soil is shallow, but in the valleys it sinks to a greater depth, and in some parts a ferruginous and calcareous kunkur predominates.
Climate and Monsoons.	150. Four circumstances naturally affect the climate of these hills. 1st. Their elevation. 2nd. Their isolated position. 3rd. Their situation between the east and west coasts of the peninsula. 4th. Their position near the line of demarcation of the two monsoons, which make an annual tour, almost as regular as clock-work, over the peninsula of India as follows:—
	151. To commence, say from the eastern coast, they blow direct from the east about the end of February and beginning of March, then from south-east, gradually going south until by the middle of April, they blow from south, veering round towards the west; these winds bring up moisture from over the Indian Ocean, and rain falls on the highlands of Ceylon, and extend usually over the southern parts of the peninsula. Towards the end of May the winds blow from the south-west and west, bringing up large banks of clouds towards the western coast, which in the end of that month and beginning of June, burst on the coast; the highlands of the Ghauts receiving the great bulk of the fall.
	152. The rain falls heaviest at the western end of the Neilgherries, on the "Koondas," which are the highest parts of the line of Ghauts and in Coorg. On the coast it is lighter towards the south, increasing opposite the Neilgherry range to about 120 inches, which is the average fall at Calicut, and continues about the same up to Mangalore, opposite the highest parts of Coorg, where 180 inches fall, after which it decreases, and at Bombay the fall of rain is not more than about 80 inches. It goes on decreasing as it passes into Guzerat until it is lost altogether, there being no monsoon in Sinde. The rain passes inland from the western coast over the Mysore and the Deccan, and goes northward and eastward. In September and beginning of October, the winds veer round to north and north-east, and then occurs our north-east monsoon with its accompanying rains.
	153. The south-west monsoon sets in and prevails in Pegu at the same time as on the western coast, and the fall of rain diminishes as it goes inland north and east, just as it does on this peninsula.
	154. It will appear from this, that the Neilgherries on their western side receive very heavy rain, which extends as far as Ootacamund, whereas the hills to the south-east of the Neilgherries, such as the Pulneys, which are so much more inland, receive a lighter fall, at the same time that they share in the earlier rains of April, and again in the latter rains of the north-east monsoon, thereby giving them more the character of the climate of Kandy and Newera Ellia, and a greater freshness throughout the year, and in a measure a freedom from the aridity which prevails on the Neilgherries for three or four months.
Seasons.	155. The year is divided into two seasons, the cold similar to the autumn of the south of France, sets in in December and terminates in March, the remaining months resemble a mild autumn in the south of England.
	156. January is uniformly fair, clear, and dry. The nights are very cold, and attended with frost in the valleys. The same remark will apply to February, except that frost is stronger, and in March it disappears, when the weather becomes milder, and there are a few heavy showers. Towards the close of April, the wind begins to vary from north-east, and finally settles in the south-west, when the air becomes mild and balmy. May is the warmest month, but the heat is often relieved by the fall of rain in torrents, intermingled with hail, ushering in the south-west monsoon which occurs in the early part of June, and continues with greater or less constancy throughout July and August, when the weather on the lower hills is comparatively dry and fine. September and October are uncertain months, depending on the state of the south-west monsoon which, if begun early and exhausted, renders the weather fine, warm, and pleasant, but if deficient in previous rain, a good deal of mist and drizzle generally prevails. Towards the end of September the wind again begins to shift round to the north, when the weather becomes suddenly colder; mists and fogs are common throughout the year; some gales of wind occur once or twice a year, generally about the changes of season, but thunder and storms are of rare occurrence. The changes of temperature are sudden.
Salubrity.	157. The upper ranges are decidedly salubrious, in the lower the climate is hostile, and then from March till August malarious remittent fevers prevail. But it were difficult to find a climate more congenial to the feelings, more calculated to preserve health, or to restore the invalid, than this elevated area affords. Hardly a day passes without a refreshing sea breeze from either coast, rarified and rendered bracing by the altitude of the position, admirably adapting it to the unimpaired European constitution, and to the valetudinarian. I believe it calculated to promote recovery in all save the exceptional cases detailed in a former chapter. Vide paras. 121, 122.
	158. In support of my own views of the salubrity of the upper ranges of the Pulney Hills, I will now quote an extract from a communication from the Collector of the district, a resident there for several years, in reply to some observations made by the Director, now Principal Inspector-General, on my public report to him for the information of Government. "I conceive the remarks by the Director-General in regard to the salubrity of the upper ranges of the Pulneys wholly opposed to most clearly established facts. Mrs. Clarke and my family resided on these hills from July 1851 to January 1856, when they went to

INSPECT.-GEN. MACPHERSON'S REPORT. MADRAS.

STATIONS.

REPLIES.

II. The Pulney Hills—*cont.*

England for the benefit of education. Mrs. Clarke and the greater part of the children never left the hills from the day they ascended there in 1851, till they came down in 1854, they enjoyed most excellent health and no doctor was ever called in to see them, Mrs. Clarke curing all their ailments; in fact, they enjoyed better health on the Pulneys than they did in England, where I afterwards lost two of diphtheria.

"All who resort to these hills generally go up at the end of February, and remain till the end of October, when Madura (the head-quarters of the district) is bearable. Mr. Hodgson went up with fever in February, and benefited greatly while there. One Sunday in May he had a congregation of 50 including the American missionaries and their families.

"I consider that the Pulneys should be the location of European troops stationed in the southern division. With rail, as is proposed, from the foot to Madura, and thence to Tutecorin on the south, and Trichinopoly on the north, and from Trichinopoly to Negapatam on the east, and to the junction of the Great Western Railway on the west, we could throw a fine healthy active body of English troops into every part of the south where they might be required. They could get down in six hours, and the rail would take them to any part of the division in 12 more."

159. Before it be finally decided to erect barracks for 1000 European soldiers at Trichinopoly, the extremity of the division, I would urge the consideration of the advantages of quartering at any rate, a portion of the force upon those mountains, which are situated near its centre, by which means military and sanitary conditions would be reconciled and probably equal influence would be exerted over the surrounding country. I am confident that any additional expense incurred would be fully counterbalanced by the favourable results which a well-directed system of interchange from the plains to the higher altitudes would produce upon the health of the men. I beg to refer the Royal Commission to Sir Charles Trevelyan's Minute on Madura, dated 8th February 1860, wherein he gives a glowing description of his visit to the hills which form the subject of this article.

III. THE NEILGHERRY MOUNTAINS.

160. The topography and physical character of this well known elevated range of mountains has been so frequently described, and the salubrity of these vast plateaus, which combines, with the advantages of a hill station, those of easy access and a sea voyage, is so well established, that it will be unnecessary for me to dwell on the subject at any length.

161. The Table at paragraph 116 gives the elevation and average temperature of the civil and military stations on these hills; Wellington being the only military cantonment. Here palatial barracks have been constructed for a complete regiment of European infantry at an enormous cost. This is a great mistake, first, because the climate is alone sufficient to ensure good health in an ordinary dwelling-house; and second, because although the Government may be disposed to adopt the plan of hill stations, an extravagant estimate of expenses to be incurred is apt to postpone or prevent the attempt.

162. I am quite of opinion with Sir Ranald Martin, who in his evidence before alluded to, states, "that provided the site be of sufficient elevation, well cleared, drained, and levelled, with a good water supply, the building material need not be of a costly character." Well-constructed huts of wood planking, raised on pillars two feet high, with deep verandas all round, and having space sufficient for 10 or 12 men, would be abundant protection. On the Penang Hill and on the high lands in Java, where the rain is more incessant than on our hills, houses are usually constructed of this material, and they are calculated to last for 15 to 25 years with ordinary repairs.

163. The station of Kotagherry on the Neilgherry Hills (6,100 feet above the sea) is considered the most salubrious on the plateau. Its climate is a happy medium between the other three stations of Ootacamund, Wellington, and Coonoor, and it is considered peculiarly favourable for convalescence from bowel disorders, dependent on functional derangements. Situated on a spur of the range, it overlooks and is easy of access with the plain below. The great trunk railway which crosses the peninsula from Madras to Beypoor, passes within a few miles of the foot of the hill, thus greatly facilitating the communication.

164. On this plateau I would recommend that barracks be erected for European convalescents resorting thither from Bombay, and from lower Bengal. In the former Presidency, there are no hill ranges of sufficient elevation to impart vigour to the convalescent, and even these are uninhabitable for many months every year, during the prevalence of the south-west monsoon. A couple of days would transport him from Bombay to Beypoor, the western terminus of the railway, and from thence to the foot of the Kotagherry pass, is but a few hours' journey.

South of the Ganges.

In Bengal.

Calcutta, 2 European Infantry Regiments, average strength - - -	2000
Dum Dum, 1 do. do. -	1100
Ditto 1 Company of Artillery	
Barrackpoor, do. do. -	1100
Chinsura Depôt - - -	1000

In Behar.

Hazarbog, 1 European Infantry Regiment	1000
Deyree, do. do. -	1000
Dinapore, 2 ditto and Artillery -	2100

North of the Ganges.

Buxar, 1 European Infantry Regiment -	1000
Gazeepore, do. do -	1000
Benares, 2 ditto and Artillery -	2300
Allahabad, 3 do. do. - -	4000

165. In Lower Bengal, again, the large European force garrisoning the stations, as per margin, are unprovided with sanitaria; the fall of rain at Darjeeling, (10 to 12 feet per annum) the only mountain within moderate distance, renders it inapplicable for a convalescent depôt. Moreover, certain death would be the result of a march through the Terrai, a belt of jungle 50 to 60 miles in length, from Dinagepoor to the foot of the hills, between the months of June and December, which embraces the most trying season of the year. Invalids from all these stations would reach Calcutta, and be transported to Kotagherry with far greater facility and safety than to Darjeeling.

166. Thus, without the establishment of any means of transport beyond what already exists, the sick or wounded soldier may with facility be sent in the one case from Calcutta to Madras, and in the other from Bombay to Beypoor, thence in a few hours by rail without fatigue or delay, to a climate surpassing in salubrity any in the globe, where there is everything to exhilarate the mind and reinvigorate the drooping constitution, or if the nature of his malady be unsuited for a residence on an elevated locality, he can be landed, if from Bengal, at the "sea coast sanitarium" of Waltair, and if from Bombay, at that of "Sedashaghur," the description of which I reserve for a future occasion.

STATIONS.	REPLIES.
III. The Neilgherry Mountains —*cont.*	167. I append below an abstract for the current year of the annual returns of sick of Her Majesty's European regiments which have been received from out-stations up to this period. It will be observed, that although the regiment at Wellington has laboured under some disadvantages, consequent on want of space from the non-completion of the barracks, and the absence of other essential sanitary desiderata, which will ultimately be supplied, that their death-rate is lower than any other of the stations quoted.

Abstract of Sick.

Classes of Disease.	H. M. 60th Rifles, Strength 1,137, at Wellington.			H. M. 74th Regt., Strength 812, at Bellary.			H. M. 91st Regt., Strength 819, at Kamptee.			H. M. 1st Royals, Strength 1,045, at Secunderabad.			H. M. 17th Lancers, Strength 448, at Secunderabad.			18th Royal Irish, Strength 961, at Secunderabad.		
	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.
Fevers	184	176	5	207	203	1	293	281	2	298	288	3	854	841	5	515	501	5
Eruptive fevers	—	—	—	1	1	—	—	—	—	1	1	—	4	2	1	—	—	—
Diseases of the lungs	67	63	2	67	63	2	33	32	1	99	94	3	62	61	1	73	70	2
Do. of the liver	47	44	1	62	59	1	30	27	2	233	221	8	31	28	1	49	45	—
Do. of the stomach and bowels.	180	175	1	180	174	3	172	162	3	547	534	6	261	249	10	438	425	13
Do. of the brain	27	24	—	25	15	9	19	12	6	11	9	2	37	27	8	12	9	2
Epidemic cholera	—	—	—	3	2	1	12	3	8	10	7	3	44	17	27	29	17	12
All other diseases	532	489	1	738	711	4	458	452	1	601	579	—	471	455	—	624	588	—
Total	1,037	971	10	1,283	1,228	21	1,017	949	23	1,800	1,733	25	1,764	1,680	53	1,740	1,655	34
Average deaths to strength per cent.	0·87			2·58			2·80			2·38			11·83			3·53		

168. During a service of 24½ years I have frequently had my attention called to the debilitating effects of the climate at Cannanore on the constitution of Europeans who have resided there for a series of years. The report of the surgeon 74th Highlanders for the past year, now before me, goes to substantiate my views on this point. He observes, "The remarks which I have before made relative to the debilitating, relaxing, and undermining effects of the climate of the western coast (where he was stationed with his regiment three years) have been but too fully and practically illustrated. The great majority of men and officers who served there for from three years and upwards, have either died, been invalided, or sent home sick. One of the great peculiarities of the climate seems to be, that while on the coast men like it, are not often sick, it is when they go to a drier climate that the mischief becomes apparent. I am strongly of opinion that, if possible, no regiment ought to remain on the western coast more than two years during the time of Indian service."

169. If strategetical considerations would admit of holding Malabar and Canara and the western portion of Mysore under control, by stationing a portion of the European force now at Cannanore on the Neilgherry hills, a salutary hygienic interchange of the allotment for this division of the army from the plains to that elevated plateau would be an important sanitary change on the present system of retaining the corps there for a series of years. The railway from the neighbourhood of Cannanore to the foot of these hills affords facilities for putting this plan into force in the space of a few hours' duration.

170. I beg to draw the attention of the Royal Commission to the large number of admissions from fever at Wellington on the Neilgherry plateau. The prevailing type being a low remittent or typhoid; a disease which is admitted to have its origin in a poison produced from refuse animal matter allowed to decompose and taint the air we breathe or the water we drink. In former days this malady was unknown on the hills; but, as before observed, it is now common to the plains also, arising I believe from the same cause.

171. I believe that much mischief is done by the want of proper attention to conservancy during the construction of public buildings, on which thousands of labourers are employed for a period of months and perhaps years, and that the absence of this is now in a great measure the cause of the zymotic affections, which are endemic at this station.

172. When on duty in September 1858 on the Neilgherries with Lord Harris, our late Governor (who eagerly adopted, and so far as his power lay, enforced the introduction of any well-arranged system of sanitary reform brought to his notice) I was compelled to bring to his Lordship's notice the imprudent neglect of prophylactic measures during the construction of these barracks, as follows:—

"The strictest attention is now required to sanitary matters, while so many labourers (3,000) are at work on the buildings, for nothing can be more noxious or offensive than the system at present in force. The cantonment and neighbourhood is tainted with fœcal atmosphere; go where you will, in the unfinished buildings, in court-yards, even in the well-finished rooms, human ordure is found. Already the result of this neglected conservancy is exhibited in low fevers amongst the European children and adults, and there is danger that the place may become so polluted as to establish a malarious atmospheric taint which may hereafter become an incidental source of disease. The coercive interference of Government is therefore required to preserve the character of the station for salubrity."

173. Although measures were forthwith adopted to correct the evils above described, I believe the seeds then sown are now producing baneful fruit. But I will reserve any further observations I have to offer on this head until I treat of barrack accommodation generally.

174. I cannot concur with those who argue against hill stations, because from their isolation and seclusion soldiers dislike them. True there are here greater facilities for separating the men from the debasing effects of drunkenness and low vice which they unfortunately indulge in in the plains. But in so enjoyable and temperate a climate, there can be found employment in abundance as labourers and artizans on public works, in making up their own appointments, in gardening, &c., &c., instead of being permitted, as is too frequently the case, to lie in bed sleeping and dozing all day long, a practice, the *ennui* of which I believe to be second only to the above-named morbific influences on the constitution of our troops.

Inspect.-Gen. Macpherson's Report. Madras.	Stations.	Replies.
	IV. Bangalore.	175. As a sanitarium, from its central position, its elevation 3,000 feet, and the salubrity of its climate, is one of the best and most important positions in the south of India, whether considered in a military or sanitary point of view. Sir Alexander Tulloch, in his evidence before the Reorganization Commission, says, that from returns extending over a number of years, it appears that troops located at Bangalore do not sustain a greater loss than 3 per cent. annually, and a considerable portion of even this number arises from disease contracted at other unfavourable stations. 176. The death-rate at Bangalore from 1842 to 1857 inclusive has only been 2·2 per cent. per annum, and I have every reason to believe, as superior accommodation is provided the soldier, that we have not yet attained our minimum in this respect. Vide Return 1859–60. Appendix C. 177. It would therefore seem advisable that the station should be considered the most important, and be the most numerously garrisoned of any in the country. It does not appear to have a single objection.
	V. Ramandroog Hill.	178. The only remaining station for European troops south of the Kistnah is Bellary, the head-quarters of the Ceded Districts. It is now 12 years since the solitary hill which forms the subject of this chapter was first occupied as a convalescent depôt; 12 years prior to then, when I first did duty at Bellary, a deadly fever was supposed to be the certain result of a visit to the locality. Times are now changed, and experience has taught us that the number and extent of our hill stations may be increased with the utmost advantage to the health and efficiency of all who resort thither. 179. Ramandroog is 38 miles distant from Bellary, and it is one of a broken series of hills denominated the Sundoor range, encircling a rich well watered valley of the same name. The entrance into this valley from Bellary is peculiarly picturesque. To the right and left an unbroken semicircle of mountains approach each other; at a distance they appear to unite in the centre of the arch, but as you approach you find them cleft to their base, and giving passage to a narrow winding mountain torrent, whose bare perpendicular rocky sides tower many hundred feet above you. 180. There is an easy ascent to the summit of the mountain, at its greatest elevation above the sea, viz., 3,400 feet, and 1825 above Bellary there is a cleared platform, one mile and a quarter in length, and about as much more of a like elevation connected to it by a tongue of land, but yet uncleared. The entire hill is hornblende, peculiarly rich in iron ore. Some detached pieces affect the magnet, and beneath the vegetable mould which ages have accumulated on the surface, lumps of pure metal crop out from masses of scoria. A disintegrated lateritious earth has accumulated on the surface of the hill, the decomposition of the hornblende. The extreme porousness of this mass gives immediate passage to surface moisture, so that no water is found until the underlying rock is reached, usually at a depth of about 500 feet from the plateau above, where there is a perennial supply. 181. The average temperature of the Droog somewhat resembles that of Bangalore; but the variation of the thermometer is less, and the climate is much more equable. Throughout the year the temperature is most agreeable to the feelings, imparting elasticity to the constitution, and inviting out-door exercise. From its solitary position, even in the hottest seasons, the air reaches it fresh, rarefied by elevation, not obstructed by high walls, not heated by passing over a large extent of table land, and not rendered impure by emanations from town filth, such as is too often the case at Bangalore. 182. Ramandroog is essentially a convalescent station. On the occasion of my visit I found in the depôt invalids from the Royal Artillery, H.M. 12th Lancers, H.M. 1st Batt. 1st Royals, H.M. 74th Highlanders, H.M. 3rd Batt. 60th Rifles, and H.M. Indian Artillery. Only one death had taken place among the invalids during the 12 months prior to my visit, and the books exhibited only an average daily sick list of 11¾ per cent., a rate which does not exceed that of a healthy body of men in the plains. The great advantage of the climate of the Droog is owing to its unvarying and equable temperature, whereby the natural action of the skin and kidneys are neither excited nor checked, and thus congestions of the large organs are avoided. 183. Some of the convalescents whom I met on Ramandroog I had seen nine months before in hospital at Secunderabad, reduced to death's-door from dysentery, and apparently without much hope of recovery; now what a marvellous change for the better; one of them observed in reply to my questions, "I was but a short time here, Sir, when I got an appetite like a horse, and instead of feeling weak as a child scarcely able to crawl, I was continually on my legs, and I am now nearly as stout as ever." 184. This is essentially one of Sir Ranald Martin's "valuable islands in the plains which has sanitary excellencies peculiar to itself." The climate is well adapted for all who are free from organic disease; it supports a slight decline of health, and provides against threatened alterations of structure, although it cannot restore a constitution thoroughly broken down.
	VI. Sanitaria for Secunderabad.	185. The turbulent character of the people of Hyderabad render the presence of a strong European force here indispensable. There are no hill stations near it, and the sea-coast sanitaria are hundreds of miles off. It is no doubt, therefore, a very difficult station to deal with, more especially as it bears at certain seasons a bad reputation for the European soldier. In 1858 the mortality, chiefly from hepatitis and sanguineous or scorbutic dysentery, was— 1st Royals - - 10½ per cent. Lancers - - 5 per cent. Royal Artillery - 5 „ Madras Artillery 3½ „ Military considerations here override medical ones, our only alternative therefore is by the erection of barracks upon the most approved principles, and upon the healthiest spots, by protection against overcrowding, by a liberal supply of vegetables with their food, &c., to guard the health of the troops as far as possible. 186. Convalescents from Secunderabad are now either sent to the Ramandroog Hill, near Bellary, upwards of 300 miles over a difficult road, or they proceed to Masulipatam, the nearest point to the coast, about 200 miles, with the view of taking passage to Madras, or to the sea-coast sanitarium of Waltair; in both cases involving a journey of much fatigue and danger to the invalid. This station is 1,800 feet above the sea. In 1846 I was encamped between the 20th January and 20th March on a solitary hill, called Dungoond, one of Coilcondah range, about 2,600 feet above the sea. It was a common place of resort for the officers and their families, from the oppressive heat of the station of Muctul,

STATIONS.	REPLIES.
VI. Sanitaria for Secunderabad —*cont.*	which we then occupied; we always enjoyed the change, and found much relief from the extreme heat below. In 1849 I made a short report to Government on the topography, &c., of the hill, from which the following is an extract:— "The village of Dungoond, from which the hill derives its name, is situated in the Chetapoor Talook, and is, I believe, a jagheer of the Newab Shumshul-oomah of Hyderabad. It is almost an isolated mountain, being connected at its base towards the south-east, to a chain of high land, which forms a continuous ridge with the Aloor and Palmoor group. Towards the north-west the hill terminates at first in an abrupt slope, which soon becomes more gradual until it reaches the river Bema, some 1,500 feet beneath the surface plateau of the mountain, is about four miles long by one broad. "The hill is of trap rock formation, its summit presents a beautiful extent of table land, eight or ten miles in circumference, with neither rising ground or jungle to intercept the view, or the free current of air from one side to the other. The soil on the centre of the plateau is kunker, it is more elevated than the circumference, which is a black loam; there is no stagnation of water on it. Extensive beds of rich iron ore are seen. The slopes on the hill and for miles around on every side are covered with thick jungle. There are three perennial springs on the hills, affording a bountiful supply of excellent water. "The inhabitants residing on the two villages on the summit appear robust and healthy. They cultivate large and rich crops of pulses, &c., and assert that fever is not a disease of the mountain, although they often contract it below. Amongst the European adults and children who resorted to the hill, no case of fever occurred. I was particularly impressed with the salubrity of the position, and consider it well adapted for those who begin to exhibit declining health. A thermometer suspended under a tree denoted a lower range at noon, than it did at sunrise in the plains; the lowest range being at sunrise 59°, at 9 a.m. 73°, at noon 82°, at 3 p.m. 78°, and at sunset 72°, while the highest temperature indicated at the same periods of the day was 66°, 79°, 85,° and 84° of Fahrenheit, the greatest variation in the 24 hours being 23°. There was seldom a lull in the wind. "There is nothing in the appearance of the site nor in the surrounding country which would lead one to dread impure exhalations; on the contrary there is every indication of much purity of atmosphere, and the natives assured me that they are never visited with endemic disease. I am of opinion, even should it not realise the expectations I have formed of it, that it may notwithstanding prove an acquisition to the Hyderabad division of the army at certain seasons. It is said to be distant from Secunderabad about 70 miles south-west, and from Sholapore, a military station on the Bombay side, 40 miles." I am not aware that any steps were taken to examine further into the practicability of converting this hill into a sanitarium. The serious difficulties we encounter on this score, at the large military station of Secunderabad, may now induce an inquiry into the subject, as well as expedite the arrangements proposed at paragraph 88.
VII. SANITARIA FOR JAULNAH.	187. The question of the transfer of the military force at Jaulnah to the neighbourhood of Arunghabad, is now, I understand, under discussion by the authorities. Hitherto of all our stations garrisoned by European troops, Jaulnah has exhibited the smallest death rate. Doubtless sound military reasons exist for this meditated change, and it would not be becoming in me to observe on these. But in the location of troops sanitary considerations are so intimately blended with military, that I may be excused expressing my views on the contemplated measure.
	188. I have no hesitation in saying that our past experience of Arunghabad does not speak well for its future salubrity, for an European garrison. Fever is endemic to the spot, and a peculiar annoyance is caused by the high winds, which come in gusts between the gorges of the hills, making the site not only disagreeable but injurious. If on military grounds Arunghabad should be considered a better site than Jaulnah, then the country around Roza should be thought of. But before the great outlay of building barracks anywhere be entered on, the question should be well considered, whether the site should be fixed as suggested; or on the range of table land extending from Luckenwarra to Adjuntah, in the vicinity of Booldana, where the climate is very fine.
	189. The table land about Booldana forms the southern wall of the valley, and you look down to the plain beneath, a descent of 700 to 1,000 feet. The atmosphere on the higher regions thus situated is more free from unhealthy influences, and there is a greater difference in the climate than can be accounted for by the mere difference in altitude; moreover, the medical statistics of Booldana itself during the 20 years which our knowledge of it extends, for the hill which passes by that name has long been a resort for Europeans from Jaulnah and Arunghabad, are favourable to its salubrity.
	190. There might not be a sufficiency of water for a large body of men on the plateau of Booldana; but the valley of the Paingunga lies a mile from it, and the river of the same name running through it never dries, and the wells all along the valley are always abundantly supplied. But even on the highest plateau, a little expenditure, by running bunds across the gorges of ravines, would store any amount of water for the troops. In determining, therefore, on the future site for a military station, I recommend that the ground somewhere near Booldana should be seriously taken into consideration. Booldana is about 75 miles from Arunghabad, and 60 miles from Jaulnah, in latitude 20° 34′ north, longitude 76° 24′ east, situated on the Luckenwarra and Adjuntah range of hills; its probable elevation being 700 feet above the plain of Berar, which is 1,300 feet above the sea. The average rain fall is 28 inches.
VIII. CHICULDAH.	191. This is another range of undulating table land which may be turned into use as a sanitarium for European troops occupying the upper Deccan. The plateau of Chiculdah is one mile in length and three quarters of a mile broad. It is situated in latitude 21° north and longitude 77° east. It is one of the Vindhya, or as some denominate it the Gawilghur range, and is 3,600 feet above marine level.
	192. It has long been a favorite spot of resort for ladies, and children, and for invalid officers serving in His Highness the Nizam's country, who can bear testimony to the benefit they derived from a sojourn there. The varied and extensive scenery, and the bracing air which prevails during the hot season, exhilarates the mind and brings immediate relief to the lassitude induced by the suffocating heat usual in the Deccan at this period. The mean temperature of the plateau is 71°; the hottest months, April and May, give a mean of 83° and the coldest, January and February, 59°. The hottest day ever observed the thermometer rose to 96°; the coldest it sunk to 47°. The greatest diurnal range was 22°, the least

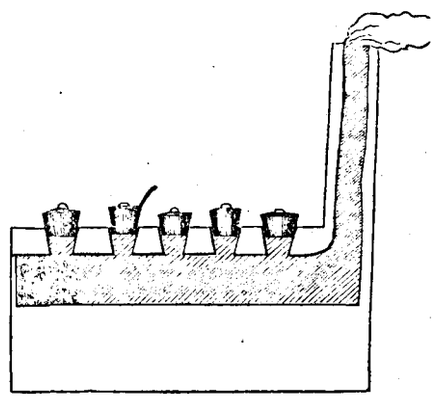
STATIONS.	REPLIES.
	4°, and the annual fall of rain averages from 45 to 55 inches. Potatoes and other European vegetables thrive well on the summit of these hills.
IX. SANITARIA FOR NAGPORE AND KAMPTEE.	193. This is the last of the great military cantonments in the Madras Presidency occupied by European troops, which will come under review under this head. Until lately Nagpore had no sanitarium, the usual course being to send the invalid to Madras for change of air, a distance exceeding 700 miles.
	194. Recent inquiries, however, hold out flattering hopes that a very eligible site for European convalescents and others has been discovered on the Puchmurree range of hills, at a place called Muthoor, which lies contiguous to the following 12 stations:—Sehore, distant 114 miles; Saugor, 104 miles; Dumah, 117 miles; Jubulpore, 105 miles; Mundla, 117 miles; Nursingpore, 59 miles; Hoosingabad, 62 miles; Baitool, 50 miles; Sconee, 64 miles; Bundwarra, 102 miles; Kamptee, 83 miles; and Nagpore, 84 miles. The stations of Kamptee, Saugor and Jubbulpore being provided respectively with accommodation for 1,800, 1,200 and 1,000 European soldiers; so that the convalescents of a force of 4,000, amounting probably to 200 men, besides women and children, have now a prospect of reaching a healthy hill station, nearly 3,500 feet above the sea, in a period of a few days.
	195. At a distance of 50 miles from Kamptee, and 30 from Muthoor Hill, is Chindwarra, a civil station in the Nagpore division, 3,000 feet above the sea. The climate here has already proved beneficial to European invalids, and sanguine hopes are entertained that the more elevated plateau will surpass it in salubrity. An intelligent committee of military and medical officers sent there in the hottest season of the year, report most favourably of the Muthoor sanitarium site; a valley 1½ miles long by ¾ of a mile wide, having a good water supply, and a mean temperature during the day, in the month of May of 87°, and of 78° from sun set to sun rise, the average daily temperature being 83° or 11½° lower than Kamptee.
	196. The Committee are of opinion that the Muthoor sanitarium offers very considerable advantages as a station for invalids, and that it is possible it will bear comparison with Ramandroog, which is about the same height above the level of the sea, and has been found one of the most useful sanitaria for invalids generally in all India. It lies in 22° 13′ north latitude, and 78° 40′ east longitude. Unfortunately the state of our finances in India has for the present retarded the construction of buildings on the site, with the view to its occupation.
X. SEA-COAST SANITARIA.	197. At paragraph 122 of this report, I observed on a numerous and important class of diseases which rapidly run to destruction at elevated ranges—an extra tropical climate, a sea voyage, a residence on the coast, or at salubrious localities within the softening and refreshing influence of the sea breeze, constituting the only safe and efficient remedy for them.
	198. The establishment of a sanitarium at Cape Town for coast sick, is likely to be the means of restoring the health of many men of Her Majesty's forces who have suffered within the tropics, embracing as it does a considerable sea voyage, in addition to a sojourn in a temperate climate.
	199. But there are three localities (vide large map) on the line of coast between Calcutta and Bombay, to which I would draw the attention of the Royal Commissioners as suitable sites for sea coast sanitaria for European convalescents and others, for whom the longer sea voyage to the Cape may not be deemed necessary. The first of these is—
XI. WALTAIR.	200. The head quarters of the northern division of the Madras army, and a most eligible position on the Bay of Bengal for the formation of an extensive sea coast sanitarium. In form it represents an elbow of land running out into "Lawson's Bay," which is bounded on the south by the "Dolphin's nose," a ridge 450 feet high; and on the north by "Lawson's ridge," of nearly equal elevation. These elevated points approximate inland, assuming a crescentic or horse-shoe figure. The distance between the horns of the crescent exceeds six miles. From the point of the elbow the ground gradually ascends on every side to the centre, a distance of two miles, to an elevation of 210 feet above high-water mark. This high ground comprises an area of about a mile in length, and two in breadth; the distance from the surrounding hills varying from two to four miles.
	201. The peculiar formation of this space secures to it a very equable temperature. The scorching hot winds which prevail in other parts of the division at certain seasons are unknown here, the usual difference in the thermometer at this period being 13°. The daily variation throughout the year averages 4°; the maximum is 90°, and the minimum 70°, the annual fall of rain being 41 inches. Thus, when there is no direct sea breeze, the land wind, broken by the surrounding elevated ranges, reaches the station converted into a sea breeze, untainted by emanations from the soil.
	202. The testimony of those who are acquainted with the locality for years, as well as medical statistics, are strong on the question of its salubrity. Acute disease is almost unknown, and its character for a sanitarium has already been established. The relaxing effects of the west coast are not experienced here.
	203. His Excellency Sir Patrick Grant, in whose company I visited this station, by earnest and unceasing entreaty, has induced the Government of India to sanction some expenditure towards the erection of accommodation on this desirable locality. Sensible of the importance of discovering elevated table land within the influence of the sea breeze, and that a combination of a residence on the coast for invalids suffering from organic disease, and afterwards as convalescents, to recover their strength, on more elevated ranges, offers the best prospect of restoring men to health and rendering them effective—His Excellency has also for many months past caused practical inquiry to be made as to the salubrity of certain portions of the Orissa range approximating the coast, varying in elevation from 3,500 to 4,500 feet above the sea, termed Gallicondah.
	204. I believe that success will result in these inquiries, and that the station of Waltair will become the most desirable one in India, for ere long the sick soldier, suffering from structural disease, can be conveyed from Secunderabad after a land journey of some 50 miles, in comfortable boats on the Kistnah or Godavery, afterwards on the line of canal which will shortly intersect that country to the coast, and thence by steam to the spot; or if from any of the stations in Lower Bengal, once shipped in Calcutta he will in the first instance receive benefit by the sea voyage, and thereafter at Waltair, where he will arrive by steam in 48 hours after embarkation.

Stations.	Replies.
XII. Cape Calimere.	205. No atmosphere is perhaps more salubrious than that of the sea coasts of continents. The cape called Point Calimere, which juts sharply into the sea 28 miles south of Negapatam, possesses an equable and moderate temperature, and enjoys a great immunity from disease. The soil around is sandy; to the west is a salt tidal marsh, which does not appear to affect the salubrity of the place. It is much famed for the coolness of its climate, and for the refreshing and invigorating influence of its pure sea breeze. The place has long been an agreeable resort for invalids and others during the hot months in the interior. Its position, contiguous to the Pulney Hills and adjoining the terminus of the railway now in progress at Negapatam, adds to its importance as a sea coast sanitarium.
XIII. Beitkul Bay, or Sedashaghur.	206. On the western coast, about 48 hours steam from Bombay, between Mangalore and Goa, a spur of the range of Ghauts, in North Canara, averaging a hundred feet in elevation, runs into the sea for upwards of a mile, and, with islets contiguous, forms a noble nearly land-locked bay. The circumference of this bay cannot be less than 10 miles; it has seldom a ripple on the surface, and there is deep water close to the land. A detachment of native troops are located here, and the intelligent medical subordinate in charge informed me that the salubrity of the position is past question, and that during his residence there for six years not one case of cholera occurred, although the disease frequently raged all around. I think the place admirably suited for a sea-coast sanitarium at all seasons, except during the prevalence of the south-west monsoon, more especially for invalids from Bombay.
XIV. Résumé.	207. I have now completed the subject of sanitaria, and I hope I have not been altogether unsuccessful in showing— 1st. That frequent change of air is perhaps the most efficient mode of preserving a high standard of health in India. 2nd. That by the location of a portion of our European troops occasionally on hill plateaus, not only would they be available on emergencies, but their health and efficiency would also be secured. 3rd. That political, financial, hygienic, and, I would add, compassionate considerations demand that our British soldiers should occupy stations favourable to European life; and doubtless the most innocuous known positions are the summits of our mountains. 4th. That every military station of importance in the southern peninsula, except Secunderabad, has in its vicinity healthy hill ranges adapted for the residence of Europeans, and that our military positions would in no degree suffer by quartering portions of our regiments upon them. On the contrary, in a strictly military point of view, the possession of high ground is advantageous, especially if military works are in contemplation. 208. It will of course be necessary that careful examination of the proposed new stations be made, to ascertain that they fulfil the conditions necessary. All I would urge is, that hill ranges do exist in the neighbourhood of the most important military stations; and it is therefore well worth inquiry whether such might not be rendered available as proposed, whereby the present high rate of mortality and invaliding might be reduced. 209. Finally, as regards the disposition of our sanitaria, I have attempted to show— 1st. That the upper ranges of the Shevaroy Hills are available for the freshly-imported recruit, for time-expired men and invalids preparatory to embarkation, and for the introduction of a healthy interchange of a portion of the European force stationed at the Presidency. 2nd. That the Pulney Hills are available for the introduction of a system of interchange for the European force stationed at the head-quarters of the southern division of the army. 3rd. That Wellington, on the Neilgherry Hills, is available for putting into execution the like desirable measure for the force at Bangalore and Cannanore. 4th. Kotagherry, on the same mountain plateau, can be turned to good account for invalids from Bombay and from Lower Bengal. 5th. That Ramandroog, near the head-quarters of the Ceded Districts, although of moderate elevation, has acknowledged superior advantages in itself, which ought to influence us in prosecuting our inquiries into similar elevated ranges, and induce us to extend the beneficial influence of its climate more generally than we now do. 6th. That invalids from Secunderabad can be sent to Ramandroog, should no other mountain be discovered more contiguous to the station. 7th. That Chindwarra and Muthoor are available for the convalescents from Kamptee and other stations in Central India; and 8th. That sea-coast sanitaria are available on the north at Waltair, on the east at Point Calimere, and on the west at Sedashagurh, for invalids from the three Presidencies.
	DISEASES, &c.
I. Venereal Disease.	Destructive effect of venereal disease on the health of the soldier, and the loss of efficiency resulting therefrom:—
	210. This difficult question is now attracting the attention of reflecting men at home, both in its physical and moral bearings, and it becomes us to look at it in the face here, in relation to the health and efficiency of the army generally.
	211. From the army statistical reports presented to Parliament two years ago by Her Majesty's Commissioners, we gather that the admissions into hospital from venereal diseases amount to 206 in every 1,000 cavalry, and 277 in every 1,000 infantry of the line; that on an average 688 men out of the home force are always in hospital from this cause alone, and that the money loss to the State from this cause is calculated at nearly 14,500*l.* per annum. This is only a part of the enormous evil, for a large proportion of the sufferers have their constitutions permanently impaired. Other diseases are induced or aggravated by the venereal poison, and the mortality and invaliding are largely affected by it.
	212. If we turn to India we find the case no better. At all stations of the army where European troops form part of the garrison an organized system of prostitution is in force. A more respectable class, under the control of a procuress, and a low debased class who acknowledge the control of a male pimp. Soldiers usually visit these women between 2 o'clock p.m. and evening roll-call. They often take a fancy to one particular woman, and by previous arrangement visit her. Some females informed me that between 2 and 8 p.m. they have frequently been visited by 10 and 12 soldiers, and that, too, after they had contracted disease. In course of my inspection cases have come to my notice where

STATIONS.	REPLIES.
I. Venereal Disease—*cont.*	soldiers had intercourse with females under treatment, regardless of consequences which they knew must result. A certain number of the debased class attend on guards, and prowl about the barracks when night comes on; and when a regiment proceeds on the march some of them accompany it, encouraged to do so by the soldiers clubbing together for this purpose.
	213. It was necessary to enter thus much into detail in order to show how the thoughtless soldiers seek to gratify the strongest of their appetites, reckless of the consequences to themselves and to the State. At Cannanore, and along the western coast generally, I found venereal disease in its worst form, and it was a common occurrence to find the primary and secondary forms of the malady occurring simultaneously. It is partly from this deplorable state of matters that cutaneous affections in their most hideous forms are so common here, on the Malabar coast.
	214. H.M. 66th Regiment, garrisoning this station, had 25 per cent. of the strength under treatment for the well-marked Hunterian chancre with indurated base, or that form which, according to our best authors, is essentially the infecting chancre which generates constitutional syphilis. At Trichinopoly the baneful effects of this disease were more evident in the 2d European Light Infantry, its constitutional as well as its primary effects were in active operation. Within 10 months after the arrival of the 1st King's Own Dragoons at Bangalore, there were 170 admissions from syphilis, out of a strength of 520, and in the same period and at the same place I found that the enormous number of 394 had been admitted into hospital with this loathsome disease, out of an average strength of 745, in the 60th Rifles.
	215. But I need not multiply instances. The returns in the body of this report show the extent of the disease. At all our stations, civil as well as military, in the progress of my inquiries, I found that syphilis was the curse of the place. I have witnessed it in the child of five years of age and in the old hag of 60. I have traced the history of many who imbibed the disease early in their career, and have arrived at the conclusion that five years was a liberal average within which one-third become broken down and unfit for active service. At Poonamallee, the depôt for Her Majesty's regiments at this Presidency, an opportunity was afforded of seeing syphilis as a cause of invaliding and premature inefficiency in full operation. The great majority of invalids had their constitutions more or less impaired by the destructive poison—a poison, too, which passes down to their posterity, which they imbibe in the public service.
	216. We have now to consider the best means of meeting this indisputable evil. We cannot, perhaps, indulge the hope that this terrible disease can be entirely banished from the army, but it is our duty to devise some plan to reduce it to its minimum. The marginal note at paragraph 28 of this report, will show that, through the interference of his Excellency the Commander-in-Chief, active measures towards the introduction of a reform in this matter have already been instituted. But more than this is required. To a large body of our soldiers marriage is forbidden. In time of peace the *ennui* of a soldier's life is great everywhere, but in this country, shut up the greater part of the day, as he has nothing to occupy his mind, he seeks for excitement in every den of vice and debauchery to which he can obtain access.
	217. I am of opinion that the system of moral and religious instruction which has of late years been introduced into this country through the educational department, should be extended so as to embrace our European military schools; that healthful and improving employment and recreation, and every possible means, consistent with discipline, should be used to raise the tone of the soldier's mind, and to wean him from habits as destructive to himself as they are hurtful and costly to the state he serves.
	218. But I am not so utopian as to believe that we can gain our end entirely, or even mainly, by such means. We must have recourse to other measures. We must have the aid of the magistrate to help us in controlling this "social evil;" and here we are sure to be met with many objections. Interference of this sort is not congenial to British habits, customs, and tastes; it is "inquisitorial and unconstitutional;" it is "contrary to the liberty of the subject." The fastidiousness of our countrymen in matters of this sort is notorious. It has long stood and still stands to some extent in the way of many sanitary and social reforms; but, apart from other considerations, the time has now arrived when the Government must act regardless of such feelings, if they really desire to secure to the State the full measure of service from those alone on whom we rely for support.
	219. The best mode of dealing with this, the police part of the question, has occupied my most earnest attention. I have put myself in direct communication with several civil magistrates of experience and ability; and my mind is now fully assured that before one step is taken in this direction, a legislative enactment is required, to have general powers conferred on the local Government to pass rules for the "better prevention of the spread of venereal disease in large towns and in military cantonments." This is a better title than "An Act for the better control of prostitution." The law should, in the first instance, be put into force in all military cantonments and sea-port towns, and penalties should be enacted in all cases of its infraction.
	220. For the administration of the law, appoint the commandant or the magistrate of the district, the police officer, the surgeon, and the chief native official at the station as Commissioners; then license and register every brothel and prostitute, and have them open to constant inspection. Respectable nurses, and native dressers, and some well selected peons would do the work of inspection at the brothels; and the surgeon in charge of the lock hospital would receive and arrange the sick in the building with a view to their comfort as well as to their respectability. With good management the utmost success might prevail. The women will thus become in a great measure their own police and spies, and their own sanitary commissioners. I would earnestly press the serious consideration of this subject on the Royal Commissions, for the evil is a shocking one, and it is increasing on our hands.
II. INTEMPERANCE.	221. While I believe that the consumption of spirits by the soldier is a fertile source of disease, I am also of opinion that a moderate use of malt liquor or wine is favourable to his health. I would withdraw the spirit ration altogether, remove spirits from the canteen, and restrict the sale of it in the bazaars to soldiers, and substitute in its stead good malt, light wines, tea and coffee.

Stations.	Replies.
III. Health of the Troops.*	222. A gravelly surface and sandy subsoil, or a sandy surface and gravelly subsoil is that best adapted for barracks. A rocky substratum is also good; but a substratum of compact clay retains moisture, is damp and cold, and should be avoided. (Query 18.) 223. Sixteen years is a good age for recruits to enlist in England, to come to India about 17 years. He should land between the middle of August and middle of March. I would certainly recommend his being sent immediately, by rail or other conveyance, to the hills for two years or upwards. He should take with him tweed or other clothing from England for this purpose. There he must be marched about, drilled, made to garden, work at trades, &c.; in short, taught to be industrious, before he be sent out to mix with the idle old soldier. There will then be no need of intermediate depôts. The soldier would thus be gradually accustomed to the climate, and he would not be exposed to the many dangers which beset his path in the early years of his service. (Queries 19 to 20.) 224. If the course I have urged under the head of hill ranges be put in force, I see no reason why a soldier may not be able to continue the full term of service for which he has enlisted in India, without subjecting the state to any additional cost. I think it should be so arranged that invalids should reach England about the middle of spring. The foregoing remarks are equally applicable to all young officers, as well as soldiers, arriving in India. The plan now adopted of transporting men, by bullock transit, from one station to another has greatly diminished mortality. In none of the moves conducted in this way has cholera appeared; formerly, no march was made without it. The effect of exposure and fatigue on young recruits was well exemplified in the large mortality and prostration during the march of the 4th King's Own from Ahmedabad in June last year. (Queries 21 to 23.)
IV. Causes of Disease.	225. It is universally allowed to be a matter beyond further question that visitations of the entire class of zymotic diseases, as typhus, scarlet fever, dysentery, diarrhœa, and cholera, are governed by the same laws. The predisposing causes may be denominated, 1st. Remote. Produced by a disturbance of the electric and magnetic forces of the atmosphere, rendering the animal frame prone to imbibe disease. And, 2nd. Proximate, as the respiration of a vitiated or poisoned atmosphere, noxious effects of bad water and food, excesses either in eating or drinking, &c. The two former being produced by, *a.* Overcrowding or lodging an absolute number of individuals in a given space, without the means of renewing the air. *b.* Privies, cesspools, graveyards, &c., and the noxious influence of putrid animal effluvia, whether these proceed from foul drains and sewers, from slaughter-houses, or animal dung heaps. *c.* Water polluted by percolation into wells of the contents of cesspools, graveyards, drains, &c., contaminated by deleterious gases, and decomposed by organic and other noxious matter, or the original impurity of the supply. *d.* Defective supply of pure water, which is essential to personal cleanliness, and as an article of food. As water forms nine-tenths of the weight of the body, it penetrates into the substance of every organ, and it must be the medium for all the changes effected in the frame. *e.* The use as food of diseased or improperly fed animals. The regulation which provides for an inspection of the soldier's animal food before issue to the men should be extended to an examination of the animal before it is slaughtered.
V. Cholera.	226. There are many circumstances connected with outbursts of this pestilence which are apparent, and others which are, as yet, inexplicable to us. The following, amongst others, have come before me in the course of my inspection tour:— 1st. In the Salem district six miles from Trippatoor, about 100 men, of a nomad tribe, were employed in making a cutting on the line of the railway through disintegrated granite, some 20 feet in depth; suddenly springs of clear and tasteless water were exposed, and almost simultaneously with this, a virulent outbreak of cholera appeared, which carried off 15 of them in 48 hours. The band immediately thereafter dispersed; and although others sunk from the effect of the disease, evidently imbibed on the spot, no fresh seizure took place; nor did the disease spread among the many other hundred workmen who were employed at no great distance. 2nd. A detachment of Her Majesty's 74th Highlanders, when en route from Sholapore to Bellary, in the month of January, at the time in perfect health, marched past (100 yards distant) a camp of native soldiers, who were suffering at the time from cholera; three days afterwards the disease appeared in the detachment and carried off seven men. 3rd. The magistrate of the district of Malabar having reported to Government, that within a limited range of his district 1,539 deaths had taken place out of 1,796 seizures from cholera, I was directed to inquire and report thereon. In passing through the district I satisfied myself that the report by the magistrate was correct; and that on the disease passing away a malignant small-pox epidemic took its place. There was no difficulty here in tracing a cause. It was evident to the eye and to the nose in every town and hamlet I passed through. A baneful practice of intermural burials has been carried on, until the dust of generations has reached the doors of dwelling-houses, and accumulated high above the ground floors of the houses. The corpses are merely sprinkled over with earth; a mat is placed over the face, one end being left above ground for some days to admit of the escape of the gases. In the midst of the necropolis are wells from which the inhabitants receive their water supply. On an average 10 feet of rain falls on this coast per annum. Under these circumstances can we wonder at these outbursts of epidemics, that foul ulcers, inveterate cutaneous diseases, intestinal worms, &c., &c., are always present amongst the inhabitants? 227. In whatever mode malignant cholera passes into the frame, a poisoning of the blood immediately takes place. The profuse discharges from the stomach and bowels I view as the *vis medicatrix naturæ;* death in such cases seldom occurring under 18 to 24 hours. But where the productive causes operate with intense force, as it did in Malabar, we have the cholera *sicca*, where the secretions are arrested and the individual is struck down as if shot dead.

* I have already entered at length into the subjects referred to from query 1 to 17 of this head.

STATIONS.	REPLIES.
VI. STATE OF BARRACKS.	What means can we adopt to render the climate of the plains as little injurious as possible to those whom necessity compels us to keep there?
	228. Every young engineer officer should attend a course of hygiène at the new Military Medical College, Chatham, before he joins his corps. As a rule in the construction of barracks, &c., I am constrained to say that, so far as my experience goes, sanitary considerations are about the last subject that receive their attention.
	229. Before the foundations of a proposed range of buildings are dug, a ground plan for deep and surface drainage should be prepared, and the barracks erected accordingly. The next step should be to provide latrines for the workmen, pits with cross boards and temporary roofs; lime or charcoal, with earth to be thrown into these once or twice a week; and fresh pits to be opened so soon as the accumulations below have risen to three feet from the cross planks. My observations at paragraph 172, exemplifies the evil results occurring on the accumulation of vegetation and surface filth during the erection of great public buildings.
	230. Ranges of barracks should always be built *en echelon*, and furnished with open verandahs on both sides, the upper portions of which should have fixed open venetians or jalousies. The floor of the barrack should always be raised 18 to 24 inches, or, what is still better, on low arches. The cubical space considered requisite for each man is 1,000 feet; but it of course makes all the difference whether this space is arranged perpendicularly or laterally. The present style of barrack building is to make the rooms exceedingly lofty, as at Bangalore, where really the climate is excellent. The consequence is that the lateral dimensions are comparatively contracted, and the men's beds will be in close proximity to each other. This injudicious arrangement is a pity, because expense is incurred without a corresponding benefit. Again, the wings to the barracks, which open into the rooms, and are, in fact, like the aisles of a church, are fitted up for the reception of saddlery and horse equipments, a bad arrangement for India.
	 231. The walls and ceilings of barracks should be thoroughly cleansed every quarter, and whitewashed every half year. Lavatories, kitchens, latrines, and urinals should undergo the process of cleaning every month, and whitewashing every quarter. All solid and liquid refuse of barracks should be removed in carts to a distance. This is the only true way of retaining the position sweet. These apartments should be provided with ingress for air below, and free roof ventilation. Cooking places should be constructed of one long furnace, with chimney at the end, as in the sketch, by which fuel is economized and dirt and smoke prevented. Kitchen ranges after this plan, introduced by Surgeon Duff, of this army, are now coming into general use in private dwelling houses. They should be introduced in all barracks and hospitals.
	232. Military bazaars require as much, or even more, care in their construction and subsequent conservancy as military barracks. Once formed, they grow in size rapidly. Too often the nidus of disease lurks here, to be called forth on any exciting cause. Drainage should be well considered, houses should be constructed on a distinct plan, and made uniform, as well as can be, with streets, so formed as to admit of free ventilation.
	233. The question of the best positions for European soldiers in India is one of vital importance, and can only be satisfactorily decided by minute examination, by competent parties, of the various localities, and by earnest endeavours to reconcile military and sanitary considerations.
VII. HOSPITALS.	234. In addition to the observations made under the last head, which are all applicable to the subject of this, I may state that the lavatory, urinal, and privy arrangements in our hospitals generally are very defective. The high prison-like wall which we usually find surrounding our hospitals as well as our barracks, should in all instances be removed and give place to a dwarf wall, surmounted by a rail. A day room should be attached to every hospital, provided with chess and draught boards, &c., light reading, tables and couches, to which the convalescent could proceed during the day, instead of passing his whole 24 hours, as he now does, in his bed. This room would also serve as a refectory, or convalescents might have their meals in the verandah. Anything is preferable to the present system of taking his food on his knee, seated on his bed, possibly with dying men around him. An ambulance to enable convalescents to get morning and evening exercise by taking them to the country, where they could get out and walk, ought to be attached to each hospital.
Beds and Bedding.	235. The sooner wooden beds are banished from our hospitals the better. They are objectionable in every way; clumsy, difficult to keep clean, and, worse than all, they harbour vermin. The last is a very serious evil, for it adds to the sufferings of a sick man. I know no sight more piteous than that of a patient suffering under a fractured limb disturbed, fevered, and tormented during a long night by voracious insects crawling about the injured extremity. Every wooden cot should be destroyed, and light iron frames substituted.* There is also great room for improvement in the bedding. The quilts afford a most imperfect protection to the sick soldier from the damp and cold, particularly during the rains and in damp climates. The quilts are not quilted at all; they consist of little more than a piece of blue and white cloth, stitched together. In many hospitals this is all he has below him, with a similar covering for his person. A good mattrass, a blanket, sheets, and pillow slips should be provided for every bed in hospital.
Utensils.	236. The present night chairs are open to great objections. In a large military hospital, during an epidemic of dysentery, it is the present practice to keep in an open verandah, or at the bed-side of the patient, the secretions from the bowels of patients labour-

* I have striven for upwards of four years to obtain iron beds of an improved pattern for the European troops in this Presidency, but with very limited success.—P. G.

STATIONS.	REPLIES.
VII. Hospitals—*cont.*	ing under this disease for the inspection of the medical attendant. The objectionable construction of the night chair permits the fetor to escape, so a privy atmosphere of the most pestilential kind pervades the whole place. I have long been assured that evil consequences follow on this practice. I have seen fever patients and others exposed to these emanations, smitten with the prevailing epidemic in its most putrid form; and my opinion has been strengthened by the researches into this question of the late Dr. Budd, who has shown how diseases are propagated in this way. It would be easy to correct the evil, either by receiving the evacuations in a vessel containing a saturated solution of some of the chlorides, by having a room to place them in, or by substituting for the present a more appropriate air-tight vessel.
VIII. INSTRUCTION AND RECREATION.	237. Throughout this report, when an opportunity presented, I have urged the introduction into all our regiments of a system not only of instruction and recreation, but also of trades. To the soldier in times of peace "idleness is certainly the bane of all evil." In the useful arts there is not a regiment which could not furnish tinmen, watch-makers, bookbinders, printers, gun-makers, saddlers, tailors, shoemakers, and various other trades. They could manufacture their own accoutrements, as well as supply the public with many useful articles, and, as gardeners, their own mess, at any rate, would be secured with a sufficient supply of the articles of diet, which they so much stand in need of at every station. The establishment of Government workshops in this manner would be a vast saving to the State. I would also make the soldiers' wives industrious by encouraging them to employ their time as dress-makers, in needle and fancy work, by appointing periods for the sale of these articles, and giving prizes to the most deserving. The arrangements to be under the superintendence of a committee of ladies and gentlemen at the station. 238. In the hot season, one hour's drill in the morning, and occasionally in the evening, for a like period, ought to be sufficient; and at this period marching parades are, perhaps, the least harassing. The usual means of recreation, such as cricket, skittle and ball grounds, gymnasia, theatres, &c., should be encouraged. The institution of savings' banks would be advantageous, and in the neighbourhood of the men's barracks there should be sufficient shade from trees to enable soldiers to take exercise, without injury to health, during the day.
IX. AMBULANCE.	239. Our present arrangements for the conveyance of hospital equipments and for the transport of troops, in health and sickness, are very faulty. The subject has engaged much of my attention lately, and I have submitted elaborate reports to Government urging the introduction of an entirely new system, which, it is acknowledged by the authorities, would combine efficiency and much economy. I refer the Royal Commissioners to the published printed proceedings of Government, noted in the margin. Wherein will be found in detail the old arrangements, as also those recommended to be adopted by me in this presidency, for field hospitals, ambulances, transport of sick, and hospital supplies. No. 4,450, dated 8th December 1857. No. 992, „ 18th March 1858. No. 3,921, „ 14th September 1858. No. 2,221, „ 15th June 1860.
X. BURIAL OF THE DEAD.	240. The graveyards in many of our military cantonments are not sufficiently removed from the abodes of the living. At Secunderabad two large graveyards adjoin the European barracks; and there is another in the centre of the cantonment. At the convalescent depôt of Ramandroog the graveyard is placed on the summit of the plateau, about 150 yards from the married men's quarters. The surface is so hard that blasting with powder is necessary before sufficient depth can be secured. The position is highly objectionable. An excellent spot is available down the slope of the hill, to which it ought to be removed. I would recommend that no native burning or burial ground should approach nearer than three miles of a military cantonment; and what is equally, if not more, necessary, that public latrines should be erected contiguous to all native towns and bazaars. At present many of the native burial-grounds border on our cantonments, whose outskirts are also too often promiscuously defiled with human ordure and other offal, which is not only a perfect nuisance, but highly objectionable, as regards the salubrity of our stations.
XI. RETURNS AND REPORTS.	241. The voluminous returns demanded from all hospital establishments, and the amount of scriptory labour in preparing these, demands reform. A regimental surgeon is obliged to make out five occasional, three daily, three weekly, thirty monthly, one quarterly, two half-yearly, and thirty-five annual returns; and the civil surgeon has others besides; copies of all having to be kept for record in hospital. It would materially facilitate public duty were one class of returns made applicable for the army at home and in India; and if blank printed forms of these were issued to medical officers, corresponding forms being bound up into volumes, to be filled up when copies are to be retained. So far as I am aware, none of our returns exhibit the sickness and mortality of soldiers' wives and children, nor are there mortuary tables of the civil population generally.
XII. DUTIES OF MEDICAL OFFICERS.	242. In no army in the world are young men entrusted with responsibility at so early a period in their career as in this. It follows, therefore, that nowhere ought more vigilance to be exercised than in the selection of those whose duty it is to support and direct them in the discharge of their difficult duties. Their moral as well as their professional qualifications should not be open to question. 243. Every one of us must remember the anxieties we experienced in the early days of our career, when we suddenly found ourselves in the sole charge of a large body of officers and men, whose lives were, without appeal, in our hands, and, if we speak the truth, most of us must confess that we have purchased our experience dearly. 244. I am deeply impressed with the conviction that the principle of selection for the administrative offices in the service should be very rigidly enforced; and I am strongly of opinion that the duty of aiding our young medical officers, by placing over them men capable of guiding and advising them, has been too much neglected. What we require is, a man to whom the young physician can look up, not merely as an official superior, but an experienced counsellor to whom he can resort with confidence in the hour of difficulty. 245. The importance of judicious inspections cannot be overrated. With the area of this vast presidency to inspect, including the Pegue division and our stations in the Straits of Malacca, it will hardly be possible for the Inspector-General of this army to re-visit a station sooner than every third year. I am now completing the third year of my office, during which

STATIONS.	REPLIES.
XII. Duties of Medical Officers —*cont.*	period I have travelled, without ceasing, by land, upwards of 9,000 miles, at the average rate of three miles an hour, and have visited the Straits, but the Pegue division has yet to be inspected. Deputy inspectors of divisions should pay as much attention to detached stations and sanitaria as to the cantonments under their immediate observation, by journeys over the circle of their superintendence at different seasons of the year. It would advance the interest of the service were their appointments made to terminate in five years after election.

CONCLUSION.

246. Having concluded my remarks on the more important subjects referred to in the foregoing list of queries, it only now remains for me to beg the indulgence of the Royal Commissioners for the prolixity of my observations, rendered to some extent necessary by the vast range of topics it was necessary for me to enter upon. I am very sure that the records of this army contain, although, perhaps, in a fragmentary state, all that I have endeavoured to bring into one view; but the observations even of the most experienced professional men in all that relates to the sanitary condition of the army, have not always met with that regard which was due to them, or they have been attended to only when the pressure of some epidemic created a panic.

247. Even in England, the last place where sanitary considerations obtained a hearing was in those influential quarters where rests the highest military authority. The terrible ordeal of the Crimea came and laid bare to the world the defects of our system. At first the whole current of the public indignation was directed against the medical department, but the report of the Royal Commission appeared, and its terrible disclosures shocked the moral sense of the whole nation. They were aware of the wasteful expenditure of life in the Crimean war, but they were unprepared to find that in England, the healthiest country in the world, the occupation of a soldier in times of the profoundest peace stood at the bottom of the list of unhealthy occupations. Her Majesty's Commissioners therein further observed, that the blame did not rest with the medical department, whose officers had never ceased to protest against a system that brought discredit on themselves, enormous losses to the State, and death to its most faithful guardians.

248. I respectfully submit, that it is for us to profit by this great example, and to hasten to amend what is faulty in our system here. By giving a better direction to prevent expenditure, half the evils pointed out may be remedied. If it is anywhere proved that a system now in operation tends to the destruction of health, it then becomes incumbent on those who support it to demonstrate that considerations of the most urgent state necessity demand its continuance. But even then, how much can be done to mitigate the unavoidable evil! For example, what strong military considerations exist for quartering the depôts for European soldiers at the hottest stations within the limits of the Presidency, and one that is most frequently visited by terrible epidemics of cholera? In a word, I solicit attention to what I have advanced with a view to earnest endeavours to prevent disease, to remove its remediable causes, and thus directly to promote the moral and physical well-being of those who have such high claims on the State they serve; and I am well assured that in the end the State will reap a rich reward in the increased health, happiness, and efficiency which will result from such well-directed efforts.

Inspector-General o Hospitals Office,
Madras, 27th December 1860.

DUNCAN MACPHERSON, M.D.,
Inspector-General of Hospitals,
Her Majesty's Madras Army.

N.B.—If deemed necessary, I can hereafter transmit a supplementary report on the Pegue division and the Straits of Malacca.

APPENDIX A.

INDEX to the REPLY by INSPECTOR-GENERAL Dr. D. MACPHERSON, and TABLE exhibiting the SICKNESS and MORTALITY of the CIVIL and MILITARY ESTABLISHMENTS in the MADRAS PRESIDENCY during TWELVE MONTHS prior to the date of his INSPECTION of the several STATIONS.

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases. Fever. Admitted.	Fever. Died.	Lungs. Admitted.	Lungs. Died.	Liver. Admitted.	Liver. Died.	Stomach and Bowels. Admitted.	Stomach and Bowels. Died.	Brain. Admitted.	Brain. Died.	Rheumatism. Admitted.	Rheumatism. Died.	Venereal. Admitted.	Venereal. Died.	Cholera. Admitted.	Cholera. Died.	Other Diseases. Admitted.	Other Diseases. Died.	Total. Admitted.	Total. Died.	Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
1	CHINGLEPUT	Jail Hospital	258	84	—	2	—	—	—	29	—	6	—	7	—	3	—	4	1	118	1	253	2	2¾	0·77	0·79
		Civil Dispensary	—	127	—	52	—	1	—	3,907	2	130	—	532	—	125	1	9	5	4,012	6	8,895	14	24	—	0·16
3	CUDDALORE	European Garrison	81	1	—	3	—	11	1	11	3	4	—	5	1	10	—	1	1	63	—	109	6	9¼	7·40	5·50
		Native Garrison	267	17	2	9	1	1	—	6	1	—	—	24	—	—	—	5	3	33	3	95	10	8¾	3·74	10·52
		Civil Hospital and Dispensary	—	1,417	1	220	—	26	—	9,107	—	200	—	709	—	734	—	82	23	4,388	11	16,873	36	102½	—	0·21
6	TRICHINOPOLY	European Garrison	781	286	1	82	—	45	2	307	2	83	2	60	—	328	—	12	3	475	2	1,678	12	82	1·53	0·71
		Native Garrison	2,079	551	1	36	2	9	—	163	4	20	1	186	—	64	—	28	11	832	6	1,889	25	58	1·20	1·32
15	TANJORE	European Garrison	58	9	—	3	—	1	—	7	1	3	—	1	—	7	—	—	—	19	—	50	1	3	1·72	2·
		Native Garrison	230	46	—	4	—	—	—	3	—	3	—	18	—	2	—	2	1	30	2	108	3	3¾	1·30	2·77
		" "	148	13	—	2	—	—	—	8	—	—	—	16	—	2	—	1	1	39	—	81	1	4	0·67	1·23
16	COMBOCONUM	Jail Hospital	174	154	1	3	—	—	—	271	16	3	1	29	—	6	—	4	2	155	5	625	25	10	14·36	4·0
		Civil Hospital and Dispensary	—	209	—	108	1	9	—	1,324	3	96	—	348	—	249	1	29	—	2,244	7	4,616	12	80	—	0·25
17	NEGAPATAM	Native Garrison	188	28	—	1	—	—	—	7	—	—	—	6	—	2	—	—	—	11	—	65	—	4	—	—
		Jail Hospital	54	64	—	7	1	—	—	45	4	—	—	4	—	—	—	1	—	48	6	169	11	6	20·37	6·50
18	TRANQUBAR	Native Garrison	180	16	—	—	—	—	—	18	—	—	—	7	—	2	—	1	—	32	—	76	—	2	—	—
		Jail Hospital	31	3	—	2	—	—	—	22	1	—	—	5	1	—	—	1	—	16	2	49	4	¾	12·90	8·16
19	MADURA	" "	219	86	2	2	—	—	—	85	8	5	2	14	—	2	—	24	13	196	7	414	32	1¼	14·61	7·72
		Civil Hospital and Dispensary	—	37	1	11	2	—	—	48	1	23	1	68	1	68	1	—	—	249	17	504	24	1	—	4·76
20	TINNEVELLY and PALAMCOTTAH.	Native Garrison	768	116	3	13	1	1	—	56	2	6	1	67	2	19	1	2	—	215	2	495	12	18	1·56	2·42
		Jail Hospital	281	77	—	1	1	—	—	61	9	2	—	3	—	1	—	2	2	52	2	199	14	17	6·06	7·03
		Civil Hospital and Dispensary	—	5	1	6	—	1	1	34	6	3	—	12	—	41	—	1	1	115	8	218	17	25	—	7·79
21	QUILON	Native Garrison	785	116	1	27	—	3	1	34	—	4	—	113	1	11	—	1	—	403	—	712	3	38	0·38	0·42
22	COCHIN	" "	258	61	—	6	—	1	1	26	—	3	—	40	—	9	—	1	—	122	—	269	1	5	0·38	0·37
23	CALICUT	European Garrison	105	—	—	2	—	—	—	2	—	—	—	2	—	4	—	—	—	5	—	15	—	3	—	—
		Native Garrison	208	9	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	20	—	31	—	2	—	—
24	MULLIAPOORUM	European Garrison	145	4	—	3	1	1	—	29	2	—	—	1	—	6	—	—	—	9	—	53	3	2½	2·06	5·66
25	TELLICHERRY	Native Garrison	85	8	1	5	—	—	—	7	—	—	—	11	—	—	—	—	—	18	1	49	2	2	2·35	4·08
		Jail Hospital	157	59	1	4	1	—	—	29	3	2	—	7	—	7	—	—	—	85	8	193	13	3	8·28	6·73
		Civil Hospital and Dispensary	—	201	—	38	—	1	—	350	—	31	1	40	—	21	—	—	—	232	6	914	7	18	—	0·76
26	CANNANORE	European Garrison	601	9	—	17	1	—	—	60	—	1	—	17	—	40	—	—	—	128	—	273	1	5	0·16	0·37
		Native Garrison	1,860	726	2	47	4	4	1	91	6	7	1	179	—	44	—	—	—	379	6	970	22	7¾	1·18	2·26
		" "	114	54	—	2	1	—	—	23	—	1	—	11	—	10	—	3	—	72	—	176	1	5½	0·87	0·56
30	COIMBATORE	Jail Hospital	418	53	3	5	2	—	—	79	11	4	1	8	—	6	—	7	5	95	5	257	27	9¾	6·45	10·50
		Civil Hospital and Dispensary	—	841	3	90	3	2	1	1,281	9	100	—	291	—	94	—	70	30	3,077	19	5,846	65	103	—	1·11

Appendix A.—Index to the Reply by Inspector-General Dr. D. Macpherson, and Table exhibiting the Sickness and Mortality of the Civil and Military Establishments in the Madras Presidency—*cont.*

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases. Fever. Admitted.	Fever. Died.	Lungs. Admitted.	Lungs. Died.	Liver. Admitted.	Liver. Died.	Stomach and Bowels. Admitted.	Stomach and Bowels. Died.	Brain. Admitted.	Brain. Died.	Rheumatism. Admitted.	Rheumatism. Died.	Venereal. Admitted.	Venereal. Died.	Cholera. Admitted.	Cholera. Died.	Other Diseases. Admitted.	Other Diseases. Died.	Total. Admitted.	Total. Died.	Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
31	Salem	Native Garrison	259	12	2	3	—	—	—	5	2	3	2	9	1	1	—	1	1	15	1	49	9	6	3·47	18·3
		Jail Hospital	223	61	3	6	—	—	—	57	15	3	—	9	—	9	—	87	47	176	14	408	79	16	35·87	19·36
		Civil Hospital and Dispensary	—	335	2	59	—	2	—	460	13	36	—	164	—	126	—	95	30	1,523	10	2,800	55	43	—	1·96
32	Vellore	European Garrison	248	9	1	5	3	—	—	13	2	8	1	16	1	5	—	10	—	32	2	98	10	14½	5·86	10·20
		Native Garrison	1,277	306	1	13	—	—	—	84	3	3	1	133	—	38	—	44	24	346	2	967	32	52½	2·40	3·30
		Civil Hospital and Dispensary	—	474	—	89	1	2	—	1,561	5	115	1	338	3	452	—	20	8	2,170	12	5,281	30	9	—	0·48
33	Chittoor	Native Garrison	219	20	1	12	2	—	—	11	1	2	1	19	—	3	—	5	—	30	—	102	5	6	2·28	4·90
		Jail Hospital	363	41	1	9	1	1	—	20	2	4	1	9	1	9	—	14	9	125	4	232	19	6½	5·23	8·18
		Civil Hospital and Dispensary	—	1,160	1	165	2	1	—	3,327	1	358	—	407	—	116	—	32	8	2,162	9	7,819	21	72	—	0·48
34	Arcot	European Garrison	318	7	—	12	1	4	—	28	1	2	—	2	—	31	—	—	—	21	—	107	2	4	0·62	1·66
		Native Garrison	1,233	92	1	15	1	—	—	29	1	2	—	29	—	12	—	8	5	156	3	343	11	16½	0·89	3·20
37	Poonamallee	European Garrison	106	11	—	17	1	24	1	33	1	7	—	11	—	26	—	—	—	55	1	184	4	10	3·77	2·6
40	Palaveram	Native Garrison	663	313	15	66	2	—	—	201	23	23	—	233	5	39	—	—	—	574	16	1,449	61	153	9·20	4·2
41	Saint Thomas's Mount.	European Garrison	315	226	3	40	3	12	—	120	2	39	1	36	2	68	—	5	1	230	—	776	12	59	3·80	1·6
		Native Garrison	534	79	—	21	2	1	—	75	5	14	—	35	—	36	—	7	4	173	4	441	15	23	2·80	3·40
42	Madras	European Garrison	1,096	763	7	187	10	74	4	432	19	59	3	85	1	460	—	15	9	855	26	2,885	79	134½	7·20	2·73
		Native Garrison	4,132	535	8	102	6	14	1	204	15	50	3	267	1	214	1	13	10	1,529	11	3,166	54	108¼	1·30	1·70
		Jail Hospitals	266	61	—	8	—	1	—	83	4	8	—	22	—	51	2	39	19	94	4	367	29	15¾	10·90	7·90
		Civil Hospitals and Dispensaries	—	3,644	15	1,900	36	135	6	17,793	102	620	15	2,854	10	2,196	26	220	95	34,240	255	54,682	565	1,678¾	—	1·03
49	Bangalore	European Garrison	1,752	929	20	114	7	105	5	767	37	106	16	224	1	729	3	161	92	1,222	43	4,357	226	137	12·89	5·18
		Native Garrison	1,900	868	5	68	3	2	—	146	8	31	—	151	—	127	1	23	11	651	7	2,098	35	112¼	1·84	1·66
		Lock Hospital	—	—	—	—	—	—	—	—	—	—	—	—	—	97	—	—	—	—	—	97	—	15	—	—
61	Hoonsoor	Native Garrison and Public Cattle Depôt.	1,271	161	2	3	—	—	—	10	1	7	—	8	—	8	—	13	8	10	4	320	15	10½	1·17	4·68
62	Mercara	Native Garrison	687	223	5	15	1	—	—	103	4	4	—	63	—	16	—	14	4	250	4	688	18	23	2·62	1·81
64	Jaulnah	European Garrison	536	736	5	21	2	29	—	127	3	25	1	36	—	140	—	27	15	148	1	1,289	27	110¼	5·03	2·09
		Native Garrison	1,330	209	1	22	3	7	1	15	3	9	2	54	1	97	—	17	2	268	2	738	15	36¼	1·12	2·03
67	Nagpore	European Garrison	529	104	1	22	—	10	—	104	3	15	1	16	—	81	1	—	—	139	—	491	6	28	1·13	1·22
		Native Garrison	2,782	832	6	64	4	10	2	171	4	25	—	238	1	109	—	1	1	817	7	2,267	25	104	0·89	1·10
		Civil Hospital and Dispensary	—	278	—	37	2	3	—	461	11	11	1	94	2	104	1	1	—	486	15	1,474	32	73	—	2·17
77	Secunderabad	European Garrison	1,767	779	23	198	10	170	15	1,241	64	24	3	102	1	9	—	—	—	174	1	3,145	117	144	6·62	3·72
		Native Garrison	736	452	2	25	—	—	—	79	5	14	1	120	—	40	—	—	—	412	7	1,142	15	68	2·03	1·31
92	Masulipatam	" "	734	189	5	12	1	5	—	43	5	15	—	27	—	29	—	1	1	182	3	501	15	27¼	2·04	2·99
		Civil Hospital and Dispensary	—	530	—	104	—	6	1	1,019	1	47	1	270	—	96	1	109	19	1,150	4	3,331	27	46	—	0·81
93	Guntoor	Native Garrison	316	23	1	13	1	—	—	3	—	3	—	21	—	2	—	—	—	47	5	112	7	8	2·21	6·24
		Civil Hospital and Dispensary	—	517	3	113	1	—	—	940	1	58	1	414	—	68	2	—	—	1,445	4	3,555	13	56¾	—	0·36
94	Nellore	Native Garrison	332	23	—	1	1	—	—	8	3	2	1	15	1	—	—	1	—	28	4	78	10	6	3·01	12·87
		Jail Hospital	318	49	2	2	—	—	—	19	—	4	1	3	—	5	1	3	2	22	—	107	6	3½	1·88	5·91
		Civil Hospital and Dispensary	—	409	3	170	7	2	—	898	19	86	4	367	6	513	1	11	4	1,482	34	3,938	78	107½	—	1·99

Appendix A.—Index to the Reply by Inspector-General Dr. D. Macpherson, and Table exhibiting the Sickness and Mortality of the Civil and Military Establishments in the Madras Presidency—*cont.*

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases. Fever. Admitted.	Fever. Died.	Lungs. Admitted.	Lungs. Died.	Liver. Admitted.	Liver. Died.	Stomach and Bowels. Admitted.	Stomach and Bowels. Died.	Brain. Admitted.	Brain. Died.	Rheumatism. Admitted.	Rheumatism. Died.	Venereal. Admitted.	Venereal. Died.	Cholera. Admitted.	Cholera. Died.	Other Diseases. Admitted.	Other Diseases. Died.	Total. Admitted.	Total. Died.	Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
95	Bezwarrah	District Engineers Department	3,000	95	1	14	—	6	—	179	—	—	—	25	—	9	—	3	2	98	2	429	5	1⅓	0·16	1·16
96	Dowlaishweram	Native Garrison	591	209	2	17	1	2	1	24	1	3	—	95	2	83	—	—	—	484	5	920	14	22	2·36	1·52
97	Rajahmundry	Civil Hospital and Dispensary	—	401	1	112	3	6	—	924	4	99	2	276	2	345	—	1	—	1,506	19	3,670	31	171	—	0·75
98	Samulcottah	Native Garrison	1,150	307	1	35	—	2	—	61	1	12	1	129	4	80	1	—	—	436	—	1,062	8	49	0·006	0·007
99	Coconada	Civil Hospital and Dispensary	—	108	—	30	—	8	—	831	4	11	1	66	—	75	—	10	1	358	5	1,298	11	21¼	—	0·84
100	Vizagapatam	European Garrison	382	30	2	12	—	8	—	29	4	26	6	29	—	39	1	—	—	143	4	317	17	25¼	4·45	5·36
		Native Garrison	1,094	236	2	26	3	—	—	60	1	6	—	75	—	36	—	—	—	239	1	738	7	20½	0·63	0·94
		Jail Hospital	174	41	3	6	1	1	—	20	3	—	—	8	1	1	—	—	—	141	1	218	9	6	5·14	4·12
		Civil Hospital and Dispensary	—	1,017	—	209	1	4	1	2,311	1	94	2	406	—	178	1	—	—	2,016	10	6,235	13	64	—	0·20
101	Vizianagrum	Native Garrison	833	163	—	19	1	—	—	54	1	5	—	117	2	54	—	—	—	234	2	649	6	5	0·72	0·92
102	Chicacole	" "	1,598	300	2	11	1	1	—	33	—	12	—	26	—	25	—	—	—	341	4	949	7	14½	0·43	0·73
		Jail Hospital	162	8	—	1	—	—	—	7	4	1	—	—	—	2	—	—	—	12	2	31	6	4	3·70	19·3
		Civil Hospital and Dispensary	—	766	—	170	—	—	—	1,339	—	378	—	626	—	163	—	—	—	1,499	5	4,941	5	93½	—	1·10
103	Russelcondah	Native Garrison	1,088	422	2	6	—	1	—	50	1	9	—	55	—	33	—	—	—	207	—	833	3	10½	0·27	0·36
104	Cuttack	" "	928	471	6	48	—	3	—	56	2	18	1	119	—	48	—	—	—	316	—	1,073	9	32	0·96	0·83
105	Bellary	European Garrison	929	240	1	70	6	40	3	194	8	11	—	31	—	230	—	4	1	381	8	1,165	27	49	2·90	2·65
		Native Garrison	1,920	453	1	18	2	5	1	95	2	6	—	99	—	91	—	101	55	340	4	1,210	65	43¼	3·38	5·37
110	Kurnool	" "	1,080	318	2	33	1	2	—	74	—	3	—	76	2	36	—	38	18	265	1	845	24	22¾	2·22	2·84
		Jail Hospital	118	20	1	1	1	—	—	48	2	1	—	3	—	3	—	14	5	79	—	170	9	4½	7·62	5.29
		Civil Hospital and Dispensary	—	546	—	124	1	3	1	1,666	2	32	—	823	—	917	—	54	15	3,283	4	6,638	23	59¼	—	11·25
111	Cuddapah	Native Garrison	1,015	679	8	5	—	1	1	16	2	9	—	37	—	85	—	14	3	301	—	1,147	9	55½	0·88	0·75
		Jail Hospital	392	178	11	2	2	—	—	34	10	3	1	—	—	1	—	29	21	154	4	401	49	7¾	12·5	12·19
		Civil Hospital and Dispensary	—	1,221	2	97	—	10	—	845	5	60	1	231	—	203	4	91	25	1,626	17	4,324	54	67½	—	1·25

APPENDIX B.—General Table, exhibiting the SICKNESS and MORTALITY from the most important DISEASES amongst the EUROPEAN TROOPS of the MADRAS ARMY for 15 Years, from 1842 to 1856–7, contrasted with the Results of 1857–8.

Years.	Strength.	Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.		Dropsy.		Total of preceding Diseases.		General Total of all Diseases.		Per-centage of				
		Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Sick to Strength from 9 principal Diseases.	Death to Strength from 9 principal Diseases.	Sick to Strength from all Diseases.	Deaths to Strength from all Diseases.	Deaths to Strength, excluding those from Cholera.
1842	12,080	335	163	3,137	26	991	34	1,683	37	1,912	121	194	20	1,171	7	2,414	5	43	8	11,880	421	19,490	508	98·3	3·4	191·3	4·2	2·8
1843	12,436	448	206	4,031	50	911	36	1,663	37	2,008	158	381	27	1,171	5	2,188	7	49	11	12,850	537	21,676	610	103·3	4·3	174·3	4·9	3·2
1844	13,057	111	54	3,431	53	811	23	1,333	20	1,360	89	387	21	1,248	5	2,099	3	35	7	10,815	275	19,291	367	82·8	2·1	147·7	2·8	2·3
1845	12,548	232	124	3,971	52	930	50	1,447	27	1,625	102	179	21	1,048	9	2,470	7	31	8	11,933	400	20,396	941	95·09	3·1	162·5	3·9	2·9
1846	11,113	146	75	2,966	36	827	40	949	17	1,439	98	147	16	882	10	2,332	8	30	8	9,718	308	16,641	402	87·4	2·7	149·7	3·6	2·9
1847	11,429	32	22	2,710	30	740	41	1,292	14	1,346	116	236	28	1,047	4	3,401	4	30	1	10,834	260	17,895	337	94·7	2·2	156·5	2·9	2·7
1848	9,679½	3	2	2,677	23	701	13	822	9	841	50	1,288	25	1,064	5	3,484	5	30	9	10,910	141	17,290	174	112·7	1·4	178·6	1·7	1·7
1849	9,559	43	26	2,807	12	625	32	884	19	905	72	967	34	967	2	3,091	5	22	2	10,311	204	15,589	245	107·8	2·1	163·08	2·5	2·2
1850–1	9,136¼	35	21	2,932	14	626	28	659	9	704	45	971	45	932	4	2,675	7	18	5	9,552	178	14,646	226	104·5	1·9	160·3	2·4	2·2
1851–2	9,119	25	15	2,257	14	644	27	657	5	1,011	71	920	37	924	3	2,479	6	14	8	8,931	186	14,091	216	97·9	2·03	154·5	2·3	2·2
1852–3	9,170½	253	155	3,719	53	633	32	1,412	30	1,413	109	925	31	967	3	1,975	4	53	8	11,350	425	16,911	478	123·7	4·6	184·4	5·2	3·5
1853–4	8,291	121	61	2,674	29	585	27	1,241	12	1,085	91	900	30	959	3	1,926	1	34	7	9,525	261	14,853	324	114·8	3·1	179·1	3·9	3·1
1854–5	9,021	131	65	3,287	29	500	31	1,154	11	923	72	777	28	955	4	2,431	3	24	9	10,182	252	15,465	300	112·8	2·7	171·4	3·3	2·6
1855–6	7,599	25	11	2,494	20	633	34	805	11	865	62	551	24	732	2	2,225	0	12	2	8,342	166	12,308	200	109·7	2·1	161·9	2·6	2·4
1856–7	7,513	136	58	2,127	11	530	18	723	8	686	46	753	22	722	1	1,949	2	14	5	7,640	171	11,526	215	101·6	2·2	153·4	2·8	2·08
Total	151,751¼	2,076	1,058	45,220	452	10,687	466	16,724	266	18,123	1,302	9,576	409	14,789	67	37,139	67	439	98	154,773	4,185	248,068	5,093	101·9	2·7	163·4	3·2	2·6
Per-centage of treated to Strength		1·3		29·7		7·04		11·02		11·9		6·3		9·7		24·4		0·2		101·9		163·4						
Do. Deaths to do.		0·6		0·2		0·3		0·1		0·8		0·2		0·04		0·04		0·06		2·7		3·2						
Do. do. to treated		50·9		0·9		4·3		1·5		7·1		4·2		0·4		0·1		22·3		2·7		2·05						
For 1857–8	9,396	245	112	3,061	36	567	27	1,306	15	871	60	773	31	755	7	2,434	3	19	6	10,031	297	15,591	385					
Per-centage of treated to Strength		2·6		32·5		6·03		13·8		9·2		8·2		8·03		25·9		0·2		106·7		165·9						
Do. Deaths to do.		1·1		0·3		0·2		0·1		0·6		0·3		0·07		0·03		0·06		3·1		4·09						
Do. do. to treated		45·7		1·1		4·7		1·1		6·8		4·01		0·9		0·1		31·5		2·9		2·4						

APPENDIX C.—AVERAGE DEATH RATE in the under-mentioned CORPS in 1859–60.

—	Wellington, H.M. 60th Rifles.	Bangalore, 1st Royal Dragoon Guards.	St. Thomas's Mount, Artillery.	Secunderabad, H. M. 1st Royal Regiment.	Bellary, H. M. 74th Regiment.	Kamptee, H. M. 9th Regiment.	Secunderabad, H. M. 18th Regiment.	Secunderabad, H. M. 17th Lancers.
Strength - - -	1,137	586	590	1,045	812	819	961	448
Average Death Rate per Cent. -	0·87	1·19	2·37	2·39	2·58	2·80	3·53	11·60

Appendix D.

General Table exhibiting the Sickness and Mortality in each Division of the Madras Army for 15 Years, from 1842 to 1856–7, contrasted with the Results of 1857–8.

Divisions.	Europeans. 1842 to 1856–7. Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Europeans. 1857–8. Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	15,780	24,363	436	77	154·3	2·7	2·2	1·7	285	419	3	—	147·01	1·05	1·05	0·7
Centre	20,790¼	30,861	882	187	148·4	4·2	3·3	2·8	668	1,807	38	4	270·5	5·6	5·08	2·1
Southern	14,221¾	25,531	424	108	179·5	2·9	2·2	1·6	491	922	11	2	187·7	2·2	1·8	1·1
Mysore	25,586½	35,354	581	157	138·1	2·2	1·6	1·6	931	1,579	8	—	169·6	0·8	0·8	0·5
Malabar and Canara	14,441¼	22,237	326	15	153·9	2·2	2·1	1·4	722	882	9	—	122·1	1·2	1·2	1·02
Ceded Districts	10,400½	17,957	359	201	172·6	3·4	1·5	1·9	569	628	10	—	110·3	1·7	1·7	1·5
Hyderabad Subsidiary Force	19,984½	36,334	688	56	181·8	3·4	3·1	1·8	540	890	10	—	164·8	1·8	1·8	1·1
Nagpore Force	8,536¾	17,070	316	37	199·9	3·7	3·2	1·8	250	474	10	—	189·6	4·0	4·0	2·1
Northern (Europeans to 1851)	1,126¼	901	58	—	80·01	5·1	5·1	6·4	88	194	7	2	220·4	7·9	5·6	3·6
Southern Mahratta Divisions (Europeans to 1846).	1,132	2,609	52	12	230·4	4·5	3·5	1·9	—	—	—	—	—	—	—	—
Saugor (from 1846)	1,698	3,660	46	8	216·6	2·7	2·2	1·2	2,792	4,199	65	7	150·3	2·3	2·07	1·5
Tenasserim Provinces	5,267¼	8,604	159	26	163·3	3·01	2·5	1·8	65	133	3	—	204·6	4·6	4·6	2·2
Straits	851	944	18	—	110·9	2·1	2·1	1·9	37	118	4	—	318·9	10·8	10·8	3·3
Aden	2,248	3,530	86	19	157·02	3·8	2·9	2·4	—	—	—	—	—	—	—	—
China {Europeans from 1842 to 1845; Natives from 1842 to 1847}	539	1,846	27	1	342·4	5·009	4·8	1·4	—	—	—	—	—	—	—	—
Labuan {Europeans from June 1852 to 1855–6; Natives from 1848}	47¼	123	5	—	261·7	10·6	10·6	4·06	—	—	—	—	—	—	—	—
Bengal Presidency (from 1848 to 1850–1)	—	—	—	—	—	—	—	—	787	1,757	174	91	223·2	22·1	10·5	9·9
Sinde (for 1842)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Burmah (from 1852)	9,109½	16,144	562	147	177·2	6·1	4·5	3·4	1,171	1,589	21	2	135·6	1·7	1·6	1·3
General Hospital	—	—	68	7	—	—	—	—	—	—	12	4	—	—	—	—
Total	151,751¼	248,068	5,093	1,058	163·4	3·3	2·6	2·05	9,396	15,591	385	112	165·9	4·09	2·9	2·4

Divisions.	Natives. 1842 to 1856–7. Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Natives. 1857–8. Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	43,255¼	28,416	809	340	65·6	1·8	1·08	2·8	1,612	1,475	17	9	91·5	1·05	0·4	1·1
Centre	57,732½	35,400	1,242	331	61·3	2·1	1·5	3·5	2,798	3,352	123	35	119·7	4·3	3·1	3·6
Southern	78,646½	61,003	1,665	976	77·5	2·1	0·8	2·7	4,001	3,414	45	12	85·3	1·1	0·8	1·3
Mysore	83,137½	65,178	1,500	769	78·3	1·8	0·8	2·3	3,095	3,157	54	18	102·003	1·7	1·1	1·7
Malabar and Canara	49,389½	29,903	482	61	60·5	0·9	0·8	1·6	2,673	1,633	29	—	61·09	1·08	1·08	1·7
Ceded Districts	56,437½	41,783	937	488	74·0	1·6	0·7	2·2	2,816	3,119	27	4	110·7	0·9	0·8	0·8
Hyderabad Subsidiary Force	118,661½	89,937	1,904	1,028	75·7	1·6	0·7	2·1	3,822	3.505	31	—	91·7	0·8	0·8	0·8
Nagpore Force	71,547¾	43,978	955	307	61·4	1·3	0·9	2·1	3,429	4,161	72	15	121·3	2·09	1·6	1·7
Northern (Europeans to 1851)	110,310	103,026	2,178	538	93·3	1·9	1·4	2·1	6,649	7,834	127	11	117·8	1·9	1·7	1·6
Southern Mahratta Divisions (Europeans to 1846).	52,110	38,537	888	468	73·9	1·7	0·8	2·3	315	170	—	—	53·9	—	—	—
Saugor (from 1846)	58,603½	48,505	528	48	82·7	0·9	0·8	1·08	2,125	2,437	51	29	114·6	2·4	1·03	2·09
Tenasserim Provinces	82,393½	38,055	685	60	117·4	2·1	1·8	1·8	1,500	2,244	39	—	149·6	2·6	2·6	1·7
Straits	20,609½	17,669	306	4	85·7	1·4	1·4	1·7	2,056	2,590	45	—	125·9	2·1	2·1	1·7
Aden	14,062½	9,546	253	30	67·8	1·7	1·5	2·6	—	—	—	—	—	—	—	—
China {Europeans from 1842 to 1845; Natives from 1842 to 1847}	11,235	24,806	993	15	220·7	8·8	8·7	4·003	450	1,867	31	—	414·8	6·8	6·8	1·6
Labuan {Europeans from June 1852 to 1855–6; Natives from 1848}	1,183½	3,000	32	—	253·5	2·7	2·7	1·06	155	827	11	—	533·5	7·09	7·09	1·3
Bengal Presidency (from 1848 to 1850–1)	6,043¾	7,283	84	3	120·5	1·3	1·3	1·1	1,625	1,997	33	19	122·8	2·04	0·8	1·6
Sinde (for 1842)	126	18	3	—	14·2	2·3	2·3	16·6	—	—	—	—	—	—	—	—
Burmah (from 1852)	20,306½	34,893	464	71	171·8	2·2	1·4	1·3	8,781	15,055	307	23	171·4	3·4	3·2	2·03
General Hospital	—	—	185	3	—	—	—	—	—	—	30	2	—	—	—	—
Total	885,791¾	720,938	16,093	5,540	81·3	1·8	1·1	2·2	47,902	58,837	1,072	177	122·8	2·2	1·8	1·8

APPENDIX E.

GENERAL TABLE exhibiting the STRENGTH, SICKNESS, and MORTALITY in each DIVISION of the MADRAS ARMY for 16 Years, from 1842 to 1857–8, contrasted with the Results of the Year 1858–9.

Divisions.	Europeans. From 1842 to 1857–58. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Europeans. For 1858–9. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	16,065	24,782	439	77	154·2	2·7	2·2	1·7	952	1,542	30	8	161·9	3·1	2·3	1·9
Centre	21,458¼	32,668	920	191	152·2	4·2	3·3	2·8	1,039	3,009	68	21	289·5	6·5	4·5	2·2
Southern	14,712¾	26,453	435	110	179·8	2·9	2·2	1·6	958	1,582	20	6	165·1	2·08	1·4	1·2
Mysore	26,517½	36,933	589	157	139·2	2·2	1·6	1·5	1,906	2,512	28	2	131·7	1·4	1·3	1·1
Malabar and Canara	15,163½	23,119	335	15	152·4	2·2	2·1	1·4	982	1,599	11	2	162·8	1·1	0·9	0·6
Ceded Districts	10,969½	18,585	369	201	169·4	3·2	1·5	1·9	1,304	2,167	48	7	166·1	3·6	3·1	2·2
Hyderabad Subsidiary Force	20,524¼	37,224	698	56	181·3	3·4	3·1	1·8	2,047	4,547	148	—	222·1	7·2	7·2	3·2
Nagpore Force	8,786¾	17,544	326	37	199·6	3·7	3·1	1·8	629	738	8	—	117·3	1·2	1·2	1·08
Northern (European to 1851, and from 1857–8).	1,214¼	1,095	65	2	90·1	5·3	5·1	5·9	150	395	10	—	263·3	6·6	6·6	2·5
Southern Mahratta Division (European to 1846).	1,132	2,609	52	12	230·4	4·5	3·5	1·9	—	—	—	—	—	—	—	—
Sangor (from 1846)	4,481	7,859	111	15	175·3	2·4	2·1	1·4	2,587	7,098	107	—	274·3	7·6	7·6	2·7
Tenasserim Provinces, Pegue (from 1852–3) } Amalgamated in 1858–9.	15,612¾	26,470	745	175	169·5	4·7	3·6	1·8	2,204	3,419	44	1	155·1	1·9	1·9	1·2
Straits	888	1,062	22	—	119·5	2·4	2·4	2·07	66	127	3	—	192·4	4·5	4·5	2·3
Aden (from 1844 to 1854–5)	2,243	3,530	86	19	157·02	3·8	2·9	2·4	—	—	—	—	—	—	—	—
China { European, from 1842 to 1845; Natives from 1842 to 1847 and 1857–8. }	539	1,846	27	1	342·4	5·009	4·8	1·4	—	—	—	—	—	—	—	—
Labuan { European from 1852–3 to 1855–6; Native from 1848 }	47½	123	5	—	261·7	10·6	10·6	4·06	—	—	—	—	—	—	—	—
Bengal Presidency { European for 1857–8; Natives for 1848 to 50–1 and 1857–8. }	787	1,757	174	91	223·2	22·1	10·5	9·9	658	1,266	32	—	196·9	4·8	4·8	2·4
Sinde (for 1842)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Hospital	—	—	80	11	—	—	—	—	—	—	8	—	—	—	—	—
Total	161,147½	263,659	5,478	1,170	163·6	3·3	2·6	2·07	15,482	30,031	655	47	193·9	4·2	3·9	2·1

Divisions.	Natives. From 1842 to 1857–58. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Natives. For 1858–9. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	44,867½	29,891	826	349	66·6	1·8	1·06	2·7	2,247	2,270	17	4	101·02	0·7	0·5	0·7
Centre	60,530½	38,752	1,365	366	64·02	2·2	1·6	3·5	3,291	3,958	106	31	120·2	3·2	2·2	2·6
Southern	82,647⅓	64,417	1,710	988	77·9	2·06	0·8	2·6	5,825	4,966	126	87	85·2	2·1	0·6	2·5
Mysore	86,292½	68,335	1,554	787	79·2	1·8	0·8	2·2	2,855	2,995	82	54	103·8	2·8	0·9	2·7
Malabar and Canara	52,062½	31,536	511	61	60·5	0·9	0·8	1·6	2,956	2,379	57	21	80·4	1·9	1·2	2·3
Ceded Districts	59,253½	44,902	964	492	75·7	1·6	0·7	2·1	4,013	3,285	23	6	81·8	0·5	0·4	0·7
Hyderabad Subsidiary Force	122,183½	93,442	1,935	1,028	76·2	1·5	0·7	2·07	4,569	6,844	7	—	149·7	1·02	1·02	0·6
Nagpore Force	74,976¾	48,139	1,027	322	64·2	1·3	0·7	2·1	4,085	3,592	25	—	87·9	0·6	0·6	0·6
Northern (European to 1851, and from 1857–8).	116,959	110,860	2,305	549	94·7	1·9	1·5	2·07	9,938	8,581	116	—	86·3	1·1	1·1	1·3
Southern Mahratta Division (European to 1846).	52,425	38,707	888	468	73·8	1·6	0·8	2·2	243	153	4	—	62·9	1·6	1·6	2·6
Sangor (from 1846)	60,728½	50,942	579	77	83·8	0·9	0·8	1·1	2,630	3,509	27	—	133·4	1·02	1·02	0·7
Tenasserim Provinces, Pegue (from 1852–3) } Amalgamated in 1858–9.	62,981	90,249	1,495	154	143·2	2·3	2·1	1·6	10,440	14,962	248	18	143·3	2·3	2·2	1·6
Straits	22,605½	20,259	351	4	89·3	1·5	1·5	1·7	1,843	2,029	53	2	110·09	2·8	2·7	2·6
Aden (from 1844 to 1854–5)	14,062½	9,546	253	30	67·8	1·7	1·5	2·6	—	—	—	—	—	—	—	—
China { European, from 1842 to 1845; Natives from 1842 to 1847 and 1857–8. }	11,685	26,673	1,024	15	228·2	8·7	8·6	3·8	195	808	18	—	414·3	9·2	9·2	2·2
Labuan { European from 1852–3 to 1855–6; Native from 1848 }	1,338½	3,827	43	—	286·02	3·2	3·2	1·1	146	807	5	1	5·5	3·4	2·7	0·6
Bengal Presidency { European for 1857–8; Natives for 1848 to 50–1 and 1857–8. }	7,668¾	9,280	117	22	121·02	1·5	1·2	1·2	2,374	3,447	15	—	145·1	0·6	0·6	0·4
Sinde (for 1842)	162	18	3	—	14·2	2·3	2·3	16·6	—	—	—	—	—	—	—	—
General Hospital	—	—	215	5	—	—	—	—	—	—	38	3	—	—	—	—
Total	933,693¾	779,775	17,165	5,717	83·5	1·8	1·2	2·2	57,653	64,585	1,008	227	112·02	1·7	1·3	1·5

BOMBAY PRESIDENCY.

BOMBAY.

Accommodation	Queen's Troops	Artillery	Head Quarters, 2nd Battalion - - 14	105
			4th Company, 1st Battalion - - - 91	
		Infantry,—Head Quarters, 2nd European Regiment L.I. -		588
	Native Troops	Artillery,—Gun Lascars - - - - -		49
		Infantry	2nd Grenadiers - - - - 769	1,757
			23rd Regiment Light Infantry - - 424	
			Marine Battalion - - - - 564	

References to Subjects and Queries.	Replies.
I. Topography.	1. Bombay is an island close to the west coast of India. It is partly hilly and in part flat, backed by mountainous land on the main. During the fair weather it is dry, but it is swampy in the low lands during the rains. About half the island is covered with woods, and there is but very little waste ground. Many tanks exist, but no springs are to be found there. Mountainous islands stud the harbour, between which and the western ghauts of India is an intervening strip of low land, called the Konkan, varying from 10 to 30 miles in breadth. 2. The elevation of the station above the sea is about 180 feet at the highest point, much is but a little above the sea at high water. There is some high land adjoining the station, but it is mountainous, without table land or plateau, and of no advantage in a military point of view. 3. The nearest mountain table land is Matheran, about 50 miles distant, and about 2,800 feet above the level of the sea, but it is only four or five miles long, and less in breadth. 4. The station is surrounded by the sea, but there is no lake or river in the vicinity of any consequence. There are estuaries of the sea running into the mainland, which are more or less bordered by marshes. There are also salt water marshes in the adjoining island of Salsette, within a mile or two of Bombay. The vicinity of the station is subject to overflow, and, besides the tides which daily overflow, there are the rains which last from June to September, inclusive, and for the most part during that time deluge the island. The marshes in Salsette are supposed to be a cause of fever in Bombay, from the wind blowing over them to that place in October, but not to any remarkable extent. 5. The station is open and exposed to the winds. The barracks for the Artillery (*i.e.*, Fort George), however, are hemmed in by the fort walls, and confined, and the barracks for the line are in the midst of high buildings in the fort of Bombay. Those at Colaba are freely open to the air. The native lines are not well situated in this respect. The temperature of the station is, in Fort George, where the Artillery are situated, and also in the barracks for the line in the fort of Bombay, much raised by the buildings being exposed to reflected sun heat. With respect to Fort George, this evil has been much mitigated, if not altogether removed, by having the lime-wash of the exterior of the buildings coloured a dark grey. Fort George I consider a tolerably healthy situation. The winds to which the station is exposed are pretty regular, blowing from the sea by day and the land by night in the fair weather. The land winds are the cause of severe rheumatism, fever, &c., to persons exposing themselves to them while asleep. During the rains the wind blows chiefly from the south-west, and are, like the sea breeze of the fair weather, healthy, but damp. 6. The island is for the most part cultivated, so is also the mainland between the mountains. There are tanks for irrigation, besides which there is a large reservoir in the island of Salsette, about 12 miles from the town of Bombay, which supplies it plentifully with water; it is situated in the valley of Vehar, in Salsette. No ill effect on the health of the station has been observed to arise from artificial irrigation. There are no limits placed to the cultivation of rice. Wherever the land suits it is planted, but not nearer than three miles from the fort. Neither indigo, hemp, nor flax are grown in the island. 7. The station is close to the town of Bombay, the population of which is said to be between 400,000 and 600,000 persons. 8. The whole district in its geological formation consists of trap and trap rock, with shell beaches on the shores towards the sea. The ground of the station has been built over for centuries, and the barracks and lines are on part of it. 9. Water is found during the dry season at from 13 to 18 feet below the surface, and during the wet season from 0 to 10 feet. 10. The rainfall and surface water flows steadily away from the hills, but not from the neighbouring plains. It chiefly runs off the surface, the soil being hardly more than 18 feet thick anywhere, and almost all argillaceous; where there are depressions it remains until it evaporates or is removed for purposes of irrigation. There is no drainage from the adjacent higher ground passing into the subsoil of the station. 11. The water supply of the station is derived mostly from wells, but at Colaba, where the well water is scanty and brackish, there are two covered tanks within the lines. The Vehar lake water will shortly be available for ample supply at Colaba. There are tanks all over the island of Bombay more or less, of various sizes, but none in the fort. There is, however, the fort ditch instead. The same also at Fort George, which has also a tank. There is no tank at Colaba, where the other barracks are. The tanks are filled by the rains and gradually become exhausted towards the end of the dry season. These tanks contain here and there water plants, shell fish, and a few little fishes, but for the most part they are kept free from all. The tanks used for bathing purposes in the fort are not used for drinking, but the water from most of them, when taken home, is used for domestic purposes. They are kept as clean as possible, and the first fall of rain is not allowed to enter those most used. No ill effect on health is apparently produced by the tanks of Bombay. 12. The water supply is generally ample, except at Colaba, as before stated, but the quality of the water in the wells varies greatly. It contains for the most part a large quantity of lime and brackish sea salt in addition. That which is drinkable, although not of the best kind, is not unwholesome. The water from the reservoir is almost pure. The means of raising the water is by ropes and buckets, and by Persian wheels at the tanks and wells, whence it is conveyed to the troops by water-carts, puckallies, and bheesties. The whole of the barracks, &c. should be brought into connexion with the Vehar lake main, and all existing tanks kept full by the same to meet possible occasional failure in the main pipe.

BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	13. There is nothing remarkable either in favour or against the climate of Bombay. It is for the most part very relaxing, but suits many Europeans much better than the dry atmosphere of the interior of the continent—children and persons rather advanced in life, and old residents in India. 14. New stations are generally selected by a committee of military medical officers.
II. CLIMATE.	1. There is an observatory at Bombay for conducting and registering meteorological observations. 2. Table of Meteorological Observations.

TWO YEARS of OBSERVATION, from JANUARY 1858 to DECEMBER 1859.

Months.	Barometer, Mean.*	Mean Temperature.	Mean Daily Range.	Rain, inches.	Winds. Sea. Hours.	Winds. Land. Hours.	Days of Sunshine.
		°	°				
January	29·927	74·0	14·2	—	17⅛	7	—
February	29·928	75·9	13·5	—	19½	4¼	—
March	29·865	79·6	12·5	—	19½	4¼	—
April	29·792	84·4	12·0	0·10	20	4	—
May	29·731	85·7	10·4	0·80	21½	2½	—
June	29·682	84·3	8·9	20·66	20½	3¼	—
July	29·648	81·8	7·8	23·98	20	4	—
August	29·725	80·4	6·9	11·03	23½	½	—
September	29·778	80·1	8·3	10·71	18	5½	—
October	29·888	80·7	10·8	2·11	15	8½	—
November	29·889	81·7	13·1	—	12½	11	—
December	29·937	74·8	13·5	0·7	10½	7	—

* Barometer 37½ feet above the mean sea level, and reduced to 32° Fahrenheit.

REMARKS as to CLOUD, DEW, WIND, STORMS, &c.

Winds.—From the beginning of June to the beginning of October the south-west monsoon prevails, and after a short interval of close muggy weather, is succeeded by north-easterly winds, which inconstantly alternate with north-westerly (sea) breezes through the cold season, and on from the beginning of March towards the monsoon, a period which embraces the hot weather. The land winds (north-easterly) are the most injurious to the inhabitants.

Tides.—The rise of the tide is usually 14 feet, and occasionally as high as 17 feet. Bombay is said by McCulloch to be the only port of consequence in India where the rise is sufficient to afford wet and dry docks. The harbour of Bombay is deep and capacious, with a safe though narrow channel, entered from the southward.

Rain.—The annual average fall of rain, which is almost entirely confined to the monsoon, may be put down at 78 inches, and the number of rainy days at 102. The evaporation of Bombay is excessive, and almost equals, it is said, the average fall of rain.

Barometer.—The average range during the whole year is very slight, 0·110 inch or 0·112 inch representing it. Occasionally in the cold months the daily variation is as much as 0·2 inch, and during the monsoon as little as 0·120.

3. The climate of Bombay, from its proximity to the sea, is generally more or less moist, in the rainy seasons particularly so, and with the exception of about three months in the year, viz., December, January, and February, is very debilitating. The streets are watered during the dry season, and the air is tolerably free from dust. The slaughter-houses and public necessaries situated at Boree Bunder, when the wind is from the eastward, affect the purity of the air in places situated close by. The number of sick among the troops in Bombay is usually above the general average. Drill and exercises take place generally in the cold weather. The native troops, from the dearness of provisions, cannot afford to feed themselves and families sufficiently well. The most healthy months are from January to June, the remainder being generally unhealthy; the prevailing diseases during the latter months being fevers and bowel complaints.

4. Malabar Point might with some expense be made a capital sanitarium for European troops, capable of accommodating from 250 to 300 men. Water is scarce, and must be supplied from the Vehar waterworks.

5. I have served at a great many stations, and may say generally that while the table land is good for healthy men, and the hills for those who are simply debilitated from intermittent fever, &c., yet the lower and coast stations are the best for children and old residents in India.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Plans and sections are transmitted of Town barracks, Fort George barracks, Colaba barracks, and the depôt barracks.

4. TABLE of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
*Town Barrack.**		Ft. In.	Ft. In.	Ft. In.				Ft. In.		Ft.	Ft.
Ground Floor	106	356 0	32 0	132 0	149,994	1,415	107	1 8	24	5	3
Do. do.	106	356 0	32 0	132 0	149,994	1,415	107	1 8	24	5	3
Upper Story centre room	106	302 0	44 4	11 6	153,962	1,452	126	1 8	24	9	4
Do. side room	71	211 6	44 4	11 6	107,824	1,518	132	1 8	15	9	4
Do. do.	71	211 6	44 4	11 6	107,824	1,518	132	1 8	15	9	4
Total	460	—	—	—	—	—	—	—	102	—	—

* Date of construction of barracks about 1804; total number of rooms or huts, 5 rooms; total regulation number of non-commissioned officers and men, 460.

4. Table of Barrack Accommodation—*cont.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.				Ft. In.		Ft.	Ft.
Guard Room - -	7	44 0	20 0	11 0	98	1,383	125	1 8	4	6	3
Prisoners' Room in do., 6, each - - -	1	8 0	7 0	11 0	616	616	56	1 8	1	2	3
Solitary Cells, 6, each -	1	10 0	10 0	12 0	1,200	1,200	100	1 8	3	2	3
*Fort George Barrack.**											
Lower Story room, 3, each	44	143 6	23 8	11 8	39,621	900	77	1 8	12	8	4
Upper do. do.	44	144 6	24 5	14 4	50,513	1,148	80	1 8	12	5½	4½
Total -	264	—	—	—	—	—	—	—	72	—	—
Quarter Guard room -	7	49 0	14 0	12 0	8,232	1,176	98	1 8	11	4	3
Advanced do. -	7	44 6	11 6	12 0	6,141	877	73	1 8	3 6	7½ 4½	4 4
Do. do. cells, 2, each	1	10 0	11 6	12 0	1,380	1,380	115	1 8	1	2	2½
Prisoners' room - -	4	23 0	14 0	12 0	3,864	966	80	1 8	5	5	3
Do. - -	3	18 0	14 0	12 0	3,024	1,008	84	1 8	3	5	3
Solitary cells, 4, each -	1	10 0	10 0	16 0	1,600	1,600	100	1 8	3	2	3
Colaba Barrack.†											
Single men's rooms, 6, each	53	211 0	22 6	12 0	56,970	1,075	89	1 8	20	6	3
Total -	318	—	—	—	—	—	—	—	120	—	—
Quarter guard room -	4	20 0	20 0	11 3	4,500	1,125	100	1 8	3	3	2½
Do. do. -	4	20 0	20 0	11 3	4,500	1,125	100	1 8	3	3	2½
Do. prisoners' do. -	1	10 0	9 3	11 3	1,040	1,040	92½	1 8	1	2½	2
Do. do. -	1	10 0	9 3	11 3	1,040	1,040	92½	1 8	1	2½	2
Advanced guard do. -	7	50 0	20 0	7 6	7,500	1,071	142	1 8	6	2½	2
Hospital do. -	4	21 0	14 0	9 0	2,646	661	73	1 8	2 3	6½ 3½	4 2½
Solitary cells, 6, each -	1	100	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Depôt Barrack.‡											
4 small rooms - -	31	32 6	16 0	16 6	38,110½	1,200	65	1 8	7	5	3
2 do. - -		24 6	16 0	16 6					6	7	3½
1 large do. - -		45 0	25 0	20 6					—	—	—
Total -	31	—	—	—	—	—	—	—	13	—	—
Guard room - -	7	21 9	20 0	8 9	3,806	543	62	1 8	2	4	3
Do. prisoners' room	6	22 0	20 0	8 9	3,850	641	73	1 8	3	4	3
Do. to hospital -	4	17 9	13 6	12 0	2,875	718	59	1 8	3 2	4½ 2	3 3
Solitary cells - - -	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Do. - - -	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Do. - - -	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3

* Date of construction of barrack unknown; total number of rooms or huts, 6 rooms; total regulation number of non-commissioned officers and men, 264.

† Date of construction of barrack, 1816–26, 1843–45; total number of rooms or huts, 6 rooms; total regulation number of non-commissioned officers and men, 318.

‡ Date of construction of barrack, unknown; total number of rooms or huts, 7 rooms; total regulation number of non-commissioned officers and men, 31.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. In the town barracks ground floor, on the inner side, are arched doorways, and on the opposite outer walls windows with iron bars and plank outer shutters. On the upper floor there is a similar apportionment of doorways and windows, the latter in the outer wall having Venetian shutters opening outwards. In the Fort George barracks there are no windows, but door or window openings on opposite sides, with upper similar opposite ventilating openings. In the Colaba barracks the windows are on opposite sides and open inwards. On the western side they have glazed shutters, but on the eastern, plank only. In the depôt barracks at Colaba the windows are on opposite sides, having wooden bars and plank shutters, opening outwards. In the town barracks there is a verandah on one side only of the rooms, from $10\frac{5}{12}$ to $11\frac{3}{4}$ ft. in width, running round the quadrangle on the three sides occupied by the barracks. In Fort George barracks verandahs $11\frac{5}{12}$ ft. in width extend the whole length of the building on both sides of the barrack rooms. In the Colaba barracks verandahs 9 feet in width extend the whole length of each barrack on both sides of the rooms. The depôt barracks have no verandahs. The verandahs are never used as sleeping quarters by soldiers, or other persons, unless when there has been an unusually large number of sick. There are no jalousies or jhilmils in any of the barracks, but in the town, Fort George, and Colaba barracks the verandahs have plank shutters, which can be raised or let down as desired. The depôt barracks have fixed mat weather frames over the doors and windows.

BOMBAY

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	6. The bedsteads used in barracks are iron cots, the bedding consisting of calico cases stuffed with straw, renewed frequently. No improvements are suggested. 7. No reply to this query. 8. In the town barracks iron cowls are fixed at intervals on the ridges for ventilating purposes. In Fort George barracks the ventilating cowls are of wood. In the barrack rooms also oval ventilating openings at intervals, high up in the walls, communicate with the verandahs. In the Colaba barracks there are lofty continuous ventilators with glazed shutters. In the depôt barracks the cowl ventilators somewhat resemble dormer windows. The means of ventilation are generally found sufficient, at least there are no complaints. The Fort George and town barracks should be provided with continuous ventilators along the ridges, if likely to be crowded with troops. The air of the barrack rooms is cooled by punkahs, those in Fort George are arranged on the most economical plan, so that six punkahs can be pulled easily by one man. 9. Barracks are constructed of stone and lime masonry with lime plaster, the roofs being teak trussed with double tiles. 10. In the town barracks the ground floor is laid with cut stone flags, about 1 foot above the ground, and no passage for air beneath. The upper floor is cut stone flags in rooms, and teak planking in the verandahs. In Fort George barracks the ground floor is laid with cut stone flags, about 4 feet above the ground, with no passage for air beneath, and the upper floor is composed of teak planking throughout. In Colaba there are three barracks with mud floors in the rooms, and cut stone slabs in the verandahs, and the other three are of cut stone slabs throughout. The whole is raised about 1½ feet above the ground level. There is no passage for air beneath. In the depôt barracks the floors are composed of mud raised about 1½ feet above the ground level, and having no passage for air beneath. 11. The materials used in the construction of barracks, huts, and tents are generally suitable for the climate, but at Colaba it is desirable (as lately decided by a committee) that all the barrack room floors should be raised at least 14 feet above the ground, the ground floor below to be used only in the daytime for dining and other purposes. The barracks and cantonments are kept in repair by the garrison engineer, and repairs are executed as circumstances will admit of. The walls and ceilings of barracks are cleansed and lime-washed about once in six months, but this is quite dependent on the barrack master, who might call for its execution if he pleased at shorter intervals. 12. In the town barracks the men's lavatory is 50 ft. by 20 by 10, with double bamboo mat walls and partitions, tiled roof, and cut stone floor. The water is supplied by bheesties, and it is drained by a channel cut in the floor all round the wall, which leads into the urinaries, and thence into the main drain. At Fort George barracks the lavatories are made in the rear and front verandahs with plank partitions, and pore bunder stone floors; the water is brought up by bheesties and put into barrels. The drainage runs into pipes and troughs, and so into the ditch. In the Colaba barracks there are six wash-houses, one for each barrack room, each measuring 53 by 12 feet, in which are placed water barrels for bathing purposes, supplied by bheesties. In the depôt barracks there is one room 22½ by 13 by 10 ft. which is divided in two by a mat partition, one of the rooms is used for bathing purposes, and the other is converted into a urinary. The bathing water is supplied by bheesties. Masonry drains are constructed to carry the waste water into the sea. 13. In the town barracks the cook-house is 45 by 20 by 9½ ft., and contains 27 fire-places, of brick and lime, with irons on a masonry platform 3 feet high and 3 feet wide; the roof is tiled and has an opening for the smoke to escape. The water is brought in by bheesties and put into water casks, the refuse water being conveyed away in a drain to the sea. At Fort George barracks the cook-house is 63 by 21 by 10 ft., and similar to that of the town barracks, and the water is supplied in the same way. The waste water is conveyed into the ditch behind the barracks. In the Colaba barracks there are four cook-houses to the barracks, each 28 ft. by 20 ft. by 7 ft., and the water is supplied by the regimental bheesties. The refuse water is at present thrown on the ground, where it evaporates or sinks in the soil. We are of opinion that cesspools for the refuse water and slops at each cook-house would be an improvement, and if made 3 ft. square and 3 ft. in depth would not be expensive, and could be easily emptied. In the depôt barracks the cook rooms are 34 by 12 by 10 feet and 15 by 12 by 10 feet, and the rest is similar to the above arrangement, excepting with regard to the refuse water, which is received into cesspools. There are regular washing places built on the esplanade for washing linen, with ground for drying, and also on the Byculla flats, three miles from thence. Many washermen take their clothes to wash several miles from Bombay. As far as the station is concerned I consider the washing places on the esplanade are sufficient. 14. In the town barracks the privy consists of plank seats, under which are drains, which can be flushed with water, the soil being thereby conveyed to the sea. Half the height of the walls is of masonry and the other half is composed of wooden railings. The roof is double tiled, there are two urinals attached to the lavatory, which are flushed by the water therefrom. In Fort George barracks the privy is nearly similar to the above in construction and arrangement, except that the railing and urinals are under separate roofs. In the Colaba barracks the privies are constructed on the sea beach, and the sullage therefrom is carried away by the tide, and in the depôt barracks the arrangements are the same as above. 15. The privies and urinals have tiled openings in the roof, which with doors and windows afford sufficient ventilation. The barracks are lighted at night by oil lamps suspended from the roof. 16. In the town barracks the rain water is conveyed away through a masonry drain to the sea, as also is the soil from the privy and urine from the urinals. The length of the whole is 811 feet and the breadth and depth from 1½ to 5 feet, and 1½ to 12 feet respectively, the distance of outlet from the barracks being about 250 feet. There are no cesspits for the reception of the waste water. In the Fort George barracks there are drains to convey the rain water into the ditch 72 ft. by 1½ ft. by 1½ ft., but no drains from the privies, which run into an open ditch washed by the sea, over which they are built. This ditch is always in a foul state, the cleansing by the tide not being sufficient, and there are no cesspits for the reception of the waste water. In the Colaba barracks the arrangements for draining and sewering appear upon the whole to be pretty good. A main drain runs the whole length of the barracks between the two ranges; this drain is covered and 2 feet square with a flat bottom, and at every 50 feet there is a trapdoor to admit of its being cleansed; the drain has also the advantage that the slab stone covering can be easily removed and replaced. I

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	empties itself on the sea beach at about 100 feet from the nearest barrack; into this main the urinals and washhouses all empty themselves of their refuse water, and there are two covered drains of an exactly similar description for the two rear barracks, but only 1 foot square; they empty themselves on the beach, and besides these there are open drains in all directions round the barracks, sufficient to carry off the rain water in the monsoon to the sea beach. There are two masonry covered drains, 1 foot square, one for each barrack, to carry all waste and rain water to the sea beach, about 125 feet from the barracks. The main drain in these barracks requires regular flushing to keep it clean, as for a greater part of its length the fall is slight. There is a small cesspool attached to these barracks for the use of the regimental quarter guard, about 200 feet distant from the nearest well or tank, 80 feet from the barrack room, and 300 feet from the hospital, and was emptied in March last by the engineer department; and in the depôt barracks the drainage is quite sufficient for all the purposes required; the drain from the washhouse empties itself into the drain for married men's barracks, and the waste water of the cook room is received into the cesspool, which is close to it, the dimensions of which are 4 ft. by 4 ft. by 5 ft., but at least 100 ft. distant from the nearest well, and 45 ft. from the nearest barrack; it is cleaned out periodically by the barrack department by having its contents carried away in tubs to the sea-shore. The drainage appears amply sufficient for conveying away both the surface water and the sewerage in all the barracks. All the barracks and hospitals must be more or less damp during the rainy season. All the fluid refuse is carried off into the sea. The main drain is a great nuisance, but it is situated at some distance from the lines. At Byculla the stench at times is scarcely to be endured. 17. The surface cleansing is efficiently done by sweepers, the rubbish being carted away and thrown into the sea, or distributed elsewhere out of the men's way. 18. The cantonment is generally free from vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station, bazaar, &c. 19. The native town close to the esplanade is very defective in drainage, &c., but water can now be supplied to the bazaar from the Vehar waterworks. There is a municipal commission for regulating and preserving due cleanliness in the bazaar composed at present of the deputy commissioner of police, an officer of the Bombay engineers, and an European inhabitant; the engineer is appointed by Government, and the other two are elected by the bench of magistrates of whom the natives preponderate. The native houses generally are in a filthy condition, and until the municipal commissioners, who are believed to be energetic in remedying this, can effect the object, much ordure will remain within the precincts of the buildings, where it has been accumulating for years; this reply may be taken for all the other questions on the subject. Nuisance is experienced in the town barracks by the wind blowing over the densely-packed houses, also in the Fort George from the butchers' shambles and public necessaries about half a mile to the south, and the latter of which there is no means of remedying, but the town barracks are, it is believed, about to be given up for civil office purposes. 20. The slaughter-house is situated as above mentioned. The disadvantages of the lines of the native regiments, all of which are in this locality, may be here stated. The site is as bad as it can well be; close upon the northern extremity is a densely populated native town, proverbially unhealthy, close at the eastern face is a large fish and meat market, and separated from this by little more than the breadth of the railway, are the butchers' shambles and public necessaries above mentioned. On the south close by are large railway buildings, and what is particularly obnoxious is the washermen's tanks, where enormous quantities of clothing are washed, and where many of the washermen remain day and night. That which might be expected to be the best aspect, the one looking towards Back bay and the open ocean, has most of the sea breeze shut out from it by the bazaars, and there used to be formerly newly dyed cloths spread to dry in the direction, but this nuisance was some years ago, on representations being made, immediately put a stop to. The fact is that the island of Bombay is such a populous and commercial place that Government, it is believed, scarcely know where to turn for an open space of ground. 21, 22. No reply to these queries. 23. In the town barracks there are no separate married men's quarters; the lower story is generally used by the married non-commissioned officers and men. In Fort George barracks there are sufficient quarters in the front and rear verandah-rooms of the lower story for married non-commissioned officers and men. In Colaba barracks and in the depôt barracks sufficient married quarters are provided, and no married people are allowed to occupy any of the barrack rooms with the single men.
Officers' Quarters.	1. The officers' quarters in the town and Fort George barracks are in tolerably good sanitary condition, those of the Colaba and depôt barracks are in excellent sanitary condition; the drainage is effected by covered and open drains communicating with the sea either direct or by the street drains. Ventilation is effected by the doors and windows and no improvements suggest themselves at present.
IV. Health of the Troops.	1. The stations themselves are healthy, but the adjoining native population is crowded, owing to the houses being so close to each other without drainage or free air, and the excess in the number of inmates. 2. The diseases most prevalent are small-pox and measles at times, and cholera at others epidemically; the latter is often present in a sporadic form. 3. The circumstances to which unhealthiness of natives is attributable are filth and almost entire want of free circulation of air. 4. The 4th company 1st battalion of Artillery from Sinde arrived at Kurrachee, 29th December 1853, remained there till the end of 1856, when the company was ordered to Persia, where it was employed from 7th December 1856 till the 27th September 1857. It then returned to Kurrachee and proceeded to Hyderabad, arrived there 27th October 1857, left it again for its present station, Bombay, 23rd October 1858. In Sinde the men appear to have been pretty healthy, the average number of sick being about four or five per month; the prevailing sickness was intermittent fever. On arrival in Bombay (which they reached on the 9th November 1858) many of the men were impaired in health, besides a liability to return of ague, they have suffered very much whilst in Bombay from dysentery. The 2nd Grenadier regiment N.I. was stationed at Ahmedabad before coming to Bombay, was quartered there for 3 years and 2½ months, having left it on the 10th March 1859; the state of health of the

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	regiment at Ahmedabad was good, the diseases from which the men chiefly suffered have been fever and rheumatism. The state of health of the regiment on its arrival at Bombay was good; it arrived on the 21st March 1859, at its present station. Since its arrival at Bombay the men of the 2nd Grenadier regiment have suffered chiefly from fever, scurvy, and rheumatism. The 23rd regiment N.L.I. arrived at Bombay from Mhow, the head quarters, was stationed there 15 months, and left it on the 28th March 1860; the admissions into hospital at Mhow were 1050, chiefly from fever. The regiment reached Bombay on the 1st May 1860, since when in one year after date of arrival the sick increased to 1242, the diseases being scurvy and fever; during the above period of the regiment's stay in Bombay 300 men at one time, though doing duty in the lines, were daily attending hospital for medical treatment. Her Majesty's 2nd European regiment L.I. was at Belgaum before coming to Bombay, and has left during the preparation of this report for Neemuch. Better accommodation and ventilation are required for the troops at Colaba, and new barracks are necessary. 5. The troops at this station are not camped out. 6. Hill stations do well for healthy men and for those who are simply debilitated from fevers, &c., but they are injurious in many cases in convalescence from dysentery and structural changes of the liver, &c. 7. I have not observed that troops who have been resident for some time in hill stations are more or less liable to attacks of febrile and other diseases on returning to the plains. 8. Hill stations are beneficial to the men at certain seasons, but not throughout the year. 9. At hill stations the peculiar diseases to which the men are subjected are perhaps head affections and rheumatism, though the latter cannot be said to be peculiar; and there are what are called hill diarrhœa and dysentery; elevations above 4,000 feet are not suited to chest affections. 10. More clothing, and especially increase of protection from the sun, would be beneficial at hill stations. 11. The season best adapted for residence at hill stations is the hot season. The shortest period of residence which would enable troops to obtain the full benefit of such residence would be from the middle of March to the commencement of the rains in June, about 2½ or 3 months. 12. I am not aware that there is any period of residence beyond which injury is likely to be inflicted on the health of the troops, on returning to service in the plains, but the rains (monsoon) do not admit of hill stations, generally speaking, being resided at the whole year through. 13. I am not aware of any precautions required for protecting the health of the troops on leaving hill stations for the plains, except to allow them to return at a proper season of the year. 14. Without speaking positively, I should say that service in the plains with shorter periods of change to hill stations might be expected to be the most advantageous to the health of the troops. I consider a change of station every second or third year to be beneficial. 15. Our hill sanitaria are most at present in their infancy, but great attention is being paid to procure healthy and comfortable accommodation. 16. I have no personal experience to show at what ranges of elevation above the level of the sea the most suitable sites for hill stations may be obtained. 17. There is Malabar Point, which could be advantageously occupied as a hill station, the extremity of a range of trap rock of that name jutting out into the ocean, at present one of the seats of government. This point could be easily made to accommodate about 300 men, and would be very suitable for a sanitarium; it is upwards of 100 feet high, and has a capital road to it about 5 miles long; there is a scarcity of water, but that could be supplied by the Vehar waterworks. 18. I have never found any particular classes of surface and subsoils for stations more healthy or unhealthy than others. 19. From 18 to 20 years is the best age for soldiers to proceed to India, and they should arrive there at the beginning or end of the year. Those arriving in the cold season are generally sent at once up the country to join their corps or departments, and to preserve the health of recruits on first landing they should be sent up the country as soon as possible. 20. An intermediate station should, I think, be preferred to send the troops to previously to their going to India, and on their arrival in India they should be sent to hill stations where practicable. I may add that June and July are the best months for leaving England, viâ the Cape, for ensuring not only the best passages, but also the best time for marching into the interior on arrival in India. 21. The mode of transport of troops from the port to the interior is by steamers or sailing vessels and sometimes by country boats. 22. The number of years a British soldier should serve in India is about 7 years. 23. The manner of conducting the business of medical boards at stations or presidencies is not such as to cause conflict of opinion as regards invaliding, but the services are in a state of transition; at present there is one mode of invaliding for the local army and another for the British. 24. Invalids should leave India for home in the month of February.
Diseases.	1. There are regular inspection parades for the discovery of incipient diseases at this station. 2. No cases of scorbutus or scorbutic disease have occurred among the troops at this station, except amongst the native soldiers, who feed themselves badly in consequence of the high price of provisions. In Bombay the duty is more severe than in most stations, and the price of provisions more expensive; extra batta might be allowed, and a native regiment should be relieved after the expiration of two years service in Bombay. 3. When hepatic disease owes its origin elsewhere than Bombay, that station is a very suitable place to send such cases to. 4. The appearance of dracunculus seems attributable to the water of certain notorious places, but whether it occurs from the men drinking or bathing therein is not determined. 5. The proportion of sick from venereal diseases to the total sick in hospital varies much, but the proportion in Bombay, as is to be expected, is great. Lock hospitals have been generally abolished at this presidency.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*Diseases—cont.*	6. The average strength of the European troops in the Bombay garrison for the past year amounted to 423 in number, of which 277 cases of fever have been admitted into hospital, chiefly of intermittens and quotidiana; of these 31 were of remittent fever, of which 6 died, and from continued fever there were 7 admissions and 1 death; total 7. Of dysentery there were 33 cases, and 1 death. Of epidemic cholera there was one admission, and which terminated fatally. Of small-pox 1 case was admitted, but no death, and of rheumatism there were 34 cases, but no mortality. The average strength of the native troops of the garrison amounted 2,105 in number for the past year, and the admissions into hospital from fever (chiefly quotidian) amounted to 1,330, of which number 7 died. Of dysentery there were 26 admissions and 2 deaths. Of cholera and cholera morbus, there were 11 admissions, and one death. Of small-pox there were 7 admissions, but no death, and of rheumatism there were 172 admissions, but no death. 7. The nosological character of the more frequent zymotic diseases were:— Fevers { Febris ephemera. / „ intermittens tertiana. / „ „ quotidiana. / „ remittens. Eruptive Fevers { Variola. / Rubeola. Cholera, epidemic. Fevers prevail most in the months of August, September, and October. Eruptive fevers prevail in the months of April and May; and cholera in the months of March, April, May, and June. No particular condition of the atmosphere was observed either to precede or accompany their appearance. The sanitary condition of the regimental lines at Colaba is very indifferent; the barracks are built in a low situation, and consequently are very damp in the rainy seasons; the buildings themselves are well ventilated, the necessaries and urinals are situated to windward of the barracks, and the drains empty their contents on the beach, also to windward of the buildings; consequently the wind, which generally prevails from the west, carries the odour through the barrack rooms, which must prove hurtful to the men. The water supply is both plentiful and of good quality. The native dwellings in the neighbouring bazaar are crowded, badly ventilated, and the habits of the natives themselves are filthy in the extreme, and in my opinion predisposes them to the above diseases. As to the situation of the lines of the native soldiers, I believe it is as bad as it well can be; close upon their northern length lies a densely populated native district proverbially unhealthy; close on the eastern face is a large fish and meat market, and separated from this by little more than the breadth of the railway are butchers' shambles and public necessaries or privies washed by the sea, but extending along the whole of its margin in this direction; on the south are large railway buildings and the dhobies' tanks, where great quantities of clothing are washed, and where many of the washermen remain day and night. That which might be expected to be the best aspect of the lines, the west, looking towards Back bay, has much of the sea breeze shut out from it by the regimental bazaar, and the golundaze and gun lascars lines. 8. Exposure to the sun and night dews when the soldier is in the field or on the march is likely to cause his general health to suffer and predispose him to epidemic disease. 9. At this station quinine has not been tried as a prophylactic against malarial diseases, and I know of no instance in which healthy men have been put on a course of quinine with this view; as an antiperiodic quinine is found most successful in large doses. 10. The great desideratum is to keep the regimental lines and bazaars thoroughly clean by a complete system of drainage, a liberal use of charcoal and quick lime to the urinals and necessaries, and to have the drains well flushed, and lastly, to prevent the men being exposed to the mid-day sun as much as possible (and to remove the present barracks to the higher ground on the opposite side of the road), also to have sheds and suitable workshops erected to enable the soldiers to carry on their different trades, and have their amusements without requiring them to go out in the sun.
V. INTEMPERANCE.	1. The soldiers at this station are generally temperate, only about one per cent. of confirmed drunkards. 2. The proportion of admissions into hospital through intemperance are 3·7 per cent. I have no return from which I can prepare a statistical table, showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is punishable as an offence. 3. Distilled spirits are sold both at the canteen and in the bazaar, and each man is only allowed one dram per diem of the best quality, which forms part of the ration at the station, on the march, and in the field; arrack of the best quality is alone used, and no spirits are allowed to be issued from the canteen before 12 at noon. In the field they are allowed 2 drams, but I consider it prejudicial to health, particularly to young soldiers. Spirit is never given as a ration to convalescents. No other than intoxicating drinks are sold at the canteen or bazaar which are injurious to health. 4. I consider the daily consumption of spirits by the troops injurious to health, and certainly not conducive to the efficiency and internal discipline of the corps. 5. It would in my opinion be highly beneficial to the health of the troops to abolish the use of spirituous liquors as part of the ration, and to prevent the sale of them in the canteen and bazaar. 6. Good malt liquor would in my opinion be more beneficial to health than spirituous liquors. 7. Coffee is very much used as a drink at this station, I consider if the soldiers were to drink only tea, coffee, and lemonade, they would in all probability enjoy better health, while the efficiency and discipline would be in a better state than if they drank spirituous liquors; malt liquor, however, in moderation I do not think would be in any way injurious. 8. It would be highly beneficial as a general rule to suppress altogether the spirit ration, whether for soldiers or convalescents, and to substitute for it, beer, tea, or coffee, &c.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	9. I believe it would be beneficial to the men to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops; but in Bombay, where there are so many facilities and inducements to buy drugged liquor of the most deleterious kind, every possible means should be taken to prevent the necessity of a man's going outside to seek his dram. There is a penalty for selling liquor to a soldier, but the law is easily evaded so as to be almost inoperative.
	10. I would recommend that each man who may desire it be allowed two quarts of beer or porter per diem, and to be served to him half at dinner and half at night before going to bed.
	11. By the canteen regulations the issue of malt liquor is made at the rate of one quart of porter to each man, besides which they are allowed a dram of arrack per diem. The canteen is opened from 12 noon to ¼ to 1 p.m., from 2 p.m. to ¼ to 3 p.m., and from sunset to a quarter before tattoo. No man is allowed to have 2 pints of porter at one issue.
VI. DIET.	1, 2. For the Queen's British troops, a complete ration, including a due proportion of vegetables; no fruit is provided for troops at the station, and no stoppage on account of ration. The soldier has three meals a day: 1st, breakfast at half-past 9 a.m., consisting of tea, milk, bread, fish, eggs or meat, whichever he chooses to purchase; 2nd, dinner at 1 p.m., consisting of beef, rice, bread, and vegetables, such as potatoes, onions, carrots, &c.; 3rd, supper at half-past 4 p.m., this meal consisting of very little coffee chiefly, and what the soldier provides at his own expense, or what he saves from his dinner. (2.) For European troops in the Indian army, the ration is, 1 lb. of meat, 1 lb. of bread, 1 lb. of vegetables, 4 oz. of rice, 2½ oz. of sugar, $\frac{15}{21}$ oz. of tea, 1 oz. of salt., and 3 lbs. of firewood. The rations are inspected by orderly non-commissioned officers, and passed by the orderly officer, and when objected to, by a committee of two military and one medical officer.
	3. I believe it would be an improvement and conducive to the health of the troops to vary the meat, and to allow them to have mutton alternately with beef, or say two days in the week. Good mutton in quantities is difficult to be procured in Bombay. It would also be an improvement and conducive to health to increase the vegetables to 1½ lb. The existing arrangements prevent the men from disposing of any of the rations. Orderly men also are appointed daily to look after the messing, and they are responsible for the rations in every way from the time they receive them from the quartermaster's stores.
	4. The means and apparatus available for cooking at the station are copper pots tinned once a month. The cook-rooms attached to the barracks are small and close, and are badly constructed, and instead of the smoke finding a free and easy exit, it disseminates itself throughout the room, and then not only half-blinds the cooks, but renders every attempt at supervision utterly abortive. The supply of water is abundant. The food is generally boiled. The cooking is properly done, and the different messes generally manage to have a variety of dishes, such as curries, stews, &c. Tea and coffee are also properly prepared. The men always have the latter articles supplied to them about half way between halting places on the march.
	5. I do not believe that gardens could be advantageously established near the station for the cultivation of vegetables by soldiers, no ground being available for such a purpose. Where grounds and water are available, gardens should be established, and men should be encouraged to cultivate vegetables as well for profit as amusement.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. During the cold and rainy seasons the men wear the forage cap, cloth tunic, cloth trousers, woollen socks, cotton shirt, ankle boots, and great coat. In the hot season a wicker helmet, with quilted cover and turban, khakee cloth tunic and trousers, cotton shirt, cotton socks, and ankle boots. The accoutrements consist of rifle and bayonet, with scabbard; ammunition, reserve pouch, and shoulder belt; expense pouch, waist belt, cap, pouch, and knee cap. I consider the present dress suitable to the climate at all times and seasons. The present regulation dress is well adapted for all the varieties of stations in the presidency, provided proper attention is paid to have the changes made for cold and warm weather according to temperature. I would suggest, however, that the white light clothing in garrison be substituted for the khakee.
Duties.	1. I think it would be advisable that recruits should be thoroughly drilled at home before being sent to India.
	2. The usual routine of a soldier's duties is to mount in turn any guard told off for the regiment; to escort prisoners to jail; to act as orderly to his company in turn; to keep his clothing and accoutrements clean, and to attend drill when not on duty. Drills or parades evening and morning last one hour; each man carries 10 rounds of ammunition in his pouch. The men, in my opinion, should never be kept at parade or drill more than three quarters of an hour. The best hours for drills, parades, and marches, are from daylight to a little after sunrise, and in the evening from five o'clock till a little after sunset. There are general orders on these subjects. The men have from two to three and a half nights in bed during the week.
	3. One guard is mounted about 2½ miles from the barracks, and two others in the immediate neighbourhood. Guards last 24 hours by day and night; sentries are relieved every two hours. There are roll calls morning and evening. I cannot say that I have observed any bad effect on health caused by night guards.
VIII. INSTRUCTION AND RECREATION.	1. There are no means of instruction or recreation at the town barracks, but at Fort George barrack there is attached one ball court, one skittle ground, covered with mats, one school, with good schoolmaster, and library and reading room sufficiently lighted at night, and a small soldier's garden. The Colaba barracks have one ball court, a skittle ground, under a temporary verandah, and a school with good schoolmaster; while the depôt barracks have only a skittle ground, covered with mats. No workshops are attached to any of the barracks. Theatrical amusements are occasionally provided at Fort George and Colaba. Cricket is a favourite game among the men. I do not think the present means are sufficient to occupy the men during the rainy season, especially for those men unable to read or write. There are no special restrictions imposed on the men in regard to exposure to sun and rain when

References to Subjects and Queries.	REPLIES.
VIII. Instruction and Recreation—*cont.*	off duty, but they cannot leave the barrack-yard except on pass, before five o'clock in the evening. 2. I would suggest that officers join the men in cricket, as the more they do so the better. There are now many officers who do so. In Fort George there is also a cricket club for the boys. 3. There are regimental savings banks established at Bombay, and these are of great advantage to the men. 4. No shade is afforded by trees at any of the barracks to enable the men to take exercise during the day, but there is ample shade afforded by the verandahs of the Fort George and Colaba barracks. There being only one verandah to the town barracks, the space for exercise is rather confined. There is no shade or shelter whatever at the depôt barracks.
X. MILITARY PRISONS.	1. The military prison answers its purpose very well, considering it has not been constructed *ab initio* for its present purpose, but is merely an adaptation of a portion of the House of Correction, which is essentially a jail for natives. A new building should have a more elevated site and efficient drainage, ample circulation of air all round, a verandah in front of the cells, boarded floors. and ventilators so constructed as not to tempt (as the present do) their entire closure with matting during the rainy season, when ventilation is most wanted. These arrangements might prevent the dysentery now so prevalent, and render outbreaks of cholera less frequent. With respect to lunatic soldiers, I may say that the lunatic asylum here is very unfitted for the reception and treatment of cases of this kind. It is incommodious and gloomy. But as, in my opinion, soldiers who once require restraint of this nature are ever after ineligible for the ranks, and it is an object to send these patients to England by the first opportunity, the imperfections of the lunatic asylum are of little importance in a military point of view.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. With regard to the powers of the medical officers on the line of march, camping, &c., every attention is paid to their recommendations and representations. 3. The medical officer can suggest anything he thinks proper for the preservation of the health of the troops under his charge to his commanding officer. This is usually referred to the deputy inspector-general at the presidency, who recommends to the brigadier-commandant of the garrison any improvement he considers to be necessary. 4. Field hospitals are not required at the presidency; sick European troops arriving are taken to the Colaba sanitarium; the natives to the Marine Battalion Hospital. The sick are transferred on arrival, in buggies and palanquins, according to the nature of the case. Hospital supplies are procured on requisition from the commissariat department.

XI. STATISTICS OF SICKNESS AND MORTALITY.—BOMBAY.

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1850–51	L. W. H. M. 78th Highlanders -	519	183	4	—	—	18	1	56	4	293	8	7	—	42	15	357	—	956	32	184·2	6·1
1851–52	Do. do. - -	535	66	2	1	1	13	2	123	3	481	8	5	1	1	1	339	3	1,029	21	192·3	3·9
1852–53	Do. do. - -	393	276	1	—	—	14	—	49	6	361	7	8	—	—	—	288	1	996	15	253·4	3·8
1854–55	R. W. H. M. 83rd Regiment - -	45	17	—	—	—	2	—	1	—	7	1	1	—	—	—	35	—	63	1	140·0	2·2
1855–56	Wg. H. M. 83rd do - - Wg. do. 86th do. - -	561	349	—	—	—	55	3	33	—	137	2	50	6	5	4	546	2	1,175	17	209·4	3·0
1856–57	Do. do. - -	447	473	2	—	—	73	3	57	3	141	3	23	1	—	—	356	3	1,123	15	251·2	3·3
1857–58	H. M. 8th Hussars - - Do. 33rd Regiment - - Do. 51st do. - - Do. 71st Highlanders - - Do. 72nd do. - - W. G. H. M. 86th Regiment - - Do. 92nd Highlanders - Do. 95th Regiment -	2,119	87	1	6	—	79	—	13	1	79	1	13	2	—	—	440	1	717	6	33·8	0·2
1858–59	H. M. 28th Regiment - - Do. 57th do. - - Do. 86th do. - - Do. 92nd Highlanders -	912	1,517	1	1	1	31	—	12	1	76	3	22	—	—	—	584	—	2,243	6	245·9	0·6
1859–60	Do. 28th Regiment - - Do. 86th do. - -	634	376	6	1	—	37	4	15	—	124	10	8	—	—	—	511	4	1,072	24	169·0	3·7
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850–51	2nd Battalion Artillery - -	157	176	—	—	—	20	1	16	1	85	12	22	2	10	6	267	—	596	22	379·6	14·0
1851–52	Do. do. - -	74	32	—	—	—	7	—	13	—	52	4	1	—	—	—	81	2	186	6	251·3	8·1
1852–53	Do. do. - - L. W. 1st Bombay European Regiment Fusiliers.	221	86	1	—	—	28	1	11	—	68	1	16	1	—	—	294	2	503	6	227·6	2·7
1853–54	2nd Battalion Artillery - - R. W. 1st Bombay European Regiment Fusiliers.	543	222	2	2	1	38	5	71	7	183	3	30	1	2	—	593	7	1,141	26	210·1	4·7
1854–55	2nd Battalion Artillery - - R. W. 1st Bombay European Regiment Fusiliers.	450	239	2	—	—	30	1	46	5	192	8	80	—	1	1	523	5	1,111	22	246·8	4·8
1855–56	2nd Battalion Artillery - -	146	136	—	—	—	28	—	23	—	70	3	11	—	—	—	206	1	474	4	324·6	2·7
1856–57	Do. do. - -	123	135	1	—	—	19	—	22	5	83	7	16	2	1	—	156	—	432	15	351·2	12·2
1857–58	Do. do. - -	31	29	—	—	—	9	—	6	—	15	—	4	—	1	—	59	1	123	1	396·7	3·2
1858–59	Do. do. - - 4th Company 1st Battalion Artillery	40	21	—	—	—	12	1	6	—	13	—	11	1	—	—	51	—	114	2	285·0	5·0
1859–60	2nd Battalion Artillery - - 4th Company 1st Battalion Artillery 2nd European Regiment L. I. -	233	86	1	—	—	35	3	9	1	102	7	20	1	13	8	205	—	474	21	203·4	9·0

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850–51	L. W. 1st Grenadier Regiment N. I. 5th Regiment N. I. 8th do. Head Quarters 14th do. 22nd do. 28th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,496	1,047	·7	15	—	65	9	9	1	326	13	27	2	26	17	1,149	7	2,664	56	106·7	2·2
1851–52	6th Regiment N.I. 8th do. 14th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,728	792	4	13	—	51	1	6	—	419	11	37	1	28	15	1,197	14	2,543	46	93·2	1·6
1852–53	6th Regiment N. I. 8th do. 12th do. 13th do. 14th do. 16th do. Marine Battalion 6th Company 3rd Battalion Artillery Gun Lascars 2nd Batalion Artillery	2,798	1,081	11	17	1	67	5	11	2	356	13	27	—	2	2	1,066	13	2,627	47	93·8	1·6
1853–54	5th Company 4th Battalion Artillery 6th do. 3rd do. 12th Regiment N.I. 13th do. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,594	1,785	14	19	—	68	4	9	2	411	8	35	1	79	39	1,127	12	3,533	80	136·1	3·0
1854–55	5th Company 4th Battalion Artillery 12th Regiment N. I. 13th do. R. W. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,589	2,493	26	18	—	102	4	13	1	370	9	29	3	36	18	1,275	13	4,336	74	167·4	2·8
1855–56	5th Regiment N. I. 11th do. 12th do. 13th do. 15th do. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,887	3,407	9	39	2	126	10	17	3	647	6	24	2	26	9	1,882	10	6,170	51	213·7	1·7
1856–57	Aden Troop 5th Regiment N. I. 11th do. 15th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,834	3,082	13	44	1	135	11	27	3	846	12	39	1	31	10	2,164	25	6,008	76	211·9	2·6
1857–58	1st Grenadier Regiment N. I. 23rd Regiment N. I. Marine Battalion Gun Lascars 2nd Battalion Artillery	1,784	1,117	9	34	1	95	3	9	2	492	9	29	2	3	1	1,125	7	2,904	34	162·7	1·9
1858–59	1st Grenadier Regiment N. I. 2nd do. do. 7th Regiment N. I. 23rd Marine Battalion Gun Lascars 2nd Battalion Artillery	2,469	2,250	10	39	—	119	7	7	1	289	3	17	3	1	1	1,248	9	3,970	34	160·7	1·3
1859–60	2nd Grenadier Regiment N. I. 7th Regiment N. I. Marine Battalion Gun Lascars 2nd Battalion Artillery	1,987	2,806	14	13	1	72	5	13	1	265	3	19	1	33	16	1,345	7	4,566	48	229·7	2·4

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. Europeans.	WOMEN. Strength. Indo-Europeans and Natives.	WOMEN. Strength. Total.	WOMEN. Treated. Europeans.	WOMEN. Treated. Indo-Europeans and Natives.	WOMEN. Died. Europeans.	WOMEN. Died. Indo-Europeans and Natives.	WOMEN. Ratio per Cent. to Strength. Treated.	WOMEN. Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	CHILDREN. Strength. Indo-Europeans and Natives.	CHILDREN. Strength. Total.	CHILDREN. Treated. Europeans.	CHILDREN. Treated. Indo-Europeans and Natives.	CHILDREN. Died. Europeans.	CHILDREN. Died. Indo-Europeans and Natives.	CHILDREN. Ratio per Cent. to Strength. Treated.	CHILDREN. Ratio per Cent. to Strength. Died.
1852–53	Wg. H. M. 78th Highlanders	80	8	88	63	11	2	—	84·1	2·2	116	9	125	72	9	3	1	64·8	3·2
1855–56	Head Quarters H. M. 86th Regiment	74	5	79	65	6	—	—	89·8	—	145	6	151	77	10	13	1	57·6	9·2
1856–57	Do. do.	73	2	75	130	2	4	—	178·6	5·3	138	3	141	195	—	7	—	138·2	4·9
1852–53	2nd Battalion Artillery L. W. 1st Bombay European Regiment Fusiliers.	18 25	8 19	26 44	34 5	5 5	1 —	— —	160·0 22·7	3·8 —	19 40	14 22	33 62	19 4	2 —	3 1	1 —	63·6 6·4	12·1 1·6
1853–54	2nd Battalion Artillery R. W. 1st Bombay European Regiment Fusiliers.	18 22	9 18	27 40	43 20	4 17	2 —	— —	174·0 115·0	7·4 —	25 33	17 17	42 50	16 13	3 6	3 4	— 1	45·2 48·0	7·1 10·0
1854–55	2nd Battalion Artillery R. W. 1st Bombay European Regiment Fusiliers.	14 23	8 18	22 41	26 28	15 15	2 1	— —	186·3 104·8	9·0 2·4	34 24	12 23	46 47	49 13	19 9	1 5	— 3	147·8 46·8	2·1 17·0
1855–56	2nd Battalion Artillery	16	8	24	12	11	—	—	95·8	—	26	16	42	19	9	1	2	66·6	7·1
1856–57	Do. do.	15	9	24	27	11	—	—	158·3	—	19	14	33	6	1	2	—	21·2	6·0
1857–58	Do. do.	6	2	8	16	2	1	—	225·0	12·5	10	3	13	—	3	—	1	23·0	7·6
1858–59	Do. do.	4	1	5	6	3	—	—	180·0	—	8	1	9	4	—	—	—	44·4	—
1859–60	4th Company 1st Battalion Artillery 2nd Battalion do. 2nd European Regiment L. I. Depôt European Troops	4 7 48 9	2 2 2 6	6 9 50 15	6 7 16 9	1 6 — 9	— — — —	1 1 — —	116·6 144·4 32·0 120·0	16·6 11·1 — —	3 12 64 11	2 3 7 6	5 15 71 17	4 5 9 6	2 5 — 2	— 1 — —	— — — —	120·0 66·6 12·6 47·0	— 6·6 — —

By order of the Principal Inspector-General, Medical Department,

W. C. COLES,
Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1. Plans and sections of the Fort George, Colaba, and depôt hospitals are transmitted, but there being no separate building for an hospital, a division of the upper story of the town barrack is sometimes used for that purpose. Fort George hospital is about 300 feet from the barracks to the west, and about the same distance from the stables to the south. The Colaba hospital is about 300 feet to the south-east of the barracks, and the depôt hospital about 1,550 feet to the north-east of the barracks. The European hospitals are at some distance from the bazaar, but the latter is close to the native hospitals. The sites of the buildings are generally good with the exception of the hospital of H.M.'s 56th regiment at Colaba, which has been built on low ground close to the sea. The drainage of Bombay is generally defective.
	3. The water supply of the hospitals is wholesome in quality, but it has hitherto become scanty towards the end of the hot season. The wells and tanks will now, for the future, be kept filled with excellent water supplied by a large reservoir called the Vehar lake, some 15 miles distant, and brought in through cast-iron pipes. There is an intention of supplying the hospitals and barracks direct from this source.
	4. The means of drainage employed for removing refuse water and other impurities from Fort George hospital are through open drains into the ditch, and through covered drains into cesspools; ordure from necessaries is conveyed away by buckets, which are emptied into the sea at the rear of the barracks at a distance of about 400 feet from the hospital. Colaba hospital is drained through open and covered drains which empty themselves into the sea, ordure from the necessaries is conveyed to the sea at a distance of from 100 to 120 feet. The depôt hospital refuse water, ordure, &c., is received into cesspools, which are emptied and cleaned when required. The refuse water from the cook-house is conveyed through a covered drain to the sea at a distance of 150 feet.
	5. The lowest wards of Fort George hospital are raised above the ground about six feet, and there is free perflation of air underneath the floor. At Colaba and the depôt hospitals the lowest wards are raised about two feet above the ground, and there is no free perflation of air underneath the floors. At Fort George hospital there is no provision made for carrying away the roof water; it therefore sinks into the ground or escapes into the ditch and tanks. Wooden gutters are fixed on the roof of Colaba hospital for conveying the water into covered drains leading into a tank for use. There is no provision made for conveying away the roof water of the depôt hospital; it, therefore, sinks into the ground or escapes into the sea. There is no guttering round Fort George hospital. The ground slopes towards a tank in front, into which the water falls, and in the rear the water escapes into the ditch which is all that is required. At Colaba hospital wooden gutters are placed along the eaves from which the roof water is conveyed through wooden pipes into masonry drains, and these empty themselves into the tank; there are also open drains to convey the surface water to the sea, by which means the ground is always free from pools of water. The ground slopes from the depôt hospital towards the sea into which the surface water falls, and this is found to be sufficient. The foundations and walls below the floor of wards of Fort George hospital are built of lime and stone masonry; the walls of verandahs are of single brick six inches thick; the main walls consist of teak posts on which the roof is supported, and double bamboo plastered on both sides with chunam. The roof is of teak wood trussed with double tiles, and having dormer windows for ventilation, &c.; the roof and walls are sufficiently thick to keep the hospital cool. The foundations and superstructure of Colaba hospital are of stone and lime masonry, single walls, plastered inside and out; the roof of teak wood trussed with double tiles, and both roof and walls sufficiently thick for coolness. The foundations and plinth of the depôt hospital are of stone and mud, and plinth up to the posts of stone and lime masonry; the walls are of double bamboo plastered on both sides with chunam, the roof is supported on teak round posts, and is made of teak wood trussed with bamboo battens and double tiles; ventilators with glazed shutters, fixed close up to the wall plates, and roof and walls sufficiently thick for coolness. There is a closed verandah on the east and west sides of Fort George hospital with glazed and plank shutters. The former eight feet wide, and the latter nine feet wide, and sufficient shelter from the sun's rays is afforded. At Colaba there is a verandah 10 feet wide all round with teak plank shutters, &c., and sufficient shelter from the sun's rays. A verandah 12½ feet wide is fixed all round the depôt hospital, and is sufficient shelter from the rays of the sun. The verandahs of the military European regimental hospitals are not used for the accommodation of sick convalescents, or others, except for their own convenience or on extraordinary occasions of sickness. Fort George hospital consists of one flat or ground floor raised on arches about 6 to 7 ft. in height; Colaba and depôt hospitals of one flat or ground floor each.

Table of Hospital Accommodation.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
*Fort George Hospital.**		Ft. In.	Ft. In.	Ft. In.	Feet.			Ft. In.			
1st ward - - -	15	105 2	22 0	12 10	29,692	1,979	154	1 8	18	8	4
2nd do. - - -	10	70 6	22 0	12 10	19,904	1,990	155	1 8	11	8	4
3rd do. - - -	5	38 3	22 0	12 10	10,799	2,159	168	1 8	5	8	4
4th do. - - -	3	19 0	22 0	12 10	5,364	1,788	139	1 8	1	8	4
5th do. - - -	7	54 0	22 0	12 10	15,246	1,298	169	1 8	4	8	4
6th do. - - -	4	31 3	22 0	12 10	8,822	2,205	171	1 8	4	8	4
7th do. - - -	10	75 0	22 0	12 10	21,175	2,117	165	1 8	7	8	4
8th do. - - -	4	31 6	22 0	12 10	8,893	2,223	173	1 8	3	8	4
Total -	58	—	—	—	—	—	—	—	53	—	—

* Date of construction 1839–40; total number of wards, 8; total regulation number of beds, 58.

BOMBAY.

Table of Hospital Accommodation—*cont.*

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
*Colaba Hospital.**		Ft. In.	Ft. In.	Ft. In.	Feet.						
1st ward - - -	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
2nd do. - - -	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
3rd do. - - -	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
4th do. - - -	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
5th do. - - -	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
6th do. - - -	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
7th do. - - -	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
8th do. - - -	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
Total - -	56	—	—	—	—	—	—	—	36	—	—
Depôt Hospital.†											
1st ward - - -	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
2nd do. - - -	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
3rd do. - - -	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
4th do. - - -	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
Total -	80	—	—	—	—	—	—	—	80	—	—

* Date of construction, 1822-24, 1829, 1835, 1836, and 1841; total number of wards, 8; total regulation number of beds, 56.
† Date of construction, 1858-59. Total number of wards, 4; total regulation number of beds, 80.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The ramparts of Fort George hospital partially obstruct the south-west wind. The Colaba and depôt hospitals each receive the benefit of prevailing winds; the windows in all these hospitals open outward on hinges with opening hooks and eyes, and their arrangement is conducive to ventilation and coolness. 6. Fort George hospital is ventilated by dormer windows in the roof, and by the doors and windows in the walls; these, with the punkahs going, are sufficient to keep the wards at all times free from odour or closeness. Colaba, by ventilators on the roof, and by the doors and windows in the walls, and also supplied with punkahs. Depôt, by ventilators in the walls, and also by the doors and windows; the wards are always free from odour or closeness by these means. There are no jalousies or jhilmils to any of the hospitals. 7. The means of cooling the air admitted into the wards are by punkahs or large swinging fans. 8. In the damp chilly weather means of warmth are supplied by charcoal burners, which are used also in the barracks. The walls and ceilings of the hospital wards are cleaned and whitewashed every three months. 9. At Fort George hospital the privy is about 10 feet to the south-west, and consists of a row of seats with covers, having earthenware pots underneath, which are emptied twice daily into buckets, and the contents thrown into the sea behind the barracks; water-closets are about 10 feet to the south-west of the hospital. The urinals, which are tubs with iron handles, are carried behind the barracks and there emptied. The water from the washing of the pots is allowed to run into the ditch. They do not appear to be offensive, no water is supplied to them, nor are they placed over cesspits. The privies at Colaba hospital are from 40 to 80 feet south-west, with plank seats, under which buckets are placed which are emptied into the sea daily. The water-closet is about 30 feet to the south-east. The urinals are of a similar description to those at Fort George, and are also emptied into the sea daily. They are not supplied with water, nor placed over cesspits, nor are they offensive; they are properly drained. At the depôt hospital the privies abut against the verandahs on the south and north sides, and have plank seats and a masonry trough underneath to hold water; the contents are received into cesspits, which are emptied daily. Water-closets are about 10 feet from verandah, and under the same roof as the bathing rooms, the waste water from the latter running through the urinaries. The contents of the urinals, &c., are received into cesspits, which are emptied when full. They are not placed over the cesspits, but near them. They are not offensive. 10. The bathing places at Fort George are four in number with terraced floors, off the south-west verandah, where the patients can bathe themselves from water-barrels; these are sufficient. At Colaba there is one lavatory near the rear verandah with flagstone floor. A large wooden trough lined with zinc is fitted up next one of the walls, which is supplied with water from an iron tank outside the ball-cock. From this trough the patients take the water to bathe themselves with; this arrangement seems sufficient. There are two lavatories detached from the depôt hospital, which are divided into several small compartments with mats nailed on wooden framework, so that each patient may bathe himself without being exposed to the gaze of the others. The water is supplied in barrels or tubs. The floor is terraced. 11. The sick generally pour the water over themselves with a tin pot. The water is supplied in troughs or tubs placed in the lavatories. 12. The washermen take the clothes to a distance, where they wash and dry them. Outside Fort George hospital in the neighbourhood there are public washing places; which answer the purpose well. 13. The storage is sufficient and dry. 14. Iron cots laced with cotton tape are now in use in the hospitals; there are some older ones banded with flat iron bars. The former construction answers the purpose well. 15. The hospital kitchens are generally to leeward of the hospital, and sufficiently large. Cooking pots, gridirons, and other appliances sufficient. The diets might be more varied; mutton might be allowed twice during the week as a change.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	16. Copies of the diet-tables, diet-rolls, and all other returns required for working the internal economy of the hospital, &c., are forwarded. 17. The provision for attendance on the sick consists of a hospital serjeant, and a nurse or native boy generally for each bedridden patient. There is also a European female nurse or matron for the sick females and children. 18. The sanitary condition of the hospitals is generally good, and no epidemic disease, hospital gangrene, or pyæmia, have appeared in the wards. 19. There are no other deficiencies or sanitary defects which have come under my notice as medical attendant. 20. There is no special provision made for convalescents taking exercise, but an allusion to Fort George artillery hospital will show certain accidental advantages in this respect. The floor of the wards is on a level with the ramparts, which lie against the rear of the hospital, and looking far out on the esplanade afford a cheerful and airy place of resort for the patients. There is also space on the other side of the hospital where the convalescents take exercise without being able to reach the barracks unobserved. Trees have been planted during the last two or three years. Fort George, as well as being the artillery quarters, was till lately the depôt of all the company's European troops. An invalid, though he may not require treatment, is never allowed to live in barracks excused from all duty. If he is not fit for light duty, he is always kept in hospital. 21. The arrangements made for the treatment of soldier's sick wives and children are quite equal to those of the men, and at present quite satisfactory. 22. There are no special local hospital regulations enforced which are not included in the general presidency medical regulations. 23. In matters appertaining to the sanitary state of the hospitals, to repairs in buildings, to change of diet, and to medical comforts within the hospitals at stations, camps, and on march, the medical officers have full powers, subject to the sanction and control of the deputy inspector-general of hospitals of their division. 24. There are no convalescent wards or hospital for convalescents at the stations, and allowing men convalescent in barracks does not answer well. Patients are better kept in hospital till they are fit for duty.
XIII. Burial of the Dead.	1. There are four burial grounds used by British troops, viz., one Roman Catholic and three Protestant; of the latter two are more especially episcopalian and one presbyterian; they all lie on the ocean side of the island, and have nothing intervening between them and the sea beach, except the presbyterian, which is crowded in by native hospitals and dwelling houses all round. 2. The area of the burial ground in charge of the trustees of the cathedral church is 16,648 square yards, soil sand, subsoil sand; drainage good; decomposition rapid; the ground is well kept under trustees. 3. The regulations as to burial are as follows:—The graves are made according to the size of the coffins, with about 3 feet between them, and between 5 and 6 feet deep; in the monsoon water prevents any deeper digging, and in the dry weather the sides fall in; graves are now never re-opened, except to receive the bodies of relatives of the family. The whole ground has, however, many times been covered with graves. Compulsory interment ordinarily takes place within 24 hours; when necessary, within 12 or even 6 hours. The same rules are in force with reference to burial grounds used by native troops. 4. The grave yard is never offensive. The practice as regards the burial of British troops is this, viz., the bodies of non-commissioned officers and privates are taken from the place where they died direct to the burial grounds. Those of commissioned officers first to the church, and then to the burial ground; all funerals take place in the cool of the morning and evening. 5. The dead of the camp followers or bazaar people are burnt; some few, including Mussulmen, are buried. 6. No injury to the public health accrues from the present practice. 7. I could not suggest any improvements in the way of regulation or otherwise in the burial or disposal of the dead.

(Signed) C. S. Stuart, Brigadier.
J. J. Hamilton, Deputy Inspector General of Hospitals.
Edm. Southey, Captain, Garrison Engineer.

1st May 1860.

MHOW.

Accommodation	Queen's Troops	Artillery	300
		Cavalry	400
		Infantry	1,400
	Native Troops	Infantry	1,600

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is undulating, partly cultivated and partly covered with small bushes. It is hilly and dry. There is no wood, jungle, or water in the immediate vicinity. 2. The elevation of the station above the sea is 1,862 feet, and from 100 to 200 feet above the adjacent country. Two rivers, dry in the hot season, bound the cantonment. The nearest river is the Nerbudda. There is no canal, nullah, nor marsh near the station. The edge of the Ghaut is higher than the station, but no better site for the camp exists. 3. The station is on table land. The edge of the Jam Ghaut, 12 miles distant from Mhow, is 2,328 feet above the level of the sea. 4. The Nerbudda is the nearest river; it is 27 miles distant at Burwai, the nearest point. The river does not overflow its banks. There are ravines and broken ground near the station. 5. It is open and freely exposed to winds, and nothing interferes with the ventilation. The temperature is not raised by the buildings being exposed to reflected sun heat. The station is exposed to variable winds, which, in the cold season, are cold and northerly. The pre-

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BOMBAY.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY—*cont.*	vailing wind, however, is from the west, and is more agreeable to the feelings and more healthy than from any other quarter. 6. The country is only partly cultivated near the camp. There are no works of irrigation nearer than 12 miles. Rice is not cultivated in Malwah, nor any hemp nor indigo near the station. 7. Indore, 14 miles distant, is the nearest city. 8. The geological structure is a trap formation, with a surface of water-worn pebbles and clay. Morum and black soil are found in the depressions; the latter is seldom more than three feet in depth. No former town existed on the site of the cantonment or near it. 9. During the dry season water is usually found at from 40 to 50 feet below the surface, and in the rainy season at from 10 to 15 feet. 10. The rainfall runs off readily. There is no adjacent high ground, the drainage from which passes into the subsoil. 11. The water supply is derived from wells, and there are no tanks near the station. 12. The supply of water is not plentiful, but it is good. Its composition varies in different wells; but good, pure, and wholesome water can always be procured. It has not been examined microscopically nor chemically. It is drawn and distributed by bheesties in the usual manner. No better water is to be obtained near the station. 13. There is no other topographical point of consequence to be mentioned. 14. No new stations have been selected within the Bombay Presidency for the last 20 years.
II. CLIMATE.	1. The means and instruments available for meteorological observations are the pluviometer, barometer, and thermometers, with wet and dry bulb. 2. The following Table gives the observations from April 1859 to March 1860:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain Inches.	Winds. Direction.	Winds. Force.	Day of Sunshine.
	Inches.	°	°	°	°				
January 1860 - -	28·2	70	10	75	65	The fall of rain last year was between 17 and 18 inches. The average fall is supposed to be about one-third more.	N.E.	Moderate.	Not observed.
February „ - -	28·1	71	9	77	68		E., N.W.	Moderate.	
March „ - -	28·1	80	11	85	75		W., N.W.	High wind.	
April 1859 - -	28·1	86	13	92	79		N.W.	High wind.	
May „ - -	27·9	87	17	95	78		N.W.	High wind.	
June „ - -	27·8	74	17	85	64		N.W.	Monsoon.	
July „ - -	27·7	82	7	86	78		N.W., and variable.	Monsoon.	
August „ - -	27·8	75	3	77	74		N.W.	Monsoon.	
Sept. „ - -	27·9	75	4	78	73		N.W.	Moderate & calm.	
Oct. „ - -	28·0	77	7	81	74		N.W., N.E.	Calm.	
Nov. „ - -	28·1	75	5	78	73		E.S.E.	Calm.	
Dec. „ - -	28·1	71	6	74	67		E·N.E.	Calm.	

Thermometer kept in a substantial building, highest 98°, lowest 62°, aneroid barometer.

3. The climate has always been considered good, dry, and cool. Few trees have been planted lately, but in some parts of the camp there are fine old trees. Except in gardens, there is no irrigation. The atmosphere is seldom loaded with dust. The health of the troops is affected at the change of the season, when fevers and bowel complaints prevail. The diet should be generous, without being over-stimulating, and with a good proportion of vegetables. The shelter is as yet imperfect, but is improving. The loose clothing is a great improvement. Drills, duties, and exercises are not excessive, and the drills are suited to the season of the year. The monsoon month, and more especially towards its termination, when fevers and bowel complaints prevail, are the most unhealthy. The end of the cold season and the beginning of the hot are the most healthy.
4. There is no adjacent district more conducive to health than the station.
5. The stations I have served on are Sholapore, Poona, Kurrachee, Baroda, and Aden, in the Bombay Presidency, and Peshawur and Gwalior in Bengal. Sholapore and Poona were the most healthy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Maps and plans.
4. The barracks at present occupied by the troops being temporary buildings, it is impossible to fill up the annexed form correctly.
5. The windows are on opposite sides of the rooms, and open windwards. There is a verandah 10 feet wide on an average. It is not occupied as sleeping quarters. There are properly constructed jalousies or jhilmils.
6. The regulation bedstead, used by the troops at Mhow, consist of 3 plain boards, each 6½ feet long, 10 inches broad, and 1 inch thick, supported on 2 iron trestles 18 inches high. For durability, cleanliness, and comfort, it is considered they cannot be surpassed. The bedding consists of 1 pair of blankets or cumblies, 1 cotton rug, 1 cotton quilt, 2 cotton sheets, 1 cotton pillow with 2 pillow-cases. This bedding is found not to be sufficiently warm in the cold season. Instead of 2 cumblies, 1 good English blanket should be substituted; and mattress and pillows of hair, or cocoa-nut fibre, would be preferable to those now in use.
7. The structure and dimensions of the tents used in camp are as follows:—

—	Cubic Contents.			Superficial Area.			Cubic Space per Man.	Superficial Space per Man.	Number of Men in each.
	Yds.	Ft.	Ins.	Yds.	Ft.	Ins.	Feet.	Feet.	
European hospital tent, double walled -	74	5	1,516	33	5	9	100	16	20
Native hospital tent, single walled - -	75	23	756	39	5	36	102½	16	20
European soldier's tent, double poled -	72	8	1,219	37	6	72	89	15½	22
European soldier's tent, single poled -	39	13	1,152	19	6	128	81	13¾	13
Native soldier's tent, double poled - -	48	23	1,368	31	1	74	66	14	20
Native soldier's tent, single poled - -	19	17	720	11	7	12	53	10	10
Staff Serjeant's - - - - - -	22	1	0	11	6	9	594	105	1

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. Ventilation is obtained by openings in the roof of the barracks, and is sufficient to keep the air pure by night as well as by day. The climate of Mhow renders any contrivance for cooling the air unnecessary. 9. The troops are at present in temporary barracks, constructed with either burnt or sun-dried bricks, and with tiled or thatched roofs. 10. The floors are of lime, raised 1½ feet above the surface of the soil on an average. There is no passage for air beneath. 11. The new barracks will be constructed with stone, a better material than brick for resisting heat. The executive engineer is responsible for the buildings. The officer in command for the general sanitary state. The repairs are made quickly, and the barracks are cleansed and lime-washed every 9, 10, or 12 months, seldom at longer intervals. 12. The baths are drained into a cesspit, and the water taken away by bheesties. Three wash-houses of this description are in camp. 13. The cookhouses are temporary buildings drained in a similar manner. No conveniences for washing linen exist in the Mhow cantonment. 14. The contents of the privies are removed behind. Some of the urinals have cesspits similar to the washhouses. 15. All the buildings are ventilated by openings in the roof. They are generally sufficiently light in the day, and at night oil lamps are supplied. 16. No made drains or sewers exist, but the buildings are on sloping ground. They are kept clean by meaps of carts and bheesties. No part of the barracks or hospital is damp. The drainage is received into cesspits in some instances and removed. None of the cesspits are nearer the wells than 200 yards. They are 50 feet from the nearest quarters, and are cleaned every morning. There are no foul ditches. 17. The surface cleansing is done by the barrack-master, who has an establishment *constantly* employed for the purpose. 18. The surface of the cantonment is kept free from vegetation. There are no old walls, hedges, &c., interfering with ventilation. 19. From the fact of there never being any sickness in the bazaar of a serious nature, it does not appear that the sanitary measures at present in force could be improved on. The drainage is good, and water plentiful. The ventilation would be better if the street had been built endways towards the prevailing wind, instead of laterally. Sweepings of all descriptions are put into heaps and carried away by the conservancy carts. The houses are for the most part well built and airy. There are no dungheaps or cesspits within them. No nuisance is experienced from wind blowing over the native dwellings. 20. Animals are slaughtered well to leeward of the station, about half a mile. The kites and vultures carry off the offal, and the place is clean and no nuisance experienced from it. 21. Any horses belonging to residents in the bazaar are picketed in or near the Dhurrumsula. There are no horses attached to the bazaar. The manure heaps are carried away by the conservancy carts. 22. The horses are placed to leeward of the men's barracks. Those of the cavalry and artillery are not in stables. Dungheaps are a quarter of a mile distant. It is sold to the brick-makers, and by them removed. 23. Married soldiers are in temporary patcherries.
Officers' Quarters.	1. The officers' quarters, which are in low situations, are damp during the rains. The houses are well ventilated and generally healthy. The dampness in some parts of camp during the rains might in some measure be obviated by improved drainage, and this measure is about to be carried out.
IV. Health of the Troops.	1. The station, the district, and the adjoining native population are healthy. 2. The prevalent diseases are fevers, with occasional spleen affections, small-pox, and occasionally cholera. 3. I attribute the healthiness of the natives to the elevated site, dry and cool climate, and the abundance and cheapness of the necessaries of life. 4. The European part of the garrison is recently from Europe, and these enjoyed good health. They arrived in good health, and have suffered chiefly from fevers and bowel complaints since arrival. There is a deficiency of accommodation at the station, but no part is considered more unhealthy than the rest. 5. The troops are never camped out. 6. I have never been in charge of tropical hill stations, and have no experience of them. 7, 8, 9. As stated above, I have no experience. 10. Great precautions must be necessary for troops at hill stations, but I cannot speak from experience. 11, 12, 13. No reply. 14. Undoubtedly it would be desirable to locate troops on the hills as much as possible. 15, 16. No experience. 17. There is no higher ground near this station which could be advantageously occupied. 18. A friable, light, porous soil is the most healthy for stations. 19. A mature age is the best for soldiers proceeding to India. Troops are disposed of on arrival in every respect as the regiment to which they are posted. At the sea port on first landing they have not always these advantages, and suffer accordingly. The best precaution for preserving the health of recruits, if the season will permit of it, is to remove them as speedily as possible and send them to join their regiment. 20. If there were proper intermediate stations, it would be well to locate troops in them for a time before proceeding to India. They should be prepared gradually to encounter the heat of the plains. 21. The mode of transport for troops from the port to the interior varies. Some must proceed by water, others by land, to join their regiment, according to the station it may be at. 22. If every European soldier has the benefit of a furlough to Europe after 10 or 12 years, he will complete 20 years' service with ease. 23. I never saw any bad consequences arising from difference of opinion on medical boards. The majority always forms a fair judgment. 24. The spring is the best time for invalids to leave India for home.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.* *Diseases.*	1. There are inspection parades once a week for the discovery of disease. 2. There is no considerable amount of scorbutic disease at this station. I attribute its occurrence to a deficiency of vegetables and fruits such as European soldiers are accustomed to and care for; and I recommend potatoes as the best anti-scorbutic, and which soldiers never tire of, to be issued as part of the ration throughout the year. 3. The sea-side predisposes less to hepatic diseases than high and dry climates. Stimulating food and drink also predisposes to them, and these form strong reasons for improving the vegetable portion of the ration, and substituting malt liquor for ardent spirits. The proportion of hepatic disease to other diseases usually under treatment is 3 per cent. 4. Dracunculus is rare, and not of much importance at this station. 5. Venereal cases have been as high as 60 per cent. of the sick, and as low as 8 per cent. Lock hospitals, with a good conservancy police, should be established wherever there are European troops. 6. Troops at this station suffer both from epidemic and endemic disease, chiefly the latter. Cholera, however, often appears as an epidemic, and also small-pox. Fevers are intermittent and remittent, and occasionally continued. Dysentery prevails to no great extent, and is endemic; it yields about 2 per cent. of treated and 5 per cent. of deaths. Cholera appeared epidemically last year, but not in any alarming degree. One half per cent. of cases treated, and 25 per cent. of deaths. Small-pox is neither observed as an epidemic nor endemic disease. Rheumatism is about 4 per cent. of treated and 4 per cent. of deaths. 7. The more frequent zymotic diseases are febrile complaints and disorders of the alimentary system. Fevers prevail from June to November; bowel complaints from July to October. A high temperature precedes their appearance, and damp weather, with considerable alternation of heat and cold accompany them. The station has always been considered a healthy one, and zymotic diseases are never unusually prevalent. The sanitary condition of the native dwellings in the bazaar and elsewhere may be considered satisfactory; the water supply, cleanliness, and drainage are well attended to. The crowding of native houses is always great, and their ventilation might be improved. There is nothing remarkable in the habits of either troops or natives to predispose them to zymotic disease. 8. Epidemic disease is always aggravated by irregular habits, crowding in barracks, and inferior accommodation, and the barracks here are very indifferent. 9. Quinine has not been given as a prophylactic against malarial disease. 10. Every caution is now taken in preserving cleanliness, improving the ventilation and drainage, and above all in providing the troops with proper shelter from the elements; and these should all be sedulously persevered in. Proper barracks are now in course of erection.
V. INTEMPERANCE.	1. There are no incorrigible drunkards at this station, although a few men are much addicted to drinking. 2. There are no data from which a table could be prepared to show the proportion of admissions to hospital caused directly or indirectly by intemperance. Drunkenness is punished as an offence. 3. Spirits are sold at the canteen to European soldiers, and in the bazaar are only permitted to be sold to natives. Europeans are permitted to purchase two drams of arrack daily at the canteen. Spirit is not used as part of the soldier's ration, but he is allowed to purchase in quarters from the canteen, and from the Commissariat when there is no canteen. No spirits are issued before the usual dinner hour. Spirits are not given as a ration to convalescents. No other drinks injurious to health are sold at the canteen or bazaar. 4. Spirits are seldom under any circumstances conducive to health, and not rarely very injurious. They are not conducive to discipline. 5. It would be very beneficial to restrict or abolish the use of spirits; malt liquor is far better. 6. Malt liquor or wine would be certainly beneficial as compared with spirits. 7. Coffee, tea, and soda-water are in general use, and their influence is beneficial to health and discipline as compared with spirits and malt liquors. 8. It would be beneficial to suppress altogether the spirit ration. 9. It would be beneficial to permit only beer, tea, coffee, lemonade, &c. to be sold to the troops. 10. I would recommend the substitution of malt liquor for spirits. 11. No spirits are allowed on any account to be issued at the canteen before the dinner hour; no man is allowed more than two drams per diem, and these two drams are never to be issued at the same time. The maximum issue of malt liquor to any one man is three quarts per diem without spirits, or two quarts with one dram of spirits, or one quart with both drams. The liquor contractor in the bazaar is compelled to keep up a preventive police in the bazaar and cantonment to prevent liquor being sold to European soldiers, but soldiers will contrive to obtain spirits in spite of every precaution.
VI. DIET.	1. The composition of the ration for British troops is,—1 lb. of bread, 1 lb. of meat, 4 oz. rice, 2½ oz. sugar, ⅔ oz. of tea, 1 oz. salt, 1 lb. vegetables, 3 lbs. firewood. Mutton is usually issued twice a week and beef five times. The quartermaster, orderly officer, and the quartermaster-serjeant inspect the rations daily. 2. A complete ration with vegetables is provided, but does not include fruit. No stoppage appears in the mess accounts for the above, but its value is estimated at 5*d*. The soldier has three meals daily, viz., breakfast, consisting of bread and tea, at 7 a.m.; dinner, consisting of bread, meat, and vegetables, at 1 p.m.; and tea, consisting of bread and tea, at 4 p.m. The proportion of vegetables is 1 lb. when procurable; at present they are scarce, and a half a pound is issued with a half a pound of flour. 3. During the cold weather, when vegetables are procurable, the rations are all that could be desired, and being cooked in messes, the soldier could not dispose of any part of them without detection. 4. The Commissariat supply copper kettles and saucepans for cooking, and the men pay for their cooks eight annas per mensem. There are two master cooks, two assistants, and four boys per company. The kitchens being temporary are indifferent. Water is sufficiently supplied. The food is cooked according to the wish of the men of the mess. It is properly done, and tea and coffee are to be had at coffee shops in the lines, of which the men avail themselves. They are seldom able to procure refreshment before a march.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. Water is not sufficiently abundant for the cultivation of gardens, except in low situations at a distance from the barracks. If there were gardens the men would work in them themselves, and if necessary might subscribe a small sum monthly for seeds, &c. A small allowance from the canteen fund would cover all expenses after the garden had been established.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of cloth tunics, woollen trousers, and forage cap; shoulder and waist belt, two pouches, knapsack, havresack, and water bottle; serge frock, khakee clothing and wicker helmet, ammunition boots, great coats, &c. I consider the dress suitable to the climate. During the rains and cold weather woollen clothing is worn, and khakee during the hot weather. European soldiers are never exposed in cantonments to the sun or rain.
Duties.	1. The men should be thoroughly drilled at home or in a more temperate climate than that of India. 2. The usual routine is one hour's drill daily at sunrise, except on the garrison holiday, Saturdays and Sundays. Occasional evening parades, with drill in the cool weather. The above does not appear to be injurious to the health of the men. The best hour for drill is at sunrise, and for marches, during the night and early morning. There are general orders respecting these. The men have on an average seven nights in bed. 3. Guards mount as far as half a mile from barracks; they usually last 24 hours. Rolls are called at morning parade, breakfast, dinner, tea, and tattoo. The barrack rooms are also visited during the night by the orderly serjeant to see if the beds are occupied. Night guards are not injurious when they do not come oftener than once a week.
VIII. Instruction and Recreation.	1. There is a ball court in the R.H.A. lines. Each corps has a skittle ground, but only the R.H.A. one is built by Government. There is a school, but the schoolmaster of the Bombay Artillery is untrained. There is a library and reading room, but the 3rd Dragoon Guards is the only corps which has the reading room well lighted at night. There are no day rooms, clubs, or gardens. There are regimental artificers, but no regular established workshops, except in mounted corps. There is a station theatre, but no gymnasia. There is not sufficient employment to keep the men occupied in wet weather or during the heat of the day. They are not allowed to go out in the heat of the day, and are generally healthy. 2. I would recommend that there should be ball alleys to all the barracks, with covered skittle alleys. Reading rooms well supplied with newspapers and lighted at nights. 3. The present system of savings' banks answers well. 4. The space in the verandah is insufficient for exercise, and there are no trees near the barracks.
IX. Military Prisons.	1. The military prisons in the cantonment are temporary buildings. Cells properly ventilated are to be constructed; those at present in use are not well ventilated, and are ill adapted for the purpose.
X. Field Service.	1. There are no local regulations of any consequence in regard to field medical service. 2. The medical officer has the power of objecting in regard to the line of march, camping, billeting, &c. 3. In the late campaign rules were proposed for the preservation of the health of the troops in camp by the principal medical officer, and sanctioned and published for general information by the general officer in command. 4. The orders relative to field hospitals are bad. For the transport of sick and of hospital supplies they are excellent. Copies of all regulations bearing on these matters will probably be furnished by the director-general.
XI. Statistics of Disease and Mortality.	1. The following Table gives the sickness and mortality of British and Native troops:—

MHOW.

European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1857-58	Detachment H.M. 14th Light Dragoons. Detachment H.M. 86th Regiment	148	59	—	—	—	16	—	14	1	42	—	2	—	21	8	94	1	248	10	167·5	6·7
1858-59	7-11 Royal Artillery Detachment H.M. 17th Lancers H.M. 71st Highlanders H.M. 72nd do. H.M. 92nd do. H.M. Depôt	900	826	2	2	—	76	2	46	5	281	10	16	2	1	—	808	1	2,056	22	228·4	2·4
	European Troops in the Indian Army.																					
1857-58	1st Troop Horse Brigade 4th Company 2nd Battalion Artillery Detachment 3rd European Regiment	38	9	—	—	—	3	—	1	—	16	—	1	—	—	—	38	—	68	—	178·9	—

Native Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1857-58	Gun Lascars, 4th Company, 2nd Battalion Artillery. Detachment Sappers and Miners 25th Regiment Native Infantry	207	64	—	—	—	2	—	—	—	32	—	1	—	6	3	75	—	180	3	86·9	1·4
1858-59	3rd Regiment Light Cavalry Detachment Southern Mahratta Irregular Horse. 4th Company 4th Battalion Artillery 4th Regiment Native Infantry 19th do. do. 23rd do. do. Native details	1,792	1,158	9	36	—	68	5	16	2	253	4	16	—	—	—	1237	6	2,784	26	155·3	1·4

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 1860.

W. C. Coles, Assistant-Surgeon,
Secretary.

MHOW. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. The building used as a hospital by the 72nd Highlanders was formerly used for native soldiers, and the hospital of the 3rd Dragoons was formerly an officer's dwelling house. They will both be abandoned as soon as proper hospital accommodation can be provided. To give any detailed description of them would be therefore superfluous. They are about 100 paces to leeward of the barracks and stables, and about 300 yards from the bazaar. The site is tolerably open, but is low and indifferently drained, though at a good distance from any river or nullah. 3. The water supply is abundant. 4. Refuse water is carried off by surface drains. 5. The wards are scarcely at all raised from the ground in one hospital, and in the other about two feet, but there is no perflation of air underneath the floors. The roof water runs into the surface drains. There are open drains, which are sufficient to carry away the rainfall. The walls of the hospitals are of sun-dried bricks and mud. The roofs are thatched. Both being thick, the hospitals are tolerably cool. They have verandahs about 10 feet wide, which afford sufficient shelter. The verandahs are sometimes used for the accommodation of sick, but never when it can be avoided. The hospital consists of one flat. The date of construction is unknown. There are 2 wards, and the number of beds is uncertain. The hospital is not judiciously placed. The windows open inwardly, and when open permit free ventilation. 6. They are ventilated by opening the doors and windows. One building has cowls in the roof. There are no jalousies or jhilmils. 7. There are no punkahs, but kuskus tatties are used in the hot season. 8. No means of warming are required. The walls and ceilings are limewashed every three months. 9. The privies and urinals are at one end of the buildings, running to leeward. Deodorizing agents and effective sweeping prevent their being offensive. 10. The lavatory arrangements answer the purpose, but are all of a temporary description. 11. The means of bathing is by tubs, and is sufficient. 12. The linen is washed by washermen at a distance from the hospitals. 13. The storage is dry and sufficient, but all is temporary. 14. The bedsteads are iron, the mattresses stuffed with rice straw; sheets and blankets are provided, and are all good. 15. The kitchen is conveniently situated, but temporary, like the rest. The cooking apparatus is sufficient; the diets are well cooked, and can be sufficiently varied. 16. Diet tables, &c. will most likely be furnished by the Director-General. 17. For attendance on the sick there is a hospital serjeant and ward boys, who make excellent nurses. 18. The hospital is healthy, and no epidemic diseases, gangrene, or pyœmia have had their origin in it. 19. I have already mentioned the improvements required. 20. In such hospitals as these no arrangements could be made for convalescents taking exercise. There are no suitable fenced nor shaded walks and no seats. 21. The sick wives and children of soldiers are always treated in female hospitals, but here there are none. As neither the dragoons nor Highland regiments have their families with them, the want is little felt. 22. There are no special local hospital regulations worth sending. 23. In regard to repairs, alterations, and improvements, the medical officer can only recommend. In regard to diets and medical comforts, nobody but his professional superior can interfere in the field or in camp. 24. Convalescents are kept in hospital till fit for duty, but not in separate wards.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is within the cantonment limits, but situated on the S.E. side of camp, to leeward of the prevailing winds. 2. Its area is 17,100 yards laid morum, subsoil decayed trap; it is situated on sloping ground, and the drainage good. Decomposition does not take place readily, as the soil is impregnated with lime. 3. The grave space allowed is what is necessary, so that no ground be wasted. Two feet is the interval between the graves. The depth depends on the soil; 4½ feet deep is the average. Graves are never reopened, and only one interment takes place in each. Early decomposition prevents the body being kept longer than from 24 to 30 hours. On one occasion during an epidemic, funeral parties attended twice a day at hospital, and took away all bodies they found in the dead house. Native dead are soon removed. 4. The graveyard has not been observed to be offensive. Funerals take place at sunrise and sunset. If notice be received before 3 p.m., the funeral takes place in the evening; if after that time, in the morning. 5. The dead of camp followers and bazaar people are buried and burnt. 6, 7. The present practice is the best that can be pursued, and I have no improvements to suggest.

(Signed) R. W. HONNER, Brigadier, commanding Malwa Division.
F. S. ARNOTT, M.D., Superintending Surgeon, M.D.A.
G. J. MELLISS, Lieut. Executive Engineer, M.D.

SATTARA.

Accommodation	European Troops	Artillery	88
		Cavalry	352
		Infantry	200
	Native Troops	Artillery	No accommodation.
		Cavalry	Ditto.
		Infantry	1,000

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is in a valley, the surrounding hills bare at their summits and bases, lightly and partially wooded on their slopes. It is intersected by two rivers, well cultivated (crops light) and moderately wooded. It has a general slope from the base of the hills, where the soil (the débris of decomposed rock) is dry and poor. In the flat part of the valley and near the river there is black soil, but no swamp. There are trees scattered or in clumps and single, but no jungle. Besides the water of the rivers, there are a few small tanks and nullahs here and there dammed for irrigation (which is very limited).
	2. The elevation of the station above the sea is 2,320 feet. The general valley level is about the same, the surrounding hills varying from 600 to 1,500 feet higher. The nearest notable amount of water is that of the river, distant a mile at the nearest point. There is a nullah running through, and another forming a boundary of the camp, but both are dry in the hot weather. There is somewhat higher ground a little beyond the camp, to be preferred to any other as a site for barracks in my opinion.
	3. The fort hill is distant about 1½ miles from the station. It is 1,000 feet high, with an area on the top of about one-eighth of a square mile. Utishwur, a spur of the Mahableshwur range, is 1,500 feet high.
	4. A nullah runs through camp, dry in the hot weather, and the river is within a mile. Inundation is unknown. There are no ravines or broken ground which can be considered prejudicial to health.
	5. The station is quite open, the hills being too distant to obstruct ventilation. The temperature of the station is not raised by reflected sun heat: but the barracks are hot, being temporary and kutcha. The station is subject to land winds (E. and N.E.) and to the sea breeze (W.S.W.), the latter modified by distance from the ocean; both prevail with tolerable regularity, according to the season and time of day, and neither seem to exert any marked influence on health generally, but the former prevailing at night is sometimes charged with a small amount of marsh poison from the river, as has been lately evidenced.
	6. The surrounding country is cultivated. There are no works of irrigation near the station worthy of note, and garden irrigation only very near the camp. Irrigation in its present extent is not believed to have any effect on the health of the station. There is no rice cultivation, and neither indigo, hemp, nor flax are grown in the district.
	7. The city of Sattara, with a population of 30,000, is within 2 miles.
	8. The whole of the district is of "trap" formation, the sides of the hills presenting many parallel and horizontal layers of basalt and amygdaloid, capped here and there with laterite. The station is situated on the hard swelling flank of one of the hill ranges, and occupies new ground.
	9. In the dry season water is usually found at a depth of from 15 to 45 feet, and in the rainy season at from 5 to 10 feet.
	10. The surface water flows readily away: the slope is great and the soil hard. There is no drainage from higher ground passing into the subsoil of the station. There is no water bearing subsoil.
	11. The water supply of the station is derived principally from wells, but there are two or three small tanks, which, as well as the wells, are all in rock. The extent of tank surface is 29,165 square yards, or about 6 acres. The tanks are filled during the rains, and fall low towards the hot weather, and are then nearly, if not quite, dry. There are a few aquatic plants in the tanks not requiring botanical description, and the only animal to be noted is the guinea worm. No tank used for drinking purposes is used also for bathing, nor are the wells in general use rendered impure by decaying vegetable matter or surface drainage. No nuisance or malaria proceeds from any tanks within or without the station.
	12. The water supply consists of about 15 wells and 3 tanks, and the nullah running through camp, which affords water for bathing 8 months in the year. In most of the wells the water is colourless, somewhat hard and inodorous. Its chemical composition or microscopic character have not been ascertained. As a rule, it is rather hard, though soft in the monsoon, good enough not to be injurious to health, and sufficiently abundant in most years. It is raised by means of buckets and ropes. The quantity and quality of the supply could be improved by bringing water from a large reservoir on the neighbouring range of hills, and surveys for a project having this end in view are already half complete, but their further prosecution is delayed for the present, owing to the suspension of public works.
	13. A malarious fever has prevailed this hot season, the marsh poison cause of which could only have proceeded from the river. This is the most important if not the only influence bearing on the health of Europeans at this station to be considered.
	14. I do not know the kind of data, or by whom collected, on which are founded the establishment of new stations. I think, however, that common sense and local experience, as well as scientific knowledge, should be made available on these medico-military occasions.

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References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. The means available for conducting meteorological observations at the station are the common thermometer, rain gauge, and weather-cock in the cantonment, and in addition to these a hygrometer and barometer in the civil hospital. 2. The following table contains the observations :—

Years of Observation from 1855 to 1859 (4 years).

Months.	Barometer Mean.	Mean Daily Temp.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.
	Inches.	°	°	°		°	°	Inches.			
January	27·874	70·4	81·	62·7	—	64·3	107·6	·6	S.W. & S.E.	—	—
February	27·849	74·7	81·5	66·5	—	67·4	108·8	None.	S.W. & E.	—	—
March	27·825	78·1	85·2	71·5	—	68·02	106·	·08	S.W. & E.	—	—
April	27·763	81·4	88·4	74·8	—	68·9	112·	·95	S.W.	—	—
May	27·716	80·6	85·	73·8	—	72·3	95·4	3·34	S. & S.W.	—	—
June	27·639	76·2	79·8	73·2	—	72·3	83·4	5·04	S. & S.W.	—	—
July	27·631	75·5	75·2	71·2	—	71·02	75·4	13·06	S.W. & W.	—	—
August	27·685	73·02	74·7	70·7	—	70·5	—	7·08	S.W. & W.	—	—
September	27·729	74·05	77·2	70·7	—	71·02	82·8	3·08	S.W. & W.	—	—
October	27·796	74·5	75·	69·2	—	69·7	82·8	4·65	S.W. & S.E.	—	—
November	27·856	73·9	79·7	65·	—	67·3	101·4	·57	S.W. & W.	—	—
December	27·866	70·9	79·	61·7	—	64·7	103·6	·59	S.W & W.	—	—

The above is filled in from the records of the civil hospital, which afford a more extended period of observation (including that of the barometer) than those of any hospital in camp. I think they must not be valued beyond an "approximation," but an extract of observations under Surgeon Murray, quite trustworthy, is appended. See opposite page.

3. The climate, generally considered, is good for three months. The air is hot and dry, but not very exhausting. In the rains, it is fresh, not damp or chilly, and the temperature very equable. The cold in the winter months is not invigorating. I think there are no influences (except the river in some years) prejudicial to health. The station is proved to be healthy for natives, and with good and well-placed barracks, would be no less so for Europeans. Light early morning drill is desirable in the hot weather. As to diet, clothing, &c., there is nothing special required by the climate.

From June to December, comprising the rains and the beginning of cold weather, is the unhealthy season for natives, when fever, bowel complaints, and rheumatism prevail. October, with the hot months of March, April, and May, are unhealthy for Europeans, when they suffer from fever principally of a mild type.

4. There is no district on the same level as the station more conducive to health, and the hill sites, adverted to under Topography, are not habitable all the year round.
5. The stations on which I have served are the following:—Bombay, Shikapore, Sukkur, and Hyderabad (in Sinde), Surat and Deesa (in Guzerat), Sattara (in the Deccan). Of these stations, according to my experience, Deesa is the healthiest.

III. SANITARY CONDITION OF STATION.

1, 2, and 3, maps and plans.
4. The following table gives the accommodation in the barracks:—

Date of construction of barracks, January to July 1858.

Total number of rooms, 13.

Total regulation number of non-commissioned officers and men, 520.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
				To wall plate.	Including vacuity of roof.			About		Feet.	Feet.
13	40	100	20	10	29,000	735	50	2 feet.	18	4½	3
Guard Room	1	25	12	10	3,900	557	43	2 „	6	4½	3
Prison Cell	1	8	6½	10	676	676	52	2 „	1	2¾	2½

5. The windows are on opposite sides, and open as casements. There is a five feet verandah on both sides, and at the ends also. The verandah is never occupied as sleeping quarters. There are no jalousies or jhilmils.
6. The bedsteads for hospital patients are of iron. For the barracks, iron trestles with wooden boards. No bedsteads are used in tents. I have no improvements to suggest.
7. The tents used in camp are bell-shaped, with double flys. They are 14 feet 6 inches by 14 feet. The number of men, 13; superficial area per man 15.7.4; cubic space per man, 123. 7. 5. Double poled tents, with double flys, are 22·6 feet by 14 feet 6 inches, to contain 22 men. Superficial area per man 14. 9. 11; cubic space per man, 124.
8. There is no appliance in the barracks for ventilation, which is not sufficient unless the windows are opened. No means are used for cooling the air.
9. The barracks have wattle and dab walls, and grass thatches, and are of a merely temporary construction. Tents are made of cotton cloth.
10. Floors are constructed of beaten earth. They are raised from one to five feet above the ground, according to the slope of the surface, and there is no passage of air beneath.

A SYNOPSIS of Four Years' METEOROLOGICAL OBSERVATIONS (from 1st January 1844 to 31st December 1847), at SATTARA.

Latitude 17° 40′ N., Longitude 74° 2′ E. Height above the sea, 2,320 feet.

Months.	In-door Temperature. Means. Mean Temperature.	In-door Temperature. Means. Mean Daily Variation.	In-door Temperature. Means. Mean Daily Maximum.	In-door Temperature. Means. Mean Daily Minimum.	In-door Temperature. Means. Difference of Mean Temperature of successive Months.	In-door Temperature. Extremes. Extreme Daily Range.	In-door Temperature. Extremes. Extreme Monthly Range.	In-door Temperature. Extremes. Extreme Maximum.	In-door Temperature. Extremes. Extreme Minimum.	Out-door Temperature in the Shade. Means. Mean Temperature.	Out-door Temperature in the Shade. Means. Mean Daily Variation.	Out-door Temperature in the Shade. Means. Mean Daily Maximum.	Out-door Temperature in the Shade. Means. Mean Daily Minimum.	Out-door Temperature in the Shade. Means. Difference of Mean Temperature in successive Months.	Out-door Temperature in the Shade. Extremes. Extreme Daily Range.	Out-door Temperature in the Shade. Extremes. Extreme Monthly Range.	Out-door Temperature in the Shade. Extremes. Extreme Maximum.	Out-door Temperature in the Shade. Extremes. Extreme Minimum.	Humidity of the Air.	Rain Fall. Means. Mean Monthly Fall.	Rain Fall. Means. Mean Number of Rainy Days.	Rain Fall. Means. Mean Day Fall.	Rain Fall. Means. Mean Night Fall.	Rain Fall. Extremes. Extreme Daily Fall.	Rain Fall. Extremes. Extreme Monthly Fall.	Winds. Direction.	Winds. Force.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	Inches.		Inches.	Inches.	Inches.	Inches.		
January -	70·0	8·7	76·4	67·7	—	12·5	18·0	80·5	59·5	73·4	17·4	82·1	64·7	—	23·0	31·0	86·0	53·0	8·5	0·01	1 in 2 years.	—	0·01	0·03	0·03	E., S.W.	Modte.
February -	72·6	8·0	76·6	68·6	1·6	11·0	20·0	80·0	58·5	73·2	18·2	82·3	64·1	0·2	26·0	33·0	90·0	50·5	9·3	0·08	3 in 4 years.	0·08	—	0·18	0·18	E., W.	Fresh
March -	77·8	6·8	81·2	74·4	5·2	10·5	15·5	85·5	68·5	81·5	20·5	91·8	71·3	8·3	32·0	38·5	100·5	62·0	10·2	0·04	3 in 4 years.	0·01	0·03	0·07	0·18	E., S.W.	Modte.
April -	80·6	8·2	84·7	76·5	2·8	11·8	17·7	90·7	68·0	85·1	20·7	95·5	74·8	3·6	31·5	36·5	102·5	64·0	10·5	2·97	2	1·54	1·43	4·40	10·88	E., W., S.W.	"
May -	80·1	8·6	84·4	75·8	0·5	11·0	14·0	87·7	71·0	85·5	19·0	95·0	76·0	0·4	26·0	29·5	103·5	70·0	8·2	1·26	4	1·17	0·09	1·55	3·49	"	"
June -	77·8	4·6	79·3	74·7	3·1	11·3	15·5	86·0	70·5	75·9	7·6	79·7	72·1	9·6	22·0	22·0	93·0	69·0	4·5	7·53	20	4·66	2·87	2·09	10·39	E., W., S.W.	"
July -	73·8	3·1	75·4	72·3	3·2	7·3	10·0	82·0	70·0	73·6	4·6	75·9	71·3	2·3	7·5	11·0	91·0	60·0	3·5	10·44	24	5·18	5·26	3·41	16·04	W., S.W.	Fresh
August -	73·0	3·2	74·6	71·4	0·8	6·0	7·5	78·5	69·5	72·7	3·2	74·3	71·1	0·9	10·0	10·0	80·0	69·0	3·7	3·28	24	2·21	3·07	1·81	11·91	W.	"
September -	74·0	4·7	74·4	71·7	1·0	8·5	11·0	81·5	69·0	73·8	7·8	77·7	69·9	1·1	16·0	19·0	83·0	64·0	4·2	4·54	12	3·41	1·13	3·55	9·71	"	Light
October -	76·1	5·4	78·8	73·4	2·1	9·0	13·0	82·5	69·0	76·6	12·4	82·8	70·4	2·8	21·0	30·0	93·0	63·0	6·1	3·65	6	1·10	2·52	3·25	5·25	"	"
November -	72·0	7·0	75·5	68·5	4·1	13·0	19·0	81·0	60·0	70·9	14·0	77·9	63·9	5·7	21·0	25·0	85·0	58·0	7·6	2·74	2	0·33	2·41	4·61	8·00	E.	Modte.
December -	71·8	7·2	75·4	68·2	0·2	11·0	17·3	80·0	61·0	71·2	16·7	79·6	62·9	0·3	25·0	27·0	86·0	57·0	8·1	0·66	1	0·36	0·30	1·72	2·46	E., S.	"
Quadrennial Mean and Extremes	75·0	6·3	78·2	71·9	2·2	13·0	20·0	90·7	58·5	76·0	13·5	82·8	69·3	3·1	32·0	38·5	103·5	50·5	7·0	39·20	97	20·07	19·13	4·61	11·91	—	—

This gives the rain-fall in the city; the average annual fall in camp, distant 1½ miles, is from 6–7 inches *less*.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	11. The European barracks being temporary, are of course defective in all respects. The huts of the native lines are good enough. Barracks and cantonments are kept in repair by the engineer department, and are quickly executed. The commanding officer is responsible. There is no specific period for cleansing and lime-washing, which are performed, when needed, at intervals of from four to six months. 12. There are no baths. 13. The cooking is conducted by the soldiers' servants on wood fires. Water is brought by bheesties. Linen is washed and dried by dhobies (washermen). 14. The urinals and privies are not drained. They are cleansed in the manner usual in India, by a class of men called bhungies or sweepers. 15. The ventilation is spontaneous by the doors and windows. The barracks are lighted at night by oil lamps. 16. There are no sewers. The surface drainage is readily and efficiently carried off by open trenches. No part of the barracks or hospitals is known to be damp. There is no stagnant drainage. There are no cesspits. One nullah on the east side of the camp is occasionally offensive for short periods. 17. The system of surface cleansing (lately improved) is good. It is performed daily, and the refuse manure, &c., carried to a safe distance from and to leeward of camp. 18. The surface of the cantonment is kept perfectly free from vegetation. There are no old walls or hedges interfering with ventilation. 19. The sanitary condition of the bazaar is in every point good. A sufficient number of sweepers are employed, and a cart to carry away refuse, &c. No improvement has to be suggested at this station. There are no native houses near enough to require description. No nuisance is experienced from wind blowing over native dwellings. 20. Animals are slaughtered near a watercourse (nullah) to the eastward of cantonments. There are no regulations in force further than that they are obliged to be to leeward of camp. The offal is removed daily, and no nuisance is experienced from the slaughtering places. 21. There are no bazaar stables. The few tattoes in the bazaar are picketed in an open space in rear of the bazaar, and the manure is carted away daily. 22. There are no artillery or cavalry stables. The horses are picketed in double lines. The cavalry horse lines are distant about 100 yards from the men's quarters in a south-westerly direction. The artillery horse lines are distant from the men's quarters 60 yards, in an easterly direction. The dung is deposited in a nullah in rear of the barrack, at a spot which is 200 yards distant from the nearest barracks, and 600 yards from the hospital. 23. There is separate accommodation for the married non-commissioned officers and privates, and they do not occupy the barrack rooms with the men.
Officers' Quarters.	1. The sanitary condition of the officers' quarters (which are separate houses) is good. No general recommendation would apply to dwellings no two of which are alike.
IV. HEALTH OF THE TROOPS.	1. The district in which the station is situated is healthy. 2. The diseases most prevalent among the native population are fevers (chiefly mild intermittent), sub-acute rheumatism, and guinea worm. Spleen disease is rare; cholera prevails in some seasons. 3. I attribute the healthiness of the native population chiefly to the elevation of the district and the scanty vegetation of a somewhat poor soil. 4. Before coming to this station, the European troops were at Ahmednuggur. Their stay was 2 years and 11 months, and they left on the 12th July 1857. Their general health there was good. There is no record of the prevalent diseases. They arrived here healthy on the 25th July 1857, since which intermittent fever of a mild type is the disease they have chiefly suffered from. The native regiment had been at Baroda 3 years and 3 months, and left by wings on the 31st March and 25th April 1859. Their general health there was bad. The prevailing diseases, fever and rheumatism. They arrived here in an unhealthy state on the 27th April and 31st May. The men have suffered here from fever and rheumatism in the sub-acute or chronic form. The barracks (temporary as they all are at this station) occupied by the artillery stand on a low site, and are therefore nearer and more exposed to the malaria of the river. 5. The troops have never been camped out. 6. I have never been in charge of troops at a hill station. 7. My experience scarcely justifies an opinion in regard to the health of troops at hill stations. I once sent a few men from a troop of horse artillery to Mount Aboo, in whom little tendency to relapse was shown on their return. 8. I approve of selecting hill stations for troops. 9. I have no experience as to diseases peculiar to hill stations, but men there would doubtless be subject to capillary congestive forms of disease of both kinds (æsthenic in old soldiers with enfeebled organs). Dysentery and diarrhœa are said to prevail. 10. At hill stations, I should give diet according to the increased assimilating power, holding inflammatory tendency in view; and warm clothing, especially a flannel belt over the belly or any weak organ, with protection from the night air, avoidance of wet feet, and exercise strong enough to excite perspiration in the strong and increase action in the weak. 11. I have no experience, but am of opinion that the hot months are best adapted for the hill stations, to avoid cholera and exhaustion; September and October should be selected to avoid malaria. With my avowed inexperience, I could not define the time necessary for troops to obtain the full benefit of a hill station. 12. I think any period beyond the acquirement of moderate tonicity would be injurious. This period would apply differently to young and old soldiers. 13. The special precautions for protecting health on leaving hill stations are avoidance of sun, and all stimulating influences, diminished food, lighter clothing. 14. Long periods of residence on the hills, and short on the plains, would in my opinion most conduce to the health of the troops. Moderately frequent change of station in the plains is beneficial, and before intolerance of the climate contemplated in the transfer has been acquired (as from Guzerat and the coast to the Deccan). 15. Mount Aboo and Poorrendhur are the only hill stations with which I am acquainted, and in these the barrack accommodation is limited. 16. I have an opinion in regard to the level most suitable for hill stations, but no experience. 17. There is higher ground near this station at Utishwur, four miles to its summit from the station, accessible by a good enough road for beasts, but not carts. Its height is 1,500 feet

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	above the plain, with a climate described by occasional residents to be good; but I think the rain-fall is too great for residence in the monsoon. 18. I have found light surface and porous subsoils most healthy; black soil, as containing vegetable matter decomposing under heat and moisture, excepted. 19. I consider from 20 to 25 the best age for soldiers proceeding to India, and the best time of landing the beginning of the cold weather. I have no knowledge how troops are disposed of on landing, beyond a general one that the barracks at Bombay, into which most of the troops are at first received, are all bad, either in site or construction. I should recommend that troops should be sent straight to a plateau or hill station of moderate elevation. 20. If the Cape, Australia, or the Mauritius are the intermediate stations referred to for troops proceeding to India, they might be sent there now, but not; I think, when hill stations are organized. I should advise their being sent to hill districts on landing. 21. In Bombay, the mode of transporting troops to the interior is chiefly by land marching. The first great precaution is the selection of a proper season; the next to keep the men from liquor. 22. I consider about 15 years as the length of time for a soldier to serve in India. Longer, if the hill sanitaria plan is carried out. 23. In my own experience I have found no conflict of opinion on the subject of invaliding. If, however, opinion is invited as to other boards, I am strongly against them for passing recruits, and think that at least the final power of rejection should be vested in the regimental surgeon. 24. Invalids should leave India so as to arrive at home in early summer.
Diseases.	1. There are regular inspection parades of European soldiers for the discovery of incipient disease ordinarily once a week. 2. There has never been scorbutic disease amongst the European troops, and only an occasional case of taint amongst the present natives of the brigade. 3. The ratio of cases of hepatic disease to all others has been only 1·03 per cent. for three years. 4. The primary cases of dracunculus (that is not brought here) amongst the Europeans under observation have only been 0·62 per cent. on all others. Amongst the native troops it has been more common, and avoidance of the tanks and wells known to produce it is the only preventive I know of, and this cannot be carried out with the natives to any useful extent. 5. On a three years' estimate, venereal cases amongst the Europeans have borne a ratio only of 8·22 per cent. to all others, and no precautionary suggestions have to be offered as to this station. 6. As regards epidemic diseases, both European and native troops are most subject to fevers, chiefly mild quotidian intermittents. Dysentery is so rare as hardly to be called an endemic disease. The troops, European especially, suffer little from it. Cholera and small-pox prevail amongst the population most years; the troops are protected by prophylactic care and vaccination; they suffer little. The native troops suffer much from rheumatism, the Europeans scarcely at all. In the European battery, average strength 74 (the only detail susceptible of correct observation), there have been two deaths only, one from dysentery, and one from cholera; the ratios therefore would be of no practical use. 7. Very few zymotic diseases have come under my observation at this station; their invasion might be expected at the beginning and end of the rains: Cholera and small-pox generally prevail in the hot weather, when the air is hot and moist; in the station bazaar and native lines this class of diseases may be looked for. The former is small, and stands on a slope; the houses are not crowded, and no organic remains are allowed to accumulate. The lines are open; in both the best sanitary means available are in force. The troops and natives are for the most part cleanly in their persons, but the latter are opposed to ventilation in their dwellings. 8. Some of the soldier's duties and occupations favour epidemic disease, but there are no personal habits conducing thereto which cannot, I think, be controlled. 9. Doses of quinine as a prophylactic have been tried at the station to a small extent; I tried them some years ago on the malarial banks of the Indus without much effect. 10. The only morbific cause to be guarded against at this station is marsh poison, chiefly from the river. It is small in quantity, but brought by the night wind on the soldier at the susceptible time of sleep, producing fever, as has been evidenced this hot weather. This applies to the Europeans only, and might, in my opinion, be obviated by good barracks.
V. Intemperance.	1. The soldiers at the station to whom observation has been extended are temperate; there are no confirmed drunkards. 2. Admissions to hospital from drunkenness and its sequelæ have been so very rare that a scale of proportion would be too small for statistical usefulness. Drunkenness is punished as an offence. 3. Rum or arrack received from the commissariat on indent is sold to the soldier only at the canteen. Bazaar shopkeepers are prohibited from selling liquor to soldiers. Spirits are procured from Government of the first quality, and issued to the troops on payment, diluted with one-fourth of water. The quantity varies in different regiments and seasons, usually it is about a dram a day to each man. Spirits form no part of the ration of the soldier. It is never or very rarely indeed given to convalescents. No other drinks are sold at the bazaar or canteen injurious to health; fresh toddy is not obtainable. 4. The consumption of spirits is injurious to the health of troops and convalescents; it is neither conducive to health nor to the efficiency and discipline of the corps. 5. I think it would certainly be beneficial here to abolish the use of spirituous liquors. 6. I consider malt liquor and wines less injurious than spirits. 7. Coffee, tea, lemonade, and similar drinks are used at the station to a considerable extent; I consider that as a rule they are preferable. Malt liquor is *sometimes* necessary. 8. It would be highly beneficial to suppress the use of spirits altogether. 9. It would be beneficial to restrict the canteen supplies to malt liquor, porter, &c. 10. I would recommend that in restricting the sale of spirits in the canteen, the most rigid means be adopted to prevent the purchase of them in the bazaar, &c. 11. There are no local canteen and bazaar regulations; they are laid down in Jameson's Code and its appendices, and are strictly enforced and implicitly obeyed.

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BOMBAY.

References to Subjects and Queries.	REPLIES.
VI. DIET.	1. The composition of the ration for Queen's British troops and Europeans in the Indian army is of meat, bread, vegetables, and groceries; 1 lb. meat, 1 lb. bread, 1 lb. vegetables, $\frac{3}{7}$ oz. of tea, $1\frac{2}{7}$ oz. of sugar, 4 oz. rice, 1 oz. salt; mutton twice a week. The rations are inspected by the quartermaster serjeants of detachments, and subsequently by the orderly officer, after having been passed by the commissariat inspector in the first instance, when submitted by the contractors. 2. A complete ration (except fruit) is provided, and the stoppage is 3 annas 4 pice per diem. 3 meals a day; breakfast at 7 a.m., dinner at 1 p.m., and supper at 7 p.m. The proportion of vegetables in the ration is 1 lb. to each man. 3. The diet scale, when practicable, might be more varied, as in fact it is at this station by the issue of mutton. There is no arrangement to prevent the troops disposing of any part of the ration; such a thing is not known. 4. Cook-rooms are attached to each barrack; they are separate buildings, and the rations are cooked in copper utensils, which are tinned monthly. The kitchens are clean and good, considering their temporary construction. Water is supplied by bheesties. The food is boiled, there being no appliances for roasting; the cooking is not sufficiently varied. Tea and coffee are properly prepared. Troops usually commence the march about 2 or 3 a.m., and are supplied with coffee half way, but have no refreshment before starting. 5. Gardens for the cultivation of vegetables by the soldiers might decidedly be established at this station with advantage; they should be on the self-supporting plan.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. A soldier's dress consists of a tunic and shell jacket, black cloth trousers, and forage cap during the monsoon and cold weather. Khakee clothing and red serge coat, with wicker helmet and blue serge trousers, in the hot season. The accoutrements consist of a shoulder belt, waist belt, pouches, and bayonet scabbard; I consider the present dress suitable to the climate. The helmet might be made lighter; the guard dress is according to the season of the year. There are verandahs and sun-boards as a protection from the sun, and verandahs and sentry-boxes as a protection from rain.
Duties.	1. It would be advisable for the men to be thoroughly drilled at home before being sent to India. 2. They have parade in the morning for one hour with arms, in the evening one hour without arms, for four days in the week; fatigue duties and guards. The men do not suffer from drill; the best hour for drill is the early morning. There are no general orders on the subject. They have, on an average, five nights in bed during the week. 3. Guards are mounted at about one mile from barracks at the most distant guard; they are relieved every 24 hours. There are three roll calls by day and one by night; night guards are not prejudicial to health at this station, and no further precautions are required.
VIII. INSTRUCTION AND RECREATION.	1. There are no ball courts, skittle grounds, library nor reading room; no gardens, workshops, nor gymnasia. There is one school in the artillery, and a theatre (barrack-room). These are certainly not sufficient to keep the men occupied during the wet season or heat of the day. The men are restricted from exposing themselves to the sun during the heat of the day, and other restrictions are imposed which are conducive to health. 2. I should recommend the men having full amusement and occupation, such as ball courts, skittle grounds, school, library, day rooms, gardens, workshops, gymnasia. 3. Savings' banks have been already instituted with advantage. 4. There is not sufficient shade from trees or otherwise to enable the men to take exercise without injury during the day.
IX. MILITARY PRISONS.	1. The cells, like the barracks, being temporary, are defective.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. As in all mixed medical and military consultations, the power of the surgeon is limited to recommending; this is enough where the commanding officer and himself, as is usually the case, are *en rapport;* if not, I appre hend there is an appeal open. 3. The practical operation of measures for the preservation of the soldier's health in camp I leave to be disposed of by men of more recent experience in the field.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following form shows the statistics:—

SATTARA.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857-58	Detachment H.M.'s 14th Light Dragoons. Do. do. 3rd Dragoons Do. do. 33rd Regiment	132	33	—	3	1	7	—	7	—	14	1	3	—	—	—	81	—	148	2	112·1	1·5
1858-59	Do. do. 3rd Dragoons Do. do. 6th Inniskilling Do. do. 18th Royal Irish Do. do. 33rd Regiment Do. do. 56th do.	346	208	1	1	—	16	—	10	—	48	2	16	2	—	—	230	—	529	5	152·8	1·4
1859-60	Do. do. 6th Inniskilling Do. do. 31st Regiment Do. do. 57th do. Do. do. German Legion	301	319	—	—	—	14	1	5	—	84	—	24	—	18	10	270	—	734	11	243·8	3·6
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1857-58	4th Troop Horse Brigade 2nd Company 2nd Battalion Artillery Detachment 3rd European Regiment	156	38	—		—	4	—	6	—	22	—	5	—	—	—	85	—	161	—	103·2	—
1858-59	2nd Company 2nd Battalion Artillery	89	90	—	1	—	6	—	2	—	24	—	4	—	—	—	87	—	214	—	240·4	—
1859-60	Do. do. do do.	82	156	—	—	—	1	—	1	—	17	1	4	—	1	1	34	—	214	2	260·9	2·4

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Disease of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	5th Company 4th Battalion Artillery 18th Regiment Native Infantry 24th do. do.	1,548	283	—	1	—	36	1	4	—	63	1	4	—	—	—	414	—	805	2	52·0	0·1
1851-52	5th Company 4th Battalion Artillery 24th Regiment Native Infantry	776	153	—	2	—	12	—	—	—	58	—	12	—	3	2	207	2	447	4	57·6	0·5
1852-53	5th Company 4th Battalion Artillery 24th Regiment Native Infantry	791	151	1	—	—	15	—	1	—	27	—	17	1	—	—	160	—	371	2	46·9	0·2
1853-54	6th Company 3rd Battalion Artillery 5th Company 4th do. do. 24th Regiment Native Infantry	758	179	—	2	—	11	—	1	1	38	—	3	—	—	—	171	1	405	2	53·4	0·2
1854-55	6th Company 3rd Battalion Artillery 26th Regiment Native Infantry	903	139	2	9	—	11	—	1	—	78	3	8	—	—	—	244	2	490	7	54·2	0·7
1855-56	6th Company 3rd Battalion Artillery 26th Regiment Native Infantry	810	299	—	2	—	18	2	2	—	56	—	5	—	—	—	281	2	663	4	81·8	0·5
1856-57	6th Company 3rd Battalion Artillery 22nd Regiment Native Infantry 26th do. do. do. Detachment 24th do. do.	1,722	392	1	9	1	30	3	4	—	93	—	6	1	—	—	490	—	1,024	6	59·4	0·3
1857-5	6th Company 3rd Battalion Artillery Detachment 1st Regiment Sinde Irregular Horse. Detachment Southern Mahratta Irregular Horse. 22nd Regiment Native Infantry	975	518	3	46	2	15	1	—	—	80	—	6	1	2	1	464	3	1,131	11	116·0	1·1
1858-59	Detachment Southern Mahratta Irregular Horse. 22nd Regiment Native Infantry	708	293	2	14	—	8	—	—	—	43	—	2	—	—	—	366	2	726	4	102·5	0·5
1859-60	Detachment Southern Mahratta Irregular Horse. 8th Regiment Native Infantry	804	387	4		—	60	—	1	—	89	3	6	—	8	3	435	—	998	10	124·1	1·2

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 17th August 1860.

W. C. COLES, Assistant-Surgeon,
Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan. 2. The hospital is situated on the right front of the men's barracks, 150 yards distant from the nearest, and about 450 yards from the horse lines; it is 900 yards distant from the bazaar, and N.E. of it, and upwards of a mile from the houses of the civil population. The site is open and freely ventilated, and there are no high walls, trees, buildings, &c., anywhere near it. The sites of the present European hospitals are in my opinion objectionable, but, as before observed, they are temporary buildings. 3. The water supply is sufficient and wholesome. 4. All sewage and refuse is cleared away by sweepers. All surface water is carried off by open drains. The hospital is situated on quickly sloping ground. 5. The lowest ward is raised on an average 1½ feet above the ground; there is no perflation of air under the floor. The roof water is conveyed away by trenches and by the natural slope of the ground; it does not sink into the subsoil, the surface being quite hard. The surface drainage consists of open trenches, and is quite sufficient; the natural slope allows of no lodgment, and is such that little or no artificial drainage is needed. The hospital is built of wattle and dab walls, grass-thatch roofs, and earthen floors; the roof is thick enough, but the walls, from their construction, are too thin. There are five-feet verandahs on both sides, closed in on the monsoon side by weather frames; the verandah is not sufficient, but the building is only temporary. The verandahs are not used for the sick. The hospital consists of one flat. The following table shows the hospital accommodation:— Date of construction, January to July 1858. Total number of wards, 4. Total regulation number of beds, 78.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	To Wall Plate. Feet.	Including Vacuity of Roof.					Feet.	Feet.
1	20	60	20	10	17,400	870	60	—	12	4½	3
1	20	60	20	10	17,400	870	60	—	12	4½	3
1	12	40	20	10	11,600	960	66	—	8	4½	3
1	26	80	20	10	23,200	890	61	—	14	4½	3

SATTARA.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospital has a western aspect, and is so placed as to receive the full benefit of the prevailing winds. The windows open as casements, but being like the rest of the building, only of temporary construction, are incapable of excluding the hot winds. 6. Apertures for ventilation are made in the upper part of the walls under the eaves, but they do not afford sufficient. There are no jalousies or jhilmils. 7. There are not any means of cooling the air. 8. There are no means of warming. Cleansing and whitewashing is done whenever needed, generally about three or four times a year. 9. The privies and urinals are in rear of hospital, and are approached by covered passages, as shown in the accompanying sketch. They are kept clean by sweepers. There are no cess-pits. 10. There is a washing-room at the end of each ward sufficient for the purpose. 11. There is a washing room attached to each temporary hospital, convenient and sufficient enough. 12. There are the usual means of washing linen, and they are sufficient. 13. The storage is sufficient and dry. 14. The bedsteads are iron; the bedding, rice-straw mattress and pillows. 15. The hospital kitchen is temporary, 12 yards distant from the wards, not on the side of the prevailing wind. It is furnished with the usual cooking apparatus. The cooking is properly done, and if soup is made in jars, varied enough. 16. The diet tables are kept in the laid down forms in general use. 17. There is a hospital orderly, and until lately a hospital matron, and the attendance, with the occasional help of a comrade in special cases, is sufficient. 18. The sanitary state of the hospital is good, and no epidemic disease, pyœmia, or gangrene have manifested themselves. 19. As might be inferred, the European hospitals being temporary, are defective in some points. 20. There are no fenced grounds or shaded walks or seats for the convalescents, but an airy open space adapted to morning and evening exercise. 21. Up to a late date there was a ward set apart for the reception of women and children; the arrangement at present is not satisfactory, for I think the female ward ought to be kept up. 22. There are no special local hospital regulations. 23. All alterations and repairs, whether sanitary or not, are submitted to and carried out by the military authorities. Diets and medical comforts are solely under medical control. 24. There are no convalescent wards or hospital, but where troops are treated on a large scale, such a ward is necessary.
XIII BURIAL OF THE DEAD.	1. The burial ground for British troops is about one mile from the station. It is dead to leeward in reference to the prevailing winds, being to the S.E. 2. The area is 17,000 square yards. The soil throughout is *moorum* (trap-rock), decomposed in situ. It is believed that decomposition readily takes place. It is carefully kept. 3. The grave space allowed is 10 × 3, and the interval between graves three feet. The graves are about six feet deep. The ground is new, and no grave has been reopened. Only one body is interred in each grave. Burial takes place at ordinary times within 24 hours. During epidemics as soon as possible. There are no burial-grounds for native troops in camp. 4. The grave yard is never offensive. The practice of burial is according to standing regulations. 5. The dead of camp followers and bazaar people are disposed of according to caste; some burned, some buried. 6. No injury accrues to health from the present practice. 7. I can suggest no improvements.

(Signed) H. J. PELLY, Colonel commanding at Sattara.
ROBERT DENT, Staff Surgeon.
M. K. KENNEDY, Captain Executive Engineers.

Sattara, July 19th, 1860.

MULLIGAUM.

Accommodation -	Queen's Troops -	Artillery, 26	Non-commissioned Officers and Men.		
		Infantry, 102	"	"	"
	Native Troops -	Artillery, 80	"	"	"
		Infantry, 858	"	"	"

References to Subjects and Queries.	REPLIES.
1. TOPOGRAPHY.	1. The surrounding country is an open level plain; flat and dry. There is no jungle, and but little wood in the vicinity; a river runs close to the bazaar and lines. 2. The elevation of the station above the sea is about 1,300 feet, and from 20 to 25 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest mountain or table land is about 35 miles distant, and about 3,200 feet higher than the level of the station. 4. The nearest water is only a few yards distant from the station, but the vicinity is not liable to overflow. There is no broken ground, ravines, or water pits near the station. 5. The station is not encumbered in any manner, but is open and freely exposed to the winds. The temperature of the station is not raised by being exposed to reflected sun heat. The station is exposed to all winds except that from the sea.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The surrounding country is only partially cultivated. There are no works of irrigation. There is no cultivation of rice or of indigo, nor is the preparation of hemp or flax carried on near the station. 7. The town of Mulligaum is three-quarters of a mile distant from the station. 8. The surface of the district is black loam, with sub-strata of trap rock; the ground upon which the station stands was never occupied before. 9. Water is found about 20 feet below the surface during the dry season, and about 15 feet during the rainy season. 10. The rain-fall and surface water sinks into the soil, and thus drains off. There is no adjacent higher ground the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from the river and wells; there are no tanks. The wells require to be cleaned out once a year; being constantly used, the water remains pure. 12. The water supply is unlimited; its colour is clear and good, but it tastes as if slightly impregnated with vegetable matter. There are no means at the station of ascertaining its chemical composition; most of the water from the wells is hard, but good and not injurious to health. It is raised by hand buckets. No better supply can be obtained. 13. There are no topographical points bearing on the health of the station not included in the foregoing answers. 14. New stations are selected by the Quartermaster-General's Department in consultation with the medical authorities.
II. Climate.	1. The only means and instruments available at the station for conducting and registering meteorological observations are a pluviometer and a thermometer. 3. The climate is generally dry; during the months of May and June very hot, but mornings agreeable up to 10 a.m. Cold weather pleasant, with very few fogs. The only trees are near the houses, a few of the gardens irrigated; the air is pure and unmixed with dust, and dust storms are very rare. The troops are generally healthy, there is good shelter, and the usual diet and clothing required. Drill during the rains and cold season can be carried on till half-past 7 a.m. and after 5 p.m. The most healthy months are during the hot season, from March to middle of June, and October is the most unhealthy month. Fevers and rheumatism are the prevailing diseases. 4. There is no district near the station, the climate of which is more conducive to health. 5. The following are the stations at which I have served, with their comparative salubrity :— Poona—Healthy. Sattara—Very healthy. Bombay—Healthy. Baroda—Unhealthy; much fever and diarrhœa. Hyderabad—Healthy, but periodical sickness prevails. Sukkur—Healthy, but climate very hot and enervating. Dadur—Unhealthy; exceedingly hot fevers prevail. Quetta—Above the Bolam Pass, unhealthy. Aden—Healthy.
III. Sanitary Condition of Station.	1, 2, 3. A map and ground plan of the station and barracks is transmitted. 4. Table of barrack accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Inches.		Feet.	Feet.
No. 1	90	264	21	19	105,336	1,170½	61⅔	22	50	4	3
No. 2	26	60¾	19	14½	16,737	643¾	44⅔	22	6	3¾	3½
		It has not been considered necessary in the answers to the following queries to describe in detail Barrack No. 2, which is an old building of pucka construction, but of smaller dimensions than would now be given to a barrack for an equal number of men.									
Total -	116										
Guard-room, 1 -	4	33½	15¼	13½	6,862½	This guard-room is divided into three rooms, one for the guard and two for prisoners.		22	5	4 ft. 11 in.	3 ft. 6 in.
Prison Cells, 2 -	1	10	10	17⅔	1,766	1,766	100	22	1	3	3

5. The windows are on opposite sides, and open inside, with two glazed shutters. There is a verandah on both sides, and also at the ends, surrounding the barrack room. It is 10 feet wide. There is ample space within the room for the sleeping quarters of the soldiers, but it is believed that there would be no objection to their moving their cots into the verandahs if desired in the hot weather. No other persons use the verandahs. There are no jalousies or jhilmils.
6. The cots used in barracks are of iron, laced with cotton tape. A soldier's bedding consists of one humda mattress, two cotton covers for ditto, one blanket and one sheet. No improvements are suggested.
7. No tents are used in camp.
8. The barracks are ventilated by apertures in the roof, called lift ventilators; the ventilation is sufficient to keep the air pure by night as well as by day, when the windows, as usual in this station, are left open. No apparatus is used for cooling the air for barrack rooms at this station.

MULLIGAUM, BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	9, 10, 11. The barracks are only of a temporary nature, the roof being double-tiled with teak wood trusses, and supported on teak posts. The walls are built of sun-dried bricks. The floors are constructed of moorum, and are raised about one foot above the ground. There is no passage for air beneath the floor. The barracks are only of a temporary description; should they be permanently rebuilt, they would no doubt be on an improved plan. It is thought that permanent barracks should be provided with double roofs and good ventilators, so that there might be a current of fresh air to carry away any hot air between the two roofs, and thus prevent its increasing the temperature of the room below; barrack rooms should also be raised about 15 feet above the ground, the spaces below being used as canteens, libraries, store rooms, &c. It is essential to the coolness and salubrity of a barrack that its wall should be sheltered completely from the sun by broad verandahs. No other suggestions to offer. The barracks and cantonments are kept in repair by the barrack serjeant when repairs of a petty nature are required, and by the executive engineer of the district for more extensive repairs. Repairs are quickly executed. The walls of the barracks are cleansed and whitewashed as often as may be considered requisite. There are no stated intervals for the execution of this work. The barracks are without ceilings. 12. In the lavatory common basins and tubs are used by the soldiers for washing and bathing. Water is supplied by bheesties, and after use passes through the urinals, and is conveyed away by a covered drain into a cesspool, also covered. 13. The cookhouses have no special means of cooking provided, nor any means of supplying water. There is an open drain to carry off the refuse water. There are no conveniences for washing and drying linen in the barracks. 14. There are no drains to the privies, their contents being conveyed to a suitable distance by sweepers. 15. The privies are provided with a similar ventilator to the barracks, and are lighted from an arched opening and fixed venetians. The barracks are lighted at night by hanging oil lamps. 16. The barracks and the surrounding ground are drained by natural nullahs, which find an outlet in a river about half a mile distant. All the surface water is speedily carried away, but the drainage from the lavatory and urinals is inefficient. No portion of the barrack or hospital is damp. The drainage is sufficient, with the exception of that from the urinals, which is received in an objectionable cesspit. There is no well or tank within the influence of this cesspit, which is seven feet square, and 40 feet in rear of the lavatory. The cesspit is 40 feet distant from the men's quarter, and about a quarter of a mile from the hospital. There are no foul ditches. 17. The refuse, manure, &c., which is found within or near the cantonment is removed without delay by scavengers' carts. 18. The surface of the cantonment is kept free from vegetation; there are no old walls, thick hedges, &c., interfering with the external ventilation of the station, bazaar, &c., which is good. 19. The drainage and ventilation of the bazaar is good, and water supply abundant. There are no latrines, and the streets are tolerably open and clean. A regular establishment of sweepers is kept up under the supervision of the superintendent of bazaars; there is only a small detachment of police, and no improvement is necessary. There are no native houses near the station, excepting those in the bazaar, and no dung heaps or cess-pits are allowed. 20. Animals are slaughtered about 200 yards in rear of the bazaar, and to leeward of it; there are no written rules regarding slaughtering places. No nuisance is experienced from the condition of these places, and the offal is buried. 21. The bazaar horses are picketed near the owners' residences, and the place is cleared daily, and the manure burnt. 22. There are no artillery or cavalry stables; nor any regular picketing grounds at the station. 23. There is ample and good accommodation for married non-commissioned officers and men. The married people's quarters are separate from the barrack rooms.
Officers' Quarters.	1. The sanitary condition of officers' quarters is good. The drainage and ventilation also good. No improvements to suggest.
IV. HEALTH OF THE TROOPS.	1. The station, district, and population are healthy. 2. Fevers and rheumatism are the most prevalent diseases among the native population. Cholera is the chief epidemic, and spleen disease is rare. 3. The healthiness of the neighbouring native population is to be attributed to there being little jungle, and the country being generally dry. 4. The troops had been stationed at Poona for upwards of three years, and left there 26th September 1859; fevers and rheumatism were the chief complaints. They arrived at Mulligaum in good health on 2nd April 1860, and since then fevers and rheumatism have been the chief diseases. No portion of the present station is more unhealthy than the rest. 5. The troops are never camped out. 6. I have not been in charge of troops at hill stations. 7, 8. Cannot state whether troops who have been resident for some time on hill stations are more or less liable to diseases on returning to the plains. I certainly approve of hill stations, especially during the hot season. 9. Troops are liable to be attacked with dysentery, liver and heart disease on going to hill stations. 10. The precautions necessary to protect men from these diseases are spare diet, warm clothing, and they should not be allowed to expose themselves to the sun from 9 a.m. to 5 p.m. They should have plenty of exercise morning and evening. 11, 12. The hot season is best adapted for residence in hill stations. Cannot say what is the shortest period to enable troops to obtain the full benefit of such residence; nor whether there is any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The special precaution for protecting the health of the troops on leaving hill stations for the plains is to prevent their exposure to the sun. 14. Residence on hill stations, with short periods of service in the plains, is most conducive to the preservation of the health of the troops; but cannot say that service on the plains, with short periods of change to hill stations, would be equally conducive to their health; change of station in the plains is decidedly beneficial. 15, 16. Cannot say whether the barrack and hospital accommodation provided at hill stations or sanitaria are sufficient for the health and comfort of the troops. No experience to show what elevation above the sea is most suitable for hill stations.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	17. Sufter Sing, about 60 miles distance from the station by the road, could be advantageously occupied as a hill station. Its elevation above the plain is about 2,000 feet. The range of thermometer under a chupper, from March to June, is 76° to 92°, and seldom above 88°. The climate is most agreeable, and out of the influence of the hot winds. Europeans cannot live there during the rains, it being enveloped in clouds, but it is quite accessible after October, and very healthy. 18. Gravelly soils are the most healthy for stations. 19. Soldiers proceeding to India should be from 20 to 25 years of age, and the best period for them to land there is in November. No knowledge as to the mode of disposing of troops on first landing, but to preserve their health they should be immediately sent to their regiments or depôts. 20. Troops should be sent direct from the home depôts to India; and to diminish the dangers of the earlier years of service they should not be kept out at drill too long in the morning or commence too soon in the afternoon. 21. Mode of transport of troops from the port to the interior is by railway or bullock train, or water carriage and the usual march; sufficient precautions are taken to preserve the health of the troops on the route. 22. A British soldier should serve in India from 10 to 12 years. 23. The manner of conducting the business of medical boards is such as to avoid conflict of opinion as regards invaliding. No suggestions to make. 24. Invalids should leave India for home at the end of the cold season, in February.
Diseases.	1. When European troops are present, there is a weekly inspection for the discovery of incipient diseases according to order. 2. There has been only one case of scorbutus among the troops at this station. It frequently occurs after rheumatism. The preventive measures are, a generous diet of animal food, vegetables, lime juice, and spirits. 3. Disease of the liver is very rare amongst natives; prophylactic measures necessary to diminish its frequency are, spare diet, no beer or spirits, small quantities of wine only, horse and walking exercise, flannel next the skin, and a belt also of the same. 4. Dracunculus is peculiar to those who drink or wash from certain tanks or wells. The water should be heated before used. 5. The proportion of venereal diseases to the total sick is 2·5 per cent. Lock hospitals and supervision over the women in the regimental and other bazaars would be most decidedly advantageous to the health of the army. Women should be registered, and a person appointed to inspect them once a week. This is not necessary in native regiments, where venereal disease is very rare. 6. Cholera and small-pox are the only epidemics among the troops at the station. Of Fevers—122 cases have occurred from all the common types. Dysentery—6 cases, very rare. Cholera—occasionally. Small-pox—occasionally. Rheumatism—23 cases; this disease is rather frequent. The proportions of admissions and deaths from these diseases are 65·3 per cent. of the total admissions, and 0·8 per cent. of the total deaths. 7. Zymotic diseases are generally preceded by languor, general derangement of the digestive organs, and disinclination to any occupation. Intermittent fever is the most common type. The seasons when such diseases are most prevalent is after the rains, when the weather is muggy, hot, and damp. These diseases are prevalent in the most crowded, lowest, and dampest portions of the bazaar. The personal habits predisposing to these diseases are want of cleanliness and good food. 8. The causes of prevalence of epidemic disease amongst the soldiers are, exposure to great variations of climate, excess of duty, and overcrowding of barracks. 9. Small doses of quinine taken before going out is a good prophylactic against malarial diseases. 10. To prevent or mitigate epidemic disease, bathing should be resorted to daily, flannel should always be worn next to the skin, the barracks should be well ventilated, and the men should be exposed as little to the sun as possible.
V. Intemperance.	1, 2. The soldiers at the station are temperate. There are no confirmed drunkards. There are no admissions into hospital from diseases directly or indirectly caused by intemperance. There are no European troops at this station. Drunkenness is always punished as an offence. 3. There is no canteen at this station; spirits are sold at the bazaar by the liquor contractor. There are no data to ascertain the probable amount consumed by each man per diem. Spirit is no part of the soldier's ration at the station, on march, or in the field, except when Europeans are present. Cannot say whether it has happened among the men to take a dram before morning parade. Spirit is never given as a ration to convalescents. No other intoxicating drinks are sold in the bazaar. 4. Small quantities of spirits are not generally injurious to the health of the troops, and are frequently advantageous to convalescents. Spirits are not conducive to the efficiency of the corps. 5. It would be beneficial to restrict the sale of spirits in the bazaar, and only give them as a ration to the troops on a line of march. 6. Malt liquor or wines are much more healthy drinks than spirits, and decidedly more adapted to the climate. 7. Coffee, tea, lemonade, and similar drinks are much used at the station, and their influence on health, efficiency, and discipline, as compared with spirits and malt liquor, is very good and beneficial. 8. It would be beneficial to suppress altogether the spirit ration, whether for soldiers or convalescents, and to substitute for it beer, tea, &c. 9, 10. The sale of spirituous liquors in the canteen should be restricted, and encouragement given to the sale of coffee, tea, lemonade, &c. No recommendations to make, but those already stated. The soldier should have his beer or porter after his dinner. 11. There are no canteen regulations. There is only one liquor contractor in the bazaar, who is subject to the general bazaar rules; his shop is open from sunrise to 9 p.m. No liquor is permitted to be sold to European soldiers when such are present at the station.
VI. Diet.	There being no European troops at this station, no information is given under this head.

MULLIGAUM. BOMBAY.

References to Subjects and Queries.	REPLIES.
VII. DEESA, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements at this station consist of cloth jacket and trousers for the cold season, and white jacket and linen trousers for the hot season, a Kilmarnock cap, pouch and belt, and waist-belt with bayonet. The present dress is suitable to the climate, and for the soldier's duties by day and by night, and at the different seasons. No suggestions to make for dress of native troops. The guard dress is the usual dress, and the men are protected when on guard from the sun and wet by guard-rooms and sentry-boxes.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India. 2. At this station a soldier goes on guard every fourth day. Drill is carried on for an hour and a half, morning and evening, at 5 a.m. and 5 p.m. respectively. The men do not suffer in health from drill. The early morning is the best time for drills, parades, and marches, and the standing orders of the army appoint this time. The soldiers have, on an average, from three to four nights in bed during the week. 3. Guards are mounted about a quarter of a mile from barracks, and the tour of guard is for 24 hours. There are roll calls every morning and evening, but not during the night. Night duty, when light, is not found to be injurious to health.
VIII. INSTRUCTION AND RECREATION.	1, 2. There are no means of instruction and recreation at the station. 3. The institution of soldiers' savings banks would be advantageous. 4. There is not sufficient shade from trees, &c., to enable the men to take exercise without injury to health during the day.
IX. MILITARY PRISONS.	1. There is no military prison, defaulters being confined in the quarter guard and cells. These are in a good sanitary state.
X. FIELD SERVICE.	1. There are no local regulations for field medical service, not included in the general Presidency Regulations. 2. The practical working of the powers of the medical officers, as regards the conduct of the line of march of troops, &c., is good. 3. The brigade major or staff officer is responsible for the regulations of camp being observed; the medical officer can only represent defects, but has no power. No improvements to suggest.
XI. STATISTICS OF SICKNESS AND MORTALITY.	4. No knowledge of the arrangements adopted in the Presidency for field hospitals, &c.

MULLIGAUM.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1858-59	7/11 Royal Artillery - - - Detachment H.M.'s 18th Royal Irish Do. do. 56th Regiment - Do. do. 92d Highlanders	51	32	—	—	—	4	—	6	—	12	—	5	—	1	1	77	1	137	2	268·6	3·9
1859-60	Do. 6/13 Royal Artillery - Do. H.M.'s 3rd Dragoon Guards. Wing H.M.'s 28th Regiment - - Detachment H.M.'s 57th Regiment -	118	154	—	1	—	9	—	2	—	21	—	5	—	4	2	70	—	266	2	225·4	1·6

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	11th Regiment Native Infantry -	853	281	—	3	—	6	1	1	—	42	—	9	—	1	—	238	1	581	2	68·1	0·2
1851-52	2nd Company 3rd Battalion Artillery 11th Regiment Native Infantry -	806	171	—	20	—	18	—	3	1	55	2	10	—	3	1	195	2	470	6	58·3	0·7
1852-53	2nd Company 3rd Battalion Artillery 4th do. do. do. 4th do. 4th do. do. 11th Regiment Native Infantry - 22nd do. do. - -	868	296	1	3	—	16	2	2	—	57	2	11	—	1	—	287	—	673	5	77·5	0·5
1853-54	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	979	166	3	7	—	8	1	2	—	56	2	14	1	—	—	229	—	482	7	49·2	0·7
1854-55	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	995	76	1	15	—	7	1	5	1	24	—	5	1	2	—	117	1	251	5	25·2	0·5
1855-56	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	975	69	2	12	—	3	—	3	—	57	1	1	—	—	—	125	1	270	4	27·6	0·4
1856-57	2nd Company 4th Battalion Artillery 19th Regiment Native Infantry -	623	222	5	1	—	25	—	—	—	18	—	5	—	—	—	502	—	773	5	124·0	0·8
1857-58	6th Company 4th Battalion Artillery 4th Regiment Native Infantry - 19th do. do. - -	1,273	712	3	11	—	133	8	29	1	138	4	23	—	2	1	832	4	1,880	21	147·6	1·6
1858-59	Detachment 3rd Regiment Native Infantry. 19th Regiment Native Infantry - 23rd do. do. - - 30th do. do. - -	384	241	3	16	—	4	—	2	—	37	—	2	—	—	—	254	—	556	3	144·7	0·7
1859-60	3rd do. do. - - Detachment 6th Regiment Native Infantry. - Detachment Candeish Bheel Corps - 3rd Division Military Train - -	604	223	1	7	—	14	—	5	—	49	—	3	—	12	5	217	1	530	7	87·7	1·1

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

W. COLES, Assistant Surgeon, Secretary.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital is situated in an open space of ground, quite clear of buildings of every description. It is about 100 yards outside the bazaar, the houses of which are the nearest to it. The site is open and freely ventilated, there being no high walls or trees to interfere with ventilation. It is healthy and the drainage is good, and is free from malaria. 3. The water supply is abundant and wholesome. 4. No refuse water lodges in the vicinity of the hospital; a deep nullah runs close outside the compound. 5. The wards are about a foot above the ground, and flagged with cut stone; there is no circulation of air underneath. The roof water sinks into the subsoil. The fall of rain is never heavy, and soon drains off from the slant towards the nullah. The hospital is built of burnt brick and lime. The roof is double-tiled and the walls are double, and of sufficient thickness to keep the building cool. It is supplied with verandahs all round, about 8 feet wide, which afford sufficient shelter from the sun. The verandahs are used for the accommodation of the sick and convalescents. The hospital consists of one flat. Table of Hospital Accommodation. Date of construction, 1826–27. Total number of wards, 4. Total regulation number of beds, 56.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Inches.		Feet.	Feet.
2	40	95¾	21	16½	33,177⅜	829⅜	50¼	22	10	7¼	4½
2 in the same building.	8	22 ft. 10 in.	21	14	6,979 7/16	872⅜	62·3	22	4	4¼	

The hospital is so placed as to receive the full benefit of prevailing winds. The windows open on hinges outwards; the ward windows have jhilmils.

6. The ventilation of the wards is effected by the jhilmils being kept open when the windows are not entirely so—and is sufficient to keep them at all times free from odour or closeness. The jhilmils are of common construction.

7, 8. There are no means allowed for cooling the air admitted into the ward, or apparatus for warming. The walls and ceilings of hospital wards are cleansed and limewashed once in six months, but oftener if necessary.

9. The privies, &c. are about 20 yards from the hospital, connected by an open passage roofed in. They are not placed over cesspits. They are kept clean by the sweepers, and are not offensive.

10, 11. There are no means of washing or bathing the sick.

12. The hospital linen is taken away to be washed and dried.

13. The storage is sufficient and dry.

14. The bedsteads used in hospital are of wood, with tape; no bedding is allowed. No suggestions to make.

15. A small shed is used for cooking, which is all that is required.

16. There are no diet tables, &c. used in hospital.

17. The attendance at the hospital consists of a hospital orderly and a cook; if a man requires it, he is allowed a comrade from the regiment.

18. The sanitary condition of the hospital is good; no epidemic diseases have ever occurred in the ward.

19. There are no deficiencies or sanitary defects requiring improvement.

20. Convalescents are allowed to take exercise in the compound, which is quite sufficient.

21. Soldiers' sick wives and children either attend the hospital treatment or are seen at their own houses. There should be a ward for women and children, otherwise the present arrangements are satisfactory.

22. There are no special hospital regulations not included in the general Presidency Regulations.

23. The medical officer can at any time get repairs done to the hospital by writing officially on the subject, and can order any medical comforts he may deem necessary at all times.

24. There are no convalescent wards at the station.

XIII. Burial of the Dead.

1. The burial-ground used by British troops is about 100 yards from the cantonment boundary, and well to leeward, and clear of all houses.

2. Its area is 7,350 square yards. In the upper half of the ground the soil is hard moorum, in the lower part there is black soil to the depth of from two to three feet. The drainage is efficient and the ground well kept. Decomposition takes place readily.

3. There are no regulations as to burial, several vaults being built close to each other; the graves are scattered. They are from six to seven feet deep, and are never reopened. Interment takes place at ordinary times, from 12 to 24 hours after death, and within 12 hours during epidemics. The great majority of native troops are Hindoos, who burn their dead on the banks of the river. The Mahomedans bury their dead outside camp limits. There are no particular regulations.

4. The grave-yard is never offensive. With regard to the burial of British troops, the regulation is:—If a soldier dies early in the morning, the burial takes place the same evening; if the death occurs in the evening, the interment takes place the next morning.

5. The dead of the camp followers or bazaar people are disposed of according to caste; the Hindoos burn their dead on the river banks, and the Mahomedans bury their dead in the place set apart for them out of camp limits.

6. No injury accrues to the public health from the present practice.

7. No improvements to suggest for the regulation of the burial or disposal of the dead.

(Signed). J. Field, Captain, Commanding at Mulligaum.
J. C. Trestrail, Surgeon, 6th Regiment, N. I.
(Only one Medical Officer is present at the Station).
J. M. Greig, Captain Engineers.

1st Sept. 1860.

KOLAPORE.

Accommodation
- Queen's Troops
  - Artillery, 1 Company, 3rd Company 3rd Battalion Bombay Artillery.
  - Infantry, Wing Her Majesty's 83rd Regiment.
- Native Troops
  - Cavalry, 1 Troop Southern Mahratta Horse.
  - Infantry, 1 Regiment, 10th Regiment Bombay Native Infantry.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. Cultivated valleys bounded by bare mountain ranges to the west, north, and east, form the chief features of the surrounding country. The valleys are undulating, and the soil is composed of black argillaceous mould; the elevated ridges are covered with red soil. There are no swamps. There is very little wood and no jungle in the vicinity. Water is to be found at all seasons in the rivers, and also in the wells, which are numerous, and used for the purposes of irrigation.
	2. The elevation of the station above the sea is 1,797 feet; about 60 feet above the valleys, and 60 feet above the nearest water. There is no higher or healthier ground near the station. The hill fort of Punulla, about 11 miles distant, 975 feet above the plain, however, possesses considerable advantages as to climate, excepting during the monsoon.
	3. The nearest mountain or table land is about three miles distant, and about 900 feet above the station.
	4. The river Punchgunga is the nearest permanent water, and is about half a mile from the station. It surrounds the cantonment on three sides, at an average distance of about two miles. There are two large tanks about three miles from the station. An overflow of water takes place in the vicinity of the river Kistnah during the monsoon, and lasts for a few days only. This may occur twice or thrice during the rains. There are no ravines or water pits near the station.
	5. The station is freely opened and exposed to the prevailing winds. It is almost totally devoid of trees, hedges, and gardens. There exist no impediments to free external and internal ventilation. The buildings are scattered, so that no increase of temperature is occasioned by reflected sun heat. The winds generally are high. The land or north-easterly winds blow from November to February, and give rise to fevers, rheumatism, and pulmonary affections. The sea breeze or south-westerly winds commence in March, and blow during the greater part of the day and night. They are highly beneficial to health.
	6. The valleys in the vicinity are highly cultivated. There are no works of irrigation near the station, although partial irrigation is carried on by means of wells, but is much too limited to produce any deleterious effect on the health of the station. Rice is cultivated, in small detached fields only, within a quarter of a mile of the camp limits. No restrictions appear to have been hitherto made on this head. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on near the station.
	7. The city of Kolapore, with a population of between 50,000 and 60,000, is situated to the south-west, about a mile and a half from the station. The village of Bhovra is about half a mile to the north-west.
	8. The structure of the mountain ridges is principally of basaltic formation, trap-rock, covered with red disintegrated soil, moorum; the surface soil of the valleys is black and argillaceous; the subsoil is of clay of various colours. The red soil is met with on the higher slopes, and during the rains the colouring matter (an oxide of iron) is washed out of it, and carried down as a black powder, which is used as pounce.
	9. Water is found during the dry season between 40 and 50 feet below the surface, in carefully selected site, from 35 to 45 feet, but wells have been abandoned after digging 80 feet. In the rainy season, the wells fill to the natural ground level. The depth where water is found necessarily varies with the locality. In black soil in a valley, it has been met with at 3 feet below the surface.
	10. The undulating character of the surrounding district ensures free drainage. No water from rain or surface springs settles near the station. There is no adjacent higher ground, the drainage from which passes into the subsoil of the station.
	11. The water supply is almost entirely derived from wells. The artillery horses are watered at the river. There is no water for drinking purposes stored in tanks, there being none. The wells are not liable to pollution from leaves or impurities of any kind.
	12. The amount of water supply is too limited in the dry season. The quality of the water obtained from wells, with one or two exceptions, is good, wholesome, and unobjectionable. Its chemical composition and microscopic characters have not been ascertained. It is not hard, and is clear and wholesome. The water is raised by means of buckets, and is distributed by puckal bheesties; but an increased supply, by sinking additional wells, is desirable, and is recommended.
	13. There are no other topographical points bearing on the health of the station.
	14. New stations are generally selected by a mixed committee composed of one or more military officers, an engineer, and medical officer. It is highly desirable that the members for this and similar duties should be specially selected from their known attainments and previous experience.
II. CLIMATE.	1. There are no means or instruments available at the station for conducting and registering meteorological observations except the common thermometer in use in hospitals.
	2. The following Table of ten years' observations, from 1st January 1850 to 31st December 1859, is arranged according to the means at disposal.

References to Subjects and Queries.	REPLIES.

II. Climate—*cont.*

Months.	Mean Maximum.	Mean Minimum.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.
January - -	77·2	66·7	92·7	·43	N.E. & S.W.
February - -	81·6	69·2	95·4	—	N.E. & S.W.
March - -	87·	75·3	99·7	·58	N.E. & S.W.
April - - -	88·	76·3	100·	1·36	N.E. & S.W.
May - - -	88·8	76·6	94·8	3·64	S.W.
June - - -	81·4	75·8	84·9	6·57	S.W.
July - - -	77··	74·	88·9	11·93	W.
August - -	76·7	73·4	78·7	5·1	W. & N.W.
September - -	77·9	73·8	81·6	4·62	N.E. & S.W.
October - -	80·	74·6	86·2	4·51	N.E.
November - -	78·3	71·7	93·	·72	N.E.
December - -	76·5	66·8	93·8	·12	N.E. & S.W.

The above Table is prepared and furnished by Dr. Wicke, Civil Surgeon, Kolapore.

3. During the cold season, viz., November, December, January, and February, the climate is dry, the winds blowing generally from the north and east; dews fall in the early mornings, which are moist and fresh until an hour after sunrise. The climate generally is a very temperate one; there is no severe cold during this or any of the seasons. In the hot season, March, April, and May, there is more moisture, the prevailing winds being south-west, which blow, as a hot wind in the day, and become cool and refreshing breezes after sunset. During the rains the climate is agreeable, though damp, and is cool from strong south-westerly breezes which blow uninterruptedly. The climate is not influenced by tree-planting, canal, or other irrigation; nor is the atmosphere rendered impure by dust, excepting very temporarily. The climate is considered one of the healthiest in the Presidency. The diet and clothing require to be modified according to the seasons. No unusual precautions are found necessary to counteract atmospheric changes. Drill should as far as possible be carried on in the mornings, and in the hot season not prolonged beyond an hour after sunrise. The months of September, October, and November may be stated as those in which disease is most prevalent, with the exception of periodical epidemics of cholera and small-pox. The prevailing diseases are intermittent and remittent fevers.

4. As before stated, the hill fort of Punalla is considered to possess a climate that is likely to prove suitable for a sanitarium for sick and weakly men during a certain portion of the year.

5. The stations at which Assistant-Surgeon Wicke, M.D., Civil Surgeon at Kolapore, has served are Broach, Sattara, and Kolapore. The two latter are pretty equally balanced in point of climate, though the latter is, on the whole, to be preferred. Broach is an unhealthy station. Major Gell, 10th Regiment Native Infantry, has served at Aden, Bombay, Gharra, in Sinde, Bhoog, Tauna, Kurrachee, Deesa, Nusserabad, and Poona; as Assistant Quartermaster-General in Egypt, commanding Punjab cavalry regiment at Burmoo and Dera, Ghazee Khan, and Kolapore. Assistant-Surgeon Murray has served at Hyderabad, Kurrachee, Gharra, Jerruck, Sukkur, Sarkhana, Shillarpore in Sinde, Rajcote, Deera, Nusseerabad, Bombay, Rajpootana, and Central India campaigns, Deopore, near Seronge, Central India, Kolapore. Captain Dickenson has served at Tauna, Bhewady, Surat, Bewda, Ahmedabad, Kursole, Kaira, Bushire, Poona, and Belgaum.

The preceding meteorological observations and replies on topography were kindly prepared by Assistant-Surgeon Wicke, M.D., Kolapore, who was in medical charge of the 10th Regiment Native Infantry, during Assistant-Surgeon Murray's temporary absence with a wing of the 15th Regiment Native Infantry.

III. SANITARY CONDITION OF STATION.

1, 2, 3. A map and plan of the station and adjacent country, and ground plan of the barracks is transmitted.

4. Table of barrack accommodation.

Date of construction of barracks for European artillery and infantry, 1857–58. Native infantry lines, 1854–55.

Total number of rooms or huts :—8 barracks, 752 huts for native infantry.

Total regulation number of non-commissioned officers and men :—European artillery, 120; infantry, 348; native infantry, 752.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
								ft. in.			
European Artillery, 3/3 Artillery, 2.	56	147½	22	14	45,430	811½	58	1 8	31	4	3
Wing, H.M. 83rd Regiment, 6 -	54	139	22	14	42,812	792½	56½	1 8	24	4	3
10th Reg. Bombay N.I. 752. -	1	14	8	6	672	672	112	on floor	None.		
Guard Room. 3rd Company 3rd Battalion Bombay Artillery.	7	39½	10½	12	4,977	711	60	1 8	5	3	2
Guard Room. Wing, H.M. 83rd Regt. -	15	44	14½	12	7,656	510	42	1 8	5	3	2
Guard Room. 10th Regiment Bombay Native Infantry.	14	30	20	13½	8,100	578½	43	on floor	4	3½	2½
Prison Cells. 3rd Company 3rd Battalion Bombay Artillery.	1	10¾	7½	12	847	847	80⅚	1 8	1	2	2
Prison Cells. Wing, H.M. 83rd Regt. -	1	10	7	12	840	840	70	1 8	1	2	1½
Prison Cells. 10th Regiment Bombay Native Infantry.	1	8	8	13½	864	864	64	on floor	2	2	2

KOLAPORE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides in the European infantry barracks, and on adjacent sides in European artillery barracks. There is a verandah on both sides 5 feet broad and 8 feet high; the verandah is never occupied as sleeping quarters by soldiers or other persons; there are no jalousies or jhilmils. 6. At this station the artillery have some iron cots, and some iron with wooden boards; the remainder are entirely of wood. For reasons hereafter stated the men greatly prefer iron cots. The bedding consists of a couple of native blankets, a wadded quilt, and sheets, but the men of the artillery have, in general, provided themselves with English blankets and extra bedding in consequence of the dampness of the monsoon. 7. The structure and dimensions of the tents used in the Bombay army are as follows (they are of six kinds):—

—	Size.	Inner Walls, No. of Cloths.	Outer Walls, No. of Cloths.	Inner Fly, No. of Cloths.	Outer Fly, No. of Cloths.	No. of Men to each Tent.	Cubic Space per Man.	Superficial Feet per Man.
European soldiers' single-poled tent - -	15 × 15	—	3	3	3	13	137	17¼
" " double-poled tent - -	22 × 15¼	—	3	3	3	22	116	15¼
Native soldiers' single-poled tent - -	14½	—	—	—	3	22	30½	7½
" " double-poled tent - -	14⅔ × 24⅔	—	—	—	3	30	65	7
European hospital, double-poled tent - -	24 × 15½	3	3	3	3	20	168¼	18½
Staff Surgeon's single-poled tent - -	10 × 10	—	3	3	3	6	122½	16½

8. Ventilation is effected in the European barracks by the outer wall being only six feet high, and the space between the top of the wall and the roof being fitted with bamboo mat frames, which can be raised or lowered according to the state of the weather; also by doors and windows. The ventilation is sufficient for the purification of the air by night and day, from the strong breezes that prevail at this station. No means of cooling the air of barrack-rooms exist, nor is the want of such apparatus felt at this station in so excellent a climate. Huts or lines for the native infantry are generally too low, and are constructed without any regard to ventilation or adequate drainage; they are seldom in such repair as they would be were they properly built originally, and kept in good order by Government.

9, 10. The barracks are principally built of timber frame-work, the space between the posts being filled up with burnt bricks set in mud; the roofs are covered with single tiles, and the floors are of moorum, and are raised two feet above the level of the ground; there is no ventilation from beneath the floors.

11. The barracks were originally intended to be merely temporary; they were framed of timber which had returned from Persia, but by building up the walls, &c., they may be considered as permanent, and upon the whole as suitable to the climate. Double tiling would be a decided improvement, and would render them drier in the monsoon. The barracks and cantonment are kept in repair by the engineer's department. Repairs are quickly executed. The cantonment staff officer, according to separate general order, is responsible for the cleanliness of the camp. As a general rule the walls of the barracks are limewashed once a year, but oftener if necessary.

12. The washing places are attached to the barracks outside the verandahs, they are of simple construction, being merely stone paved floors, and raised masonry platforms for the hand basins. Only one washing place is attached to each barrack; the water is kept in casks, which are filled by the bheesties as required; the waste water runs through the urinary, and from thence to a cesspool, from which it is removed by sweepers. There are no baths, and the lavatory arrangements altogether are very defective.

13. The cookrooms are provided with no other means of cooking besides the ordinary fire-places; water is kept in casks supplied by bheesties; and waste water runs from a sink through the wall into a cesspool outside, from which it is removed by sweepers. The arrangements for washing are not carried on in barracks in this country.

14. The privies are of the following construction:—The excreta fall on the floor of the privies, which is paved and slope outwards and downwards to a drain, by which fluids are carried off to a cesspool; this is emptied by the sweepers, who also remove the deposit from the paved slope through the openings in the rear wall; it is then carried by the sweepers in buckets and deposited at a certain distance from camp.

15. The ventilation of barracks has been replied to in question 8. In the cookrooms ventilation is secured by raising that portion of the roof immediately above the fire-place about six inches higher than the rest of the roof. The barracks are lighted at night by the ordinary brass hanging oil lamps, three of which are in use in each barrack room.

16. There are no arrangements for draining and sewering the barracks. The natural drainage is good. The men's lavatories, urinaries, kitchens, &c., are drained into cesspits, which are regularly emptied by the sweepers at daylight, and purified with lime. Excepting during the monsoon the barracks are airy and dry, but it is then found necessary to have charcoal pans burning, in consequence of the moisture of the air. A small cesspit is attached to each bathing room, urinary, and privy. To each married man's quarters there is a bathing room with a cesspit. The nearest well is about 200 yards from the artillery barracks; about a quarter of a mile from the European infantry ones; and about half a mile from the hospital. There are no foul ditches.

17. The surface refuse is collected in carts, and deposited at a certain distance from camp, where it is periodically burnt.

18. There is very little vegetation of any kind in the cantonment. There are no old walls, thick hedges, &c. to impede the ventilation of the station, bazaar, &c.

19. Cantonment bazaar is kept clean, is sufficiently drained, and is not overcrowded. The local arrangements are under the superintendent of bazaar and police.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	The following are the local arrangements for preserving cleanliness in the station bazaar at Kolapore:— The whole of the filth and rubbish which accumulates at the bazaar is collected by the inhabitants in baskets every morning, and is placed in front of their houses. These baskets are emptied into a scavenger's cart kept up by the Government for the purpose. The contents are deposited in an open space about 350 yards to the east of the bazaar and burnt. One sweeper is maintained by Government, and the filth collected by him is thrown into a nullah about 400 yards to the eastward of camp, where the bazaar people resort for the purposes of nature. All stagnant water is removed every morning by the bazaar sweeper, or by sweepers kept up by the inhabitants. Two bazaar peons and two of the night police maintained by the inhabitants, prevent any nuisance being committed within camp limits from 4 a.m. to 10 a.m. daily, and all offenders apprehended are fined by the superintendent of the bazaar and police. These arrangements have hitherto proved sufficient. There are no native houses in the vicinity of the station. 20. The slaughter ground is to the east or leeward of camp, and is about half a mile distant. No nuisance is experienced from it in the cantonment. 21. There are only about six tattoes in the bazaar, they are stabled with the buffaloes of the milkmen. Bullocks are picketed in an open space to the north of the bazaar. The whole of the refuse grass, manure, &c. is daily removed by the bazaar cart. 22. The artillery stables are open sheds. They are situated to the leeward of the artillery barracks, but to the windward of the infantry ones. The manure is removed daily. The dung is sold or made into fuel and taken to a distance. The urine is allowed to evaporate, and to a certain extent deodorized by means of lime. The stables are nearly a mile from hospital. 23. The accommodation for the married people is sufficient. None of them occupy barrack rooms with the men. The patcheries, however, are of a very slight temporary description, and would require improvement were it decided to locate European infantry here permanently. They are damp during the monsoon.
Officers' Quarters.	Officers reside in separate bungalows, the compounds of which are kept clean. They are, from their position on a ridge, well drained naturally. Any inattention to cleanliness would receive due notice from the station authorities. No improvements are suggested.
IV. Health of Troops.	1, 2, 3. The station of Kolapore is a very healthy one, the mortality amongst the Europeans being lower than in any other cantonment in the Bombay Presidency. From January 1830 to December 1849, out of an average strength of 292, the deaths were only 20·54 per 1,000. The entire district enjoys more or less the influence of a sea breeze, which commences in the afternoon or evening, and tempers the westerly winds in April, May, and June, and renders the hot weather much less debilitating than at most stations. It is even considered in some respects superior to Belgaum in point of climate. Amongst the native population the endemics are intermittent and remittent fevers, guinea worm, tape, round, and thread worms, and itch. The epidemics are cholera, small-pox, and measles. Its salubrity is no doubt attributable to its elevation,—1,797 feet,—to the open nature of the country in the immediate vicinity of the camp, freedom from luxuriant vegetation, and to its free exposure to westerly and south-westerly winds. 4. The only force that has been here any time is the 3rd company 3rd battalion of artillery, which is a newly raised one. The men composing it were drawn from different stations. It has been located here for two years and a half, and has enjoyed excellent health. It has suffered from intermittent fever, but not to any extent. The native infantry lines are perhaps the least healthy, the wing of the 15th Regiment N.I., that was here last year, having suffered from cholera, which, however, was attributed to defective drainage, and to the existence of concealed cesspits in or near some of the huts. 5. The system of camping out has not been practised here, as the troops have been much moved about latterly. The 10th Regiment N.I., for example, has just returned from field service in Rajpootana and Central India, and with the exception of a three weeks' halt in the first monsoon, has passed upwards of two years under canvass. 6. Our experience of hill stations is confined to a short sojourn at Mahableshwur. 7. We have no data to furnish, but consider that a residence at hill stations would not only lessen the liability to fever, but would tend generally to diminish the predisposition to climatic disease which is occasioned by a protracted residence in the plains. 8. We highly approve of selecting hill stations for troops when practicable. 9. In the Himalaya group, Kussowlie, Subathoo, Simla, and Dugshai, troops are liable to hill diarrhœa to a greater extent evidently than on the few hill stations on the Bombay side. 10. Bowel complaints might in some measure be guarded against, so far as they possibly could, by the use of flannel under-clothing, pure water, attention to cleanliness, clearing the jungle, thorough drainage, and a strict system of conservancy. 11. In the Deccan hill stations the hot weather and post monsoon are the most suitable seasons for residence there. The shortest period of residence to derive benefit from hill stations is from one to two years; but even a single hot season on the hills has a remarkable effect on individuals, free from organic disease, debilitated by service and hard work in the plains. 12. Not aware of any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The precautions for protecting the health of the troops on leaving hill stations for the plains are to make the transition easy and to avoid too long marches and exposure to the sun. 14. As a general rule it is advisable to have European troops located periodically on the hills, and especially to canton them as much as possible on high table lands; stations such as Belgaum, Kolapore, and Poona proving very suitable to the European constitution. Until the system of railways, however, is much more advanced, stationing troops on the hills can only be hoped for, as a large portion of the army will be required in the plains to preserve order amongst a mixed population, as well as to curb warlike robber tribes on the frontiers. It would doubtless prove most beneficial to have European children after five years of age sent to the hills, and to arrange that the European soldier should pass one year in five in a climate more suited to his constitution than the enervating one of the plains. Change of station in the plains is beneficial, and is very requisite in unhealthy localities.

References to Subjects and Queries.	Replies.
IV. Health of Troops—*cont.*	15. The sanitaria on the Bombay side are very limited. Those in the Deccan were some time ago fully reported upon by Dr. Morehead, then superintending surgeon, Poona division—one of the highest authorities on Indian diseases. 16. The elevation of Mahableshwur and Mount Aboo is 4,500, but a less height would evidently prove suitable. At Pôonagunee, 4,000 feet, the rains are comparatively light, amounting to about 50 inches, while Mahableshwur is uninhabitable during the monsoon. 17. Punulla, a dismantled hill fort 11 miles from this station, is 975 feet above the plains, and has a climate suitable for a sanitarium, excepting perhaps during the monsoon, when it would in all likelihood be too damp, from being enveloped with clouds. It bears a high reputation among the natives, who declare that cholera has never been known to enter the fortress. The water is said to be good and pure, and slightly impregnated with iron, which abounds on the hill. 18. The most healthy soils for stations have been sandy gravelly soils, through which water readily percolates; moorum red soil, compound disintegrated rock (trap), coloured with oxide of iron. The worst met with by me in the course of 16 years' service was the limestone formation at Sukkur, Hydreabad, and Tatta. The presence of iron in the soil has not been found injurious to health, as ironstone is met with at some of the most healthy stations in the Bombay Presidency—at Mahableshwur, Punulla, Kolapore. When the 10th Regiment Native Infantry was at Supree, in Central India, which is a very healthy station, ironstone was found to be common. 19. Soldiers proceeding to India should be about 20 years of age, or when the constitution is sufficiently formed. The best period for troops to land in India is early in November, at Bombay, Kurrachee, and Calcutta. Recruits for the Indian army are usually landed at Bombay, and thence dispatched to their different stations, being supplied before starting with light clothing and bedding. If proceeding to the Deccan, they are forwarded by rail to Poona, from which they are marched to their respective stations, and on arrival at regimental head-quarters are sent to drill. To preserve their health they should be carefully looked after at the Presidency, at once dispatched up the country to their respective regiments, and in no case detained long at the Presidency towns, where they are extremely apt to be led into vice and intemperance. 20. Troops should be sent direct from home, as no perceptible advantage would be derived from residence at an intermediate station. To diminish the dangers of the earlier years of service they should be sent to a healthy station, such as Poona or Belgaum. The former has the recommendation of easy access by rail, but the latter has the advantage in point of climate. 21. The arrangements relative to the transport of troops are made by the quartermaster-general's department. It may be stated generally, however, that water transport, when available, should be adopted—steam in preference to sailing vessels—and that sending troops by country craft should be entirely discontinued. Pattinars have long been considered as unfit for the public service, being from their form, construction, and rig unmanageable in rough weather, when, moreover, they are liable to capsize from having to wear, being unable to tack. 22. The number of years a British soldier should serve in India varies according to circumstances, from 12 to 15 years. 23. There is rarely any conflict of opinion with regard to invaliding at the medical boards, as the committees are entirely composed of medical officers, who should, however, be selected for this important duty, and not be taken from the roster. In mixed committees for the examination and passing recruits, for example, it is different. To rectify any defects in their constitution, it should be made imperatively necessary for all recruits to be finally passed by the regimental medical officer, who is more interested than strangers in selecting only thoroughly effective men for his regiment. 24. Invalids should leave India in January, so as to reach home in the summer.
Diseases.	1. There are regular weekly inspections in the detachment 56th Regiment for the discovery of venereal disease. 2. There has been no scorbutus among the European troops. The 10th Regiment Native Infantry has been too short a time here to enable me to form an opinion regarding native troops suffering from the disease at this station. Moreover, many of the men have brought a scorbutic taint with them from Central India, the result of long-continued over-work, hardship, and privation. As a preventive measure to this disease, greater encouragement should be given to gardening and to the cultivation of vegetables at all large stations. 3. The proportion of hepatic disease treated in the 3rd company 3rd battalion Artillery is small, only three cases of hepatitis having been in hospital in the last two years. The climate of India is the principal cause of hepatic disease, which arises from long continued exposure to a high temperature, the disease occurring on exposure to the sun, and great diurnal changes, in the most abstemious, as in the case of the French traveller Jacquemont, as well as in intemperate habits. Addiction to spirits no doubt induces organic disease of the liver, which is followed by intestinal hemorrhage and dropsy. This form of disease might in some measure be obviated by the use of malt liquor instead of spirits; by active habits and attention to the state of the skin; by the daily use of the swimming bath, which is a most important means of preserving health. 4. Dracunculus is rare among the European troops, but is prevalent among the natives here. The origin of the disease is still involved in obscurity. It arises from the use of water containing the worm or its germ, but whether from drinking or from bathing in such water, is still an open question. Her Majesty's 8th Hussars and 10th Regiment Native Infantry suffered considerably from the disease last year, and evidently contracted it in the jungles near Seronge in Central India. 5, 6. The following table shows the admissions from venereal diseases in the hospital, 3rd company 3rd battalion Artillery, during the last two years. It would be advantageous to establish lock hospitals at all large stations where Europeans are located. The troops at the station do not suffer from epidemic or endemic diseases to any extent. The only corps that has been stationed here for any length of time is the 3rd company 3rd battalion Artillery, the detachment of the 56th Regiment having been here for little more than two months and the 10th Regiment Native Infantry for a month and a half.

References to Subjects and Queries.	Replies.

Abstract showing the Admissions and Deaths from the following Diseases during the last Two Years at Kolapore Hospital, 3rd Company 3rd Battalion Bombay Artillery.

Diseases.	1858–59. Average Strength, 103.		1859–60. Average Strength, 93.	
	Admissions.	Deaths.	Admissions.	Deaths.
Hepatitic	—	—	3	—
Venereal	37	—	29	1
Dysentery	7	3	1	—
Cholera	—	—	—	—
Smallpox	—	—	—	—
Rheumatism	12	—	3	—
Fevers	25	1	12	—
All other diseases	91	—	71	1
	172	4	119	2

Of Fevers there were	1858–59.		1859–60.	
	Admissions.	Deaths.	Admissions.	Deaths.
Febris Ephemera	6	—	3	—
" Ints. Quotidiana	11	—	8	—
" " Tertian	1	—	—	—
" " Quartana	1	—	—	—
" Remittens	1	1	—	—
" Continua	5	—	1	—
	25	1	12	—

Daily average sick, 1858–59 - 7
" " 1859–60 - 4

IV. Health of Troops: *Diseases*—cont.

7. The more frequent zymotic diseases are,—endemic, intermittent, and remittent fevers, epidemic cholera, small-pox, and measles. The former occur mostly at the termination of the rains, when there is considerable diurnal variation of temperature—hot days and cool mornings and evenings. Cholera and small-pox appear generally in the hot weather, the former in close, sultry, or muggy weather, with a highly charged electrical state of the atmosphere. The station bazaar is healthy; the dwellings are clean, and not overcrowded, and it is well drained. The native population generally are predisposed to disease from neglect of sanitary arrangements in the vicinity of their dwellings.

8. With regard to the influence which the soldiers' duties and occupations in barrack, &c., have on the prevalence of epidemic disease, it is difficult to reply more than generally. The more varied and agreeable a soldier's occupation is rendered, the better will be his health. In the field and on the march his health is usually good, from his enforced regular habits, free exercise in the open air, and the absence of means of dissipation. On his return to the routine of camp life he enjoys a less high state of health, caused to a certain extent by the less exciting nature of his employment, but more, perhaps, from the greater opportunity of indulging in intemperance in all large cantonments.

9. Small doses of quinine have not been tried at the station as a prophylactic against malarial diseases.

10. The station might be improved by sinking additional wells, so as to ensure a sufficient supply of good water during the hot season, when it is apt to become somewhat short. Planting trees might also be recommended as likely to add to the salubrity of the station. But the chief and most urgent measure as preventive of disease would be entirely to abolish cesspools and urinaries, and to introduce "the dry system of conservancy," as in Bengal, of removing all excreta in moveable iron pans, and of emptying them into filth carts morning and evening. Under the present system it is impossible, even with the greatest care and vigilance, to prevent the vicinity of cesspools and urinaries from becoming very offensive during light winds or calm weather. The only drains that it is desirable to continue are those connected with the lavatories, and those for the efflux of rain water.

V. Intemperance.

1. The soldiers of the detachment 56th Regiment are considered to be temperate. The 3rd company 3rd battalion Artillery are considered to be somewhat intemperate, and to have about five per cent. drunkards in the company, though no case of habitual drunkenness has occurred for a very long time.

3. In the hospital, 3rd company 3rd battalion Artillery, the admissions from delirium tremens were:—In 1858–59, 3 cases; in 1859–60, 3 cases. Drunkenness is always punishable as an offence.

3. In the Artillery canteen arrack is sold at 25° below proof, and is issued at the average rate of one dram per man daily. It is always paid for, excepting when artillery are serving on board ship, when it forms part of the ration. No spirits are issued in the Artillery canteen until the evening. Spirit is no part of the soldier's ration, excepting, perhaps, in the field, when it is considered necessary. When spirit is given to convalescents, it is by the special direction of the medical officer, and is always limited and of the best quality. In the bazaar an inferior description of ginger beer is sold, called "pop," which is decidedly injurious to health, and is apt to induce bowel complaints, and even cholera.

4. In moderation, spirit does not seem materially to affect health or prove injurious to discipline. The officer commanding detachment 56th Regiment distinctly states that the quantity allowed, of one dram to each man, is not detrimental to the internal discipline of the detachment.

5. It would not prove beneficial to the health of the troops to abolish the use of spirits in the canteen, as the men would very soon find a substitute in the cheaper and more deleterious spirits of the country, easily procurable at all large stations. At this station men have been known to have delirium tremens, caused chiefly, if not entirely, from the use of eau de Cologne, or what is sold at the bazaars as such.

6. The use of malt liquor is greatly preferable to that of spirits. Wines of a good quality would be beyond the soldier's means.

7. In the Artillery, tea, coffee, &c. are much used, and their consumption is encouraged as much as possible by the commanding officer. Their influence on health, efficiency, and discipline is undoubtedly beneficial.

8, 9. It would not be advisable to suppress altogether the issue of spirits from the canteen store, but something might be done by gradually substituting and cheapening the supply of beer.

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References to Subjects and Queries.	REPLIES.

V. Intemperance—*cont.*

10. The use of tea, coffee, and lemonade should be freely encouraged, and, as far as practicable, the use of beer should be substituted for spirits. This can only be done in cantonments. In the field, during war, beer and porter cannot be carried about. In Central India, officers as well as men had occasionally to depend on the commissariat department for arrack, from the difficulty of getting carriage and from the nature of the country in which operations were carried on.

11. The following is an abstract of the more important canteen regulations:—The canteen of the 83rd Regiment is open at noon for the issue of porter, and for the issues of porter and arrack from 2 to 3, and from 7 to 9 p.m.; when tattoo beating begins at 8 p.m. it is open from 6 to 8 instead of 7 to 9 p.m. The allowance of liquor to any one man is one quart of porter and one dram of arrack per diem. If he receives the quart of porter at noon he is not allowed to draw any more porter, and only one dram of arrack for the remainder of the day. If he receives only a pint of porter at noon, he can have the remaining pint and one dram of arrack in the evening; but whether he receives a pint of porter or no porter at all at noon, he can receive no more than one pint of porter and one dram of arrack in the evening. No liquor, without permission of the commanding officer, is allowed to leave the canteen except the porter at noon. No person not belonging to the regiment can receive liquor from or in the canteen. All issues from the canteen are paid for in ready money. No man on guard or picquet, or for reinforcement, or convalescent, or defaulter, is allowed in the canteen, and no liquor is allowed to be sold directly or indirectly from there to any native whatsoever. The canteen of the 3rd company 3rd battalion Artillery is opened at the following hours, 7 a.m. to 7.30 a.m. for the issue of one pint of porter; 12 noon to 12.30 p.m. for the issue of one pint of porter; and from 7 p.m. to 8 p.m., when the men can procure one pint of porter and one dram of arrack. There are no local bazaar regulations; those contained in 2nd Supplement to Jameson's Code are duly acted up to. No liquor is allowed to be sold in the bazaar to European soldiers or their wives or children, nor is liquor allowed to be brought into camp by unauthorized persons.

VI. DIET.

1. The composition of the ration is as follows:—

—	Queen's Troops.	—	European Troops in the Indian Army.
	lb. oz.		lb. oz.
Bread	1 0		1 0
Meat—Beef	1 0	Beef or Mutton	1 0
Tea — Black	0 $\frac{10}{21}$		0 $0\frac{5}{7}$
Tea — Green	0 $\frac{6}{21}$		
Sugar	0 $2\frac{1}{2}$		0 $2\frac{1}{2}$
Rice	0 4		0 4
Salt	0 1		0 1
Potatoes	0 8		0 8
Mixed Vegetables	0 8		0 8
Firewood	3 0		3 0

The only changes are from beef to mutton, and from bread to biscuit, and in the vegetables, which vary according to the season of the year. The ration is inspected by the commissariat officer, the orderly officer, and the non-commissioned officer on duty. That of the sick in hospital is inspected by the medical officer.

2. A complete ration, including vegetables, is provided. In the 56th Regiment the stoppage is 3 annas 4 pice a day. In the Artillery each man pays 2 pice a day for fruit and spices for puddings. Breakfast, dinner, and supper are taken at 8 a.m., 1 p.m., and 4 p.m., respectively. In the hot weather a change might be advantageously made by having a light meal in the middle of the day and the principal one in the evening; but it is not certain that the men themselves would prefer the arrangement. The proportion of vegetables in a ration is one pound.

3. The rations issued are excellent. They might be varied more from beef to mutton. In the Artillery the men change the rice for a supply of milk for their tea. A small quantity of milk might be added to the ration, and some butter, perhaps, during the rains and cold weather.

4. The kitchens are good, but the camp kettles are too large, and there are no means of roasting the meat. The kitchens are clean, open, and well ventilated, and sufficiently supplied with water. The food is either boiled or fried. It is properly done, but not sufficiently varied, from the want of roasting apparatus. Tea is properly prepared. In the Artillery arrangements are made to have coffee prepared for the men, either before a march or as a refreshment half way; but this is not the case in the 56th Regiment detachment.

5. Gardens for the cultivation of vegetables would be advantageous in many respects, by employing the men out of doors and affording an agreeable relaxation from the dull routine of camp life. They should be under the superintendence of officers selected for the duty by the commanding officer.

VII. DRESS, ACCOUTREMENTS, AND DUTIES.

1. The soldier's dress in the Artillery consists of cloth tunic and trousers, serge jackets and trousers, khakee light clothing, and helmet with turban over it. The accoutrements are, sword belts and knapsacks, the latter is only worn on heavy marching order parade. In the 56th Regiment khakee clothing is worn during the hot season, and shell jacket and cloth trousers during the rest of the year. Woollen clothing, light or thick, according to the season, should be worn by men exposed to night air, and flannel under-clothing throughout the year, but particularly during the monsoon, the neglect of which precaution is apt to occasion bowel complaints. During the hot weather the men should wear cotton socks, and woollen ones during the rest of the year. The men on guard wear cloth clothing, excepting in the day in the hot season. The helmet is by far the best and most suitable head dress for the climate. Its construction, however, is open to improvement as regards durability and lightness. The dress of the men of the 10th Regiment Native Infantry is, for parade, forage cap without cover, cloth shell jacket or tunic, and American drill fatigue trousers. In cold weather, cloth trousers are worn on all duties before 8 a.m. and after 6 p.m., and guards wear great coats during the night. For summer clothing, white clothing cut tunic

References to Subjects and Queries.	Replies.
VIII. Dress, Accoutrements, and Duties—*cont.*	fashion has been introduced, and has been directed not to be dyed until a regiment is ordered on service. This would occasion considerable inconvenience, even were it always possible to dye some 1,500 tunics khakee coloured at a short notice. A peak is very much required for the forage cap to protect the eyes from the intense glare of the sun. This could easily be introduced without any general order being issued that would excite remark. Were it intimated that its use would be permitted, the native officers would at once adopt it, and it would become generally appreciated by the men. The shoes now in use are of a bad description, and of country leather, which becomes worn out in a short time in wet weather. It would be preferable were Government to provide the article in the same way as to European troops. The want of good shoes was severely felt by the 10th Regiment Native Infantry, which underwent no ordinary hardship and privation in the Central India campaign, having in the course of two years marched 3,689 miles. The committee beg to recommend loose serge coats and khakee clothing, the same as is used by European Infantry, instead of the present dress, for regular Native Infantry. The accoutrements are, buff waist and shoulder belts, with bayonet frog and scabbard, black leather pouch, with 10 rounds of ball ammunition. The present accoutrements are badly slung, the whole weight of the ammunition being thrown on one shoulder, and the one too that has to bear the weight of the musket. This could be obviated by dividing the ammunition into two smaller pouches. The knapsack when packed is too heavy, and is, moreover, quite unsuited to the natives, for when likely to come into use on a forced march it cannot really be carried without exhausting or distressing the men. A better and more serviceable haversack is desirable.
Duties.	1. No apparent material advantage would be derived from drilling troops at home. It would seem preferable to have them drilled in this country by the officers and non-commissioned officers under whom they have to serve. 2. The usual routine of soldiers' duties at this station are:—Artillery, morning parade or drill from 5 to half-past 6 a.m. Stables, 6.25 a.m. to 7.30 a.m. Breakfast, 8 a.m. Orderly room, 9 a.m. Cleaning harness, arms and accoutrements, and barracks, until noon. Dinner 1 p.m. Supper, 4 p.m. Drill or stables, 5.30 p.m., and in evening, tattoo roll call. 56th Regiment detachment.—Guard mounting and drills, twice a day, three-quarters of an hour morning and evening. The best hours for drills are early in the morning, earlier in the hot than in the cold weather. With regard to marching, the instructions in separate general orders are as clear and distinct as could be wished. The commanding officers, however, often assume large discretional powers in marching, evidently from want of due appreciation of the importance of preserving the energy of the men from the effects of the sun, which seems to operate more quickly on a soldier, fatigued at the end of a march, buttoned up and accoutred, with a rifle and supply of ammunition, than it would do on the same individual disencumbered of his arms and lightly dressed. The Artillery have five nights and the 56th Regiment six nights in bed during the week. The 10th Regiment Native Infantry have morning parade every day, Sundays and holidays excepted, averaging about one and a quarter hours in duration. Orderly room at 8 a.m.; evening roll call and inspection parade, once a week. Evening parade for non-commissioned officers, three times a week. On weekly holidays roll call is taken at tattoo beating. The average nights in bed for privates are three; for naiques four; for havildars, five. Guards last for 24 hours day and night, and are mounted in the main street in the regimental lines. They are, with one exception, within half a mile of the lines, and the treasury is three miles distant. The European Infantry mount guard in barrack square and are relieved every 24 hours. There are roll calls at morning parade, breakfast, dinner, evening parade, and tattoo, and check roll calls when required. The night duties here are light, and do not have the same effect as in unhealthy stations. With regard to the movement of troops, by special general orders, long and distressing marches, unless under special orders or emergencies, are strictly forbidden. The hours of marching must depend on the season, climate, state of roads, distance, and service; but on ordinary occasions, when troops are not in an enemy's country or disturbed district, or in charge of prisoners or treasure, it should be so timed as to bring them to their ground by or soon after sunrise; all unnecessary exposure being sedulously avoided, as prejudicial to health.
VIII. Instruction and Recreation.	1. The means of recreation and instruction are as follows:—There are no ball courts, but the Artillery have skittle grounds in the lines. There is no adult school. The Artillery have a library, which is well lighted. There is no day-room or soldiers' clubs. There are no soldiers' gardens, but the Artillery cultivate small plots of ground during the rains. There are no workshops or gymnasia, but there is a station theatre, which is out of repair, and which has fallen down since the preparation of this report. The means are not sufficient to keep the men occupied during the wet season and during the heat of the day. The commanding officer of the Artillery does not restrict his men, but permits them to expose themselves as they please, and encourages them in getting up cricket matches. In the 56th detachment the men are not allowed to expose themselves unless on duty. 2. A ball alley should be built, and plunge baths established, as the men have no means of keeping themselves clean properly, from the defective lavatory arrangements in the barracks. Indeed in all stations where European troops are located, plunge baths should be built, as they are most essential to the health of the troops. In several stations they have been already introduced, as at Kurrachee, Belgaum, Kulladgee, &c. Their effect on the health of the troops can hardly be overrated. 3. Soldiers' savings' banks are already established at the station. 4. There are no trees in camp to afford shade, but there are good verandahs to all the barracks.
IX. Military Prisons.	1. The European cells can scarcely be considered as good, the cubic space being less than the minimum allowed in barracks for European troops in Bengal Public Works Code. There are moreover no wash-houses for the prisoners.
X. Field Service.	1. There are no local rules for field medical service which are not included in the Bombay Medical Code, Section XI. 2. With regard to the powers of the medical officers, as to the conduct of the line of march, of troops bivouacking, camping, billeting, &c., the rules for encampment on service are laid down in pages 143–4–5, separate general orders; and ordinary camping in page 81 of the same, but contain no reference to medical officers. These arrangements are entrusted entirely

References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	to the commanding officer. This renders it a matter of considerable delicacy for the medical officer to offer any suggestion, as such recommendations are not always well received. To illustrate the working of the present system a few instances had better perhaps be adduced. In a cavalry regiment that had a short time previously arrived in the country, the corps was marched late and kept out in the sun. The result was that the men suffered from exposure and the sick list increased. The surgeon represented to the colonel the advisability of marching earlier, but was not attended to. The next occurred in an infantry regiment, which, on account of an outbreak of cholera, was moved into tents. The colonel, from a want of knowledge of sanitary matters, had the tents so closely pitched that the ropes nearly interlaced. The surgeon ventured to suggest that the tents were too close to allow of proper ventilation, and was publicly informed that it was no affair of his. He accordingly reported the matter to the brigadier, who personally inspected the camp and ordered every second tent to be taken down and pitched elsewhere. In giving another illustration of the disregard of medical officers' opinions, there is no reason for withholding the details, as it has already appeared in print. At the end of April 1846, the 22nd Regiment Bombay Native Infantry was ordered from Mhow to Baroda, and Dr. Arnott, the surgeon in charge, remonstrated against the march being undertaken at such an advanced period of the year, and as cholera and small-pox moreover were then raging along the line of march. His representation however was not attended to, and within ten days of leaving Mhow there were 300 cases of cholera, of which 200 died. Dr. Arnott too, a good and zealous officer, fell a victim to the disease, and the regiment was left in the middle of the jungle without any medical aid. 3. The regulations for preserving the health of troops in camp are laid down in separate general orders, an extract from which is appended. Ventilation and water supply come only to a limited extent within the province of the regimental medical officer, whose duties are confined to the details of station and field hospitals. At large military stations the senior medical officer has latterly been nominated sanitary officer, and is thus permitted to make recommendations bearing on the health of the troops. The power, however, of the medical officer in the matters referred to is very restricted, being confined to submitting suggestions to the military authorities, which may or may not be received in good part. The result is that medical officers are somewhat reluctant to interfere unless obliged to do so officially through the occurrence of sickness. During the two last years on field service in Rajpootana and Central India I only recollect of having once offered a suggestion to the commanding officer, and that was in a private form to the officer now commanding the regiment, who is a personal friend of many years' standing. It would be preferable were it clearly laid down to be the duty of the medical officer to advise the commanding officer in all questions relative to the health of troops, as he is fully as responsible for the health of the regiment as the commanding officer is for the maintenance of discipline and proper interior economy, having annually to furnish a detailed statistical account of his charge to the Director-General at the Presidency. Any cases of difficulty or doubt could easily be set at rest by a reference to the Deputy Inspector-General of the division, which course would ensure attention and discretion, and would prove more conducive to the interests of the public service than the present arrangement, by which the sphere of usefulness of medical officers is in a great measure limited to the details within hospital. Since the above was written, the Director-General's quarterly sheet of general orders and medical circulars of the last quarter contains the following:—In a general order, 11th February 1860, regimental medical officers have been directed as at home to frequently examine into the state of the barracks, of their environs, and to suggest any improvements that may appear necessary to the commanding officer. Copies of such suggestions to be invariably forwarded to the Director-General's office, Bombay, and to be inserted in the annual report of the medical history of the regiment. 4. When it is necessary to establish a field hospital, a surgeon is selected, from his experience generally, and is nominated in general orders, with as many assistant-surgeons under him as may be required. The field surgeon, in concert with the superintending surgeon, makes the requisite arrangements for medical stores, commissariat supplies, and sick carriage. The rules on this subject will be found in section xi., Medical Code. During the campaign in Central India the dooly was the best, and by far the most comfortable means of carrying wounded men. The next in point of convenience was the new pattern iron kajawak on a camel, and the last, the ambulance or spring cart, which was slow and not suited for forced marches, or for operations in a hilly or jungly country. The number of dooly bearers in an European regiment might, perhaps, be slightly reduced and replaced by kajanahs, but the former can never be dispensed with in this country.

XI. STATISTICS OF SICKNESS AND MORTALITY. KOLAPORE.—EUROPEAN TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M.'s 3rd Dragoon Guards. Detachment H.M.'s 33rd Regiment.	173	1	—	3	—	1	—	1	—	14	—	—	—	—	—	49	—	69	—	39·8	—
	European Troops in the Indian Army.																					
1850-51	3rd Company 1st Battalion Artillery.	101	295	1	—	—	—	—	—	—	23	1	4	1	—	—	100	1	422	4	417·8	3·9
1857-58	Detachment 4th Troop Horse Brigade. 3rd Company Reserve Artillery. Detachment 2nd European Regiment.	182	107	—	—	—	8	—	7	—	29	2	6	—	—	—	131	—	288	2	158·2	1·1
1858-59	3rd Company Reserve Artillery. Detachment 2nd Regiment European Light Infantry.	430	146	1	1	—	15	1	12	—	83	6	15	—	—	—	352	1	624	9	145·1	2·1

NATIVE TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	17th Regiment Native Infantry. 19th Regiment Native Infantry.	994	298	3	—	—	15	1	4	1	51	2	8	—	—	—	337	1	713	8	71·7	0·8
1851-52	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	1,004	719	3	1	—	19	1	2	—	31	—	9	3	3	2	339	1	1,123	10	111·8	0·9
1852-53	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	918	375	2	—	—	18	—	8	1	32	—	7	1	—	—	327	2	767	6	83·5	0·6
1853-54	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	733	178	1	1	—	26	2	—	—	44	2	4	1	—	—	296	4	549	10	74·8	1·3
1854-55	5th Company 3rd Battalion Artillery. 6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	851	404	6	7	—	13	—	5	—	79	2	6	—	125	51	406	1	1,045	60	122·7	7·0
1855-56	6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	803	194	—	9	—	8	—	1	—	59	2	8	—	—	—	440	1	719	3	89·5	0·3
1856-57	6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	663	124	—	15	—	12	1	1	—	41	—	10	—	—	—	282	2	485	3	73·1	0·4
1857-58	27th Regiment Native Infantry.	599	94	1	26	—	8	1	1	—	49	—	10	—	—	—	215	—	403	2	67·2	0·3
1858-59	27th Regiment Native Infantry. 15th Regiment Native Infantry. Detachment Southern Mahratta Irregular Horse.	560	152	2	9	—	9	1	—	—	27	—	5	—	15	5	229	1	446	9	79·6	1·6

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

W. C. COLES, Assistant-Surgeon, Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. The hospitals occupied by the European troops face S.W. by S., and are about half a mile from the barracks and stables. The sudder bazaar is about 350 yards distant on the north of the hospitals. The site is open and freely ventilated, the ground being the highest in the immediate neighbourhood, and almost the highest in camp. The site is generally healthy.

3. There are wells of excellent water in the vicinity of the hospitals, which are generally sufficient. In the hot weather the supply for troops in camp is apt to become somewhat short before the setting in of the monsoon.

4. No system of drainage exists. The refuse water runs off, and is either evaporated or absorbed. Impurities from the necessary run into a cesspool, from which they are removed by the hospital sweepers.

5. The average height of the floor of the Artillery hospital above the surface of the ground is about 3 feet, and that of the European Infantry is about 5 feet. There is no ventilation underneath the floors. The roof water is partly absorbed, but a good deal runs off from the slope of the ground on which the hospital is built. No system of drainage or gutterage exists, the natural slope of the ground being sufficient to carry away any rain water rapidly. The walls of the hospital are of stone and lime, plastered with lime inside, and pointed with lime outside. The walls are single, 2 feet in thickness. The roof consists of a double layer of semi-cylindrical tiles, with bamboo matting below. Both roof and walls are considered sufficiently thick to keep the hospitals cool. The hospitals have a verandah 10 feet wide all round; the front and rear of it are open, but the ends are built up, forming dispensary and store-rooms, &c. The front is moreover protected by a second verandah of bamboo matting, which affords sufficient shelter from the sun's rays. The verandahs are never used for the accommodation of sick, convalescents, or others, excepting in an extreme case perhaps, from want of room. The hospital consists of one flat, the basement story.

Table of hospital accommodation.

Date of construction, 1854–5.

Total number of wards, 3, one in each hospital.

Total regulation number of beds.—About 48 in the European wards, and 60 in the Native Infantry hospital.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients Bed above the floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. in.		Ft. in.	Ft. in.
Wing of H. M. 83rd Regiment, 1	32	96	22	16	33,792	1,056	66	1 6	14	4 6	3 0
3rd Company 3rd Battalion Artillery Hospital, 1.	16	50	22	16	17,600	1,100	69	1 6	8	4 6	3 0
10th Regiment Bombay Native Infantry,* 1.	60	176	20½	9	32,472	541	60	1 6	16 2	4 0 3 0	3 0 2 6

* This was originally a gun-shed, and was recently occupied by the commissariat department as cattle-shed. It was lately converted into a hospital to accommodate the sick of the 10th Native Infantry, as they were exposed in tents at the beginning of the monsoon.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospitals are so placed as to exclude the north-easterly winds, and to receive the benefit of the sea breeze as much as possible without being exposed to the south-west monsoon. The windows are made in two halves, opening from the centre inwards in the usual manner.
	6, 7, 8. In the European Infantry hospital ventilation is effected by three large iron ventilators in the roof, in the shape of revolving cowls, which, with the windows and doors, are sufficient to keep the wards free from odour or closeness. As these openings are always turned from the wind they do not admit cool air freely, though they allow of the exit of heated air. During the heavy rains, moreover, the rain beats in and renders the wards so damp that it is necessary to use charcoal in the monsoon to keep it dry. In the Artillery hospital there are two ventilators of the same description. There are no jhilmils. There are no other means employed for cooling the air admitted into wards, or warming them, than those already described. The walls and ceilings of hospital wards are cleansed and limewashed as a general rule every three months inside, and once outside annually, or oftener if necessary.
	9. There are two large necessaries in the rear of hospital under one roof, 8 feet high, connected with the wards by covered passages. They are divided by a partition wall inside; one is 30 × 12, the other is 25 × 12 feet. The walls are of stone and lime, 2 feet in thickness, with single tiled roof and roughly paved stone floor. All fluid excreta run into a cesspool behind them; all other impurities are removed by the sweepers. As the privies are cleaned out regularly, and lime daily employed for deodorizing, they are not offensive.
	10. In the 3rd company 3rd battalion Artillery the lavatory arrangements for the hospital are: 1 large bathing tub, 1 slipper bath, and basins at the rate of 1 to every 100 men. In the detachment 56th Regiment, 1 tub, and basins at the before-mentioned rate. This proportion is insufficient.
	11. There are no regular bath rooms attached to the hospitals. This is owing to the fact that the European troops now occupy the hospitals which were built for the native troops stationed here. It is understood that a site has been selected for a new hospital for the Europeans nearer the braracks.
	12. Washing and drying hospital linen, &c., are performed at a distance by hospital washermen in this country.
	13. Storage is very limited.
	14. The cots used in hospital consist of strong wooden frames with cotton tape stretched across them. The bedding consists of straw mattrass, 6½ by 3½, at the rate of 20 per cent. of the strength; pillow cases are of the same description, 2½ feet by 15 inches, at the rate of 60 per cent. of the strength; cotton sheets, 7½ × 4½ feet, at 60 per cent.; bedding quilts, gingham lined, with soft country blankets of the same size as sheets, at the rate of 30 per cent. Lately suttringees or bed carpets, 5½ by 2½, have been sanctioned in addition to the above. It would be advisable to substitute in all hospitals and barracks strong iron cots, painted, which would be more durable and economical, and certainly much cleaner than wooden ones, which are greatly disliked by the men from their speedily becoming infested with bugs.
	15. The cooking of the hospital diets is properly done, as far as the means at disposal permit. The apparatus for cooking, however, is insufficient; additional kettles being required and camp ovens for roasting.
	16. Diet tables, rolls, &c., according to regulations.
	17. In the detachment 56th Regiment no hospital orderly is allowed for attendance on the sick. It is evidently desirable to have a steady non-commissioned officer nominated for this duty in all hospitals, whether of a wing or only a detachment of two companies. A matron is sanctioned only for a complete battalion of artillery or infantry.
	18. The sanitary condition of the hospitals is good. The wards have been free from hospital gangrene, pyæmia, &c., from its free ventilation and excellent site.
	19. There are no sanitary defects calling for especial notice. It would be an improvement to have a small cylindrical drain with a sufficient fall to carry the fluid impurities a greater distance from the hospital than at present. This could be flushed regularly daily. But the chief and most important alteration that is necessary is the introduction of the dry system of conservancy in barracks and hospitals.
	20. When convalescents are too reduced to take exercise they are sent out for air in a doolie. In special cases in the Artillery permission is obtained to have exercise on horseback. There are no shaded walks or seats set apart for their use.
	21. At present there is special provision made for the treatment of soldiers' sick wives and children; they are attended in the married people's lines. These arrangements are temporary. A new hospital is required for the European troops, for whom the present accommodation would be insufficient in the event of much sickness occurring amongst them. A female hospital also is much needed for the treatment of sick women and children.
	22. There are no special local hospital regulations not included in the general Presidency Regulations.
	23. In reference to the powers of the medical officer as to repairs, &c., he can bring to the notice of the commanding officer any repairs required through the adjutant of the regiment, and he can have the hospital whitewashed on indent countersigned by the superintending surgeon of the division. With regard to medical comforts, he has discretionary powers, restricting himself to the scale laid down. But his powers are rigidly circumscribed, and almost entirely confined to hospital details, his practice being strictly reviewed and expenditure controlled by the superintending surgeon of the division, while the commanding officer is authorized to see that order, regularity, and discipline prevail in the regimental hospital. The course pursued by Lieut.-General Sir Hugh Rose in Central India towards the medical department seems more likely to encourage zeal, to foster *esprit de corps*, and to stimulate to increased exertion, than frequent interference with executive medical officers. He is reported to have said, "I never interfere with you, and only wish to interfere when "you require my assistance to carry out your arrangements."
	24. There are no convalescent wards. In the event of much sickness occurring among the troops such an accommodation would be an advantage.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial-ground for British troops is about a mile from the station, bearing south-easterly and to the leeward of the camp. 2. Its area is about 200 feet square, and it is surrounded by a wall 8 feet high. The soil on the east side is black, but on the west this gives place to moorum, so compact that it is difficult to excavate. There is no subsoil drainage. The surface drainage is effected by means of openings left in the plinth of the wall. 3. The burials have been so few that it has not been found necessary to make any regulations as to the space allowed for each grave. The interval between each grave depends on the season, whether it is wet or dry. In the monsoon the sides of newly-dug graves fall in so much that a much larger interval must be allowed than in the dry season. The depth of the graves is never less than 4 feet, and in the dry season it is greater. During the rains a greater depth cannot be obtained in the lower part of the graveyard on account of the water. Hitherto there has been no necessity for reopening graves, nor, according to the rate of mortality since the inclosure of the graveyard, is such a necessity likely to arise for many years. The time of interment in the case of soldiers depends a good deal on the recommendation of the regimental surgeon, and in the cases of others on the wishes of the friends of the deceased. 4. The graveyard was slightly offensive last year during the time that cholera prevailed. The cause of its becoming so was attributed to the burial of native Roman Catholics without coffins. No measures were taken in the matter, as the nuisance did not extend beyond the walls, and the situation of the graveyard with respect to the camp rendered such measures unnecessary at that time of the year, when the wind blew directly from the camp to the graveyard. There are no local regulations for the burial of British troops. They are buried according to the custom of the service. 5. The bodies of Mahomedans and certain classes of Hindoos are buried in a place set apart for that purpose. The burial-ground is situated to the north, and about half a mile from the lines of the 10th Regiment Native Infantry. No houses are near to the burial-ground except one or two bungalows, which are about a quarter of a mile from it. The bodies of the other classes of Hindoos are burnt in the river. 6. No injury to the public health has resulted from the present practice, as the ground seems to have been well selected. It is desirable that the bodies should be interred sufficiently deep. The inhabitants have, up to the present time, been in the practice of digging about 5 feet deep, but in many cases much less. 7. The only improvement in the European burial-ground would be, as far as practicable, to have the bodies buried in coffins.

(Signed) J. S. Gell, Major, 10th Regiment N. I., Commanding at Kolapore.

T. Murray, Assistant Surgeon, 10th Regiment Native Infantry.

W. R. Dickinson, Captain, Executive Engineer, Belgaum and Kolapore.

15th August 1860.

APPENDIX.

Cantonments and Quarters.

Separate General Orders, par. 11.

The preservation of cleanliness is of the first importance, and to this end the encroachment of huts or shops, temporary or otherwise, beyond the space already marked out for the purpose, or extending enclosures or court-yards without the sanction of Government, is to be particularly prevented.

11. All persons residing within military cantonments are required to keep all drains and water channels in and about their premises free from obstruction; to remove all causes of malaria, to keep their hedges, inner and outer, cut to the height of 4 feet from the level of the ground, and not more than 2 feet in breadth, and branches of trees lopped off to the height of 6 feet from the ground.

38. Commanding officers of regiments are to be held responsible that the above regulations are observed within the lines of their respective corps. The work is to be performed under the immediate superintendence of the Regimental Quartermaster, and without expense to the State.

41. The Cantonment Staff Officer is responsible for the general cleanliness of camp. He will procure such assistance of carts, bullocks, sweepers, &c., as may be necessary, and prefer charges for the whole expense in contingent bills.

47. The Line or Staff Serjeant of each cantonment is daily to inspect a portion thereof, so that in the course of one week every portion shall be visited by him, and to report daily to the Cantonment Staff Officer as concerns all subjects embraced in existing orders relative to cleanliness, good order, and the removal of all preventible causes of malaria.

48. The Station Staff Officer is himself to make a similar inspection weekly, and to report in writing to the Commanding Officer, who is to take immediate measures to correct what may be wrong.

49. These reports, with memoranda of measures adopted or required to check irregularities and remedy defects, are to be sent on the first of each month to the Assistant Quartermaster-General of Division, for the information of the General Officer commanding.

BELGAUM.
BOMBAY.

BELGAUM.

Accommodation { Queen's Troops - { Artillery, 1 Company, with Light Field Battery attached. Infantry, 1½ Regiments.
Native Troops - Infantry, 2 Regiments.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is bare and somewhat exposed, undulating in the immediate neighbourhood of the station; hills and mountains at a distance varying from 5 to 30 miles, with intervening valleys. There is not much wood, jungle, or water in the vicinity of the station.
	2. The elevation of the station above the sea is from 2,100 to 2,260 feet. It is on a level with the adjacent country, and 20 to 100 feet above the nearest water. There is no higher or healthier ground adjoining the station.
	3. The nearest hills are about 8 miles distant, and the nearest hill with table land about 30 miles distant. The height of the latter is about 650 feet above the station.
	4. A small nullah runs through the camp, and there is also a large tank close to the fort; both are dry during the hot season. The nearest river is 16 miles distant. The vicinity is not liable to an overflow of water. There are a few ravines and water pits near the station, but they do not appear to have affected the general health of the troops.
	5. The station is open, although there are some trees adjacent; but with the exception of the fort, which is somewhat shut in, there is free circulation of air throughout the camp. The temperature of the station is not raised by reflected sun heat; it is exposed to both land and sea breezes. The land winds of the cold season injuriously affect the health of the troops; the sea breezes, however, are beneficial.
	6. The higher tracts close around are uncultivated; the lower land is all cultivated; their extent is perhaps the same. The large tank near the fort is an irrigation work, and several of the wells may be said to be the same, as fields are irrigated from them. Artificial irrigation has no effect on the health of the station, it is so very limited. The cultivation of rice is not prohibited. No indigo is cultivated, nor is the preparation of hemp or flax carried on near the station.
	7. Shahpoor is distant about half a mile from the station, and the town of Belgaum is between the fort and the camp; the latter, it is said, numbers some 18,000 inhabitants.
	8. The ground of the district is undulating, its geological structure is trap and laterite here and there cropping out. The general surface of the higher ground is composed of laterite detritus, that of the valleys is composed of negur or black soil. The camp is on new ground, but the fort, which is also included in the camp limits, is supposed to be 600 years old.
	9. Water is found during the dry season from 10 to 70 feet below the surface, according to the site of the well. The difference in depth between the dry and rainy season varies to the extent of 47 feet.
	10. The greater part of the rain-fall flows very readily away; on the lower ground some sinks into the soil, but much of it lies on the surface until it evaporates. There is no higher ground the drainage from which passes into the subsoil of the station.
	11. The water supply of the station is derived from wells; there are no tanks for the water supply of the station. The wells are liable to pollution, both from leaves and other matter falling into them, and yearly cleansing is desirable. No nuisance or malaria proceeds from any tanks within or without the station.
	12. In camp the supply of water is somewhat defective, owing to the wells being at a distance. The water is good, and has no unpleasant taste or smell. Indications of the presence of chlorides are found when chemically tested, also of sulphates of lime or magnesia, or both; carbonic acid is also present, and probably a salt of iron. It has not been microscopically examined, but it is clear from taste and smell, soft, good, and not injurious. The supply in camp is rather limited; the water is raised in leather moats (skins) by bullocks and emptied into troughs, and thence conveyed by water carriers. More wells might be sunk, or tanks might be built, to improve the water supply.
	13. We can suggest no other topographical points bearing on the health of the station not included the previous answers.
	14. New stations are sometimes selected by a commanding officer, but we believe more generally by a committee, of which the commanding officer, the senior officers of the medical, engineer, and quartermaster-general's departments are members. Elevated ground appears to have been generally preferred. We recommend that officers should be specially selected to determine so important a question, and that time, opportunity, and every facility should be afforded them of forming a proper opinion. We would also strongly recommend that no barrack or hospital be built till the climate of the station at which it may be intended to erect it may have been duly considered and the plans have been approved of by officers competent to judge, as the climate at different stations varies greatly, and the same kind of barrack or hospital will not suit for all.
II. CLIMATE.	1. The means and instruments available at the station for conducting and registering meteorological observations are—

Anemometer	1
Pluviometer	2
Barometer, standard	1
,, mountain	1
Hygrometers, Daniell's	2
,, Regnault's	1
Thermometer, standard air	2
,, ,, wet bulb	2

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	Self-registering: Maximum in air (bulbs protected) - - - 1; ,, in sun's rays (bulb exposed) - - - 2; ,, wet bulb - - - - 1; Minimum in air (bulbs protected) - - - - 2; ,, in grass (bulbs exposed) - - - 1; ,, wet bulb - - - - - 1; Clock - - - - - - - - 1

2. Meteorological table from 1856 to 1859.

Months.	Barometer Mean, at 9½ a.m.	Mean Temperature at 9½ a.m.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
	a	*a*	*a*	*b*	*b*	*b*	*b*	*c*	*b*	*b*	*b*	*b*	
Jan. -	27·520	71·87	28·47	85·10	56·63	73·06	61·53	113·7	—	S.E.	0·85	12	Clear or light clouds, light dews, moderate winds, no storms.
Feb. -	·499	74·74	31·82	90·45	58·63	78·29	62·37	118·9	—	N.E.	0·66	19	Clear, light dews, winds sometimes strong, no storms, occasional clouds of dust.
March -	·440	77·76	32·50	94·33	61·83	80·52	66·72	119·0	0·56	S.W.	0·66	12	Light clouds, mornings hazy, weather sultry, dews sometimes heavy, wind moderate.
April -	·400	81·06	30·85	96·50	65·65	82·21	68·70	114·4	2·37	W.	0·69	11	Often cloudy, occasionally close and sultry, and a storm about the end of month.
May -	·337	78·02	22·92	89·26	66·34	79·04	70·59	114·5	6·25	W.	0·76	8	Cloudy, close, thunder, lightning, and occasional storms.
June -	·277	74·95	15·19	80·89	65·70	75·03	70·98	92·3	8·90	W.	1·25	none	Cloudy, stormy, much thunder and lightning, often hazy in the morning.
July -	·263	72·98	12·60	78·69	66·09	73·13	70·40	88·9	15·80	W.	1·15	none	Cloudy, moderate winds, occasional storms, with thunde and lightning.
August -	·315	72·43	13·14	77·87	64·73	71·93	69·24	84·5	9·40	W.	1·35	none	Cloudy, wind often high, electric disturbances unfrequent.
Sept. -	·361	74·26	16·33	80·31	63·98	72·90	69·03	96·2	3·26	W.	0·87	2	Cloudy, mists, wind sometimes stormy, few electric disturbances.
October	·401	73·48	22·54	84·95	62·41	75·06	77·39	111·5	6·30	E. & E.	1·00	6	Cloudy, mists, occasional storms, with thunder and lightning.
Nov. -	·451	72·31	21·95	83·45	61·50	75·15	67·10	104·4	2·31	S.E.	1·08	8	Sometimes cloudy, but generally clear mornings, mists, dews, wind moderate.
Dec. -	·517	70·37	25·02	82·63	56·61	72·22	61·75	111·4	—	E. & N.E.	0·92	11	Settled weather, dews, wind moderate, occasional clouds.

a, for four years; *b*, for two years; *c*, for one year.

3. The climate is generally good, there is no excess in either dryness, moisture, heat, cold, fog, or damp, but it is variable. The trees growing in the station affect the climate beneficially. The irrigation in the neighbourhood is not injurious. Dust storms occasionally occur in the hot season, but do not affect the salubrity of the air. The general influence of the climate on health is good. During the cold and rainy seasons warmer clothing is required, and places to live in that are roomy, well-ventilated, and easily kept dry. Duties cannot be avoided, but drill and exercises should be avoided, so far as possible, from the middle of June to the end of August, on account of the ground being wet. Drills should take place generally in the morning, but during the monsoon the evening is preferable. The healthy and unhealthy months vary somewhat in different years; but for a period of 8 years the most healthy months for the European soldiers were January, February, September, August, October, and July; and the most unhealthy, May, June, March, November, April, December, and in the order stated. For the natives the healthy months were January, September, August, February, October, March, and the unhealthy, April, May, June, July, November, and December, and in the order given. The healthy season may however be stated to be from the beginning of August to the end of February, and the unhealthy from the beginning of March to the end of July, as it is during these months that epidemics usually prevail. During the unhealthy months the prevailing diseases are fever, intermittent principally, but also remittent and continued, affections of the stomach and bowels, and hepatic diseases; there are also occasional outbreaks of cholera, small-pox, and measles.

4. Not aware of any district near the station, the climate of which is more conducive to health than that of the station.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	5. I have served at Sattara, Poona, Bhewady, Bombay, Surat, Mulligaum, Rajcote, Ahmedabad, Deesa, Kurrachee, Hyderabad (Sinde), Sukkur, Quettah, Kelat, Ahmednuggur (Deccan,) and Belgaum; of these Bombay and Upper Sinde are the worst, and Belgaum, Poona, and Ahmednuggur the best, but with common precautions troops might be stationed at any of them.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A general map of the station and adjacent country; a plan of the station itself, and a ground plan of the barracks are transmitted. 4. Table of barrack accommodation. Date of construction: { 12 European barracks in camp, 1837 to 1842. Old artillery barrack in the Fort, 1829; new artillery barrack in Fort; 1859–60. Total number of rooms or huts, 14 barrack rooms and 60 end or verandah rooms, comprising 52 quarters for non-commissioned officers. Total regulation number of non-commissioned officers and men, 52 non-commissioned officers and (*a*) 932 men.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Inches.		Ft. In.	Ft.
9 Infantry Barracks in Camp, each.	*a* 72	193½	22	*b* 13¾	58,534	813	59	18	28	5 0	4
3 Infantry Barracks in Camp, each.	*a* 70	192	24	*b* 18¾	86,400	1,234	66	"	24	6 10	4
Old Artillery Barrack in Fort.	*a* 36	106⅙	30⅚	*c* 12	*d* 38,475	1,068	89	"	11	5 0	4
New Artillery Barrack in Fort.	*a* 38	110	24	*b* 20 7/12	54,340	1,430	69½	"	19	5 0	4
9 Barracks, 72 men in each.	648										
3 Barracks, 70 men in each.	210										
Old Artillery Barrack.	36										
New Artillery Barrack.	38										
Total -	*a* 932*										
Guard Rooms.†										Feet.	
One of the Infantry Quarter Guards, European.	*e* 17	40	18	*b* 16	11,520	642	42	18	3	5	3
One of the Infantry Quarter Guards, Native.	*e* 17	36½	20	*b* 11	8,030	472	43	on the ground.	2	5	3½
Jail Guard, Native -	*e* 20	20	15	*c* 12½	3,750	187	15	Do.	2	5	3
Fort Main Gate, European.	*e* 12	36½	16	*c* 11	6,424	535	49	18	2	4½	3½
Arsenal Guard, European.	*e* 8	20	16	13	4,160	520	40	18	2	5	4½
European Infantry Hospital Guard.	*e* 7	17	17	*c* 10	2,890	413	41	18	3	5	4
Prison Cells.											
20 Cells under separate roofs, each.	1	10	10	*f* 11	1,100	1,100	100	18	1	2	2¼
6 Cells under 1 roof, each.	1	12	8	13	1,248	1,248	96	18	2	2	7¼

N.B.—*a* The number of men is calculated at 5 running feet along each wall inside per man, excluding doors.
b Height under the tie beams. } The roofs are open to the ridge; no ceilings.
c Height of side walls inside. }
d Spaces taken up by the pillars have been deducted.
e The usual strength of these Guards.
f This is the height to the plank ceiling, which has an air hole in its centre; and above it, the walls are carried 3 feet, having in each of its four sides, between the ceiling and the roof, a circular ventilating hole 1½ feet in diameter.

* The sepoys' huts are of native construction; a number built end on constitute a "pendall," which is of various lengths. It will average, say, 20 to 22 feet broad, 5 feet high at the sides, and 11 at the ridge. The interior being partitioned off with wattle and daub into separate cabins, giving, perhaps, an average of 80 to 100 square feet to each man; one small door, about 3 by 4, is all that admits light and air into each den. The pendall is usually single-tiled.

† There are other guards of less strength; but it is, perhaps, not intended to insert all.

5. The windows are on opposite sides and open inwards. Every barrack has a verandah on both sides extending its whole length. In one artillery barrack it is 8½ feet broad, in the other 12 feet. In 9 of the infantry barracks it is 10 feet 7 inches broad. In the remaining 3 the inclosed verandah is 9½ feet in the clear.

The verandahs are occasionally used as sleeping quarters in the hot weather. Three

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	of the infantry and one artillery have the front verandah enclosed by Venetians and glass—the rest are open. 6. The bedsteads used in barracks are boards and iron trestles. The bedding consists of coverlids, sheets, bolsters, and cotton mattresses in barracks, and the same are used while marching or on field service, minus the boards and trestles. 7. There are six descriptions of tents in use in the Bombay army. All are made of a cotton cloth manufactured in this country called durgaree.

—	Size.	Inner Walls, Number of Cloths.	Outer Walls, Number of Cloths.	Inner Top, Number of Cloths.	Outer Top, Number of Cloths.	Number of Men to each Tent.	Cubic Space to each Man.	Superficial Area per Man.
	Feet.						Feet.	Feet.
European Soldiers, single-poled tent - -	15 × 15	0	3	3	3	13	137	17¼
" " double " - - -	22 × 15¼	0	3	3	3	22	116	15¼
Native Soldiers, single-poled tent - -	14½ diam.	0	0	0	3	22	30½	7½
" " double " - - -	14⅔ × 24⅔	0	0	0	3	30	65	7
European Hospital, single-poled tents - -	24 × 15½	3	3	3	3	20	168¼	18½
Staff Serjeants, single-poled tent - -	10 × 10	0	3	3	3	6	122¼	16½

8. The barracks and guard rooms have small ventilators on the ridge. Tents and sepoy huts are not ventilated. The ventilation is sufficient for the purification of the air whenever they are not crowded. There are no means of cooling the air of the barrack rooms.

9. The walls of the barracks are built of laterite and lime, doors and windows, plank shutters, and the roof is double-tiled. The tents are constructed of durgaree cloth. Huts have mud walls and single-tiled roofs.

10. The barrack rooms are paved with stone; the floors are raised to various heights from 0 to 8 feet, according to the fall of the ground. They are solid, with no passage of air underneath.

11. The materials used in the construction of the barracks, huts, and tents are suitable for the climate. We would recommend that the floors should be planked, and if the barracks were more lofty, and had a continuous ventilation along the ridge, it would increase their salubrity. The barracks and cantonment roads are repaired by the department of public works, and repairs are quickly executed. The officer commanding the station is answerable for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed at no stated intervals, but whenever the commanding officer of the troops occupying the barrack consider they require it.

12. There are one or more washing rooms to each barrack. The water is kept in casks filled by the water carriers, from which the men help themselves. The artillery have one plunge bath in the fort, and the infantry two in the camp. They are supplied with water raised by bullocks from adjoining wells. The water is let off through a hole in the bottom of the bath, from which a drain leads to the lower ground, where it runs to waste. The artillery can use their waste water in their gardens, if they choose.

13. A cooking range extends the whole length of the barrack cook rooms, and is topped by a number of small cooking places, open to the front and top, and of a sufficient size for a camp kettle to rest on. The fuel used is wood. There is also an oven in each cook room. Men from Goa are employed as cooks, paid by the soldiers. Water is supplied by carriers, and the drainage is led into the adjoining cesspool, which is emptied whenever necessary. There are no conveniences for washing and drying linen, nor are they necessary, the work being done by washermen generally beyond the cantonment limits.

14. The solid matter is removed from the privies daily by sweepers, the liquid finds its way into cesspools, which are cleared out whenever necessary.

15. The barracks are ventilated by the doors and windows, and ventilators in the roof. At night they are lighted by 3 lamps in each barrack. The washing places are ventilated by loopholes in the walls, the privies by doors and holes. The cook rooms are open in front, and have loopholes in the walls, and a portion of their roofs is raised. The urinals are attached and under the same roof as the barracks. None of the above subsidiary buildings are lighted at night.

16. The cesspools are cleaned out by sweepers as often as required. The drainage is sufficient, but some of the drains open too near the barracks. There is no dampness in any of the buildings beyond that caused by the weather in the monsoon. There are no foul ditches.

17. The surface cleansing is for the most part daily and efficiently done; some is burnt and the rest removed and used as manure.

18. The surface of the cantonment is kept free from vegetation. There are no old walls, &c. interfering with the ventilation of the station, bazaar, &c.

19. The bazaar is well drained. Its ventilation, as in all station bazaars, is deficient; the houses being low and crowded. The water supply is good, and there is no want of cleanliness. There are sweepers and scavenger carts to carry away rubbish and burn it. There are public privies and cesspools, but the better classes have privies near their houses, and they pay for sweepers to keep them clean, but at times they are very offensive. The bazaar is too crowded. Houses should be pulled down and the streets widened. The native houses near the station are generally low, mean, and dirty looking, there are dung-heaps and cesspits near them as well as within the enclosures. No nuisance is experienced in barracks by the wind blowing over the native dwellings, but only because they are at a distance.

The native town affects the general health of the station from bad conservancy.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	20. Animals have hitherto been slaughtered within bazaar limits, and the offal has been carried away about a mile and a half beyond the camp limits. Very little nuisance is experienced, but a more distant place for the purpose would be better, and one has lately been selected. 21. The bazaar horses, buffaloes, and other cattle are kept on the owners' premises. All the manure is carted away, except the cow-dung, which is kept for fuel. 22. In constructing the stables, the roof has been carried up to a greater height along the centre of the stable. The spaces between the upper and lower roof and the pillars that support the former, being open, thorough ventilation is secured, assisted by the large entrances at either end, which also admit a sufficiency of light. The stables are outside the Fort, and away from any barracks or hospital. The dung-heaps are in the first instance near the stables, but are afterwards sold for manure. There are no picketing grounds. 23. There are not sufficient quarters for married non-commissioned officers and men. Some of the end verandah rooms are occupied by married men; they are separated from the unmarried.
Officers' Quarters.	1. There are no public quarters for officers. They occupy private hired bungalows, which are generally well ventilated and drained.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are generally healthy. 2. Intermittent fevers, bowel complaints, ulcers, and affections of the air passages are the prevalent diseases among natives. Diseases of the spleen are not very frequent. Cholera and small-pox are often epidemic. 3. The diseases from which the natives suffer are chiefly caused by imperfect ventilation, want of personal cleanliness, as well as about their dwellings, errors in diet, and ignorance and disregard of all hygienic laws. 4. One of the European regiments at this station was at Kurrachee from April 1859 to January 1860, their health there was not good as they were suffering from scurvy which originated at Aden, Mooltan, and Sinde. They arrived at Belgaum, 29th January 1860, and their health since has much improved. Venereal has been the chief disease among them since arriving. The other regiment was at Nusserabad for 2½ years, and left it on the 17th February 1860. Their general health was good, but they lost many men from sunstroke while in pursuit of the rebels in 1858. They afterwards suffered from intermittent and remittent fevers; hepatic and abdominal affections also prevailed, and often proved fatal. They arrived at Belgaum, 16th April 1860, since which slight cases of fever and venereal affections have been the chief complaints. Of the two native regiments, one was at Aden three years; they left on the 23rd December 1857, they suffered much from scurvy, which carried off a number of men. The regiment arrived at Belgaum, 6th Februry 1858, in very indifferent health, and has since principally suffered from scurvy, intermittent fevers, and bowel complaints. The other regiment was nearly two years at Jhansi and the neighbourhood, they left 3rd January 1860; but while there, suffered much from intermittent fever. They arrived at Belgaum, 13th April 1860, since which bowel complaints of a mild type have been chief diseases. No part of the men's present accommodation is more unhealthy than the rest in a marked degree, but some of the European barracks are lower and not so well ventilated as the others, consequently they are not so healthy. 5. Troops are not camped out except when epidemic disease such as cholera breaks out among them. The result is generally beneficial, and the disease soon disappears. 6, 7, 8. No experience regarding hill stations. 9. Troops going to hill stations are liable to head attacks, hepatic affections, and rheumatism. 10. Warm clothing, good shelter, no night duty, plenty of exercise and recreation, and abstinence from ardent spirits, are the precautions necessary to guard against these attacks. 11. The hot season before and after the monsoon is the season best adapted for residence in hill stations, and the shortest period to derive benefit from such residence is 7 months. 12. Not aware that there is any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The precautions necessary for protecting the health of the troops on leaving hill stations for the plains are, that they should leave in the beginning of the cool season; their marches should be easy, and encamping grounds should be carefully selected; supplies, especially water, should be good and plentiful; they should not, except it be altogether unavoidable, be brought to the plains at an unhealthy season, and above al when an epidemic prevails. 14. Long residence on the hills and short residence on the plains is likely to be most conducive to the health of the troops. Long residence in the plains is injurious; long residence at hill stations does not benefit much. Frequent change of station plains is beneficial. 15, 16. No experience. 17. Not aware of any higher ground near the statien which could be advantageously occupied as a hill station. 18. We think the laterite detritus, with rock, is as healthy for stations as any we have experience of; light sandy soil is also good; black and clayey soil is objectionable. 19. Soldiers proceeding to India should not be under 20 years of age. They should land there in the months of November, December, or January. Troops landing in Bombay are generally quartered in the town barracks, and the men are provided with suitable bedding, &c., but as soon as arrangements can be made, if a regiment, it is sent to one

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	of the healthier stations; if recruits, they join their regiments, in either case proceeding by ordinary marches. Since the late alterations the clothing is unobjectionable. The drills are light and the duties seldom very heavy. Recruits should never be quartered, or even landed in Bombay, but be sent to Kurrachee, Poona, or some other healthy station at once. Their drills should be light, and also their clothing, exposure to the sun avoided, personal cleanliness observed, and abstinence from spirituous liquors enforced; intemperance and debauchery of every kind should be provided against as much as possible. 20. We see no objection to troops being sent direct to India, provided they arrive in the early part of the cold weather, are well looked after during the earlier periods of their residence, and are sent to a healthy station. We do not think any material benefit would be derived from a residence at an intermediate station. If possible it would be advisable to send them to a hill station, and where it cannot be done they should be sent to the coolest and most healthy station on the plains. 21. The mode of transport of troops from the port to the interior is by marching, rail, bullock-train, steamers, and country boats. As a general rule, troops should be exposed to the sun and rain as little as possible, and they should never be moved from one station to another while any epidemic prevails along the line of march, when it can be avoided. The cool season should, if possible, be always selected for moving troops. 22. Ten years is the period a British soldier should serve in India; but many think this too long, while others would extend the period to 14 years, or even more. 23. The manner of conducting the business of medical boards is generally such as to avoid conflict of opinion as regards invaliding. The present system works well, and we have no improvements to suggest. 24. Invalids should leave India for home in the months of December, January, or February, when going round the Cape. But there should be invaliding committees, and invalids should be sent home oftener than once a year.
Diseases.	1. In some regiments there are weekly inspection parades, and in others quarterly inspections, for the discovery of incipient diseases. 2. Scurvy is of rare occurrence at this station; from 1850 to 1858 inclusive, 224 were admitted with this disease, and 8 died. Of these, 25 admissions and 1 death were among the European, and the remainder among the native soldiers. They were nearly all from other stations, principally from Aden. The proportion which this disease bore to other diseases was 223 to 26,452, or 0·84 per cent. In the few instances in which it does occur at the station, it is mainly attributable to inferior or insufficient diet, owing to the restrictions natives sometimes impose upon themselves. The remedies are sufficient and nourishing food, vegetables, fruits, and other anti-scorbutics. 3. During the 9 years from 1850 to 1858, the proportion of admissions for hepatic disease, including jaundice, was 744 to 26,452, or 2·81 per cent., and of deaths 33 to 287, or 11·5 per cent. Of the admissions, 693 were Europeans, and 51 were natives; and of the deaths, 24 and 9 respectively. The principal causes of the disease are the variable nature of the climate, exposure to the sun, and intemperance, when the disease occurs by itself; but it is a very frequent concomitant of fever and dysentery, and attributable to them. The prophylactics we would recommend are regular and temperate living, suitable clothing, and careful avoidance of exposure; but the climate of the station is very unsuitable for hepatic affections, and no regiment which has suffered much from fever or bowel complaints should be sent to it, if it can be avoided. 4. Dracunculus is a very rare occurrence at this station. The total admissions during 9 years were 331, but they were nearly all from other places, such as Dharwar, Kulladhee, and Kolapore. The fact of the disease ever having been contracted at Belgaum is doubted. 5. The proportion of the constantly sick from venereal diseases to the total sick, from 1850 to 1858, was 2,943 to 26,452, or nearly 11·13 per cent. Of these, 2,542 were European, and 401 native soldiers. To the above might, there is very little doubt, be added half of 447 cases of orchitis and stricture, and at least a third of the most severe of 2,341 cases of rheumatism has been of venereal origin, as well as some cases of ophthalmia. Venereal, especially syphilitic, diseases are frequent and formidable at this station, and often seriously impair the efficiency of a regiment. The most effectual means of diminishing the liability of the soldiers to this disease, would be to allow them to marry in larger proportions than at present. Were all the loose women in or near the bazaar, whether within the military or civil limits, registered and subjected to periodical medical inspections, a lock hospital might be of use, but not otherwise. The restrictions necessary to render a lock hospital useful, hardly accord with British ideas of the liberty of the subject, and hence in a great measure their inutility hitherto, and their having been generally abolished. 6. The troops at the station suffer from the following diseases:— *Fevers.*—Intermittent, remittent, continued, and ephemeral; also eruptive fevers. *Dysentery.*—Acute and chronic. *Cholera.*—Sometimes mild, but often of a most severe type. *Small-pox.*—Mild and virulent. *Rheumatism.*—Acute and chronic, idiopathic and of syphilitic origin. The proportions of admissions and deaths from the above diseases to the total admissions and deaths were 10,359 and 102 to 26,452 and 287 respectively, or 39· per cent. of the total admissions; and 35·54 of the total deaths, during a period of 9 years. Of those admitted, 7,358 were Europeans and 3,001 natives; and of the deaths 80 and 22 respectively. To show the proportion of admissions and deaths among the Europeans compared with the native troops, it may be stated that the total strength of the former during 9 years was 9,519, and of the latter 13,437, or an average of 1057·66 of Europeans and 1493·0 Natives for each year. 7. Intermittent fevers are very tractable, and remittent and continued generally so when not complicated with hepatic, pneumonic, or cerebral affections. Measles are generally mild and seldom fatal. Small-pox is very often fatal, especially among infants.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops: *Diseases—cont.*	Chicken-pox is generally a trifling complaint. Cholera, when prevailing epidemically, is rapid in its progress, and extremely fatal. Dysentery and diarrhœa are often severe, but generally manageable if uncomplicated; but at this station hepatic affections are common concomitants. Hooping cough is generally mild, but of long duration. Erysipelas generally requires stimulant treatment. Catarrhal affections are frequently severe but seldom fatal. The hot season and the first part of the monsoon, that is, from the beginning of March to the end of July, are the seasons when such diseases are most prevalent. The climatic and atmospheric conditions which precede or accompany their appearance, are hot, close, and oppressive weather, with variable and irregular winds, and frequent calms. The sky is generally clear till about the end of March, and there are few electric disturbances, but afterwards it is more or less cloudy, and sometimes overcast, and storms, with rain, thunder, and lightning, are not infrequent, till about the middle of June, when it becomes settled monsoon weather. The sanitary condition of the station is upon the whole good. But the bazaar and native dwellings are greatly wanting in cleanliness and ventilation, as the houses are close, crowded, and confined. The water supply is very fair, both as regards quantity and quality; but the drainage is bad or very indifferent. The European troops are at present too crowded, and the natives always so. The crowded state of the native population, their want of cleanliness, both personally and in and about their dwellings, and their apathy and disregard of all sanitary measures, no doubt predispose them to disease. 8. The nature of the soldiers' duties, and occupations in barracks have very little influence on epidemic diseases, but their habits of exposing themselves to the sun, frequenting the bazaar, and their irregularities and intemperance, tend to excite disease, and to render it more severe when they are attacked by it. 9. Small doses of quinine have not been tried at this station that we are aware of, as a prophylactic against malarial diseases. 10. To prevent or mitigate epidemic disease, the troops should have more space, the Europeans in their barracks and the natives in their huts; both should be loftier and better ventilated dwellings. Every inducement should be held out to the European soldier to eschew the bazaar, and the irregularities there committed, by providing him with reading rooms, and all rational means of occupation or amusement. The conservancy of the cantonment might be improved, and in the bazaars and native population it should be far more insisted upon. If it could be done the streets should be widened, and proper ventilation in the dwellings enjoined, as well as the removal of all impurities. Vaccination should also be more generally practised.
V. INTEMPERANCE.	1. The soldiers at the station are generally temperate. The confirmed drunkards are about 1 per cent. 2. The proportion of admissions into hospital from diseases directly caused by intemperance were, last year, in one regiment, 10; in another only 4. This refers to Europeans; among the natives there was none. The admissions caused indirectly were in the case of one regiment 15; in the other regiment not known. No natives were admitted on account of intemperance. There are no available materials for the preparation of a statistical table showing the effect of abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence. 3. Arrack, supplied by the commissariat, is sold in the canteens, and the quantity generally consumed is 1 dram per man a day; more than 2 drams is not allowed. It is of good quality. Distilled spirits of the worst description are sold in the bazaar, and may be had in almost any village. In the bazaar the sale should be repressed more stringently than it is. Spirit is not part of the soldiers' ration at the station, on the march, or in the field. None is issued from the canteen but what is paid for by the men. The quality of the spirit is good. No spirits are allowed before dinner, and no morning drams. Spirit is never given as a ration to convalescents. A convalescent is not allowed to enter the canteen. Drinks injurious to health, other than intoxicating drinks, are sold in the bazaar, but not in the canteen. 4. Opinions differ as to whether the consumption of spirits is conducive or injurious to health. Some would allow no spirits except under special circumstances, such as great fatigue: while others think them beneficial, or, at all events, not injurious, when used in moderation. If used in moderation it does not affect the discipline or efficiency of the corps. 5. It would be beneficial to restrict or abolish the use of spirits if it could be effectually done; but if there was no canteen the men would resort to the bazaar, and drink the bad liquor vended there. As matters stand, to abolish the use of spirituous liquors would be injurious. 6. Good malt liquors are preferable to spirits in this climate. Wine is better than spirits, but not so good as malt liquor, and its expense is too great to admit of its being used by the men. 7. Coffee, tea, lemonade, &c., are in use to a very considerable extent. Their influence is good in every respect; they tend to keep the soldier from drinking other liquors, and whatever diminishes drunkenness is beneficial to health and discipline. 8. We are not prepared to say that it would be beneficial to suppress the issue of spirits from the canteen, as the men would get liquor and of a bad quality elsewhere. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteen, and to substitute beer, coffee, &c., but to prohibit the sale of spirituous liquors there would not be advisable. 10. The present canteen regulations work well. There should be a good large canteen where the men could sit down and drink their liquor comfortably. A good coffee shop should be attached to all barracks; and the sale of liquors in the bazaar to soldiers should, if possible, be wholly prevented. 11. The canteen regulations are according to section x. 3rd Appendix, Jameson's Code. There are no regimental bazaars.

References to Subjects and Queries.	REPLIES.
VI. DIET.	1. The diet for Queen's British troops and European troops of the Indian army is the same at this station, and consists of—

Bread	1 lb.	Tea	⅝ oz.
Meat	1 lb.	Sugar	2½ oz.
Rice	4 oz.	Salt	1 oz.
Vegetables (8 oz. of these usually potatoes)	1 lb.	Firewood	3 lb.

When tea is not supplied 1¾ oz. of coffee is issued. The vegetables are the produce of the country, and vary according to the season of the year. A responsible inspection of the ration is made by corporals of companies, and by the orderly officer daily; and an inspection of them is frequently made by the commanding officers.

2. Complete rations are supplied, including vegetables, but no fruit. The stoppage is 3 annas 4 pice per day per man. There are three meals; in one regiment breakfast at 7 o'clock, dinner at noon, and tea at 4. In the other, the hours are 8 a.m., 1 p.m., and in the evening respectively. There is one pound of vegetables in each ration.

3. An improvement in the ration would be made if the quantity of rice were reduced, and the supply of vegetables or bread increased. Spices and cocoa-nuts should be added to the ration to enable the men to have currie occasionally. Mutton should be sometimes substituted for beef, which is the meat always supplied at this station. Such a thing as a soldier selling or exchanging his ration is of very rare occurrence; but part of the rice is often given to native cooks and others. Soldiers often purchase extras at their own expense.

4. The means and apparatus for cooking are the ordinary kitchen, with camp kettles, frying and stew pans, flesh forks, meat dishes, and tins. There is no cause of complaint with reference to the cleanliness, lighting, or ventilation of the kitchen, but the water supply is not so copious as might be wished. The food is cooked as the soldier wishes; besides having it boiled or roasted he may have it stewed or made into pies. There are few complaints about the cooks; considerable variety in cooking is attainable in this country; tea is properly prepared. A soldier pays one rupee per month for cooking. The men have tea, coffee, or other refreshment generally in the middle of the morning's march.

5. Gardens for the cultivation of vegetables could not be advantageously established for soldiers, as without the assistance of a native they would be too much exposed to the sun; and much of their time in the morning and the evening is occupied by drill, rifle practice, &c. Small plots of ground near the barracks would be useful as a recreation, but the number of men that have a taste that way is small. If they were established it should be under such regulations as the commanding officer might think necessary from time to time.

VII. DRESS, ACCOUTREMENTS, AND DUTIES.

1. The component parts of a soldier's dress are:—A tunic of red cloth, a red serge frock, one pair of Oxford mixture trousers, one pair light blue cloth trousers, two suits of cotton dyed cloth called khakee, a wicker helmet with khakee cover, and a blue felt forage cap with the same kind of cover. The accoutrements are a shoulder and waist belt for carrying the ammunition and bayonet.

List of necessaries for Europeans and natives, extracted from Jameson's Code, pages 32–33, section 13, Appendix.

INFANTRY OF THE LINE.

Europeans.

1 forage cap with chin strap.	1 coir pillow.
2 white cotton covers for ditto.	2 cotton cases for ditto.
2 white cotton covers for dress cap.	1 haversack.
4 white cotton jackets.	1 jamboo, with plate and cover.
5 pairs white cotton trousers.	1 comb.
2 pairs dark blue ditto (barrack change).	1 hair brush.
4 white cotton shirts.	1 clothes brush.
2 check ditto (barrack change).	2 shoe brushes.
3 flannel waistcoats or belts.	1 razor, brush, and soap.
4 pairs cotton socks.	1 sponge.
2 pairs worsted ditto.	1 button stick and brush.
4 towels.	1 marking stick.
2 pairs braces.	1 knife, fork, and spoon.
3 pairs shoes.	1 holdall.
1 sleeping carpet (6 ft. by 2½).	1 account book.
1 numda mattress.	1 gun stopper.
2 cotton covers for mattress.	1 oil rag.
2 sheets.	Blacking and pipe clay.
1 Europe blanket or 2 kumblee blankets.	

Additional, when on field service, 1 water canteen.

Natives.

1 Kilmarnock forage cap with chin strap.	2 meerzaies.
2 white cotton covers for ditto.	1 dhoputta (2½ yds. long by 2½ ft. wide).
1 chin chain for ditto.	2 dhoties or paijamas.
2 white linen or cotton jackets.	2 chudders.
3 pairs white linen or cotton trousers.	1 ruzzai.
2 pairs black cotton ditto.	1 sleeping carpet (6 ft. by 2½).
1 great coat.	1 haversack.
2 pairs braces.	*Cooking utensils.**
1 canvass bag.	1 brass lota (small, 5½ inches wide, 3½ inches deep), and cord.
1 clothes brush.	1 brass lota (large size).
1 shoe brush.	1 tuvwa (iron), 9 inches wide.
1 button stick and brush.	1 thalee (brass), 9 inches wide and 2 inches deep.
1 marking stick.	1 kuttora (brass).
1 gun stopper.	1 chimcha (brass).
1 oil rag.	1 chimta (iron).
Blacking and pipe clay.	
2 pairs shoes.	

Additional, when on field service, 1 water canteen.

* Total weight not to exceed 6¼ pounds.

BELGAUM. BOMBAY.

References to Subjects and Queries.	REPLIES.
VII. Dress, Accoutrements, and Duties—*cont.*	The above equipment is sufficient and suitable. We have no improvements to sug gest beyond the addition of a puggree to the Kilmarnock cap of the natives. The guard dress from sunset to 8 a.m. is a tunic and cloth trousers. By day a serge frock or khakee clothing. Guards have shelter in guard-houses, and the sentries in veran dahs or sentry boxes.
Duties.	1. Recruits should be thoroughly drilled at home, and sent out direct to India withou residence at an intermediate station. Some think that a recruit learns his duty bes with his regiment, and that he should join it at once. 2. The usual routine of a soldier's duties are guards, roll calls, parades, and drills Morning parades and evening drills are one hour in duration. Morning roll call a ½ past 5 a.m.; noon roll call at noon; afternoon roll call at 5 o'clock; tattoo roll cal at 9 p.m. The number and duration of drills is much left to the commanding officers who take care that they are not carried to an extent to prove injurious. Early morning is the best time for drill or march when the weather is fine. The men should be in barrack or on their encamping ground not later than an hour after sunrise. The orders ar that on all ordinary occasions the marches should be "so timed as to bring them t "their ground by or soon after sunrise." The average number of nights the me have in bed during the week varies from 3 to 5 or 6, according to the strength o regiments and the amount of duty. 3. The most distant guard from the barracks is about 2 miles. All guards are for 2 hours, of which the soldier stands 8 hours on sentry, viz. 2 hours out of every 6 hours There are day and night roll calls, but they vary very much at the discretion of the com manding officers, who avoid disturbing the men at night as much as possible. Nigh guards are injurious to health, and there should be as few of them as possible, and those i the most healthy position admissible. The great coat should be worn close to the bod and the accoutrements outside.
VIII. INSTRUCTION AND RECREATION.	1. The means of instruction and recreation are as follows:—There is one ball court be tween the greater part of two European regiments and about two skittle grounds pe company; there are also cricket bats and balls and quoits. There are schools wit good schoolmasters, also a library, which is sufficiently lighted till tattoo. There is n day room or soldiers' clubs. There are some small gardens near the barracks culti vated by the soldiers, but from the want of water very little can be done in them ex cept during the monsoon. One regiment has a tailors' and carpenters' shop, but ther are no workshops properly so called; they are much wanted. There is no theatre o gymnasia. The means are not sufficient even for one regiment to keep the men occu pied during the wet season and the heat of the day, and the greater part of two regi ments are occupying the several buildings intended for one regiment only. On regiment is restricted from exposure when off duty during the hot weather from 8 a.m to 4 p.m.; in the other there is no restriction but that the head be properly covered the men are, however, discouraged from exposing themselves during the heat of th day. The rule observed by the latter regiment we think preferable. Too much con finement is bad. 2. Workshops should be built to encourage soldiers to practise their various trades gymnasia should be attached to every range of barrack; each barrack should have reading-room; also sheds for games in the hot and wet weather. To the above man would add theatres, but we think they lead to too much excitement, to be conduciv either to health or discipline. The well behaved should be allowed to go out shootin and coursing. 3. Savings' banks have long been instituted. In one regiment (the 83rd), the deposit amount to 53,000 rs. 4. The only shade is from the barrack verandahs, which are not sufficient to enable th men to take exercise. Additional sheds, and the planting of small clumps of tree near the barracks, which could easily be done at this station, would conduce t the health of the men.
IX. MILITARY PRISON.	1. The cells are solitary, 10 feet square, well ventilated, and not prejudicial to health.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the genera presidency regulations. 2. The practical working of the powers of the medical officer, as regards the conduct c the line of march of troops, bivouacking, &c., is generally good, as his recommendation are usually attended to; but often bad, as a medical officer has no power to interfer further than the commanding officer may think proper to permit. Should the wors encamping ground be chosen, and the most injurious marches made, it may not be saf for a medical officer even to make any representation on the matter, as it subjects hin to censure. 3. The practical operation of camp regulations for the preservation of the health of th troops, &c., is generally satisfactory. The medical officer has no independent power his recommendations are usually attended to from courtesy, and a desire for th welfare of the men on the part of the commanding officers; but we think on thes matters, he should always be consulted, and when his advice is disregarded, command ing officers should be bound to submit their reasons to higher authority. 4. A force on taking the field is provided with tents for field hospitals, and they are s used, when houses or other better accommodation is not available. A field surgeon i appointed to take charge, with assistants and hospital establishments on the same pla as regimental hospitals; and according to the number of the sick, field hospitals ar established at the most convenient stations, when from the large number of sic it may be desirable to disencumber the force of them. In the field, according t present regulations, 5 per cent. of doolies, with 6 bearers each, and 1 per cent of spring carts, are allowed to Europeans, and 1 per cent. of doolies, and 1 spring cart to 500 natives. The doolies and carts are procured by indent on the ordnanc department, and the bearers and cattle from the commissariat. Hospital supplies ar carried and provided by the commissariat department. The regulations bearing o these matters are to be found in the medical codes and general orders, separate of which the committee have not copies to spare. (See Medical Code, sec. xi., p. 12 to 129; also General Orders, separate, section Carriage.)

References to Subjects and Queries. | REPLIES.

XI. STATISTICS OF SICKNESS AND MORTALITY.

BELGAUM.

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fever. Treated.	Fever. Died.	Eruptive Fever. Treated.	Eruptive Fever. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	QUEEN'S TROOPS.																					
1853-54	H. M.'s 64th Regiment	332	247	—	4	2	34	—	22	—	58	2	20	—	—	—	383	1	768	5	231·3	1·5
1854-55	Ditto	992	231	—	1	—	128	1	88	1	223	11	46	1	—	—	947	—	1,664	14	167·7	1·4
1855-56	Ditto	1,093	192	1	2	—	69	2	81	2	244	9	37	—	—	—	870	4	1,495	18	136·7	1·6
1856-57	Ditto	664	107	—	—	—	63	—	83	1	170	10	54	3	—	—	610	2	1,087	16	163·7	2·4
1857-58	8/14 Royal Artillery Detachment 3rd Dragoon Guards Detachment 33rd Regiment H. M.'s 50th Regiment Depôt 64th Regiment H. M.'s 86th Regiment	866	95	1	3	1	46	—	29	1	119	2	15	1	—	—	397	1	704	7	81·3	0·8
1858-59	H. M.'s 50th Regiment Depôt H. M.'s 64th Regiment	664	174	2	—	—	101	1	52	2	210	3	21	—	—	—	755	1	1,313	9	197·7	1·3
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	2nd Regiment European Light Infantry. Garrison and Details	1,059	293	4	—	—	118	3	77	4	240	8	31	2	1	—	1,113	3	1,873	24	176·8	2·2
1851-52	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	1,249	287	3	—	—	125	5	79	—	216	6	72	2	1	1	1,105	4	1,885	21	150·8	1·6
1852-53	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	1,163	323	1	3	1	157	3	96	3	200	13	85	4	—	—	916	9	1,780	34	152·9	2·9
1853-54	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	763	168	2	2	—	64	—	67	1	154	6	58	3	—	—	537	4	1,050	16	137·6	2·1
1854-55	3/1 Battalion Artillery Garrison Details	125	55	—	3	1	9	—	11	—	20	1	2	—	—	—	80	—	180	2	144·0	1·6
1855-56	3/1 Battalion Artillery Garrison Details	124	17	—	—	—	2	—	13	1	24	1	2	—	—	—	61	—	119	2	95·9	1·6
1856-57	3/1 Battalion Artillery Garrison Details	126	19	—	—	—	9	1	5	—	15	1	7	—	—	—	88	—	143	2	113·4	1·5
1857-58	3/1 Battalion Artillery 2nd Reg. European Lt. Infantry Garrison Details	353	471	2	4	—	19	—	11	1	76	2	24	1	—	—	274	1	879	7	249·0	1·9
1858-59	2/1 Battalion Artillery 3/1 do. do. 2nd Regiment European Light Infantry. Garrison Details	662	217	—	—	—	33	1	20	4	111	5	24	—	—	—	623	—	1,028	10	155·2	1·5

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fever. Treated.	Fever. Died.	Eruptive Fever. Treated.	Eruptive Fever. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	5/3 Battalion Artillery 4th Regiment Native Infantry 9th do. do. Detachment Poona Irregular Horse. Garrison Details	1,744	589	6	2	—	27	1	4	1	89	—	15	1	4	—	808	2	1,538	11	88·1	0·6
1851-52	4th Regiment Native Infantry 9th do. do. Garrison Details	1,246	245	1	9	—	40	—	3	1	70	1	19	1	6	3	552	2	944	9	75·7	0·7
1852-53	4th Regiment Native Infantry 9th do. do. Garrison Details	1,475	284	3	14	—	31	1	5	2	117	3	19	—	—	—	582	3	1,052	12	71·2	0·8
1853-54	4th Regiment Native Infantry Detachment 9th do. 20th Native Infantry 29th do. Garrison Details	1,315	286	1	16	—	23	—	5	1	95	—	26	1	1	1	502	1	954	5	72·5	0·3
1854-55	20th Regiment Native Infantry 29th do. do. Garrison Details	1,503	209	4	11	—	13	—	—	—	84	8	5	—	—	—	451	1	773	13	51·4	0·8
1855-56	20th Regiment Native Infantry 29th do. do. Garrison Details	1,318	149	2	35	—	25	—	1	—	55	1	9	1	—	—	344	2	618	6	46·8	0·4
1856-57	20th Regiment Native Infantry Detachment 28th Regiment Native Infantry. 29th Regiment Native Infantry Garrison Details	1,317	145	1	11	—	22	—	3	1	48	1	11	—	—	—	305	—	545	3	41·3	0·2
1857-58	15th Regiment Native Infantry 18th do. do. 20th do. do. Garrison Details	2,493	650	4	74	3	80	6	29	3	352	3	28	—	1	—	1,274	11	2,488	30	99·6	1·2
1858-59	15th Regiment Native Infantry 18th do. do. 20th do. do. 3rd Extra Battalion Garrison Details	1,790	374	2	27	—	40	3	2	—	98	3	14	—	3	1	748	1	1,306	10	73·9	0·5

By order of the Acting Principal Inspector-General, Medical Department,
W. J. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 10 October 1860.

BELGAUM.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Ground plan and elevations of hospitals transmitted. 2. The distances of the hospitals from the barracks vary from about 200 yards in the fort to about 600 in the camp. The artillery stables are outside the fort, and about one third of a mile from the hospital. In camp there are no stables. The distance of the European hospital from the bazaar is about half a mile to the north-west, of the native hospitals about a quarter of a mile to the westward, and of the artillery hospital in the fort about a quarter of a mile to the eastward. The hospital in the fort is rather confined, from the walls of the fort, trees, and buildings; but in camp the hospitals have open sites and free ventilation. The sites of all the hospitals are, upon the whole, good, not being near any rivers, marshes, nullahs, &c., and should the ground be foul and there be nuisances, it will be from want of cleanliness. 3. The water supply is wholesome, but limited, it being all brought by water carriers. There are no means of increasing the supply, except by increasing the number of water carriers. 4. There are no sewers for removing refuse water. The rain water everywhere flows naturally away over the surface. The artillery hospital in the fort has a small cesspool attached to the cook room and close to it. The native hospitals have no artificial sewerage. The European infantry hospital in camp has cesspools attached to the privies and cook rooms, with which they communicate by small masonry slab drains. Sweepers are attached to each, who remove all solid matter daily, and the cesspools are emptied whenever necessary. 5. The height of the lowest wards above the ground varies from 2 to 6 or 7 feet. The floors are solid, and only in one ward, which is upper-storied, is there perflation of air underneath. The soil is generally porous, and part of the roof water is absorbed into it, but the greater portion is carried off by the natural drainage. There are open gutters round the hospital, which are sufficient for carrying off the water rapidly. The material of which the hospital is built is generally laterite and lime. The walls and roofs are high, but not double, and are sufficiently thick to keep the building cool. The hospitals are supplied with verandahs on both sides, of different breadths, varying from 8¼ to 9 feet. They are sufficient to afford shelter from the sun's rays. The verandahs are only used for the accommodation of the sick, convalescents and others in extreme cases, under great pressure for want of hospital accommodation. Of the hospitals at this station there is only one ward which is upper-storied. Table of Hospital Accommodation. Date of construction.—Hospitals of native regiments in camp, 1834. Artillery hospital in fort, 1837. Part of the European hospital in camp, wards numbered 1, 2, 3, and separate ward with the subsidiary buildings to the right of the centre dividing wall, in 1841–42. The remainder finished in 1860. Total number of wards, 12. Total regulation number of beds, 283.*a*.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.				Inches.		Ft.	Ft.
Artillery Hospital in the Fort (one ward).	*a* 12	36 9	19 8	*b*14	10,117	843	60	18	6	4	3
Artillery Hospital in the Fort (the other).	*a* 12	36 9	19 8	*b*14	10,117	843	60	"	6	4	3
European Infantry Hospital, Camp, Belgaum.											
Ward No. 1 -	*a* 42	133 8	21 10	*b*12 10	37,451	892	69	"	20 *c* 8	5 1¾	4 6
Ward No. 2, upper-storied.	*a* 42	134 0	22 8	*b*13 3	39,505	940	71	"	20 *c* 8	5 1	4 6
Ward No. 3 -	*a* 16	51 10	22 0	*b*12 10	14,630	914	71	"	8 *c* 6	5 1¾	4 6
Separate Ward -	*a* 12	40 0	22 0	*b*12 10	11,293	941	73	"	8	4½	4
New Male Ward -	*a* 37	124 6	23 9	*b*20 0	59,137	1,598	80	"	20	2	3
Ditto - -	*a* 28	98 6	23 9	*b*20 0	44,412	1,586	79	"	16	2	3
New Female Ward	*a* 12	42 0	23 9	*b*20 0	19,950	1,663	83	"	10	2	3
Ditto - -	*a* 6	21 0	23 9	*b*20 0	9,975	1,663	83	"	6	2	3
Hospital for 1 Native Infantry Regiment.	*a* 32	96 0	22 0	*b*12 0	25,344	792	66	"	16	5	3½
Hospital for the other	*a* 32	96 0	22 0	*b*12 0	25,344	792*	66	"	16	5	3½
Total - -	*a* 283*										

a The number of beds in each ward is calculated by first excluding the doors, and then giving 6 feet from centre to centre of each bed.
b Height under the beam.
c Ventilating windows high up in the walls, half filled with wooden bars.

* N.B. Most of these calculations are according to an old scale; the rule is now to allow 1,800 cubic feet for each European and 1,100 or 1,200 for each native patient in hospital.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The artillery hospital in the fort is too much surrounded by buildings and arboreous vegetation, and the wards of the European hospital in camp are so placed relatively to each other that the full benefit of the prevailing winds is greatly interfered with as regards one of them. The windows open to the inside by halves, and are sufficient for ventilation and coolness. It might be an improvement if the portions between them and the relieving arch above were filled with Venetians, instead of being built in.
	6. Beyond the ventilation in the roof and the doors and windows there is no artificial ventilation; but the above is found sufficient to keep the hospital free from odour or closeness when not overcrowded. There are no jalousies or jhilmils.
	7, 8, 9. There are no means of cooling the air in the wards or of warming them. The walls are as a rule whitewashed once a quarter, but oftener if necessary. The several privies are provided with iron pans which are removed and cleaned out at least once a day. The supply of water is very limited. The cesspools are always more or less offensive, and it is exceedingly difficult to prevent them being otherwise.
	10. There are no lavatory arrangements. This is a great want.
	11. There are no means of bathing the sick beyond large tubs and slipper baths, except at the European hospital in camp, to which a shower bath is attached.
	12. The hospital linen is washed by washermen away from the hospital, and the work is generally done satisfactorily.
	13. The storage generally is sufficient and dry.
	14. The bedsteads used in hospital are iron cots with cross bars; the bedding consists of mattresses stuffed with straw, and pillows stuffed with straw or hemp. Cotton sheets and woollen country blankets. There is great room for improvement in the quality and manufacture of these articles. They are supplied by contract, and are of very inferior description.
	15. The several kitchens are all conveniently situated; they are ventilated by the doors and windows as well as by the roof, and they contain the means of cooking the diets in such variety as the sick require.
	16. Diet tables, &c., according to regulation.
	17. The following attendance is provided for the sick. There is a hospital serjeant whose duty is merely to see to the cleanliness of the hospital and its discipline. There are ward boys for attending on the sick, and also dooly bearers, sweepers to keep it clean, a matron and assistant for the female hospital, an apothecary and assistant apothecary, a compounder of medicines and dressers, and a steward for the provision and clothing department. The attendance is sufficient. The establishment of native hospitals is the same, only that they are much smaller. All the servants are native, and there is no matron.
	18. As already stated, one ward is greatly shut out from the breeze. To another the privy is somewhat a nuisance. Cases of epidemic disease have appeared in the wards, but only when prevailing at the station. Sores, especially venereal, sometimes take on an erysipelatous or sloughing action, but this is believed to be attributable to the climate rather than to anything about the hospitals.
	19. Some of the wards are badly placed relatively to each other; the privies and most of the outhouses are too close to the wards, and the whole are too much crowded together. One essential improvement required is, that the ward so much closed in should be made an upper-storied one, and proper lavatories should be attached to all the wards. These remarks apply to the European hospital in camp. The artillery hospital in the fort is too low and narrow. The two hospitals for natives which are in camp are too small and have no wards for infectious diseases.
	20. Convalescents can walk about the compound or hospital enclosure, and go beyond it, accompanied by an orderly, morning and evening. There is not sufficient ground suitably fenced, and there are no shaded walks or seats except in the verandahs of the hospital.
	21. There is a female hospital, with a suitable establishment, in which sick women and children are treated. The arrangements are satisfactory and sufficient to meet every useful purpose.
	22. There are no special local hospital regulations. Everything is done according to the rules laid down in the medical code.
	23. The medical officer has an establishment, and he has the power, and it is his duty to enforce cleanliness. In repairs to buildings he has no power, but through his commanding officer or superintending surgeon, or both. Any defects it is his duty to report to them. As to changes of diet, &c., his power may be said to be unlimited, but under the control of the superintending surgeon and director-general of the medical department, to whom he must always be prepared to give an account; but they seldom if ever object if the explanation of its having been required for the benefit of the sick is satisfactory.
	24. There are no convalescent wards or hospital, nor would they be of any advantage.
XIII. Burial of the Dead.	1, 2. The burial ground used for British troops is within the camp limits. The land winds pass over it to the European cantonment, but at a considerable distance, and the sea breezes pass over it to the native town and fort, the latter being a long way off.

	Acres.	
Protestant burial grounds - -	1·8	They are adjoining, with a wall between and a wall all round.
Roman Catholic - - -	1·2	
	3·	

The subsoil is principally decomposed laterite. It is carefully kept, and decomposition ought to be rather rapid as the ground is low and damp.

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead—*cont.*	3. The usual dimension of a grave for an adult is 7 feet by 2½ feet. The space between graves is 2 feet. The depth depends somewhat on the soil; when it is hard or rocky, it is 6 feet; when soft, 7 or 7½ feet. Instances of re-opening graves have been very rare, and only at the special request of a near relative of the deceased. The orders of Government now forbid the same ground being used a second time. There is no specified time for interment; but it takes place within 24 hours after decease. During epidemics, if death occurs in the forenoon, interment takes place in the evening; if in the afternoon, early the following morning. As regards natives, the grave space is less, as they do not use coffins. The intervals between them are greater, as they usually bury in an open plot of ground; their depth is also less. They are not reopened, nor, as a rule, is more than one interred in the same grave. The time of interment is not compulsory, but it takes place in much the same time after death as with Europeans. 4. The grave-yard is never offensive. In cases of severe epidemics, when many bodies are interred in the same pit, it is made deeper than usual, or more earth is heaped upon it. There are no regulations with regard to the burial of British troops, but interment takes place within 24 hours after death. And under all ordinary circumstances, in the evening before sunset, or in the morning very shortly after sunrise. 5. The dead of camp followers or bazaar people are carried beyond the camp limits, and buried or burnt. 6. No injury accrues to the public from the present practice that we are aware of; but in cases of burning, the smell is sometimes unpleasant. 7. There are no objections to the present arrangements, and no improvements are suggested.

(Signed) F. T. FARRELL, Major General, Commanding Southern Division of the Army.
T. MACKENZIE, Superintending Surgeon, Southern Division of the Army.
T. WALLER, Staff and Civil Surgeon.
W. R. DICKINSON, Captain Engineers, Executive Engineer, Belgaum and Kolapore Districts.

31st July 1860.

AHMEDABAD.

Accommodation	British Troops	Artillery	1st Company, 1st Battalion.
		Infantry	Wing 4th King's Own Regiment.
	Native Troops	Artillery	3rd Battalion.
		Cavalry	Part of Guzerat Irregular Horse.
		Infantry	11th and 14th Regiment N. I.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is flat and cultivated with grain and pulses, and large forest trees, but not densely planted or obstructing the wind. It is sandy and dry, when the monsoon water is drained off. There is a little wood, and a river running at the back of the camp; no jungle. 2. The elevation of the station above the sea is about 320 feet, and the adjacent country is on the same level as the camp. The nearest water is the river Saburmuttee, flowing a quarter of a mile from the camp, which is built along its left bank. There is no higher or healthier ground adjoining the station. 3. The nearest mountain is Mount Aboo, situated about 150 miles from camp, with an elevation of about 4,500 feet above the level of the sea. Powa Ghur is nearer, but is not adapted for a sanitarium. 4. The sea is about 65 miles from camp, and the river about a quarter of a mile as above stated. The district is not liable to an overflow of water, and there are no ravines or broken ground. 5. The station is open, and well exposed; there is nothing to interfere with free ventilation; and in our opinion the temperature is not raised by reflected sun heat. It is exposed to the hot and cold winds which blow from the S.W. and N.E., but they have no effect on health. 6. The surrounding country is cultivated. There are no works of irrigation that we are aware of. The cultivated grounds are irrigated, but I have not observed that health is in any way affected by it. The cultivation of rice is prohibited within two miles of camp; neither is there any cultivation of hemp, indigo, or flax. 7. The city of Ahmedabad is about 3½ miles from the station. 8. The geological structure is sandy, and the ground new. 9. Water is usually found during the dry season at a depth of about 35 feet, and in the rainy season at about 25 feet. 10. The rain-fall runs off and becomes speedily absorbed. The country being level, there is no adjacent ground, the drainage from which passes into the subsoil of the station. 11. The water supply is derived from deep wells, from which it is drawn by bullocks. There are no tanks in the immediate vicinity. The wells are kept cleared, and there is no malaria. 12. There is a sufficient supply of water, and it is wholesome, colourless, and free from smell. The river water is of sp. gr. 1·001 in the dry season, somewhat greater in the rains. The water from wells is of greater specific gravity. The water from the river is more wholesome than that from wells, which after long use is apt to induce disease of the spleen, a result unknown from the use of river water. The microscopic appearance cannot be determined as there is no instrument allowed. The water is drawn up from wells, and is then distributed

References to Subjects and Queries.	Replies.

I. Topography—*cont.*

about the station by bheesties. We are not aware that better water could be obtained, nor have we any recommendations to offer.

13. We are not aware of any other topographical points bearing on the health of the station.

14. No new stations have been selected in the Bombay Presidency within the last 20 years.

II. Climate.

1. The instruments available for meteorological observations are thermometers and pluviometers.

2. The following Table gives two years of observation:—

Years of Observation.

From January 1858 to December 1859.

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Winds. Direction	Winds. Force.	Remarks.
January -	71	13	78	65	N.N.E.	Moderate.	Agreeable; occasionally cloudy.
February -	80	31	96	65	N.N.E.	Do.	Agreeable.
March - -	83	21	94	73	N.E.	Do.	Sultry.
April - -	93	22	104	82	S.W.	High.	Hot.
May - -	97	22	108	86	W.S.W.	Do.	Sultry.
June - -	89	10	94	84	S.W.	Do.	Do.
July - -	90	27	104	77	S.W.	Monsoon.	Do.
August -	84	15	92	77	S.W.	Do.	Cloudy.
September -	83	13	90	77	S.W.	Do.	Sultry.
October -	83	13	90	77	N.E.	Moderate.	Sultry; occasionally heavy dews.
November -	78	17	87	70	E.N.E.	Do.	Cool.
December -	69	19	79	60	E.N.E.	Do.	Do.

3. The climate is dry, except during the monsoon; sand storms occasionally occur during the hot season, but they do not appear to have any injurious effect. The climate does not appear to affect the health of the troops. They are exposed as little as possible during the heat of the day, the regimental duties being performed morning and evening. The hot season from March to June is the healthiest. October is very unhealthy. During that month and the cold season fevers prevail, chiefly of a quotidian intermittent type.

4. There is no district that we are aware of near the station the climate of which would be more conducive to health.

5. I have served longer at this station and Deesa (both in the same province) than at any other. I have also served at Dharwar in the Deccan about three years, but judging from the hospital records, there appeared to be very little difference in the health of the troops (native). The above is the recorded opinion of the medical member. The president (Col. Lucas) has served upwards of 20 years in Guzerat, 19 of which has been at Ahmedabad. He considers it about the most healthy station in the Bombay Presidency for troops, with common care and prudence.

III. Sanitary Condition of Station.

1, 2, 3. Maps and plans.

4. The following Table shows the barrack accommodation:—

Date of Construction, June 1858.

Total number of rooms or huts, 10 chuppered and 1 tiled.

Total regulation number of non-commissioned officers and men, 50 in each chuppered hut.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.		Ft.	Ft. in.		Ft.	Ft.
2 chuppered Barracks for Artillery -	50	250	11	12	37,812	756	55	1 7	—	—	—
1 Staff Serjeant's Quarters (chupper) - -	2	56	15	12	10,080	5,040	420	1 7	—	—	—
1 tiled Barracks, 4th K.O. Regiment -	100	252	22⅙	14½	99,038	990	56	1 7	56	4	3
10 chuppered Barracks	50	250	11	12	37,812	756	55	1 7	22	3½	3
2 Staff Serjeants' quarters	2	56	15	12	10,080	5,040	420	1 7	8	3½	3
1 tiled Staff Serjeant's quarters - - -	2	56	15	12	10,080	5,040	420	1 7	8	3½	3
1 Guard Room 1/1 Artillery - - -	8	25	15	12	4,500	562	47	1 7	3	3½	3
1 Chupper Guard Room 4th K.O. Regiment -	8	30	15	12	6,525	815	56	1 7	3	2½	3
6 Prison Cells - -	1	10	10	21	2,250	2,250	100	1 7	—	—	—

In the chuppered temporary barracks the windows are all on the same side (the north). They consist of matting nailed over a wooden framework, hung from the lintel, and opening outwards, supported by lifting sticks. In the tiled barrack the windows are glazed, open outwards, and are on opposite sides. A verandah 6½ feet broad extends the entire length in front of the chupper barracks, and one 10½ feet broad extends all round the tiled

AHMEDABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	barrack. The verandahs are not occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads are wooden planks upon iron trestles; 1 foot 9 inches from the ground. I have no improvement to suggest. 7. The following table gives the dimension of tents:—

	Dimensions of Tents.							Men to each Tent.	Square Feet to each Man.
	Length.	Breadth.	Superficies.	Height of Wall.	Cubic Content.	Upper Part.	Whole Cubic Content.		
	Feet.	Feet.				About			
Tent Hospital, European - -	22	14	308	6′ 6″	2,002	2,000	4,002	12	$25\frac{8}{12}$
Tent Hospital, Native - -	22	15	330	6 0	1,980	1,320	3,300	15	22
Tent, European Serjeants', Single Pole - - - - - -	14	14	196	6 0	1,176	588	1,764	8	$24\frac{1}{2}$
Tent, Staff Serjeant's - - -	10	10	100	6 0	600	300	900	1	100
Tent, Native Serjeants', Double Pole - - - - -	22	13	286	2 0	572	1,716	2,288	30	$9\frac{5}{30}$

Ahmedabad Arsenal, June 4, 1860. E. WRAY, Major, C. Ordnance.

8. There is a continuous ventilator in the roof of the tiled barrack. Each chuppered barrack has its chupper opened and raised in four places. Each ventilator is $7\frac{1}{2}$ feet by 2 feet. The same system of ventilation obtains in the guard rooms, huts, &c. The ventilation is quite sufficient to keep the air pure at all times. There are no means used for cooling the air, the barracks being temporary.
9. The temporary chupper barracks are constructed of sun-dried brick and mud, with roofs of round teak wood and chupper. The doors and windows are of matting nailed over jungle wood frames. The walls mud, plastered and whitewashed inside and out. The floor is raised from 1 to $2\frac{1}{2}$ feet. The tiled barrack is of burnt brick and mud, with trussed roof of squared teak wood; the walls are plastered inside and out, and whitewashed. The windows are of glass, and the doors half glazed and half panel.
10. The floors are of earth and broken brick, well rammed and solidified; they are raised from 1 to $2\frac{1}{2}$ feet above the level of the ground. They have no passages for air underneath.
11. The barracks being only temporary structures, hastily erected to afford shelter to Europeans at a time of great emergency, have hitherto answered very well, but if European soldiers are permanently to be located in Ahmedabad, substantial barracks must be provided. Repairs are executed by the Public Works Department, and are performed with all reasonable dispatch. The walls and ceilings of barracks are cleansed and limewashed always once a year, but at any time on a requisition from the commanding officer the walls can be whitewashed.
12. Sketch of washhouse; 50 feet by 7. Refuse water drained into cesspools; cesspools are cleansed daily.
13. Sketch of cookhouse; it is 50 feet by 12, and the refuse water is drained into cesspools, and emptied daily. Bheestees bring the necessary supply from the neighbouring wells. Dirty linen is washed by native dhobies in the river.
14. The contents of the privies and urinals are removed every morning and evening.
15. These buildings are ventilated in the same manner as the barracks. The barracks are lighted at night with oil lamps suspended from the roof with iron rods.
16. The barracks neither have nor require any arrangement for draining or sewering. The surface water during the monsoon either flows off into a natural drain, about 150 yards to the west of the barracks, or is rapidly absorbed. The drainage from lavatories, cookhouses, privies, and urinals, being collected in cesspools, can be removed at pleasure. No part of any building is damp, the nature of the soil prevents it. There are no large cesspits nor foul ditches.
17. The refuse of the station is carried away daily by the Barrack department beyond camp limits and burnt.
18. The surface of the cantonment is kept perfectly free from vegetation. There are no old walls or thick hedges, &c., to interfere with ventilation.
19. The sanitary condition of the bazaar is good as respects ventilation, cleanliness, &c., but is rather crowded in consequence of the increased number of troops during the past year; the water supply has been sufficient in consequence of the vicinity of the river. Sweepers are kept for preserving cleanliness in the bazaar, under the supervision of the bazaar master. The native houses are small, but no dung-heaps or cesspits are allowed. There are no native buildings in the vicinity of the barracks to occasion nuisance by the wind blowing over them.
20. Animals are slaughtered at about three-quarters of a mile distant from the station. No particular regulations are in force as to the disposal of the offal; it is removed by sweepers. Were it not that the station is said to be about to be removed, we would recommend the erection of burning kilns.
21. No horses are allowed to be kept in the bazaar.
22. The are no stables at the station, and the picketing grounds for the horses of the artillery and cavalry are to the rear and to leeward of the men's barracks, at a distance of about 150 yards, and a mile from the hospital.
23. There is ample accommodation for married non-commissioned officers and men.

Officers' Quarters.

1. The temporary huts for officers' quarters are small; they are well ventilated and properly drained. Substantial houses are much required, with well-fitting doors and windows to keep out the hot winds.

IV. HEALTH OF THE TROOPS.

1. We are of opinion that the station, district, and native population are tolerably healthy.
2. The most common diseases are fevers, and occasionally cholera.
3. We attribute the healthiness of the native population to the dry sandy nature of the soil, and the absence of large bodies of stagnant water.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	4. The 4th Regiment King's Own came from the Mauritius, where they were from August 4th, 1857, to November 24th, 1858. They enjoyed good health there. The prevailing diseases were hepatic. They arrived at this station February 16th, 1859, and the diseases from which they have since chiefly suffered have been fevers. The 11th Regiment Native Infantry came from Bombay, where they were stationed two years. The health of the regiment was good. They left Bombay 2nd March 1858, and arrived here March 24th. During their residence here they have enjoyed good health. No part of the barracks is remarkable for its unhealthiness. 5. The troops (European) were under canvass from November to March during the time their huts were being repaired, but it had no perceptible effect on their health. 6. I have never been in charge of troops at hill stations. 7. I have not observed whether troops resident for some time on the hills are more or less liable to attacks of disease on returning to the plains. 8 to 16. We have had no experience in regard to the effect of hill stations on the health of troops. 17. The highest ground with which we are acquainted is Mount Aboo, 150 miles from the station. It is used as a sanitarium, and is 4,500 feet above the level of the sea; but we have no experience in regard to it. 18. We have no experience as to the class of soils most healthy for stations. 19. The best age for soldiers proceeding to India is from 20 to 25, and the cold season is the best for them to land. I cannot speak from experience as to the disposal of troops on landing, my duties having been confined to native troops. The above is the recorded opinion of the medical member. Recruits are attached to the depôts in Bombay on first landing, and sent up to Poona and Ahmednuggur as quickly as possible by rail, where all their wants are attended to. The precautions necessary are, good barrack accommodation, attention to clothing and diet, and avoidance of all unnecessary exposure to the sun. 20. It is better for troops to be sent direct from England to India, and then forwarded to well established healthy stations. 21. The mode of transport from the port to the interior is on land by marches, and on water by country boats and steamers when available. 22. The British soldier should serve in India 15 years. 23. Medical boards are always properly conducted. 24. The time of year desirable for invalids to leave India is in January and the commencement of February, from Western India.
Diseases.	1. There are no inspection parades for the discovery of disease amongst natives. We are informed that European troops are inspected weekly. 2. There has been no scorbutic disease at this station. 3. I am informed that out of 1,070 cases admitted into hospital, 4th King's Own, during the past year, 37 were from hepatic disease, but only two deaths occurred. 4. No cases of dracunculus have presented themselves. 5. Out of a daily average of sick from all causes of 28, the proportion of venereal disease would be 5. The medical officer 4th King's Own, recommends the establishment of lock hospitals, which the committee coincide in on the grounds of health; but as they were done away with some years back, being looked upon as sanctioning immorality, the committee must leave it to superior authority to decide. 6. No epidemic has shown itself during the two past years among the European or native troops. 7. There has been no appearance at this station of zymotic diseases. The hot season is the period when they usually prevail, and a sultry and cloudy condition of the atmosphere precede or accompany them. When they do occur, they are generally confined to the crowded parts of the bazaar. Insufficiency of food among the lower classes of the native population, their personal dirty habits, and the overcrowding of their dwellings, would appear to predispose them to zymotic disease. 8. No epidemic having appeared, it cannot be stated whether the duties of the soldiers would have any influence in this respect. 9. In isolated cases quinine has been used as a prophylactic against malaria, with a satisfactory result. 10. We have no recommendations to offer, with a view to the prevention of disease. The country is very open, and there is a free circulation of air throughout the camp.
V. Intemperance.	1. The soldiers at this station are generally temperate, and there are no confirmed drunkards. 2. The returns of admissions into hospital for intemperance are in the office of the superintending surgeon. The diseases directly caused by intemperance are ·08 per cent., and indirectly 3 per cent. Drunkenness is punished as an offence. 3. Spirits are sold in the regimental canteens, and under restriction in the bazaar. The arrack is 24° below London proof: the quantity allowed is one dram daily. Spirit is not part of the ration, either at the station, on march, or in the field. The canteen is never opened in quarters before noon. On the march or on service the men are sometimes allowed to receive their daily dram immediately after coming off the march. This is not good for the health when allowed. Spirits are given as a ration to convalescents at the discretion of the individual medical officer. No other drinks are sold in the canteen or bazaar which are injurious to health. 4. The consumption of spirits by troops is injurious to health. If given in moderation, it is conducive to discipline and efficiency, as it prevents troops going to the bazaar and getting country liquor, which is poison to them. 5. It would be beneficial to health to abolish the use of spirits, but impossible to be carried out. 6. Malt liquor gives an improved tone to the system, which is not imparted by wine and spirits, and the consumption of it cannot be too much encouraged. 7. We understand that there is a coffee room in the 4th Regiment King's Own and artillery, and that it is generally used. The effect of using tea, coffee, &c., is good. 8. It would be beneficial to substitute coffee for the spirit ration in the early morning, and beer in the evening and at dinner. 9. It would be beneficial to permit only beer, tea, coffee, &c., to be sold in the canteens.

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	10. I have no other recommendations on these points. 11. Canteen and bazaar regulations annexed. The following are the more important points in the canteen regulations:—Canteen open from 12 to 12¾ o'clock, to issue malt liquor only. Open from 2 to 3 p.m., and from sunset to tattoo, to issue spirits and malt liquor. No man allowed more than one dram of spirits, or one quart of malt liquor at one issue. Allowance of arrack, one dram per diem Arrack to be consumed at the place of issue. All issues to be paid for on the spot. No spirits to be issued before dinner time. Intoxicated persons or men under punishment not to enter the canteen. By the bazaar regulations no liquor can be sold to any European without the written permission of an officer.
VI. DIET.	1. The ration for British troops consists of 1 lb. bread, 1 lb. beef, 5 days, and 1 lb. mutton 2 days a week, 4 oz. rice, 1 oz. salt, 2½ oz. sugar, $\frac{12}{21}$ oz. black tea, $\frac{5}{21}$ of green tea, 1 lb. vegetables, comprising ⅓ potatoes, ⅛ onions, ⅓ yams, 3 lb. firewood. No changes are found necessary. The rations are inspected by the orderly officer of the day. 2. A complete ration is issued, including a due proportion of vegetables. The stoppage is 3 annas 4 pice daily. The soldier has three meals a day:—Breakfast at 7 a.m.; dinner at ¼ to 1 p.m., and tea at 4 p.m. 3. We would recommend giving mutton four times a week, and beef three times, instead of as at present. The beef in this country is lean and tough, and more indigestible. The rations cannot be disposed of. 4. The cooking is done in cookhouses by native cooks. The kitchens are clean, light, and well ventilated, and water is supplied by bheesties. The meat is boiled and roasted, and is at all times properly done and cooking sufficiently varied. During a march the men are halted and provided with coffee in the early morning. 5. Gardens might be advantageously cultivated, under such regulations as the commanding officer might see fit to adopt.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress consists of 1 wicker helmet, 1 forage cup and cover, 1 cloth tunic, 1 serge frock, 2 khakee frocks, 1 pair cloth trousers, 1 pair blue ditto, 2 pairs khakee ditto, 3 pair boots (2 English). The accoutrements are 1 20-round pouch, 1 40-round ditto, 1 pouch belt, 1 waist belt, 1 waist belt plate, 1 firelock sling. The present dress, as lately altered, is suitable to the climate, and under the present system no improvements can be suggested.
Duties.	1. The men may be drilled either at home or in India. 2. Drills are not prejudicial to health as at present arranged, viz., morning and evening, which are the best hours. There are no general orders on the subject. The following are the average number of nights the men have in bed during the week.

	Serjeants.	Buglers.	Corporals.	Privates.
European Artillery, 1st Company, 1st Battalion	5	3	5	5
4th King's Own Regiment	2	2	4	6
	Havildars.	**Buglers.**	**Naigues.**	**Privates.**
Native Artillery, 3rd Battalion	5	2	5	3½
11th Regiment Native Infantry	5	6	3	4
14th Regiment Native Infantry	3	3	3¼	4

	3. Guards are mounted close to the barracks, within 20 yards. They last day and night. Picquets from sundown till gun fire in the morning. There are roll calls morning and evening and at tattoo. We have not discovered that night guards have any injurious effect on the health, and we cannot suggest any additional precautions.
VIII. INSTRUCTION AND RECREATION.	1. There are no ball courts, day-rooms, workshops, theatre, or gymnasia at the station. There is a skittle ground and gardens; the latter at present not worked owing to the hot weather. There is no school room built for the purpose, but the school is held in one end of the harness room, a very hot place, and unsuited to the purpose. There is no trained schoolmaster; one of the soldiers does the duty in the 1/1 artillery, and is not properly qualified. There is no building for the library; one of the non-commissioned officers' quarters is used for it; it has one lamp. There are no proper amusements for the men, and no place for them to go to when wet or in the heat of the day. The barracks are very narrow. There are strict orders prohibiting men from exposing themselves to the sun in the heat of the day. Without such restrictions there would be more instances of apoplexy than there are. 2. For increasing the means of recreation we would recommend a ball alley, a good school room, and a gymnasium. 3. The institution of soldiers' savings' banks would be advantageous. 4. There is sufficient shade to enable the men to take exercise from verandahs, &c.
IX. MILITARY PRISONS.	1. Six cells have just been erected; they are substantially built of burnt brick; each cell is to hold one man. They are badly arranged for ventilation.
X. FIELD SERVICE.	1. We know of no local regulations for field medical service. 2. The medical officer has full powers to recommend anything tending to the health of the troops, as to the time of marching, encamping, &c. 3. He has full power to recommend or to object in all matters of sanitary regulation, and his doing so would lead to the assembling of a committee to consider and carry out any subject he may bring forward. 4. The inquiry respecting the arrangements adopted in the Presidency for field hospitals, supplies, &c. we respectfully refer to the Inspector-General at Bombay for reply. Sick carriage consists of doolies, sick carts to hold four, and kagamas or camels for convalescents.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following form shows the statistics of sickness, &c. at Admedabad :—

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857-58	Detachment H.M. 72nd Highlanders Do. do. 83rd Regiment Do. do. 86th Regiment Do. do. 89th Regiment	717	445	3	—	—	92	2	3	—	70	2	5	—	—	—	236	—	851	7	118·6	0·9
1858-59	H.M. 4th King's Own do. Detachment H.M. 51st do. Do. do. 89th do.	542	834	6	—	—	46	—	23	2	223	1	18	4	—	—	433	—	1,577	13	290·9	2·3
1859-60	H.M. 4th King's Own do.	525	670	7	—	—	29	2	42	2	114	1	10	4	3	2	336	1	1,204	19	229·3	3·6
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1857-58	1st Company 1st Battalion Artillery	50	85	2	—	—	6	—	1	—	19	—	2	—	—	—	33	—	146	2	292·0	4·0
1858-59	Do. do. do.	78	72	—	—	—	11	—	2	—	36	—	2	—	—	—	86	—	209	—	267·9	—
1859-60	Do. do. do.	100	98	1	—	—	5	—	7	—	21	—	4	1	—	—	77	2	212	2	212·0	100·0

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	4th Battalion Artillery 5th Regiment Native Infantry 7th Do. do. 12th Do. do. Staff and Details	1,831	1,327	4	5	1	15	1	7	—	156	—	11	1	32	14	694	1	2,247	22	122·7	1·2
1851-52	4th Battalion Artillery 7th Regiment Native Infantry 12th Do. do. Staff and Details	1,779	1,064	5	9	—	16	2	3	—	174	3	12	—	26	9	665	3	1,969	22	110·6	1·2
1852-53	3rd Battalion Artillery 4th Do. do. 7th Regiment Native Infantry 12th Do. do. 28th Do. do. Staff and Details	1,670	1,233	3	2	—	29	2	5	1	140	3	13	2	4	2	539	3	1,974	16	118·1	0·9
1853-54	3rd Battalion Artillery 7th Regiment Native Infantry 25th Do. do. 28th Do. do. Staff and Details	1,861	1,669	18	7	—	33	1	3	1	203	3	14	—	—	—	953	4	2,887	27	155·1	1·4
1854-55	3rd Battalion Artillery 25th Regiment Native Infantry 28th Do. do. Staff and Details	1,733	1,033	10	7	1	18	—	1	—	156	1	27	1	69	28	785	6	2,096	47	120·9	2·7
1855-56	3rd Battalion Artillery 2nd Grenadier Regiment Native Infantry 25th Regiment Native Infantry 28th Do. do. Staff and Details	1,926	818	6	21	—	35	1	7	—	195	2	14	1	1	1	689	1	1,780	12	92·4	0·6
1856-57	3rd Battalion Artillery 2nd Grenadier Regiment Native Infantry 25th Regiment Native Infantry Staff and Details	1,858	954	1	3	—	54	2	10	—	206	2	35	2	17	12	1,055	1	2,334	20	125·6	1·0
1857-58	3rd Battalion Artillery 2nd Grenadier Regiment Native Infantry 7th Regiment Native Infantry 11th Do. do. Staff and Details	2,725	1,693	20	30	—	82	1	9	—	266	4	33	2	1	1	1,512	9	3,626	37	133·0	1·3
1858-59	3rd Battalion Artillery 2nd Grenadier Regiment Native Infantry 11th Regiment Native Infantry 14th Do. do. Staff and Details	2,093	811	11	36	—	33	5	8	1	217	4	23	1	1	—	1,033	4	2,151	26	102·7	1·2
1859-60	3rd Battalion Artillery 11th Regiment Native Infantry 14th Do. do Staff and Details	1,545	1,017	7	15	—	47	1	9	1	163	1	13	1	22	13	752	2	2,038	26	196·6	1·6

EUROPEAN WOMEN AND CHILDREN.

Years.	Station.	CORPS.	WOMEN.									CHILDREN.								
			Strength.			Treated.		Died.		Ratio per Cent. to Strength.		Strength.			Treated.		Died.		Ratio per Cent. to Strength.	
			European.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.	Europeans.	Indo-Europeans.	Total.	Europeans.	Indo-Europeans.	Europeans.	Indo-Europeans.	Treated.	Died.
1858-9	Ahmedabad.	Her Majesty's 4th King's Own Regiment.	44	—	44	9	—	—	—	20·4	—	67	—	67	1	—	—	—	1·4	—

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General Medical Department,
Bombay, 27th July 1860.

W. C. COLES, Assistant Surgeon,
Secretary.

AHMEDABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan of new hospital. 2. A new hospital is just completed, which is a very good one. The building at present used for a hospital by the 4th Regiment is a large bungalow in the N.I. lines, formerly the residence of a general officer. It contains eight rooms and accommodates 54 patients. The division into so many small compartments prevents that free ventilation so desirable for the sick; and in no way does this building afford the necessary accommodation for a European regiment. There are no quarters for 1st-class servants, and the offices in the rear give but ill shelter for the 2nd class. Compared with the rest of the buildings in camp belonging to regiments it is a superior place, inasmuch as it possesses chunam floors, and walls, and a ceiling. The recent erection of puckerries and officer's quarters, and the increased strength of the corps, renders it neither large enough nor fitted for its purposes, for such an essential condition as free ventilation is destroyed by the accumulation of dwelling houses in its vicinity and to windward thereof. 3. The water for hospital use is supplied from a well in the compound, and is good and abundant. 4. Refuse water and other impurities are removed by means of cesspits. 5. There are no air passages below the wards, which are raised about two feet from the level of the ground. The roof water sinks into the subsoil; there is no surface drainage. Of the permanent hospital the walls are burnt brick and lime, sufficiently thick to keep the hospital cool. The roof is double-tiled, and ventilated by iron cowls. The hospital is surrounded by a good large verandah which is frequently used for the accommodation of sick. The hospital consists of one flat only. The following table shows the accommodation in the temporary hospital. Date of construction, not known. Total number of wards, 8. Total regulation number of beds, 59.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.			Feet.	Feet.		Feet.	Feet.
1	8	22	20	18	6,920	865	55	2	—	—	—
2	5	18	11	12	2,276	456	39	—	—	—	—
3	12	35	20	18	12,600	1,050	58	—	2	6	4
4	8	20	19	18	6,540	855	47	—	—	—	—
5	8	20	20	18	7,200	900	50	—	2	6	4
6	4	17	10	11	1,870	467	42	—	1	6	4
7	5	21	10	11	2,310	462	42	—	1	6	4
8	4	17	10	11	1,870	467	42	—	—	—	—

N.B.—The wards without windows have each 4 doors.

The permanent hospital is so placed as to receive the full benefit of the prevailing winds, that is, the hospital for the 1st company 1st battalion artillery. The windows open outwards, and their arrangement and construction are conducive to ventilation and coolness.

6. The wards are ventilated by the windows and the iron cowls on the roof. There are no jalousies or jhilmils.
7. Punkahs and tatties are used for cooling the air.
8. There are no means of warming. The walls and ceilings are cleansed and limewashed every three months.
9. A commodious latrine has been lately constructed, but at too great a distance from the main building to admit of a covered way. There are cesspits in connexion with the hospital latrines; they are satisfactorily deodorized by salt, lime, and charcoal, and the refuse is removed morning and evening daily.
10, 11. The lavatory arrangements consist of rows of basins around a small bath room, filled by hand from the well in the compound. There is also a large bathing tub, good.
12. No arrangement is required for washing linen; it is done by dhobies.
13. There are two storage rooms for medicines and clothing.
14. The bedsteads are made of iron, and the bedding is good. The mattresses are stuffed with straw and periodically renewed.
15. The kitchen is one of the outhouses in rear of the hospital, a mere make-shift. The cooking utensils are those in common use in the country, and are sufficient and good.
16. Forms transmitted.
17. The attendance on the sick consists of one hospital serjeant and one orderly, to march the sick to and from hospital. It is sufficient.
18. The sanitary condition of the hospital is good. No epidemic has occurred.
19. I have no improvements to suggest.
20. In the 4th King's Own hospital the convalescents walk in the large compound. There are no seats, but there is shade. There is the same provision for the 1st company 1st battalion artillery, with the exception of shaded walks.
21. There is a row of patcheries, but no proper hospital for the wives and children of the 4th King's Own. The women of the artillery have a commodious hospital, and the arrangements are satisfactory.
22. There are no special local hospital regulations.
23. The medical officer has full powers to suggest or object in all sanitary matters affecting the state of the hospital.
24. There are no convalescent wards; such would be an advantage.

XIII. BURIAL OF THE DEAD.

1. The burial-ground for British troops is about a quarter of a mile from the station. It is properly situated, being to the N.E.
2. It is 160 feet long by 160 broad. The soil is sandy, and the ground is carefully kept.
3. The grave space allowed is six feet by two. The interval between the graves 1½ feet. The depth of graves is from six to seven feet. They are never re-opened unless to inter another

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead—*cont.*	member of the family, or to erect a tomb. Interment takes places within 24 hours after death at ordinary times, and during epidemics as soon as possible. Arrangements for natives are left to the people themselves. Mahometans bury their dead, and Hindoos burn them. 4. The graveyard is never offensive. British troops are buried agreeably to the army regulation, in the morning and evening. 5. The dead of camp followers and bazaar people are disposed of by their own relations according to the rules of their different castes. 6, 7. No injury whatever to health accrues from the present practice, and no improvent can be suggested.

(Signed) Charles Lucas, Colonel Artillery, Commanding the Station.
M. Thompson, Staff Surgeon, Ahmedabad.
C. T. Boddam, Captain Bombay Engineers, Executive Engineer, Ahmedabad.

4th May 1860.

BARODA.

Accommodation	Queen's Troops.—Either Artillery or Infantry	- -	400.
	Native Troops. Artillery	- - - -	140.
	Native Troops. Infantry	- - - -	1,200.

N.B.—There are gunsheds for one field battery.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat, sandy, and highly cultivated, and very swampy in the monsoon. There is a great deal of wood, principally trees and hedges, with little jungle, but plenty of water. 2. The elevation of the station above the level of the sea is 90 feet, but on a level with the adjacent country. A small river runs along the eastern boundary of the cantonment almost stagnant for 9 months in the year. There is also a tank 600 yards from the barrack and 300 yards from the nearest bungalow. There is no higher or healthier ground adjoining the station. 3. The hill fort of Powagurh distant 26 miles is the only high ground within sight of the station. 4. The nearest water to the station is the Wishwamuntree river, 100 yards from the hospital. The vicinity is liable to overflow near the banks in the rains, which lasts as long as the rain falls, leaving stagnant pools. There are a few nullahs near the station, and water pits all over the country, which have a very prejudicial effect on health. 5. The station is so encumbered with trees that it is not sufficiently exposed to the breeze. The temperature of the station is raised by the buildings being exposed to reflected sun heat. The breeze blows from the direction of the sea for the greater part of the year, and from November to March the land wind blows from east and north-east. The surrounding country is cultivated. There are no large works of irrigation near the station, and artificial irrigation is not observed to have any effect on the health of the station. The cultivation of rice is prohibited only within camp limits, and plenty of rice is grown close to the cantonment in every direction. The country outside the limits belongs to the Gaicowar. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The city of Baroda to the south of the station is distant a mile and a half. 8. The geological structure of the district is alluvial deposit. The surface is admixture of black soil and sand, and the subsoil contains more clay. The station occupies new ground. 9. Water is usually found at a depth of 50 to 35 feet in different parts of the camp. 10. The rainfall, or water from surface springs, does not flow readily away. It disappears partially by sinking into a pervious subsoil; partly oozes out near the level of the station; but principally lies on the surface till evaporated. There is no higher ground, the drainage from which passes into the subsoil of the station. 11. The water supply of the station is derived from wells, and is stored in a tank of 12,000 square yards of surface; it is principally used for washing. It always has water in it. There are no plants whatever in the tank, but large quantities of fish and frogs. There is no tank used for drinking purposes that is also used for bathing. The water tank is not liable to pollution from leaves or any other matter falling into it. There is no nuisance or malaria experienced from the tank, but there is from the water holes. Draining is the only means that can be adopted for preventing this. 12. The water supply of the station is unlimited. The water is clear, and without taste or smell; it is soft, of good quality, and contains no lime salts. The chemical composition of its solid contents is, for the most part, chloride of sodium; but it also contains carbonate and bicarbonate of soda, and is alkaline; the evaporated water strongly so. It also contains a trace (faint) of lime, but no iron. There are no sulphates, phosphates, or nitrates in it. The water is raised in leather buckets by manual and bullock labour, and distributed by water carriers. 13. The villages in Guzerat, but more particularly in the Gaicowar's territory, are excessively filthy, and no means are taken for cleansing them. Water lodges in every hollow, and as the soil is very tenacious, remains stagnant till evaporated. Every road also is partly under water in the rains, there being no made roads in all Guzerat; roads are generally lower than the adjacent fields, and have very high thick hedges on each side. Filth, excessive vegetation, and stagnant pools in the surrounding country, must have an effect on the health of the station. 14. New stations are selected by order of Government, either after inquiry or trial.

BARODA. BOMBAY.

References to Subjects and Queries.	REPLIES.

II. CLIMATE.

1. There are a thermometer and pluviometer at the station, for conducting meteorological observations.

2. The Table of meteorological observations is made up from 3 years' barometrical and 12 years' thermometrical observation, and from observations for 12 years of the rain-fall, and prevailing winds.

YEARS of OBSERVATION from January 1847 to December 1853.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain.	Winds. Direction.	Winds. Force.
		°		°	°	Inches.		
January - - -	30·220	71	—	84	58	00·2	E. & N.E.	Moderate
February - - -	·215	70	—	90	56	·02	E. & N.E.	Moderate
March - - -	·542	83	—	96	71	·06	N.E., N.W.	High
April - - -	29·845	81	—	94	69	·00	W.	High
May - - -	·801	94	—	105	83	·57	W. & S.W.	High
June - - -	·755	89	—	98	80	6·26	S.W.	Calm / Variable
July - - -	·650	85	—	91	80	15·85	S.W.	Monsoon
August - - -	·730	84	—	88	76	8·10	S.W.	Monsoon
September - - -	·788	83	—	90	77	4·26	Variable.	Variable
October - - -	·671	80	—	87	73	0·37	W.	Calm
November - - -	30·222	77	—	90	64	·02	NNE., NW	Calm
December - - -	·093	73	—	89	58	·07	E. & N.E.	Moderate

3. The climate is comparatively moist, and very damp in the rains. Fogs prevail to the end of November, and during the hot season hot winds and dust prevail; it is never very cold. There are too many trees about. The influence of the climate on the troops is deleterious. Woollen clothing and good diet should be provided during the rains. Parades should be either early or late, and the men should not be exposed to the sun. The most healthy time of year at the station is from November till June, and the most unhealthy from June till November. The prevailing diseases are fevers of a very malignant type.

4. At about 18 miles from the station there is a place, Dubka, on the bank of the Mhye river, admirably adapted for the formation of a sanitarium. It is situated on the high bank of the river, on one of its bends. The soil is sandy, and cut up by numerous deep ravines, which ensures its being well drained, even during the rains. Removal to Dubka proved of the greatest advantage to a detachment of the 33rd Foot, when attacked by cholera in March of the present year.

5. The following is a list of stations, at which the Assistant Surgeon has served:—

Bombay, Mulligaum, Ahmednuggur, Ouna, Vingorla, Rajkote, Deesa, Nusseerabad, Neemuch; nine healthy stations.

Kurrachee, Dhoolia, Ahmedabad, are not injurious.

Baroda, Hydreabad, Sukkur, positively injurious.

Poona, healthy. Deesa is healthy, except in the very hot weather. Hyderabad and Mooltan, unhealthy; Belgaum, healthy; Peshawur, unhealthy; Dhoolia, average; and Baroda, unhealthy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Plan and tracings of the station, surrounding country, barracks, &c., are transmitted.

4. TABLE of barrack accommodation:—

Date of construction of barrack, 1859. Total number of rooms, 4.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft.	Ft. To tie Beam.	Ft.			Ft. In.		Ft.	Ft.
4 Temporary Barracks each.	60	200 0	20	14	56,000	933	66	1 8	40	4	2½
Total -	240 men	—	—	—	—	—	—	—	—	—	—
Guard Room -	12	66 6	16	Mean 12	12,768	1,064	88	1 8	—	—	—

5. There are windows and doors on both sides of the rooms, and doors at the end; they open inwards. There is a verandah all round each barrack 7 feet wide, and 8 feet to the eaves; used by the soldiers as sleeping quarters on hot nights. There are no jalousies or jhilmils.

6. The bedsteads used in barracks, tents, &c. are boards supported on iron trestles with a straw mattress. Coir mattress is recommended.

7. The following are the dimensions and structure of the tent:—

Description of Tent.	Dimensions.					Number of Men allotted to each Tent.		Cubic Feet to each Man.		Number allotted to each.		Cubic Feet per Man.	
	Length.	Breadth.	Height in Centre.	Height of Walls.	Contents in Feet.	European.	Native.	European.	Native.	Europeans if Sick.	Natives if Sick.	Europeans Sick.	Natives Sick.
	Ft.	Ft.	Ft.	Ft. In.									
European soldiers' double top single pole.	12	12	11	5 8	1,072	16	—	67	—	8	10	134	107
Hospital, double pole, double top.	19	12	11	5 8	1,772	25	—	70	—	12	16	148	110
Native Rowlie, No. 1. single top, double pole.	18	8	9	2 0	657	12	30	55	22	10	12	65	55
Native Rowlie, No. 2, single top, double pole.	14	7	8½	2 0	423	10	12	42	19	8	10	53	42

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. The barracks are ventilated by openings in the roof averaging 10 by 2 feet. These afford sufficient ventilation. The air is cooled by means of punkahs and tatties. 9. The barracks are made of burnt brick and mortar pillars supporting the roof and the spaces between, filled up with sun-dried brick and mud, the roof is double tiled. 10. Some of the floors of the barrack rooms are made of brick and some of chunam or lime, raised 4 feet above the ground. There is no passage for air beneath them, being all solid. 11. The materials of which the barracks, tents, &c. are constructed, are good enough and suitable for the climate. The barracks are kept in repair by the Engineer department; repairs are quickly executed. For the general cleanliness of camp the cantonment staff officer is responsible. The walls and ceilings are cleansed and lime-washed whenever they require it. 12. The water for the men's lavatories is suppled by bheesties. The water is drained out into an open ditch 7 or 8 yards from the room. A tub is used for washing. 13. The water for the barrack cook-houses is supplied by bheesties, and the refuse water is drained off into cesspools in the rear. The linen of the station is washed by dhobies, who take the things away and wash them in the river or in the tank. 14. The contents of the privies are taken away by sweepers through a trap-door in the rear. 15. The ventilation of the privies is effected by openings in the side walls under the eaves. 16. The only drainage is that which comes off the roof in the rains, when a shallow ditch is excavated all round, and the water carried off by an open drain 1ft. by 2ft. The country being so flat prevents any good system of drainage being carried out except at great expense. Neither barrack or hospital is damp. The fluid refuse of the barracks is received into cess-pits, which are situated in rear of the cook-houses, and are not near the wells; they are distant from the barracks about 40 yards. There are nullahs on all sides of the station; but average 400 or 500 yards from the barracks, stagnant pools remain in them occasionally, 17. With respect to the surface cleansing of the cantonment, the dead leaves are collected and burnt once a year; the refuse, &c. is thrown into the nearest nullah. 18. No grain is allowed to be grown in the cantonment. There are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar. 19. The bazaar is well drained, but badly ventilated and much crowded. The streets are very narrow, for want of space, but they are clean. All inhabitants of the bazaar keep their premises clean, and collect the sweepings in front of the house, whence it is removed in rubbish carts. A daily inspection is made. Four peons are allowed, which is sufficient as sanitary police. There are no native houses near the station. No nuisance is experienced in barracks from wind blowing over native dwellings. 20. The animals for the use of the troops are slaughtered within the station. The place is kept scrupulously clean, and inspected daily. The offal is removed daily. No nuisance is experienced in the station. 21. 22. There are no cavalry or artillery stables, but a shed only for sick horses, to the leeward of the barracks. The picketing grounds are arranged in lines, and surrounded by a hedge, they are too near the hospital. 23. There is plenty of accommodation for married non-commissioned officers and men. No married people occupy the barrack rooms.
Officers' Quarters:	1. The sanitary condition of officers' quarters at this station is good. There is no arrangement for drainage; as the country is so flat a very expensive general system of drainage would be required. Thinning the trees is an improvement much required, and one which is now being made.
IV. Health of the Troops.	1. The whole district, both as regards the station and the surrounding country, is decidedly unhealthy. 2. Cholera, intermittent fever, variola, leprosy, and spleen disease are prevalent among the native population. 3. The prevalence of the above diseases may be attributed to a general want of cleanliness among the population, to bad drainage, and a consequent impurity of air, in addition to which the whole country for many miles is thickly covered with trees. 4. The detachment of Her Majesty's 33rd regiment left Deesa, in September, 1859, having been there about 15 months, during which time the health of the men was tolerably good. They suffered from bad rations in the hot weather, and there were some deaths in the regiment from apoplexy. They arrived at Baroda in good health in the early part of March, 1860, and only suffered from fevers until the 28th March, when cholera appeared, and they lost 20 men out of 200. From September 1859 to March, 1860, the detachment was on field service in Okamundel, and was very healthy. There is no portion of the men's accommodation at this station more healthy than the rest. 5. The troops have always lately been marching for a great portion of the year as a detachment on field service. Europeans were camped at Dubka in April and May to avoid cholera.

BARODA.
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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	6. None of the Commissioners have been in charge of troops at hill stations. 7. None of the Commissioners have any experience of the effects of hill stations on troops. Major McGrigor has been at the Nielgherry hills for two years, and at Aboo for six months, when suffering from fever, and having got over the attack had no return of it on going back to the plains. 8, 9, 10. No experience in hill stations. 11. The best time for residence in hill stations is from April to June, and three months the shortest period of residence which would enable troops to receive full benefit to their health. 12, 13. The Commissioners have had no experience as to the injury likely to be inflicted on the health of troops on leaving hill stations for the plains, or what precautions are necessary on such occasions. I have never heard of any one finding his health impaired by prolonged residence at a hill station; but the reverse. 14. The Commissioners consider that residence at a hill station, with the shortest possible period of service in the plains, as most conducive to health. The present arrangement of changing stations about every three years on the plains seems as good as could be adopted. 15. I believe there is scarcely any barrack or hospital accommodation for troops at hill stations in this presidency. A few hills are used as sanitaria, but not as stations for troops. 16. The most suitable sites for hill stations are obtained at an elevation of between 4,000 and 8,000 feet above the level of the sea. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. There is a hill fort, Powagurh, about 26 miles off, but is not sufficiently extensive. 18. Black soil, for a station, is generally considered unhealthy. 19. Soldiers should not be sent to India until over 20 years of age, and should be landed not earlier than November nor later than January. I am unable to recommend any precautions beyond the regulations at present in force. 20. Troops should be sent direct from the home depôts to India. They should be sent on arrival to hill stations. 21. The mode of transport of troops from port to the interior is dependent on the station. Sometimes it is by rail, bullock train, or steamer, if available; but generally by marches on foot. Ample regulations exist for preserving the health of the troops, if they are acted up to. 22. The number of years I consider a British soldier should serve in India is seven. 23. No answer to this question. 24. Invalids should leave India for home about the month of February.
Diseases.	1. The Europeans are inspected weekly every Saturday morning, and the native troops at irregular intervals, at the discretion of the medical officer. 2. There has been no case of scorbutus at this station within the experience of the Commissioners, which is, however, limited to three months. 3. There have been three serious cases of hepatitis occurring among the Europeans since the arrival of the troops now in Baroda. Of these one proved fatal, one was invalided, and one recovered, in addition to which some more trifling cases of congested liver have been under treatment. Under these circumstances the Commissioners (whose experience of the station, as above stated, is very limited, and who have no records to guide them) are of opinion that this disease is not prevalent in Baroda. 4. Among the Europeans no cases of dracunculus have occurred, but among the native troops it has been prevalent. 5. Within the experience of the Commissioners venereal diseases have been rare at this station. Among the Europeans there has not occurred a single case of syphilis since the arrival of the detachment at the station, and only a few of gonorrhœa. The native troops have enjoyed an equal immunity. 6. The following are the diseases from which the troops at this station have suffered:— *Fevers.*—Among the Europeans, common continued fevers, with a tendency to head symptoms, and lasting for 3 or 4 days, have been prevalent. Those of the intermittent and remittent types have been comparatively rare. *Dysentery.*—There have been very few cases, and those of a mild form. *Cholera.*—This disease has been prevalent in the station and surrounding country during the past hot season, proving fatal to 20 men of the detachment 33rd regiment (the strength of which was 200), and to many of the native troops, and to large numbers in the city, bazaar, and villages surrounding the camp. *Small-pox.*—No cases have occurred since the arrival of the troops now in Baroda. *Rheumatism.*—There have been no cases of acute rheumatism, and only a few of the chronic form. The following shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths. Detachment H.M. 33rd Regiment. Return of sickness and mortality in the above detachment from the under-mentioned diseases during the period of its station at Baroda, from 11th March to 31st July 1860.

Diseases.	March 1860. Strength 197. Admissions during the Month.	April 1860. Strength 173. Admissions during the Month.	May 1860. Strength 177. Admissions during the Month.	June 1860. Strength 176. Admissions during the Month.	July 1860. Strength 177. Admissions during the Month.	Total Admissions.	Deaths.
Fevers	29	24	4	27	34	118	1
Dysentery	—	—	—	—	—	—	—
Cholera	3	20	—	—	—	23	20
Small Pox	—	—	—	—	—	—	—
Rheumatism (chronic)	3	1	2	1	—	7	—
	35	45	6	28	34	148	21

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	7. The more frequent zymotic diseases are febrile diseases and epidemic cholera. Fever appears about October, when vegetation is decaying, and moist muggy heat prevails; cholera about the end of the hot season, when dry hot winds and dust prevail. The eating of large quantities of unripe fruit by the troops and natives seems to be the predisposing cause of these diseases. 8. Every precaution is taken to preserve the soldiers from excessive fatigue or any predisposing influence to disease. 9. Doses of quinine have not been given as a prophylactic against malarial disease at this station. 10. The cause of unhealthiness does not exist within the station, but in the surrounding country, and in its general position and want of drainage.
V. INTEMPERANCE.	1. As a rule, the men at this station are temperate, the majority of the detachment, 33rd regiment, being soldiers not brought to notice for drunkenness. There are no confirmed drunkards; and although several are hard drinkers, no court-martial for habitual drunkenness has taken place. 2. There are no admissions into hospital from diseases directly caused by intemperance; but indirectly a large amount of the fever cases are caused by the intemperance of the men. Those who are hard drinkers come into hospital time after time with fevers. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteen to Europeans, and in the bazaar by a contractor to natives only. One dram of arrack and 1 quart of porter can be purchased at the canteen per diem, but form no part of the ration for soldiers, either at the station, on march, or in the field. The men cannot get spirit before morning parade from the canteen, and any liquor they drink then must be obtained from improper sources. Spirit is never given as a ration to convalescents. No injurious drinks other than intoxicating ones are sold either at the canteen or bazaar. 4. Taken in moderation, spirit is not injurious to troops or convalescents. Taken moderately, it does not interfere with the efficiency or discipline of the corps; but, at the same time, most of the crime among the Europeans is attributable to this source. 5. The use of spirituous liquors is restricted, but all the surrounding villages are the Gaicowar's, not subject to our regulations, and the soldiers procure liquor by some secret means. 6. In my opinion, malt liquor is preferable to spirits. 7. Tea, coffee, lemonade, soda water, &c., are not much used at this station. 8. As above stated, there is no spirit ration, but it can be procured at the canteen on payment. 9. It would not be beneficial to prohibit the sale of spirituous liquors, because they can procure worse liquor secretly, and it is impossible to prevent this. They can purchase at the canteen a quart of porter and a dram of arrack per diem. 10. The interior of the canteen is very dull, and has no furniture except tables and benches. The addition of draught boards, chess, and backgammon would render the canteen a more pleasant lounge for the soldier; and the sale of tea and coffee might be added. 11. No liquor is allowed to be sold in the bazaar by any contractor to any European soldier, and rewards may be offered not exceeding 50 rupees for the apprehension of any person providing the men with illicit spirits, which reward shall be charged against the contractor, if it occurred through his negligence. The sale of European or other foreign spirits is prohibited in the camp bazaars without licence. All cooks, clean boys, &c., must drink their liquors at the shops; and they are on no account allowed to take any away. All liquor shops are closed at 9 p.m.
VI. DIET.	1. The composition of the ration for Queen's British troops is as follows, viz., 1 lb. of bread, 1 lb. meat, 1 lb. vegetables, 3 lbs. wood, 4 oz. rice, 1 oz. salt, 2½ oz. of sugar, $\frac{10}{32}$ oz. of black tea, and $\frac{5}{32}$ oz. green tea. Mutton is issued twice a week, and on the remaining days beef. The vegetables consist of 12 oz. potatoes, and 4 oz. onions, or 12 oz. pumpkin and 4 oz. onions. The ration generally is very bad, the meat being of poor quality, deficient in nourishment and unpalatable. The vegetable supply is limited to potatoes (often bad), onions, and pumpkins, an innutritious watery vegetable, very cheap, and consequently substituted for potatoes by the contractor when he is not prevented. There is a daily inspection made of the ration by the Quartermaster Serjeant, and four times a week by the officers of the detachment. On any complaint being made the ration is reported on by a board, consisting of two officers and the medical officer of the detachment. 2. There is a complete ration with a due proportion of vegetables, but the latter are insufficient, and the ration generally, as above stated, is bad; there is no fruit included in it. The stoppage is 3 annas 4 pice per day per man. The men have breakfast at 7 a.m., consisting of bread and tea, dinner at 1 p.m. composed of meat and vegetables, and supper at 4 p.m. of bread and tea. The proportion of vegetables which enters into the constitution of the ration is 40 per cent., but of most inferior description. 3. In this station where the meat is so very bad, the issue of preserved meat (similar to that supplied to troops on board ship) twice a week, would be most conducive to the health of the European troops: this remark applies more especially to the hot weather. Measures should also be taken for the regular supply of wholesome vegetables. There is no special arrangement for the prevention of the disposal of any part of the ration by the troops, beyond the fact that the orderly corporals and orderly men of each company are responsible for the due supply of the ration to the men of their own company. The men show no disposition to sell their ration; on the other hand they have often to buy extra meat out of the bazaar. 4. The means for cooking available at this station consist of what are called cooking pots, copper tinned, and are similar to those used by all classes of Europeans in this country. The cooks are for the most part Indo-Portuguese. The kitchens are well ventilated; they are blackened inside by the smoke from the open fireplaces, but are otherwise clean. The food is both boiled and roasted, also stewed, curried, fried, and cooked in several other ways, at the option of the soldier. The cooking is properly done and sufficiently varied. Tea is prepared twice a day, but not coffee; the former, supplied by the commissariat, is always good. During a march there is usually a half way halt, when coffee is provided for the men on payment, but it is generally of indifferent quality. I have observed that it is apt to give the men diarrhœa on the march.

References to Subjects and Queries.	REPLIES.
VI. Diet—*cont.*	5. Gardens for the soldiers would be an advantage most decidedly, wherever there is a permanent European station. Not only would good vegetables be thus obtained for the men, but it would also be a source of healthy amusement to them. They should be established under this regulation, that each man should have a piece of ground a quarter of an acre in extent, each company's plot of ground to be separate. This plan is calculated to excite a spirit of emulation among the men.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of a loose tunic of khakee in hot weather and red serge in cold, trousers of khakee in the hot, and the serge in cold weather for Europeans, with khakee helmet. Since the introduction of khakee in the hot months, and of san topees, the soldier's dress has been most suitable. The red serge tunic is also a great improvement on the tight shell jacket for the monsoon and cold season. The Commissioners do not suggest any improvement in the present dress, except in the bad fit of the men's boots, which is often a cause of lameness when on the march, and a consequent burthen on the sick carriage of the regiment.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The men get up at daybreak, drill for an hour, and sometimes in the evening light, out at 9 p.m. in summer, and 8 p.m. in winter. The men do not suffer in health from drill. The best time for drill is early in the morning or late in the evening. There are several general orders on the subject, also limiting the duration of any parade to one hour. The average number of nights which the men have in bed is for Europeans 10 and natives 5. 3. The only permanent European guard is the quarter guard; but occasionally when there are prisoners in cells there is a cell guard. Guards mount for 24 hours; both are within 100 yards of the men's bungalows. There are four regular roll calls during the day, and in the hot weather every two hours, to ensure the presence of the men in barracks, and to prevent their exposing themselves to the sun during the day from 9 a.m. to 5 p.m.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of recreation and instruction at the station:—There is neither ball court, skittle ground, nor school; there is a small library and reading room, not lighted at night, but neither day room, soldiers' clubs, soldiers' gardens, workshops, theatre, nor gymnasia. The men have cricket things supplied from the head-quarters of the regiment, but Baroda not being a large European station, there is no gymnasium, the men play at cricket at the officers' gymkhana weekly. More means of recreation during the heat of the day are desirable. The commissioners would suggest an increase to the books of the library of a kind suitable for the soldier, and above all the establishment of workshops. 2. To increase the existing means of occupation, I suggest that workshops should be erected for different kinds of works, but particularly carpentry, and house joinery. Carpenters might earn 6 and 7 or 8 annas a day at this work, and be a saving to Government. 3. Soldiers' savings banks are instituted. 4. The means of amusement are not sufficient.
IX. MILITARY PRISONS.	1. The cells at the station, six in number, are very bad, all under one roof, and badly ventilated, in fact the doors cannot be closed during the day. The cells are so bad, that they are only used in extreme cases. Every cell should be separate and surrounded by tatties or mats of straw; and they should be in a prison yard, each having an iron grated door.
X. FIELD SERVICE.	1. There are no local medical regulations not included in the general presidency regulations. 2. Recommendations from medical officers as regards the conduct of the line of march are invariably attended to. 3. Encampments are directed to be on high open ground, to the windward of any village or swampy ground, and near water. Any medical officer making a suggestion has been attended to, as far as our experience goes. 4. No answer to this question.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following table gives the statistics of the station.

BARODA.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857–58	X Battery, Royal Artillery - - Detachment H.M.'s 4th King's Own Regiment - - - - - - Do. do. 72nd Highlanders Do. do. 86th Regiment -	251	30	—	—	—	14	1	1	—	14	—	5	—	—	—	49	1	113	2	45·0	0·8
1858–59	X Battery, Royal Artillery - - K do. do. - - - Detachment H.M.'s 33rd Regiment Do. do. 51st do. -	283	561	6	—	—	43	1	9	1	92	—	35	6	—	—	248	—	988	14	349·1	4·9
1859–60	1/13 Royal Artillery - - - - Detachment H.M.'s 4th King's Own Regiment - - - - - - Do. do. 33rd Regiment	528	1,142	4	—	—	40	2	25	1	104	1	21	15	7	5	320	1	1,668	29	315·9	5·4

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	1st Company 4th Battalion Artillery - - - - - - 6th Regiment Native Infantry - 13th do. do. - - - 17th do. do. - - -	1,541	1,272	5	8	—	16	1	2	—	128	3	25	2	17	7	633	1	2,101	19	136·3	1·2
1851-52	1st Company 4th Battalion Artillery - - - - - - 13th Regiment Native Infantry - 17th do. do. - - -	1,583	1,165	11	4	—	21	1	2	—	70	2	6	—	2	—	417	3	1,687	17	106·5	1·0
1852-53	1st Company 4th Battalion Artillery - - - - - - 1st Grenadier Regiment Native Infantry - - - - - 13th Regiment Native Infantry - 17th do. do. - - -	1,484	1,703	3	6	—	19	1	3	—	80	2	8	1	—	—	529	2	2,348	9	158·2	0·6
1853-54	1st Company 4th Battalion Artillery - - - - - - 1st Grenadier Regiment Native Infantry - - - - - 17th Regiment Native Infantry -	1,612	2,044	13	20	2	27	5	3	—	112	6	16	1	1	—	675	4	2,898	31	179·7	1·9
1854-55	3rd Company 3rd Battalion Artillery - - - - - - 1st Grenadier Regiment Native Infantry - - - - - 17th Regiment Native Infantry - 1st Company 4th Battalion Artillery - - - - - -	1,591	1,374	11	23	2	39	3	1	—	127	7	18	—	4	2	638	7	2,224	32	139·7	2·0
1855-56	3rd Company 3rd Battalion Artillery - - - - - - 1st Grenadier Regiment Native Infantry - - - - - 8th Regiment Native Infantry - 17th do. do. - - -	1,449	1,123	6	5	—	48	1	6	1	127	3	15	1	—	—	598	8	1,922	20	132·6	1·3
1856-57	3rd Company 3rd Battalion Artillery - - - - - - 1st Grenadier Regiment Native Infantry - - - - - 8th Regiment Native Infantry -	1,490	1,500	8	18	—	44	2	5	1	101	1	37	—	2	1	661	2	2,368	15	158·9	1·0
1857-58	3rd Company 3rd Battalion Artillery - - - - - - 8th Regiment Native Infantry -	620	413	—	9	—	18	4	7	—	79	1	11	1	—	—	561	2	1,098	8	177·0	1·2
1858-59	2nd Extra Battalion - - - 8th Regiment Native Infantry -	1,060	1,714	9	31	—	31	—	1	—	102	2	6	—	—	—	832	1	2,717	12	256·3	1·1
1859-60	1st Company 4th Battalion Artillery - - - - - - Detachment 10th Regiment Native Infantry - - - - - - Do. 14th do. do. - 2nd Extra Battalion - - -	1,026	1,538	4	10	—	25	1	1	—	125	—	7	1	6	1	672	2	2,384	9	232·3	0·8

By order of the Principal Inspector-General, Medical Department,

W. C. COLES, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department, Bombay 22nd December 1860.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. A ground plan, and marginal sketch of the hospital is forwarded. 2. The hospital is to the east or to leeward of the whole station, but far removed from the bazaar. The whole surrounding country is covered with trees, hedges, and cultivation, and there are many trees in the vicinity. Its site is much too close to the river and to the horse lines. 3. The water supply of the hospital is abundant and good. 4. The refuse water is carried off by a barrel drain, and emptied into the river through a nullah, outlet 50 yards distant. 5. The wards of the hospital are raised 1½ feet above the ground. The floors are solid, and consequently there is no ventilation under them. There is no provision made for conveying away the roof water, but it flows off towards the river. The materials of which the hospital is composed are brick and mud, pointed with chunam. There are verandahs all round the building, from which sufficient shade is obtained, they being 8 feet broad. The verandahs are sometimes used for the sick to take exercise in. The hospital consists of one ground floor. TABLE of hospital accommodation :— Date of construction about 1826. Total number of wards, 4. Total regulation number of beds, 120.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft. In.		Ft.	Ft.
4	30	98	22	14½	31,262	1,042	72	1 6	12	5	3

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospital is not so placed as to receive the full benefit of prevailing winds; on the contrary it only gets the wind after it has passed over or through the whole station, which is, moreover, so crowded with trees as to render proper ventilation next to impossible. The windows open inwards, and should be much enlarged. 6. The means of ventilation in use in the wards of the hospital are the windows, doors, and ventilators in the roof. In the hot weather punkahs are pulled day and night. Altogether the means are sufficient. There are no jalousies or jhilmils. 7. The air of the wards is cooled by punkahs and kus-kus tatties. The punkahs are suspended from the ceiling, provided with a curtain loaded with shot or sand at the bottom, and pulled by a rope. Six punkahs are pulled by one rope. The tattie is applied to the windows, and kept wet with water, and the hot wind is thus cooled before entering the ward. Every window not having a tattie must be closely shut. 8. There are no means of warming the wards, nor are any required. The ceiling and walls of the wards are cleansed and whitewashed, whenever required by the medical officer. 9. The privies of the hospital are the same as those of the barracks, and are connected with the hospital by a covered way; they are properly cleansed, and are not offensive. 10. The washing arrangements of the hospital are very good, and there is a large room provided with ghindies, or copper washing basins, tinned. 11. There is a large tub in the washing room about 8 ft. by 3 ft., kept constantly full by a bheestie, for those men who are sufficiently well to avail themselves of it for bathing. 12. The washing and drying of the hospital linen is performed by dhobies; the means are quite sufficient. 13. The storage is sufficient and dry. 14. The bedsteads of the hospital are portable iron cots, with sacking lashed to them by rope, and on this a straw mattress. Coir is recommended for stuffing the mattresses in preference to straw. 15. The hospital kitchen, cooking apparatus, &c., are similar to those at the barracks, but on a smaller scale. The cooking is well done, and the means are sufficient. 16. Diet tables according to regulation. The forms forwarded are of two descriptions, those for the superintendent surgeon of the late company's service, and those for the deputy inspector-general of H.M.'s hospitals at army head quarters. 17. The provision for hospital attendance on the sick is as follows:—There is a corporal who acts as hospital serjeant to the detachment hospital, and four ward boys to attend upon the sick. In addition to this, a European orderly is provided for such men as are seriously ill, and need constant attendance, and where natives could not be trusted. In addition to these, who are termed second-class hospital servants, there is an assistant apothecary with the detachment corporal. 18. I think that the European hospital, taken as calculated to afford accommodation to the detachment, is in itself all that could be desired; but its situation in the lee of the whole station, and close to a nullah used as a necessary by the natives, and as a receptacle for the filth of the station, is most objectionable. During the cholera, which attacked the detachment in March last, the men were at once removed from it. 19. I know of no other deficiencies, but the grand defect of position just mentioned. 20. There is no stated ground in which convalescents can take exercise, nor are there any seats. Any exercise which they require they must take in the verandahs during the day, and in the evening in the hospital compound. There are a few convalescents who live in their barrack rooms, and have permission to walk about the station. 21. There is a female hospital for the soldiers' sick wives and children; but it has no matron or assistant matron. The few women and children of the detachment are therefore attended in their own houses. The present arrangements are sufficient. 22. There are no special local hospital regulations not included in the general presidency medical regulations. 23. The application of the medical officer, in all matters appertaining to the sanitary state of the hospital, is always attended to. 24. There is no ward or hospital for convalescents at the station, nor is any such required.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is 500 yards to windward of the station. 2. The area of the ground is 10,000 square yards; the soil is black, and decomposition takes place rapidly. The drainage is effected by a passage through the wall, made by leaving a brick out here and there; no regular drainage. The ground is carefully kept. 3. Ample space is allowed as an interval between the graves, which are never on any occasion re-opened. There is no regulation depth of graves. The graveyard is not yet full. Interment is usual within 12 hours after death. There are no regulations as regards the burial grounds used by the native troops; the Jews and Mahommedans bury in their separate burial grounds, which are not offensive. 4. The graveyard is never offensive. As regards the burial of British troops, the practice is frequently to bury within 12 hours, if possible; always within 24. 5. The dead of camp followers are disposed of according to caste:—The Parsees expose to fowls of the air; Hindoos burn; and the Mussulmen bury. 6, 7. No injury from this practice accrues to the public health. There are no improvements to be suggested.

(Signed) J. McGRIGOR, Major, H.M.'s 30th N. I., Commanding station.
J. S. RIMINGTON, Assistant Surgeon, H.M.'s 30th Regiment, N. I.
A. R. KILROY, Assistant Surgeon, 33rd Regiment.
T. F. DOWDEN, Lt. Engineers.

4th September 1860.

POONA.

ACCOMMODATION	Queen's Troops	Artillery	591
		Cavalry are quartered at Kirkee.	
		Infantry	1,094
	Native Troops	Infantry	1,996

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is barren, with occasional patches here and there of vegetation and groves of trees. It is dry and undulating, and there are hills and spurs of ghats within distances of from 10 to 25 miles. There is no jungle in the vicinity, but occasional clumps of scattered bamboo and other trees. A river runs near the station, but is only visible where one is close upon it or from considerably elevated ground. 2. The station is elevated about 1,800 feet above the level of the sea, but is on a level with the adjacent country. There is no higher ground adjoining the station which could be made available for military purposes of any moment, unless it might be the hill of Parbuttie on the other side of the city from Poona, which, as it overlooks the city, would be a valuable military point to occupy. 3. The nearest mountain or table land is Singhur, about 13 miles distant. It forms a portion of a spur or range of hills running in an easterly direction from the Western Ghauts. Its height above the station is about 2,400 feet. 4. The nearest water worth consideration is the river Mota Moola, about three-quarters of a mile from the camp. The vicinity is not liable to overflow, as the river keeps within its banks. The ground near the station is a flat, almost unbroken, table land of the trap formation. There is nothing in the form of ravines or waterpits productive of any ill effect on the health of the station. 5. The station is open and freely exposed to the winds, and is not encumbered in any way with trees, hedges, gardens, &c., so as to interfere with either free external or internal ventilation. The temperature of the station is not raised by exposure to reflected sun heat, being too largely scattered for such a coutingency. From November to February cold land winds prevail, with occasional sea-breezes; from March to June hot, scorching, variable winds, and for the rest of the year the prevailing winds are from the sea. The cold and rainy seasons are beneficial to the health of the troops, but in the hot season fevers and congestive visceral disease prevail. 6. The surrounding country is chiefly uncultivated. Gardens and fields there are, but only where water is handy, and they may be said to be in patches. There are no works of irrigation near the station, and artificial irrigation being confined to garden cultivation has no appreciable effect on the health of the station. Rice is not cultivated in the neighbourhood, and the health of the station is not affected by the cultivation of indigo or the preparation of hemp or flax. 7. The large native city of Poona, containing about 80,000 inhabitants, lies to the west and windward of the cantonment about three-quarters of a mile; in other words, the cantonment is on the wrong side of the city, which lies in a hole below the station. Besides this city there are two small villages, Wanoree and Ghorpooree, both so near the cantonment, especially the latter, that they are a nuisance. Last year the cholera first showed itself in Wanoree, which is only about 100 yards or so from the lines of the artillery officers. They should both be removed, the owners of the houses receiving ample compensation. 8. The upper surface of the station is, generally speaking, of moorum, with patches of black soil here and there, and below trap rock. The station occupies new ground, i.e. it was first established 43 years ago, and had not been occupied before. 9. Water is usually found in the dry season at a depth of about 33 feet below the surface, and during the rainy season at about 19 feet. 10. The rain-fall and water from surface springs flows readily away, though some of it doubtless sinks into a pervious subsoil, whence it runs off into the river. The fact, that a few hours after heavy rain the ground is nearly dry, proves that the rain-water does not lie on the surface till it evaporates. No drainage of any consequence passes into the subsoil of the station; the natural nullahs run off the water into the river, which acts as a drain to the station. 11. The water supply of the station is derived from one aqueduct, 51 wells, three tanks, and from the river, the water of which is forced by pumps into camp. The aqueduct has its source about a mile and a half from the south-east side of the camp; it runs through the cantonment, and terminates in one of the peits or streets of the city. In the hot weather it runs nearly dry, and is obliged to be fed by water from wells in the vicinity of the source. Some of the water is stored in open tanks. The three tanks in the cantonment have a surface area of 280,450 square feet, but the water is not drinkable. There is, besides, one tank in the civil limits, close to the camp, which contains a surface area of 69,800 square feet. The water is good for drinking at certain times of the year, but not in the hot weather. The following table shows the tank surface in camp and civil limits. Camp tanks - - - - - 280,450 square feet. Civil do. - - - - - 69,800 „ Total square feet - 350,250 superficial area.

POONA.
BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	The tanks are generally full from the setting in of the rains in June till the commencement of the hot season in March, when the supply of water steadily decreases, and in May they are generally dry. The civil tank, however, never dries up. The nature of the plants and animals which the tanks contain is unknown. There are no tanks in camp containing drinking water; the civil tank is not used for bathing purposes. The tanks are not liable to pollution from leaves falling into them. There are no precautions against foul drainage or surface impurities passing into them; but the water is not used for drinking purposes. It cannot be said that either nuisance or malaria proceeds from any of the tanks within or without the station, owing to their having a natural base in the trap formation, and comparative freedom from alluvial deposit.

12. Between June and February the water supply of the station is obtained from an aqueduct, 51 wells, and three tanks, to an amount sufficient for the wants of the cantonment (the exact quantities cannot be stated), but during the hot weather, when many of the wells run dry, the water is forced up from the river by a bullock engine at the rate of 75,000 gallons per diem; but even this extra supply is insufficient to meet the demand. A better water supply for the station is absolutely necessary. The water is colourless, tasteless, and inodorous. It is soft, but its microscopic characters are unknown. The quality is good, but the present amount is insufficient.

The following table shows the chemical composition of the water.

—	Moota River at the City Bund.				—	Mota Moola River at the Jamsetjee Bund.				
	12 G.	13 H.	14 H.	15 H.		16 G.	17 H.	18 H.	19 H.	H.
Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	May 1856.
Specific Gravity at 60°	1000·0	1000·4	1000·6	1000·9	Specific Gravity at 60°	1000·0	1000·4	1000·25	1000·5	1000·3
Inorganic constituents— Chloride of Sodium, Magnesium, Lime, Sulphate of Soda, Magnesia, Lime, Nitrate of Magnesia, Lime, Carbonate of Magnesia, Lime, Silica		(x)	5·95	6·90	Inorganic constituents— Chloride of Sodium, Magnesium, Lime, Sulphate of Soda, Magnesia, Lime, Nitrate of Magnesia, Lime, Carbonate of Magnesia, Lime, Silica	(x)	2·97	2·05	2·10	1·66
Organic matter in solution	(x)	(x)	1·61	1·69	Organic matter in solution	(x)	·59	·59	·85	·68
" " suspended	—	—	1·90	14·29	" " suspended	—	—	—	1·05	·14
Total solids	1·1	6·34	9·46	22·88	Total solids	1·2	3·56	2·64	4·00	2·48
Gaseous contents	—	—	—	—	Gaseous contents	—	—	—	—	—

The water in the wells is raised by common leather buckets, and taken away in leathern skins on bullocks or in skins on the backs of coolies (bheesties). Each private individual has his own bheestie, and each regiment its set of bheesties, whose duty it is to supply water daily as it is wanted. The aqueduct water is collected here and there in branch reservoirs, and is carried away as above described, but the supply is insufficient, and, excepting during the monsoon, has to be taken care of and not wasted. A detailed scheme, accompanied by plans and estimates, for bringing more water into the cantonment was framed by Colonel Hart of the Bombay Engineers, and long since submitted to Government. The amount estimated was rupees 4,49,463, four lacs, forty-nine thousand four hundred and sixty-three. The superintending engineer, Lieutenant-Colonel Munbee, states that the estimates have been sanctioned, but when the work will be actually commenced is uncertain.

13. There are no other topographical points calling for remark which bear at all on the health of the station.

14. New stations, whether on the hills or plains, are selected by a mixed committee, composed of the senior military authorities, executive engineer, and senior medical staff, who, after making inquiry into sanitary and other questions, communicate with the civil authorities, the final decision resting with the Government. Stations have hitherto been selected on the plains.

1. There is an observatory at this station under the charge of Assistant Surgeon Chapple, R.A., with two intelligent non-commissioned officers as assistants. The following are the instruments in charge:—

Anenometers	1
Pluviometers	2
Barometers, standard	1
Self-registering thermometers, maximum in air	1
" " " in sun's rays	1
" " " wet bulb	1
American clock	1
Hydrometer, Daniell's	1
Thermometer, standard in air	1
" wet bulb	1
Self-registering thermometers, minimum in air	1
" " " in grass	1
" " " wet bulb.	

Glaisher's Tables and other books of instruction.

References to Subjects and Queries.	REPLIES.
I. Climate—*cont.*	2. Table of meteorological observations for four years, from 1st April 1856 to 31st March 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean daily range.	Mean Maximum in Air Thermometer.	Mean Minimum in Air Thermometer.	Mean dry bulb Thermometer.	Mean wet bulb Thermometer.	Mean Sun Temperature.	Rain. Inches.	Winds. Direction.	Winds. Force in lbs. per sq. foot.	Days of Sunshine.	Remarks as to Cloud, Dew, Winds, Storms, &c.
January -	28·059	69·2	27·978	81·2	58·0	68·7	58·9	98·4	0.34	E.	·0·43		Clear agreeable weather.
February -	28·033	73·4	27·932	87·0	62·9	75·7	61·0	106·5	0·00	N.W.	0·54		Clear, with fresh breeze.
March -	27·979	79·0	27·892	91·2	68·4	78·2	63·8	111·9	1·27	N.W.	0·81		Hot winds, disagreeable weather, rain.
April -	27·917	84·3	27·841	94·6	71·4	83·6	68·5	110·7	0·59	N.	1·37		Clear, moderate wind, slight rain.
May -	27·828	83·8	27·771	92·7	73·9	82·4	71·6	103·5	3·77	W.	2·35		Cloudy, high wind, and rain.
June -	27·799	88·0	27·756	84·7	71·8	79·1	72·3	95·0	2·78	W.	2·17		Cloudy, high wind, monsoon.
July -	27·780	77·3	27·738	80·0	70·3	76·1	72·0	91·2	8·57	S.W.	1·10		Cloudy, moderate wind, monsoon.
August -	27·830	75·3	27·773	78·3	68·7	74·3	70·7	89·1	7·27	W.	0·84		Cloudy, moderate wind, monsoon.
September	27·894	75·2	27·836	79·0	67·6	74·2	69·9	94·7	4·45	W.	0·81		Cloudy, moderate wind, monsoon.
October -	27·968	77·0	27·895	84·0	66·2	75·8	68·2	105·2	3·66	E.	0·55		Cloudy, with rain, fresh breeze.
November	28·038	74·7	27·950	83·2	61·3	73·7	63·1	102·9	5·50	E.	0·25		Slightly cloudy, light rain.
December	28·077	69·2	27·974	80·2	57·7	63·7	59·2	97·9	0·04	E.	0·57		Clear, light wind.

3. A reference to the preceding table will show the general character of the climate in every respect. There is almost a total freedom from fogs, and dampness is only observable during the rains, and mild in degree. Only garden irrigation and tree planting exist, and do not produce any perceptible influence on the climate. Dust storms are rare, only occurring just previous to the setting in of the rains, and not perceptibly affecting the purity of the atmosphere. The climate (a table land of the trap formation, elevation above the sea of about 1,800 feet) is most favourable to the health of troops. The diet, as per regulation, is found to be ample. The shelter afforded at present is partially good, but better accommodation is sanctioned and in progress. During the hot months the light khakee clothing should be worn; during the rainy and cold months woollen clothing, and always at night warm woollen covering is desirable, the latter owing to the great sensible variation of temperature between the day and night arising from atmospheric dryness. The most healthy months at this station are July, August, September, December, January, and February, and the most unhealthy, October, November, March, April, May and June. During October and November, owing to the cessation of the rainy season, with the elevated temperature, remittent and intermittent fevers, with visceral diseases, prevail; during the hot months of March, April, and May these, and also eruptive fevers, and congestive diseases of the cerebral, thoracic, and abdominal organs, and in June bowel complaints. Rheumatism prevails during the cold months.

4. There is no district near this station, the climate of which is more conducive to health than that of the station.

5. We have served in most of the stations in the Deccan, the southern Mahratta country, the Mhow division, Sinde, the Concan, and Guzerat. These stations in the Deccan being on an elevated table land of the trap formation, about 1,800 feet above the level of the sea, are the most conducive to the health of troops; next in degree those in the southern Mahratta country and the Mhow division from the same causes, next in degree those in Scinde; for though the elevation above the sea is slight, the country surrounding the stations is, for the most part, a sandy plain free from jungle vegetation. The stations in the Concan or coast border of the presidency are comparatively healthy, being situated within the full influences of the sea breezes, but are, however, subject to severe visitations of epidemic and zymotic diseases. With the exception of the Deesa station (salubrious from being situated in an open sandy plain) the stations in Guzerat are positively injurious, the elevation above the sea being very slight, and the soil alluvial, with a rich rank vegetation, and abounding in rivers with a small degree of fall, exhibiting extensive alluvial banks.

III. SANITARY CONDITION OF STATION.

1, 2, 3. General Maps of the station generally, with plans of the surrounding country and of the barracks are transmitted.

4. Table of Barrack Accommodation.

Barrack Rooms.	Regulation. No. of Men in each Room or Hut.	Dimensions of Rooms. Length.	Dimensions of Rooms. Breadth.	Dimensions of Rooms. Height.	Dimensions of Rooms. Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor space.	Height of Men's Beds above the Floor.	Windows. Number.	Windows. Height.	Windows. Width.	Remarks.
Ghorepooree.				mean				ft. in.				
12 New Barrack Rooms	42	100	24	23	55,200	1314	57	1 4	26	5	3	Built in 1849.
12 Old Barrack Rooms -	40	97	24	15½	36,084	902	58	1 4	16	5	3	Built in 1842.
Wanowree.												
6 New Barrack Rooms -	96	110	25	37	101,750	1059	57	1 4	77	4	8	Built in 1859–60.
Horse Artillery.												
2 Barrack Rooms -	84	100	32	27	86,400	1029	76	1 4	54	5	3	Built in 1846.

POONA.
BOMBAY.

Table of Barrack Accommodation—*cont.*

Barrack Rooms.	Regulation No. of Men in each Room or Hut.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor space.	Height of Men's Beds above the Floor.	Windows.			Remarks.
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.	
GUARD ROOMS.												
Ghorepooree - - -	15	40	16	14½	9,280	617	43	1 4	3	3	5	Built in 1842. Other guard rooms are similar in construction.
Wanowree - - -	15	40	20	20	16,000	1,066	53	1 4	2	3	5	Built in 1859.
Horse Artillery - -	6	30	16	13	6,240	1,040	80	1 4	2	5	3	Built in 1851.
28 Prison Cells - -	1	10	10	16	1,600	1,600	100	—	—	—	—	Built at various times.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	N.B.—There are six temporary chuppered buildings (barracks for the artillery) which will be pulled down when the new barracks, which have been approved, are built. There are also 14 chuppered barracks near the church (temporary buildings), erected in 1823; but they are to be pulled down on the completion of the 10 upper-storied barracks, of which six are ready.

5. The windows in the barracks are always on both sides (as are also the doors), which arrangement ensures some degree of ventilation. The windows open on hinges. In the upper-storied Wanowrie barracks there is a closed verandah, on both sides of the upper and lower rooms, 11 feet wide. The Horse Artillery upper-storied barrack has an open verandah on both sides, above and below, 8 feet wide; and the Ghorepooree barracks have open verandahs on both sides, averaging 10 feet in width (in the old barracks only 7 feet). The open verandahs are not used as sleeping quarters, and the closed verandahs of the upper-storied Wanowrie barracks only occasionally on emergency. There are jalousies in some of the barracks, and they are properly constructed.

6. The bedsteads used in the barracks are mostly boards and trestles, but there are iron bedsteads, with cross thin iron straps. The bedding for each soldier consists of 1 numda, 2 cumlie blankets, and 2 pairs of sheets, with 1 cotton coverlid, all supplied by Government. We have no improvements to suggest.

7. The following tables show the dimensions and construction of the tents used in camp.

TENT for EUROPEAN SOLDIERS, double pole.—Double poled, with fly and shed, and single set of walls.

Extreme length within - -	22 feet	For 14 Horse Artillery. or 22 Foot „ or 22 Infantry. or 16 Cavalry.
„ breadth „ - -	14½ „	
Height of walls - - -	12¼ „	
„ to ridge - - - -	12¼ „	
Total area - - - - -	319 square feet.	
Cubic space - - - -	2,393 cubic feet.	

TENTS for EUROPEAN SOLDIERS, single pole.—Single pole, with fly, shed, and single set of walls.

Extreme length within - -	14 feet	For 8 Horse Artillery. 10 Cavalry. or 13 Foot.
„ breadth „ - - -	14 „	
Height of walls - - - -	6 „	
„ to cap - - - - -	12′ 2″	
Area - - - - -	196 square feet.	
Cubic space - - -	1,268 cubic feet.	

EUROPEAN HOSPITAL TENT.—Double poled, with fly, shed, and double sets of walls.

Extreme length inside - -	22′ 9″	For 12 Europeans, or 15 Natives.
„ breadth „ - -	16′ 4′	
Height of walls - - - -	6′ 3″	
„ to ridge - - - -	12′ 9″	
This gives about - - -	30 sq. ft.	Per European.
And - - - - - -	260 cub. „	

TENTS for NATIVE SOLDIERS.—Double poled, oval shape, with fly only.

Extreme length within - -	26′ 8″	For 25 Cavalry. or 30 Infantry.
„ breadth „ - - -	13′ 9″	
Height to ridge - - -	9′ 6″	
Area - - - - - -	383 square feet.	
Cubic space - - -	1,030 cubic feet.	

TENTS for NATIVE SOLDIERS, single pole.—Nearly circular, with bell-shaped fly only.

Diameter - - - - -	11 feet	For 12 Infantry.
Height to cap - - - -	10 „	
Area - - - - - -	94 square feet.	
Cubic space - - - -	180 cubic feet.	

8. In the upper-storied Wanowrie barracks continuous ventilation is obtained by raising the upper part of the roof above the lower; the lower rooms are ventilated by a range of square holes contiguous to the floor of the upper rooms. In the other barracks there are only cowl ventilators, which are objectionable, as they always leak in the rains, and their weather sides have to be dammed up during the monsoon. Tents and guard-rooms require no extra ventilation than what they ordinarily possess by doorways and windows. The ventilation in all the barrack rooms is insufficient. Arrangements should be adopted (which the soldier

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	could not interfere with) for the free ventilation of the rooms when the doors and windows are closed. There are no means in use at this station for cooling the air admitted into the barrack rooms. 9. The barracks are constructed of brick and lime plastered; the roofs are double tiled, with teak trusses and rafters. Some of the barracks have paved floors, and all should possess them. 10. The floors (most of which, as before stated, are paved) are raised, on an average, about 3 feet above the ground, but there is no passage of air underneath them. 11. The materials of which the barracks, tents, &c., are composed are good; but the Committee are unanimously of opinion that in this country barrack rooms should be elevated above the ground at least 14 feet. Such an arrangements entails at all times a clearer and more healthy atmosphere for the soldier both by day and by night. The lower portion of the buildings might be converted into dining-rooms, washing-rooms, libraries, skittle-alleys, &c. &c. Most of the subsidiary detached buildings would thus be done away with, and no extra expenditure entailed. We also would strongly advocate for all new barracks the adoption of open verandahs; the men like them, and they add to the ventilation of the barrack rooms. The barracks and cantonment are kept in repair by the executive engineer. The repairs are mostly executed by native contractors, and often times delay is experienced in consequence of the natural dilatory disposition of the native, want of sufficient supervision, and other circumstances. No officer is responsible for the general sanitary state of the cantonment. The Committee strongly recommend that it should be the sole duty of a separate medical officer to attend the sanitary state of so large a cantonment (including Poona and Kirkee). The walls and ceilings of the barrack rooms are cleansed and lime-washed at intervals of three months, oftener if necessary. We would recommend that in future barrack rooms should be lime-washed "regimentally," and that lime, brushes, &c., should always be kept in store by the quarter-master. 12. The lavatories are merely open paved verandah rooms, with tubs placed in them amply supplied with water. The refuse water runs off into tubs placed outside. We would recommend that, instead, cut stone wedge-shaped cesspools, guaranteed against leakage, should be adopted; or perhaps large iron tubs, japanned or glazed, would be better still. There are two washing-rooms generally to each barrack room. 13. The regimental cook-room is a simple rectangular building, with an opening in the roof and walls for the smoke to escape. The fireplaces are nothing but masonry platforms about 2 feet high, with iron rests, called choolas, for the cooking pots. Water is supplied by the bheesties, and the refuse water is drained into cesspools, which are cleaned out nightly by halalcores or sweepers. Large iron japanned-glazed tubs would be better still. The washing and drying of linen for the soldiers are satisfactorily effected by dhobies employed regimentally. 14. The privies for Europeans are simple buildings, and will be easily understood by the sketch transmitted. The filth falls into baskets and is carried away by sweepers, the urine draining into cesspools. The privies for native soldiers are also enclosed buildings. The sweetness or otherwise of these places depends entirely on the sweepers and a liberal supply of deodorising materials. Pans similar to those recommended for the cook-rooms would be better than cesspools. 15. The means of ventilation have been described. None of the buildings above-mentioned are lighted at night except the barrack-rooms. These latter are not sufficiently lighted, and very great difficulty has been experienced in trying to remedy the evil. We would recommend that similar lanterns to those used on board of Her Majesty's troop ships (swinging lamps and deck lamps) should be introduced as an experiment. 16. There are no arrangements at this station for draining and sewering the barracks, but all deposits, waste water, filth, &c., &c., are removed to a specified locality by the sweepers. This system of removal under the existing arrangements is found to answer. The barracks and hospitals are never damp except in the rains, when artificial means, such as pans of lighted charcoal, are placed in the rooms for as long as may be deemed advisable or necessary. There are a few small cesspools, about 3′ × 3′ × 3′ here and there, but they are daily cleaned out. They are not in the vicinity of any wells. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is well attended to. The refuse, manure, &c., is carried away in carts and burnt in a filth-burning kiln situated at the south-east end of the camp. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, and the hedges in the camp are kept cut to a certain height, so as not to interfere with the ventilation of the station. We would recommend that householders should be forced to remove these hedges, and substitute low masonry or brick walls. We are also of opinion that all hedge-rows, outside but in the vicinity of the camp, and on either side of the road from Poona to Kirkee, should never be allowed to exceed 3 feet in height. 19. The bazaar is not well drained, nor can it be so until the supply of water is better than it is at present. The ventilation of the bazaar is pretty good generally speaking, but when the poorer classes, such as hamals, dooly-bearers, beggaries, &c., are congregated, better ventilation is desirable, and could be obtained by extending the bazaar. The water supply is not sufficient in the hot weather months, but this will be remedied if Colonel Hart's scheme is carried out. The bazaar is kept very tolerably clean. Latrines and privies for the use of the inhabitants of the bazaar are much needed, as at present the poorer classes are obliged to go to a considerable distance to attend to the calls of nature. The establishment to superintend the cleanliness of the bazaar consists of one havildar, one naique, and 20 peons. Under their superintendence are employed one muccadum, eight sweepers, and six carts. The duties of these are to daily collect and carry away the rubbish and filth of the bazaar to selected places. This establishment is far too small, and should be increased. The population consists of 27,000 inhabitants. Men are also employed, exclusive of the above, to keep the lanes in repair, cutting down prickly pear hedges, and cleaning drains, &c. The provost sergeant and the kotwals see that the above establishment do their duty. The houses of the merchants and shopkeepers in the bazaar are generally of a good description and roomy. The houses of the labouring classes are principally made of mud bricks dried in the sun, with grass chuppers for roofing, but these are gradually giving place to better buildings with tiles. There are no dung-heaps within them, as they are not allowed. It must be remarked, that when the bazaar was first formed in 1819 no attention was paid

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	to regularity of streets and houses, but people were allowed to retain the spots of ground where they had first squatted after the battle of Kirkee and Poona, in 1817. The Sudder bazaar is in front instead of rear of the officers' quarters and the cantonment, which is most objectionable. No nuisance is experienced in barracks from wind blowing over the native dwellings, except in the cases of the villages of Ghoreepoore and Wanowrie. Their contiguity to the station is the cause of this nuisance, and nothing but their removal will eradicate it. 20. The slaughter-house is at present within the cantonment, but it is shortly to be removed to a convenient place, about two miles from the centre of the camp. All slaughtering is ordered to take place during the night, and the offal to be removed to the filth burning kiln. The present slaughter-house is found to be a nuisance, and hence the necessity for its removal. 21. The bazaar horses for hire (saddle) are picketed in the horse lines between the centre street and Malcolm Tank road, and are to the number of about 20. The lines are kept clean and in repair by the owners of the horses, under the direction of a head man or muccadum. The manure is carted away by the surrounding gardeners, tile makers, &c., or taken to the jungle. All the manure is cleared away daily. The horses for carriages to the number of about 75 are kept in stabling in the bazaar. Horses for private purposes are kept in stabling in the compounds of the house owners. The manure is disposed of as above stated. 22. The horses of the cavalry and artillery are picketed in the open, in lines constructed for the purpose to the eastward of the men's barracks and hospitals. The manure is removed daily. In the picketing grounds the horses are eight feet apart, arranged in rows, and are about a quarter of a mile from the nearest hospital and barrack-room. 23. There are sufficient quarters provided at this station for the families of married soldiers, none of whom occupy barrack rooms with the men.
Officers' Quarters.	1. Officers live in separate private bungalows, situated in compounds, averaging 100 yards × 80 yards, and arranged conveniently with respect to the soldiers' quarters. We have no improvements to suggest further than that it would be advisable that several ill-conditioned houses in this cantonment should be pulled down and a better class be erected in their stead. We do not advocate officers' quarters in this country.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and adjoining native population are healthy. 2. Spleen disease is very rare at this station. At the setting in and termination of the rainy season, bowel complaints and fevers of the remittent and intermittent types prevail; during the hot season eruptive fevers, particularly variola, varicella, and rubeola, and during the wet and cold season catarrhal and rheumatic affections. 3. I attribute the healthiness of the neighbouring native population to elevation, the trap formation of the surrounding country, freedom from alluvial deposits, the general prevalence of westerly or sea breezes, and good water. 4. The stations at which the troops at this station were located before arriving here are as follow, viz., Her Majesty's 4th troop Bombay Horse Artillery, last stations, half troop at Sholapore, and half troop at Kolapore. The troops stayed at these stations for six months, and left for this on the 4th February 1860. The state of their health there was good, and the disease from which they chiefly suffered was intermittent fever. They arrived in Poona on the 18th and 22nd of February 1860 in a good state of health, and the diseases from which they have suffered since arriving are fever and stomach and bowel complaints. Royal Artillery, No. 1. battery 13th brigade, was quartered at the Cape of Good Hope, and No. 7 battery, 13 brigade, in England. The former battery had been two years at the Cape, but the latter had been always in England. The former left the Cape in September 1858, and the latter quitted England on the 10th August 1858. The health of both batteries was very good; a few of the ordinary cases of sickness only in hospital. The date of arrival in India of No. 1 battery was 10th November 1858. It was then stationed a short time at Baroda, where the men suffered from sun stroke and fever; but since their arrival in Poona their health has been good. No. 7 battery arrived on the 8th of September 1858, and though many of the men have suffered from cholera, the health of all now is good. Her Majesty's 56th Regiment was at Belgaum two years, and left on the 21st February 1860. The health of the men there was good; the prevailing diseases were fevers, hepatic, stomach, bowel, venereal, and rheumatic affections. The regiment arrived in Poona on the 23rd March 1860, in an unhealthy state, from cholera and bowel complaints, but their health has much improved since their arrival here, the prevailing diseases now being ephemeral fever and mild bowel complaints. Her Majesty's 57th Regiment was stationed at Ahmednuggur, with detachments at Aden, Sattara, and Mulligaum. They were at Aden two years and nine months, and at the other places about 10 months. They left Aden in December 1859, where the health of the men was good, and the prevailing disease venereal affections. They arrived in Poona on the 15th March 1860. Head quarters left Ahmednuggur in January 1860, at which place their health was very indifferent from intermittent fevers, and arrived here in the same month. Since their arrival here their health has much improved, and the prevailing diseases of the united corps now are ephemeral fevers, bowel and rheumatic complaints. Her Majesty's corps of Sappers and Miners, Indian army, head quarters stationary. The health of the men of this corps is good, and the prevailing diseases are fevers and bowel complaints. Her Majesty's 15th Regiment Native Infantry were at Kolapore for about 18 months, and left it in wings, the right in October 1859, arriving in Poona in November, and the left in March, arriving in April 1860. The health of the men, both before and since their arrival here, generally good. The prevailing diseases are mild fevers and bowel complaints. Her Majesty's 25th Regiment of Native Light Infantry arriving in Poona in March 1859, after nearly two years field service in Central India. They were very unhealthy from scorbutus and general cachexia; but the health of the men has much improved since their arrival here. The prevailing diseases have been fevers and bowel complaints.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	No portion of the men's present accommodation at this station is more unhealthy than the rest, all being alike healthy. 5. Troops at this station are not camped out during any portion of the year. 6. We have never been in charge of troops at hill stations, but the following replies are founded on the opinions of C. Morehead, Esq., M.D., late acting superintending surgeon at Poona, published in the "Transactions of Bombay Medical Society." His experience and researches are favourable to the residence of troops in hill stations, provided the proper season is chosen for sending troops, and if sick or convalescent that a proper selection is made. His experience is founded on personal knowledge, and the reports of medical officers stationed at Malcolm Pait, on the Mahableshwur hills, and at Poorundhur. 7. Dr. Morehead states:—If the debilitated soldier who in the plains would recover his health and strength slowly after the removal of positive disease will, by commencing a residence on the hills in October, or during the hot months, having become fitted for duty, be less liable to fresh attacks of disease, and when attacked the disease will be of a milder type; whereas, on the other hand, the continued residence in the plains leaves him predisposed to attacks of the severer forms of disease—the ultimate effect of a freer use of hill climates must be to reduce mortality and invaliding. He disapproves of sending troops during the cold or rainy months, if sick, as liable to be injured by a return of former diseases. 8. Hill stations should most decidedly be selected for troops, but only as a change of climate. 9. Convalescents sent to the hills in the cold and rainy seasons are liable to recurrences of organic visceral disease. Again, if troops go to them exhausted by service in the field they are liable to congestive, inflammatory, and organic visceral disease, but otherwise they are only subject to mild hill diarrhœa, and the general effects of a rarefied atmosphere. 10. With respect to the precautions necessary as to diet, clothing, shelter, duties, &c., &c., no data are given by Dr. Morehead's report; but the inference is clear, that as there is liability to the formation and recurrence of visceral disease, cerebral excitement, and other complaints of the sthenic type, the diet should be of a non-stimulating nature, the clothing adapted to a climate much cooler than the plains, the shelter affording perfect protection from fogs, rains, and the direct rays of the sun, and the duties and exercises depending upon the improving health of the soldier. 11. From the reports of the medical officers of the Deccan hill stations it appears that from the commencement of the month of March to the middle of the month of November the greatest advantage to health will be gained by the debilitated or convalescent from disease at Poorundhur. The rainy portion from June to October is inapplicable to Malcolm Pait. The healthy soldier may reside with advantage at Poorundhur or Pauch Gunny at any season. As far as practicable all ailing men should be afforded one month's residence in hill stations, but the period required for complete restoration of strength will vary in different cases, and its determination should be left to the discretion of the medical officer in charge of the sanitarium. 12. Applying the question of length of residence in hill stations to the hills of the Deccan, as affecting the health of troops returning to the table land on which the military station is situated, or to other stations in this presidency, Dr. Morehead states that the hill climate, from the middle of November to the end of February, might not prove injurious. Still, it possesses no advantages over that of the Deccan, and that season is most suitable for return to all stations in the plains. 13. Proper selection of period and good ambulance are the precautions required for protecting the health of troops on leaving hill stations for the plains. 14. In answer to this query, Dr. Morehead says, the question has been often raised, Would a regiment fresh from England, located at an elevation of, say 7,000 feet, retain its European vigour? Doubtless it would, a deduction being made for a rarefied atmosphere; but this regiment would not be efficient for the contingencies of service in India. If suddenly called to the plains for service in the hot season, it would show a heavy sick-list, and a rapid loss of vigour and stamina would ensue. But an improved state of general health will accrue to the soldier in India from an improved sanitary system, including the avoidance in the hot season of the heat of the plains by a more extended resort to hill stations. The maintenance of the greatest degree of health and efficiency for the ordinary contingencies of service in a tropical country is to be attained by avoiding as much as possible unhealthy localities and seasons, such as localities with malarious characteristics, the hot season all over India, and the rainy season in many parts of it. These points attended to, frequent change of service in the plains, which is most harassing to the soldier, will be quite unnecessary, and can only be deemed even advisable when troops are located in unhealthy districts. 15. The amount of accommodation in barracks and hospital at the hill stations is quite insufficient. There are two recognised sanitaria in the Deccan, Malcolm Pait, established in 1828, and the hill fort of Poorundhur, in 1852. European troops have not been located at the former, but there are Government quarters for 16 sick officers, and 77 private bungalows. Upwards of 300 visitors resort there annually, with such a favourable result to health, that with proper barrack and hospital accommodation it might be rendered an equally favourable sanitarium for troops, except during the rains, when the fall of rain, about 240 inches, renders it uninhabitable; but a distance of 10 miles on the eastern slope Pauch Gunny, at about 500 feet less elevation, with a fall of only 80 inches, would render this circumstance avoidable. At Poorundhur there are 2 barrack rooms, affording accommodation for 100 men, and a very good hospital adapted for 40 sick. There is also a patchery for 10 families, and a small female hospital. The sanitarium may at present be considered sufficient for 130 soldiers and 10 families. 16. Experience shows that an average height of 4,000 feet above the level of the sea affords the most suitable site for a hill station. 17. Poorundhur, about 20 miles distant from the station, is the nearest higher ground. Its means of access are very indifferent. Its elevation is 4,200 feet. There is much atmospheric dryness in March, April, and May, and the rain-fall during the rainy season is 72 inches; it is then frequently enveloped in mist. Its mean temperature in the cold season is 67°5, in the hot season 75°5, in the rainy season 67°4, and in October 69°6.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	18. Surfaces of the trap formation, as in the Deccan generally, also, where sand, with the detritus of metamorphic rocks prevail, are the most healthy; where the surface is alluvial, of the peat formation, as black soils, the most unhealthy, as in Guzerat.
	19. Soldiers should on no account proceed to India earlier than 20 years of age, and should land there at the commencement of the cold season, viz., November. Troops in this presidency, when landed in Bombay, are first located in barracks situated either in the centre of the fort or at the end of a spit of land "Colaba," both of which sites, and the nature of the barracks, have been repeatedly condemned as most unhealthy. Their clothing, drills, and marches are according to the season, and the duties are excessively heavy for troops on arrival in such a depressing climate as that of Bombay. If recruits arrive early in the cold season they should be at once drafted to their respective regiments as soon as they have been properly equipped, otherwise to be at once removed to the table land of the Deccan, and to remain there till the opening of the next cold season.
	20. Troops should be sent direct from the home depôts, so as to arrive early in the cold season. Regiments on their arrival in Bombay should commence their tour of service on the Deccan table land as far as practicable.
	21. Troops are transported from Bombay to the centre of the Deccan table land by railway and from thence to the different out stations by bullock train or marches. The precautions to preserve health are marching in the cold season; marches not exceeding 12 miles, made between 2 and 7 a.m.; halting every fourth march one day; careful selection of encamping ground as regards soil, good water, avoiding the neighbourhood of large native towns on account of the probable presence of epidemic disease; good tents, not crowded, with tarpaulins for the floors: coffee before starting; and no grog before the first meal.
	22. A British soldier should not serve in India for a period exceeding 12 years.
	23. The invaliding boards in this presidency are composed entirely of medical officers. There is no conflict of opinion as regards invaliding; but we would suggest that these boards assemble oftener, to afford more frequent opportunities for the sick soldier to be sent home.
	24. Invalids should leave India for home in January or February, which are the most favourable months, and not later than the first week in March, so as to insure their arrival in England in June, and secure a favourable passage.
Diseases.	1. There are weekly inspections for Europeans in the morning for the discovery of incipient diseases; but none in the native army, as it would offend the prejudices of religious caste.
	2. Scorbutus is almost unknown in this station, either in the European or native regiments. Her Majesty's 25th Regiment Native Light Infantry arrived here in March 1859, suffering severely from this disease, the result of privation and fatigue on field service in Central India. Its effects in about a twelvemonth almost disappeared. No special preventive measures are necessary.
	3. The proportion of hepatic disease among European troops is about 1 in 17. It is caused by the climate and intemperance, and is almost always idiopathic. The prophylactic measures necessary to diminish its frequency are strict attention to the wearing of flannel next the skin, moderate exercise, and the limited use of fermented and spirituous liquors. The native portion of the army is almost entirely exempt from this disease, which is to be ascribed to their abstinence from spirituous liquors, and their simple diet.
	4. The Europeans are almost free from dracunculus at this station. Among those in whom it has appeared it originated in other stations. The proportion of cases of this disease depends on locality, and may be traced to bathing in and drinking tank water subject to fluctuations in depth, and extent of water surface, and alluvial deposit. In this station the annual number of admissions in a native regiment is about 1½ per cent.
	5. The proportion of constantly sick from venereal disease to the total sick in hospital from all other diseases is about 14 per cent. among the European troops, and 3·5 per cent. among the native troops. To diminish the liability of the soldier to these diseases a strict examination should be made from time to time of the prostitutes, and the removal of the diseased women from the bazaar. The establishment of lock hospitals would be highly advantageous to the health of the army.
	6. The troops at this station suffer from diseases chiefly of the endemic class. The diseases named below are rarely epidemic at this station:—
	Fevers of the ephemeral and intermittent classes are the most prevalent, then those of the remittent type. Simple continued and typhoid fevers are very rare.
	Dysentery and all bowel complaints are prevalent at the commencement and during the rainy season.
	Cholera, as an epidemic, rarely occurs at this station; it prevailed as such at the latter end of May and during June 1859 among the European Troops in the barracks and lines on the southern border of the camp. Sporadic cases occur annually at the same season among the Europeans and natives.
	Small-pox, chicken-pox, and measles prevail among the native population during the hot season. Small-pox rarely appears among the troops, European or native, or their families, owing to the careful practice of vaccination.
	Rheumatism prevails among the European troops, chiefly with a venereal taint. Among the native troops lumbago, arthritis, and idiopathic rheumatism occasionally appear.
	The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:—Europeans, total admissions, 1,478; total deaths, 20.

Diseases.	Admissions.	Deaths.
Fevers (present) - - - -	1 in 4$\frac{107}{158}$	1 in 10
Dysentery - - - - -	1 in 82	1 in 10
Cholera - - - - -	1 in 164	1 in 5
Small Pox - - - - -	1 in 739	None.
Rheumatism - - - -	1 in 14⅓	None.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	In a native regiment of average strength, 650, total annual admissions, 350; total deaths, 5.

Diseases.	Admissions.	Deaths.
Fevers (present) - - - -	51·4	1
Dysentery - - - - -	2·5	None.
Cholera - - - - -	0·5	"
Small Pox - - - - -	0·5	"
Rheumatism - - - -	2·8	"

7. The most frequent zymotic diseases are fevers of the ephemeral, intermittent, and remittent types, dysentery, diarrhœa, cholera, rheumatism, syphilis, and eruptive fevers. During the hot season the eruptive and other sorts of fevers prevail, and during the rainy season cholera, bowel complaints, and rheumatism. Intermittent and remittent fevers, together with rheumatism, are prevalent in the cold season. The eruptive and other forms of fever are, in the hot season, accompanied by scorching winds, with occasional thunderstorms and heavy showers of rain. For diseases of the rainy season the causes are apparent. The diseases of the cold season are accompanied by much dryness of the atmosphere and variation of temperature. These diseases do not prevail in one part of the camp more than another, except fevers of the eruptive class and bowel complaints, which prevail most in the bazaars and where natives reside, owing to the general unsatisfactory sanitary state of the bazaars, the want of ventilation in, and crowding of the native dwellings, bad drainage, and deficient water supply. The European troops at this station exhibit no particular predisposition from personal habits or condition to these diseases. The poorer natives occupying small huts or otherwise crowding together, and having a national objection to the admission of air and light into their dwellings, are, from these causes, sufficiently predisposed to the above diseases, especially among the lowest castes, owing to their filthy habits of living and eating.
8. The prevalence of epidemic disease is influenced on the march and in the field by curiosity and other causes, inducing both Europeans and natives to go into the towns and villages near the camp, where epidemic disease is generally prevalent, their careless exposure to the mid-day sun, even when exhausted after the march, and their drinking the roadside water. In cantonments there is nothing in their duties or occupations to render them liable to this class of disease, precautions being taken to prevent their appearance.
9. There is no record in the camp of the trial of small doses of quinine as a prophylactic against malarial diseases.
10. Epidemic diseases very rarely prevailing among the troops at this station; it is not apparent that any permanent measures are required for their prevention or mitigation.

V. Intemperance.

1. The soldiers at this station are temperate, the proportion of confirmed drunkards being about 1 in 200 or ½ per cent.
2. The proportion of admissions into hospital from diseases caused directly by intemperance is 1 in 113, and indirectly from such cause 1 in 28. No statistical records of the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime, being kept in European hospitals, the Committee are unable to furnish a satisfactory reply on this subject. Drunkenness is always punished as an offence.
3. Distilled spirits are sold at the canteen as furnished by the commissariat department, but are forbidden for the soldier in the bazaar. The quality is good, and the amount sanctioned is one dram per diem, of which two-thirds only is generally consumed. Spirit is no part of the soldier's ration at this station, but is so, at the option of the soldier, on the march and in the field. The quality is good, and the allowance is two drams per man per diem. It is not a habit to give a dram before morning parade. Spirit is not given to convalescents. No drinks, other than intoxicating drinks, injurious to health are sold in the canteens, and precautions are taken to prevent it in the bazaar.
4. Spirit, if taken in moderation, is not injurious to the health of the men, or injurious to the efficiency and internal discipline of the corps.
5. As regards a ration of spirits it is seldom given in cantonments; while on the march, when porter or beer are not procurable, we consider spirit advantageous. We do not recommend to abolish the sale of spirits in the canteen. In the bazaar the sale is prohibited, but it is found impossible to prevent the sale in an underhand way. We would rather wish to see the canteen system thrown more open to the soldiers after certain hours of the day, and allow them to obtain spirits, wine, or beer in moderation, to be drunk on the premises, and to do away with the present system of "calling the roll of different companies, for the men "to come to the table and swallow down at a gulp their allowance." The canteen might be conducted as in England, with tables, and forms, where a soldier might call for what he wants and sit down and drink it at his leisure. This would, we are convinced, check the demand on the unlicensed seller in the bazaar, and the disposing of his unwholesome and diabolical liquor.
6. The use of malt liquors or wines are, to a considerable degree, less likely to produce visceral congestion, the fertile source of all tropical disease, than spirits, as the latter produce the same effect on the system as the elevated temperature of the tropics.
7. Coffee, tea, lemonade, &c., are much used at this station, but there are no data in existence on which to offer a satisfactory opinion as to their influence on health, efficiency, and discipline, as compared with spirits and malt liquors.
8. The spirit ration no longer exists in cantonments; porter is given as a substitute, with benefit to the health of the troops.
9. It would not be advantageous to prohibit the sale of spirituous liquors in the canteen, but it is very desirable that good malt liquor, coffee, tea, &c. should be sold as well.
10. We have no additional recommendations to make on these points.
11. The orders and regulations for the supply of liquors in the bazaars to natives, as also the license granted to European shopkeepers, are seldom infringed, the penalties being very heavy, when any parties are convicted of having surreptitiously sold any liquor otherwise

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	than as the regulation provides. No liquor is allowed to be given or sold to any European soldier, their wives or children, in the bazaar. All classes of natives who act as soldiers' servants must drink their liquor at the shops, and for this observance the kelals are held responsible. Liquor sellers have to purchase their supplies from the liquor contractor, and no other person. No liquor is allowed to be brought into camp without a pass, nor is any allowed to be sold except between the hours of six o'clock, a.m. and 8 o'clock p.m.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian Army is the same, and is composed as follows: 1 lb. bread, 1 lb. meat, beef, twice a week mutton; 4 oz. rice; 2½ oz. sugar; ⅝ oz. tea or 1⅜ oz. coffee; 1 oz. salt; 1 lb. vegetables, according to the season, but at all times ½ lb. of potatoes; 3 lbs. of firewood. The soldier has three meals per diem. The only periodical changes are in vegetables. Prior to their issue the rations are inspected by the officers on duty agreeably to Her Majesty's Regulations, by the quarter-master, and occasionally by the commanding and medical officers. 2. A complete ration, with a due proportion of vegetables, is issued to the soldier daily, but fruit does not form any portion of it at this station. The stoppage for this ration is 3 annas 4 pie daily. The soldier has three meals per diem, viz.: breakfast, at 8 a.m., of bread and tea; dinner at 1 p.m., and composed of meat and vegetables, cooked as most agreeable to the men, as curried, stewed, or roasted, and the evening meal, at 6 p.m., of bread and tea. The proportion of vegetables which enters into the ration varies according to the season, but at present the 1 pound is made up as follows: viz., ½ lb. potatoes, ¼ lb. cabbage, and ¼ lb. onions to each man. 3. The ration being so ample we have no suggestions to offer. To prevent the troops from disposing of any part of the rations precautions are taken by a non-commissioned officer being made responsible for them until they are served out to the men at the hours appointed for meals. 4. The means for cooking available at this station are of the most simple description; large and small copper vessels, tinned twice a month, and oftener if necessary, resting on iron stands over wood fires, and a spit for roasting. Permanent brick ovens are supplied in some barracks, but are not generally used. The kitchens are not sufficiently large, and, being over-crowded by native cooks, are not so clean, light, or well ventilated as they should be. They are sufficiently supplied with water. The food is boiled, roasted, and fried according to the option of the different messes. The ration is also occasionally made into curry. The cooking is properly done and sufficiently varied. Tea and coffee are properly prepared. Coffee is prepared by a canteen man before a march, and is supplied, on payment, to any of the men who may desire it. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near the station as a recreation for the men.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are composed as follows: a wicker helmet, made in India, with a turban; a forage cap (English); a tunic, cloth, and one of serge, alternate years; black cloth trousers (English); blue size trousers; six calico shirts; six pairs socks: two suits of khakee clothing; three pairs boots (1 pair English every year); three flannel waistcoats, and two flannel belts. The accoutrements as in England. With the exception of the cloth tunic and trousers, which we consider made of too heavy a material, we think the present dress is suitable to the climate; they should be made of a light material. When the troops are on field service during the hot season they should be supplied with cumberbunds as a protection to the spine and stomach from sun heat. The guard dress from 1st October to 15th June is khakee clothing by day; but at night black or blue trousers, with red serge tunic, occasionally changing to the cloth tunic on cold nights. From 15th June to 30th September red serge tunic with black or blue trousers, both by day and night. The greatcoat is taken on guard and worn when desirable, and the men mount with packs, but do not carry them on sentry. There are permanent guard rooms with sun-shades for the sentries large enough to walk about under.
Duties.	1. Soldiers should not be sent to India under 20 years of age. They should be thoroughly drilled at home, and the more they know of their duty the better. 2. The soldier at this station rises at 4.30 a.m. in the hot weather, and goes on parade about 5 a.m., with a half to one hour's drill or inspection parade with or without arms. In the cold season he rises about 5.30 a.m., drills and parades till 7 or 8 a.m., according to circumstances. Evening parades are from 5 to 6.30 p.m. Every attention is paid to the health of the soldier, and seldom does a commanding officer distress them at drill. We do not consider their health suffers from the routine of duties or drill in the garrison. The best time for drills and parades is early in the morning, and from 5 to 6.30 p.m., and marches should generally be made during the night, so as to arrive at the halting place by about half an hour after sun-rise. Orders are invariably issued, drawing the attention of the commanding officer, that the men never be kept out in the sun. The average number of nights the men have in bed here during the week is between four and five. 3. The most distant guard from the lines is about a mile and a half. The guards mount at sun-rise for 24 hours. Roll calls are made by companies at breakfast, dinner, and tattoo. There are none at night, as a general rule, but occasionally, if required. The men do not appear to suffer from the night duty. The men always take their bedding on guard with them, and it is carried by coolies, who are paid from the canteen fund. Boards and trestles are provided in each guard room.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation:—There is a ball court, one skittle ground, and another sanctioned; schools, with good schoolmasters, and a library and reading-room, but these latter being at this station attached to the schools are on that account objectionable. They are sufficiently lighted at night. There are neither day-rooms or soldiers' clubs, soldiers' gardens, workshops, theatre, or gymnasia at this station, but the three latter are much needed. At present the means are not sufficient to keep the men occupied during the wet season and heat of the day, but if the deficiencies were made good we hope they would prove ample. The men are not allowed to expose themselves to the sun between the hours of 8 a.m. and 4 p.m. The medical officers are of opinion that the health of the men has not been affected by unnecessary exposure to the sun and rain. 2. Every means should be taken to afford places of amusement; a room should be set apart for a theatre, and a reading-room separate from the school-room, as it is found inconvenient to

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	have them combined. If the fives court were covered in it would afford amusement during the day, and also be suitable for rackets. A skittle court is highly desirable. A workshop for men to follow their trades is absolutely necessary, and every facility should be afforded to the industrious soldier to follow his trade. At present they have no means for such employment and of assisting their comrades. Gardens would prove advantageous as a recreation. 3. A savings' bank exists here, and is much approved of by the soldier who has any tendency to lay by any of his earnings. 4. There are merely open verandahs to some of the barracks, which are made available for exercise, and we would insist on the adaptation of open verandahs to all barracks and other military buildings at this station. There are no trees or shade sufficient for the purpose of taking exercise.
IX. Military Prisons.	1. There are no military prisons, and we would strongly suggest the adoption of one at this station for the troops of this division. The cells are sufficient in number, and we have no objection to offer relative to their effect on the health of prisoners; but as regards prison discipline they are very deficient in arrangements and detail. If they are retained a house is required for a provost serjeant, a wall with railing to encircle them, a guard-room at the entrance, and a shed for exercise and drill. A cook-house and privies are absolutely needed.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. According to the existing regulations in the local army, medical officers can only make recommendations; it rests with the military authorities to carry them into effect, the medical officer having no authority *per se*. By the new medical code of the royal army these duties are much better defined. 3. The selection of encamping grounds rests entirely with the Quartermaster General's department; the medical officer can only (on arrival of the force) suggest or recommend; in the same way with the general arrangements for cleanliness, &c., there being no general sanitary regulations on the subject in the local army. When troops are marching, and more than one medical officer is present, one should accompany the officer of the Quartermaster General's department to assist him in the selection of the site and general sanitary arrangements of the camp, with power (if they differ) to refer personally to the decision of the commanding officer. Instructions and rules as to choice of proper sites, water soil, sanitary regulations, &c. should be published as means of guidance. Water is supplied to the men by puckal bheesties, to the hospitals by a permanent establishment, according to strength. 4. All arrangements and regulations with respect to field hospitals, ambulances, &c., will be found on a reference to the general presidency regulations, and the medical codes of the royal and local armies, all of which must be in the office of the Secretary of State for India.
XI. Statistics of Sickness and Mortality.	The following are the statistics of the station:—

POONA.

European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1850-51	H.M's 83rd Regiment - 86th Do. -	1,117	340	2	1	—	90	1	39	—	392	21	21	—	1	—	863	2	1,747	26	156·4	2·3
1851-52	" 86th Do. -	1,089	450	1	1	1	79	—	73	—	312	5	29	2	—	—	847	2	1,791	11	164·4	1·0
1852-53	" 78th Highlanders - " 86th Regiment -	1,252	401	—	1	—	98	2	83	4	308	2	31	—	—	—	868	1	1,790	9	142·9	0·7
1853-54	" 78th Highlanders - " 86th Regiment -	1,831	1,514	3	5	1	182	2	203	6	499	4	54	1	1	—	1,249	7	3,707	24	202·4	1·3
1854-55	" 78th Highlanders -	921	754	1	12	2	64	4	107	3	169	1	26	2	1	—	523	7	1,656	20	179·8	2·1
1855-56	" 78th Do. -	878	463	2	4	—	42	3	52	—	115	—	26	—	—	—	471	2	1,173	7	133·5	0·7
1856-57	" 78th Do. -	768	173	—	1	—	37	—	56	2	117	3	27	3	5	4	433	2	849	14	110·5	1·8
1857-58	D Troop Royal Horse Artillery - - - 8-14 Royal Artillery - H.M.'s 18th Royal Irish Regiment - H.M.'s 33rd Regiment - Depôt H.M.'s 78th Highlanders - - - Depôt H.M.'s 86th Regiment - - -	1,076	404	3	6	—	81	4	17	2	126	1	22	—	—	—	596	2	1,252	12	116·3	1·1
1858-59	D Troop Royal Horse Artillery - - - Detachment 8-14 Royal Artillery - - - Y. T. B. Royal Artillery - H.M.'s 18th Royal Irish Regiment - H.M.'s 31st Regiment - " 33rd Do. - Depôt H.M.'s 78th Highlanders - - - Depôt H.M.'s 86th Regiment - - - German Legion - -	3,049	1,480	3	6	—	222	4	58	4	376	7	43	2	1	—	1,858	1	4,044	21	132·6	0·6
1859-60	1-13 Royal Artillery - 3-13 Do. - 7-13 Do. - 11th Company Royal Engineers - - - H.M.'s 31st Regiment - " 57th Do. - German Legion - -	1,757	1,175	3	1	1	78	4	65	4	299	19	31	1	40	26	1,325	2	3,014	60	171·5	3·4

POONA.
BOMBAY.

EUROPEAN TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	European Troops in the Indian Army.																					
1850-51	2nd Troop Horse Brigade 3rd Do. 4th Do. 1st Bombay European Regiment Fusiliers	1,386	1,440	9	3	—	97	4	106	5	261	10	126	3	14	4	1,565	2	3,612	37	260·6	2·6
1851-52	2nd Troop Horse Brigade 3rd Do. 1st Bombay European Regiment Fusiliers	1,305	612	—	5	1	104	5	110	8	210	8	139	1	1	1	1,351	4	2,532	23	194·0	1·7
1852-53	2nd Troop Horse Brigade 3rd Do. 1st Bombay European Regiment Fusiliers	1,020	704	—	—	—	125	3	79	—	170	5	196	—	—	—	1,276	4	2,550	12	250·0	1·1
1853-54	2nd Troop Horse Brigade 3rd Do. 3rd European Regiment	560	162	—	—	—	38	2	16	1	115	1	17	1	2	2	423	1	773	8	138·0	1·4
1854-55	1st Troop Horse Brigade 2nd Do. 3rd Do. 3rd European Regiment	840	651	3	3	—	161	2	40	2	411	6	12	—	7	7	939	5	2,224	25	264·7	2·9
1855-56	Horse Brigade 3rd European Regiment	1,051	830	2	2	—	72	3	45	1	448	3	34	1	—	—	1,425	1	2,856	11	271·7	1·0
1856-57	Horse Brigade 3rd European Regiment Station Staff	1,035	521	4	2	—	80	—	59	4	266	—	28	—	8	3	1,224	3	2,188	14	211·4	1·3
1857-58	Horse Brigade 1st Company 2nd Battalion Artillery 3rd Company 2nd Battalion Artillery 4th Company 2nd Battalion Artillery 3rd European Regiment Station Staff	505	226	1	—	—	51	2	36	4	177	3	15	1	—	—	912	2	1,417	13	280·5	2·5
1858-59	Horse Brigade Depôt 3rd European Regiment Station Staff	177	129	1	5	—	26	1	17	1	71	4	6	—	—	—	247	2	501	9	283·0	5·0
1859-60	Horse Brigade Station Staff	294	167	—	—	—	44	5	23	2	128	3	19	—	30	11	289	2	700	23	238·0	7·8

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	L. W. 1st Grenadier Regiment Native Infantry 3rd Regiment Native Infantry 14th Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,207	1,071	6	39	2	63	4	5	—	196	5	20	—	20	9	905	7	2,319	33	105·0	1·4
1851-52	3rd Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,228	787	3	44	1	43	5	4	—	148	2	17	—	4	2	722	8	1,769	21	79·3	0·9
1852-53	3rd Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,248	729	4	13	—	56	1	19	2	195	4	37	1	—	—	1,066	8	2,115	20	94·0	0·8
1853-54	3rd Regiment Native Infantry 4th Regiment Native Infantry 19th Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,627	979	3	26	2	65	5	12	1	193	1	27	1	69	21	1,091	5	2,462	39	93·7	1·4
1854-55	4th Regiment Native Infantry 19th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,131	1,156	4	30	1	63	2	11	1	188	2	31	—	20	8	1,032	5	2,531	23	118·7	1·0
1855-56	4th Regiment Native Infantry 6th Regiment Native Infantry 19th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,587	1,052	—	15	—	84	—	12	—	196	3	29	—	—	—	1,034	5	2,422	8	152·6	0·5
1856-57	4th Regiment Native Infantry 6th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,577	896	1	28	—	76	3	12	2	147		19	1	6	3	928	1	2,112	15	133·9	0·9

NATIVE TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1857-58	5th Company 4th Battalion Artillery - - - L. W. 3rd Regiment Light Cavalry - - - 6th Regiment Native Infantry - - - Depôt 25th Regiment Native Infantry - Staff with Sappers and Miners - - - Detachment Poona Irregular Horse - -	2,272	889	6	51	1	62	2	13	—	158	4	21	2	—	—	1,135	6	2,329	21	102·5	0·9
1858-59	6th Regiment Native Infantry - - - 25th Regiment Native Infantry - - - Staff with Sappers and Miners - - - Detachment Poona Irregular Horse - -	1,857	557	3	30	—	34	3	8	1	72	4	9	1	—	—	777	6	1,487	18	80·0	0·9
1859-60	6th Regiment Native Infantry - - - 15th Regiment Native Infantry - - - 25th Regiment Native Infantry - - - Staff with Sappers and Miners - - - Detachment Poona Irregular Horse - -	1,807	662	2	19	—	26	1	23	1	97	1	7	—	21	7	612	5	1,467	17	81·1	0·9

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. Europeans.	WOMEN. Strength. Indo-Europeans and Natives.	WOMEN. Strength. Total.	WOMEN. Treated. Europeans.	WOMEN. Treated. Indo-Europeans and Natives.	WOMEN. Died. Europeans.	WOMEN. Died. Indo-Europeans and Natives.	WOMEN. Ratio per Cent. to Strength. Treated.	WOMEN. Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	CHILDREN. Strength. Indo-Europeans and Natives.	CHILDREN. Strength. Total	CHILDREN. Treated. Europeans.	CHILDREN. Treated. Indo-Europeans and Natives.	CHILDREN. Died. Europeans.	CHILDREN. Died. Indo-Europeans and Natives.	CHILDREN. Ratio per cent. to Strength. Treated	CHILDREN. Ratio per cent. to Strength. Died.
1852-53	H.M.'s 78th Highlanders -	80	8	88	63	11	2	—	84·1	2·2	116	9	125	72	9	3	1	64·8	3·2
	" 86th Regiment -	115	4	119	90	3	—	—	78·1	—	231	5	236	215	6	8	1	93·6	3·8
1853-54	" 78th Highlanders -	71	13	84	95	5	1	—	119·0	1·1	115	9	124	136	4	6	—	112·9	4·8
1854-55	" 78th Do. -	72	8	80	90	23	3	—	141·2	3·7	113	13	126	148	13	16	1	127·7	13·4
1855-56	" 78th Do. -	70	12	82	73	9	1	—	100·0	1·2	118	14	132	105	13	8	2	89·3	7·5
1856-57	Depôt H.M.'s 78th Highlanders - - -	68	8	76	11	1	1	—	15·7	1·3	132	6	138	12	1	3	—	9·4	2·1
1857-58	H.M.'s 18th Royal Irish Regiment - -	4	—	4	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—
	H.M.'s 33rd Regiment -	53	—	53	26	—	1	—	49·0	1·8	81	—	81	28	—	5	—	34·5	6·1
	Depôt H.M.'s 78th Highlanders - - -	64	12	76	47	7	—	—	71·0	—	128	15	143	57	3	6	—	41·9	4·1
	Depôt H.M.'s 86th Regiment - - -	78	1	79	38	—	1	—	48·1	1·2	139	7	146	30	—	1	—	20·5	0·6
1858-59	Depôt H.M.'s 78th Highlanders - - -	60	15	75	27	5	—	1	42·6	1·3	123	19	142	42	10	4	—	36·6	2·8
	Depôt H.M.'s 86th Regiment - - -	75	10	85	36	—	2	—	42·3	2·3	144	10	154	43	—	12	—	27·9	7·7
1859-60	6/13 Royal Artillery -	13	—	13	1	—	—	—	7·7	—	12	—	12	1	—	1	—	8·3	8·3
	7/13 Do. -	4	—	4	—	—	—	—	—	—	7	—	7	—	—	—	—	—	—
	Details Do. -	4	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	H.M.'s 57th Regiment -	45	—	45	7	—	—	—	15·5	—	57	—	57	11	—	—	—	19·3	—
1852-53	2nd Troop Horse Brigade	11	8	19	9	6	—	—	78·9	—	16	19	35	15	7	1	1	62·8	5·7
	3rd Do. -	11	7	18	5	1	—	1	33·3	5·5	12	9	21	1	5	—	1	28·5	4·7
	1st Bombay European Regiment Fusiliers -	28	22	50	49	40	1	2	178·0	6·0	41	20	61	44	16	6	—	98·3	9·8
1853-54	2nd Troop Horse Brigade	9	9	18	1	3	—	—	22·2	—	14	17	31	—	—	—	—	—	—
	3rd Do. -	10	10	20	10	2	—	—	60·0	—	21	9	30	3	2	2	2	16·6	13·3
	3rd Bombay European Regiment - -	16	3	19	5	—	—	—	21·0	—	21	5	26	1	—	—	—	3·8	—
1854-55	1st Troop Horse Brigade	11	10	21	2	—	—	—	9·5	—	18	20	38	2	1	1	—	7·8	2·6
	2nd and 3rd Troop Horse Brigade - - -	28	25	53	9	6	—	—	28·3	—	44	45	89	17	10	1	2	30·3	3·3
	3rd European Regiment -	20	4	24	26	2	—	—	116·6	—	19	7	26	13	—	2	—	50·0	7·6
1855-56	Horse Brigade - -	26	18	44	9	3	—	—	27·2	—	48	27	75	7	5	5	2	16·0	9·3
	3rd European Regiment -	39	7	46	46	3	2	—	106·5	4·3	51	7	58	24	2	2	—	44·8	3·4
1856-57	Horse Brigade - -	35	15	50	22	4	1	—	52·0	2·0	54	20	74	8	7	2	1	20·2	4·0
	3rd European Regiment -	45	9	54	66	—	8	—	122·2	14·8	67	11	78	60	2	3	1	79·4	5·1
1857-58	Horse Brigade - -	30	26	56	28	—	1	—	50·0	1·7	37	45	82	22	2	5	2	29·2	8·5
	Depôt 3rd European Regiment - - -	46	9	55	23	—	—	—	41·8	—	64	10	74	13	—	—	—	17·5	—
1858-59	Horse Brigade - -	38	20	58	26	6	—	—	55·1	—	50	28	78	16	2	6	2	23·0	10·2
1859-60	Do. - -	16	7	23	16	7	—	—	100·0	—	20	10	30	7	9	1	3	53·3	13·3

Note.—No reliable statistical information as to the diseases and mortality of native population procurable.

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1860.

W. C. COLES, Assistant Surgeon
Secretary.

FOONA. BOMBA

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. Plans of the hospitals, showing position as regards barrack buildings and the bazaar, are transmitted. The sites of the hospitals are generally open, and freely ventilated, and there are no causes interfering with the ventilation. The sites are generally healthy, and no nuisances arising from drainage, malaria, river banks, marshes, nullahs, ditches, water pits or foul ground, exist. 3. Although the supply of water in camp is generally insufficient, the supply to the hospitals is abundant and wholesome. 4. There is no regular system of artificial drainage in this camp, it not being allowed by Government regulation. All refuse water and other impurities are carried away by sweepers employed for the purpose, to such a distance from the camp as to ensure perfect immunity from noxious influences. 5. The lowest wards of the hospitals are raised an average of 3 feet above the ground, but there is no perflation of air beneath the floors. The roof water sinks into the subsoil. There is no surface drainage or guttering round the hospital; but from the porous nature of the soil and the situations of the hospitals the rain fall is rapidly carried away. The hospitals are built of brick and mortar, or brick and mud pointed with mortar. The roofs of the two native hospitals are thatched, those of the Europeans tiled; the floors of the former are made of a light description of clay, those of the latter are flagged. The roofs and walls are single, but sufficiently thick to keep the hospitals cool. Verandahs do not exist in the European hospitals, but they do in the native hospitals, and these average 10 feet wide, and afford sufficient shelter from the sun's rays. The verandahs are not used for the accommodation of sick, convalescents or others. The hospitals consist of one flat.

TABLE OF HOSPITAL ACCOMMODATION.

Wards.	Regulation No. of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.			Remarks.
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.	
Ghorepoore.								ft. in.				
Hospital - - - -	100	300	24	18	129,600	1,296	72	1·4	35	6½	3¼	Built in 1842. Two additional wards built in 1849.
Left Flank.												
Hospital - - -	107	349	24	18	138,204	1,291	72	1 4	72	5	3	Built in 1826.
Native Infantry.												
Left Flank - - -	30	96	22	18	38,016	1,267	70	1 4	13	6	3	Built in 1823.
Right Flank - - -	30	96	22	18	38,016	1,267	70	1 4	13	6	3	Built in 1828.
Horse Artillery.												
Hospital - - -	21	62½	24	18	27,000	1,286	71	1 4	14	3	5	Built in 1860; additions made in 1848.

As far as practicable 1,800 cubic feet of air are allowed for each patient.

The hospitals are so placed as to receive the full benefit of prevailing winds.

The windows open outwards, and their arrangement and construction are conducive to coolness and ventilation.

6. The means of ventilation in the hospitals are the doors, windows, and cowl ventilators; but these are scarcely sufficient for the purpose. A portion of the roof should be raised a foot above the lower portion entirely round the building. There are no jalousies or jhilmils.
7. The air, during the hot season, is cooled by passing through tatties, formed of a fibrous root (the "kus-kus,") which are kept constantly watered by coolies, and by punkahs.
8. There is no necessity for warming the air admitted to the hospitals. The walls and ceilings of the wards are cleansed and whitewashed whenever they require it.
9. The privies are the same as those in use in barracks. They are washed out frequently by the sweepers, are not placed over cesspits, but a deodorising material being supplied, when properly and effectually used they are not offensive. The medical officer is held responsible for this.
10. Tubs and basins, with an ample supply of water, are alone furnished for lavatory purposes at the hospital; but permanent lavatories with shower baths are much needed.
11. There are no bathing places here for the sick; but the general means for giving them hot water and other baths are supplied.
12. The washing and drying of the hospital linen are carried out by the commissariat department outside the limits of the cantonment.
13. The storage is amply sufficient.
14. The cots or bedsteads in the hospitals consist of iron frames, with broad cotton tape bottoms. The beds of the Europeans are made of quilting stuffed with straw, but the natives use their own bedding, which is simply a small rug or carpet. Some of the cots have a moveable head and foot piece. Warm cumble blankets and sheeting are amply supplied by Government.
15. The hospital kitchens are of the usual construction, and situated conveniently to the wards, and the means and apparatus are the same as those already described, and are sufficient. The cooking is properly done and sufficiently varied.
16. The diet tables and returns used in European hospitals are forwarded; but all those in use are to be found in the General Presidency Regulations and the medical codes of the Royal and local Armies. Native troops diet themselves both in and out of hospital.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	17. The establishments of sick attendants are according to Government Regulations, to be found on reference to the General Presidency Regulations and medical codes of the local army. The attendance is found sufficient. 18. The sanitary state of all the hospitals is good; and no epidemic disease, hospital gangrene or pyœmia have appeared in the wards. 19. I would suggest the following improvements:—Verandahs all round the hospitals; separate wards for contagious and epidemic diseases, a distinct ward for obstetric cases to be attached to the female hospitals, with residences for the matrons. Good accommodation for the hospital subordinates and the hospital sergeant is wanting, besides the deficiencies already mentioned. 20. Convalescents, unable to take walking exercise are carried out in doolies. There is sufficient ground round the hospitals for general exercise; but there are no shaded walks or seats. 21. There is some accommodation at each of the European hospitals for the sick wives and children of soldiers. The arrangements in this respect are, however, very unsatisfactory, being too small, which renders it necessarily to all, and the women and children at their quarters, a source of great inconvenience and danger. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The powers of the medical officer as to sanitary arrangements and repairs in the hospitals are confined to recommending what is desirable, to be supported by his medical superior, and eventually carried into effect by the various departments within whose province their fulfilment rests. All subjects connected with dieting the sick, medical comforts, &c., rest with the medical officer, subject to after supervision. 24. There are no wards or hospitals for convalescents at this station, but in in this country we are of opinion that such accommodation is highly desirable.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is about three quarters of a mile from the station, and is to the leeward of the prevailing winds as regards the station. Its area is 149,000 sq. feet; it has a surface of black soil, and subsoil of moorum. Drainage is not required; and the ground is carefully kept; decomposition takes place rapidly. 3. The grave space allowed is 2½ by 6½ feet, with an interval between each grave of 2½ feet, and a depth of 6 feet. The graves have not as yet been re-opened. Interment is compulsory, both at ordinary times and during epidemics, within 12 hours; and the same in native burial grounds. 4. The grave yard is sometimes a little offensive in the hot weather, but not sufficiently so to become a nuisance. British troops are buried agreeably with English customs. 5. The dead of camp followers and bazaar people are disposed of according to religious caste. Hindoos are burned; Jews and Mussulmans buried. 6. No injury accrues to the public health from the present practice. 7. No improvements, in the shape of regulations or otherwise in the burial, or disposal of the dead, are suggested.

(Signed) Frank Adams, Brigadier.
Commanding brigade and station.
Wm. Deeble, Surgeon.
56th Regiment.
W. J. Stuart, Surgeon,
25th Regiment, N. L. I.
Granville Close, Captain,
Exec. Engineer, Poona.

July 23, 1860.

KIRKEE.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is barren, but with occasional patches here and there of vegetation and groves of trees. It is dry and undulating, with hills and spurs of ghat within distances of from 2 to 14 miles. There is no wood or jungle in the vicinity. The river runs round three sides of the cantonment, in some parts bordering it; but generally from half to three-quarters of a mile from those parts used as barracks. 2. The station is elevated about 1,900 feet above the sea, but is on a level with the adjacent country. There is no higher or healthier ground adjoining the station, except the minor hills mentioned above; but none of these afford the space of table land requisite for a cavalry regiment. 3. The nearest table land is distant about half a mile, and may rise about 300 or 400 feet, and the nearest mountain is Surghur, about 2,500 feet above the station, and distant 15 miles. 4. The nearest water (except wells) is the river Moola, distant half a mile. There is no lake, marsh, nullah, or canal within 4 miles, and the vicinity of the station is not liable to overflow. There is no broken ground near the station, but there are some water pits between the lines and the bazaar, which fill in the monsoon, are a receptacle for filth, and near enough to be prejudicial to health. 5. The station is open and freely exposed to winds, and is encumbered in no way by anything so as to interfere with either free external or internal ventilation. The temperature of the station is raised by exposure of the buildings to reflected sun heat, the station being too largely scattered for such a contingency. From November to February cold land winds prevail with occasional sea breezes; from March to June there are hot, scorching, variable winds, and for the rest of the year the prevailing winds are from the sea. The cold and rainy seasons are beneficial to the health of the troops, but in the hot season fever and congestive visceral disease prevail.

KIRKEE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	6. About one half of the land in the neighbourhood of the station is cultivated, but the remainder is barren. There are no works of irrigation near the station. No rice is grown near the cantonment as the soil is unsuitable for it. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. Poona is the nearest large city, and is distant about three and a half miles from the station, but does not affect the health of the latter. The village of Kirkee is so near the cantonment that it is a nuisance. It should be removed, the owners of the houses receiving compensation. 8. The surface of the station is, generally speaking, moorum, with patches of black soil here and there, and below it trap rock. The station occupies new ground. 9. Water is usually found at a depth of about 33 feet below the surface in the dry season, and 19 feet during the rainy season. 10. The river acting as a drain, the rain-fall and water from surface springs flow readily away; but, except where the ravines carry off the rain more directly, it oozes into a pervious soil, and so drains off. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells, but most of these drying up in the hot season, the supply is then drawn mainly from the river. There are no tanks. 12. The water supply of the station is obtained from 7 wells, averaging 50 feet in depth, and the river. These wells are totally insufficient; they often run short (as in the present season) and Government is then put to the expense of bringing water from the river by water carriers. The bottoms of these wells are, with one or two exceptions, actually several feet above the bed of the river. To be of any permanent service they should be sunk.

TABLE showing the Chemical Composition of the Water.

—	Moola River at the City Bund.				—	Mota Moola River at the Jamsetjee Bund.				
	12. G.	13. H.	14. H.	15. H.		16. G.	17. H.	18. H.	19. H.	H.
Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	May 1856.
Specific Gravity at 60°	1000·0	1000·4	1000·6	1000·9	Specific Gravity at 60°	1000·0	1000·4	1000·25	1000·5	1000·3
Inorganic constituents: Chloride of Sodium, Magnesium, Lime; Sulphate of Soda, Magnesia, Lime; Nitrate of Magnesia, Lime; Carbonate of Magnesia, Lime; Silica	(x)	(x)	5·95	6·90	Inorganic constituents: Chloride of Sodium, Magnesium, Lime; Sulphate of Soda, Magnesia, Lime; Nitrate of Magnesia, Lime; Carbonate of Magnesia, Lime; Silica	(x)	2·97	2·05	2·10	1·66
Organic matter in solution	(x)	(x)	1·61	1·69	Organic matter in solution	(x)	·59	·59	·85	·68
" " suspended	—	—	1·90	14·29	" " suspended	—	—	—	1·05	·14
Total solids	1·1	6·34	9·46	22·88	Total solids	1·2	3·56	2·64	4·00	2·48
Gaseous contents	—	—	—	—	Gaseous contents	—	—	—	—	—

The water in the wells is raised by common leather buckets, and taken away in leather skins on the backs of bheesties or bullocks. The water is soft and the quality good, but its microscopic characters are unknown. The water supply of Kirkee is quite inadequate. In the hot weather the wells run dry, and the conveyance of water from the river is an expensive and inconvenient arrangement. In the cold weather Government pays monthly 433 rupees for water carriers, and during the hot months 617 rupees. The wells and the river are at present the only sources from which water is obtained. No aqueduct exists, nor is such a thing as a pump known at Kirkee, and all the arrangements for drawing water are what they may have been some 1,000 years or more ago. The executive engineer says that a scheme was devised in 1853 by Captain Berthon, late Engineers, for bringing water from a nullah about 4 miles south-west of Kirkee, near the village of Pashan, and that his estimate for the same was 75,585 rupees; but the project was ordered not to be carried out, as it was questionable whether the station of Kirkee was to be retained. The scheme was again ordered to be taken in hand in 1857, in conjunction with the design of the new barracks, but subsequently the then executive engineer, Colonel Hart, wrote in to say that he could not possibly undertake it till an efficient assistant was afforded him; and thus the affair has remained in *statu quo* ever since. The contemplation of this scheme has invariably been the excuse from year to year for not going to the expense of deepening the wells. The committee are of opinion that a special officer should be detached to carry out Captain Berthon's scheme of bringing water from the rivulet in question, and that it will be bad economy not to set about it at once.

13. The barracks in reference to the sea breeze, are built on the wrong side of the slight slope on which the cantonment stands. This should be attended to when the new barracks are ordered to be commenced.

14. New stations, whether on hills or plains, are selected by a mixed Committee composed of the senior military authorities, executive engineer, and senior medical staff, who after making inquiry into sanitary and other questions, communicate with the civil authorities, the final decision resting with the Government. Stations have hitherto been selected in the plains.

II. CLIMATE.

1. No meteorological instruments are specially available. Kirkee presents a more favourable aspect as regards temperature, being at all seasons some degrees cooler than Poona.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. There is almost a total absence of fog, dampness is only observable in the rains, and then is mild in degree; only garden irrigation and tree planting exist, and do not produce any perceptible influence on the climate. Dust-storms are very rare, only occurring just previous to the setting in of the rains, and they do not affect perceptibly the purity of the atmosphere. The climate is favourable to Europeans. The diet here is good and varied; but the barracks are very indifferent with the exception of two new buildings. The precautions necessary to be observed are:—duties should be light, and drills take place early in the morning, and in the evening. Woollen clothing should be worn during the rains, and khakee clothes during the hot months. The most healthy months are July, August, September, December, January, and February, and the most unhealthy October, November, March, April, May, and June. During October and November, owing to the cessation of the rainy season, with elevated temperature, remittent and intermittent fevers, with visceral diseases prevail; during the hot months of March, April, and May, these, and also eruptive fevers and congestive diseases of the cerebral, thoracic, and abdominal organs, and in June, bowel complaints are frequent. Rheumatism prevails during the cold months. 4. There is no district near the station more conducive to health that would be available for cavalry. If the barracks are rebuilt, it would be desirable to select a better site in advance of the present position, where the ventilation would be much improved. 5. We have served in most of the stations of the Deccan, the Southern Mahratta country, the Mhow division, Sinde, the Concan and Guzerat. These stations in the Deccan being on an elevated table land of the trap formation, and about 1,800 feet above the level of the sea, are the most conducive to the health of troops. Next in degree are those of the Mahratta country, and Mhow division from similar causes, and next those in Sinde, although the elevation is slight; the country surrounding the station being for the most part a sandy plain, free from jungle vegetation. The stations in the Concan, or coast border of the presidency are comparatively healthy, being situated within the full influences of the sea breezes, but they are, however, subject to severe visitations of epidemic and zymotic diseases. With the exception of the Deesa station, (salubrious from being situated in an open sandy plain), the stations in Guzerat are positively injurious, the elevation above the sea being very slight, and the soil alluvial, with a rich rank vegetation, and abounding in rivers with a small degree of fall, exhibiting extensive alluvial banks.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Map and plans of the station, and the surrounding country, and plans of the station are transmitted. 4. Table of Barrack accommodation. Date of construction—new barracks in 1843 and 1852. Old barracks in 1827 and 1837. Total number of rooms or huts - - - - 16 Total regulation of non-commissioned officers and men - - - N.C. officers - - 32 men - - - 576

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
				Mean.	Feet.			Ft. in.		Feet.	Feet.
12 Chuppered Barracks, each -	36	97	24	16	37,248	1,034⅔	64⅔	1 4	16	5	3
2 Tiled do., each	36	97	24	18	41,904	1,164	64⅔	1 4	16	5	3
2 Do. do.	36	97	24	23	53,544	1,487⅛	64⅔	1 4	16	5	3
Guard Room -	12	40	16	14	8,960	746⅔	53⅓	1 4	4	5	3
12 Prison Cells, each - -	1	10	10	17½	1,750	1,750	100	1 4	—	—	—

5. There are no properly constructed windows, but wooden shutters, which fold back on hinges, on all four sides of each barrack. There is an open verandah along the south side of each of the old barracks, about five feet wide, and in the two new barracks an open verandah about nine feet wide on the north side. There is also an enclosed verandah of same width on the south side; except on an emergency, these verandahs are never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils, except in the two new barracks, which are properly made. There are 14 old, and two new barracks.

6. The majority of the bedsteads used in barracks are merely boards and trestles, but there are a few iron bedsteads, with cross thin iron straps. The bedding for each soldier consists of one numda, two cumlie blankets, and two pairs of sheets, with one cotton coverlid, all supplied by Government. The Committee are of opinion, that iron cots should be generally substituted for the boards and trestles as securing greater health and cleanliness.

7. The following Tables show the structure and dimensions of the tents used in camp:—

Tent for European soldiers, double poled, with fly and shed, and single set of walls.

Extreme length within,	22 feet - -	For 14 horse artillery.
„ breadth „	14½ „ - -	or 22 foot „
Height of walls	12¼ „ - -	or 22 infantry.
„ to ridge	12¼ „ - -	or 16 cavalry.
Total area	- -	319 square feet.
Cubic space	- -	2,393 cubic feet.

Tents for European soldiers, single pole with fly, shed, and single set of walls.

Extreme length within,	14 feet - -	For 8 horse artillery.
„ breadth „	14 „ - -	or 10 cavalry.
Height of walls	6 „ - -	or 13 foot.
„ to cap	12 „ 2 inches	
Area -	- -	196 square feet.
Cubic space	- -	1,268 cubic „

KIRKEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	Tents for native soldiers, single pole, nearly circular, with bell-shaped fly only. Diameter, 11 feet - - - } For 12 infantry. Height to cap, 10 „ - - - Area - - - 94 square feet. Cubical space - - 180 cubic „ European hospital tent, double poled, with fly and shed, and double set of walls. Extreme length inside, 22 feet 9 inches - } For 12 Europeans, or 15 natives. „ breadth „ 16 „ 4 „ - Height of walls, 6 „ 3 „ - „ to ridge 12 „ 9 „ - This gives about 30 square feet - } Per European. And 260 cubic „ - Hospital tents for native soldiers, double pole, oval shape, with fly only. Extreme length within, 26 feet 8 inches - - } For 25 cavalry, or 30 infantry. „ breadth „ 13 „ 9 „ - - Height to ridge, 9 „ 6 „ - - Area - - - - 383 square feet. Cubic space - - - 1,030 cubic „ 8. In the old barracks, which include all except two, there can scarcely be said to be any ventilation. Each house, however (holding half a troop), has two small pigeon-house (louvre boarded) ventilators in the roof, but the construction of these is so imperfect that during the annual rains, when ventilation is most needed, they are obliged to be covered with tarpaulin by the Engineers' Department. The ventilation of the new houses is by louvre boards on the sides, and holes (of insufficient size) in the upper part of the walls of the sides, and ventilation through the roof at the top with louvre boards. The ventilation on the whole in the new houses is good. The huts and guard-rooms have no ventilation whatever, except what they receive from doors and windows. The ventilation is not sufficient to keep the air pure by night. Some arrangements should be adopted (which the soldier could not interfere with) for the free ventilation of the rooms when the doors and windows are closed. There are no means used in the barracks for cooling the air admitted. 9. The two new barracks are of burnt brick and lime; the remainder are of burnt brick and mud. The floors of the new barracks are paved; those of the old ones are of earth. The roofs of the former are tiled, and those of the latter thatched. The huts, or married men's quarters, are constructed, some of stone and mud, and some of wattle and daub, and are mostly thatched. 10. The flooring of the 14 old barracks is of mud. They can scarcely be said to be raised above the level of the ground; and such being the case, there can of course be no passage of air underneath. The floors of the two new bungalows are of stone. They are raised three feet above the ground, but there is no passage of air beneath them. 11. The materials of which the two new barracks are constructed are good; those of the other 14 decidedly the reverse. The former would be vastly improved by a continuous ventilator in the roof, as in the new upper-storied barracks at Poona. Of the remaining barracks it can only be said that they are condemned, being merely old, worn out, thatched sheds. New barracks are sanctioned, and the sooner they are begun the better, as these present old places are hardly habitable, and not suited to the climate. In fact, they are defective *in o.* In this country, barrack rooms should be elevated above the ground at least 14 feet, as such an arrangement entails, at all times, a clearer and more healthy atmosphere for the soldier both by day and night. The lower portion of the building might be converted into dining rooms, washing rooms, libraries, skittle alleys, &c. Most of the subsidiary detached buildings would thus be done away with, and no extra expenditure entailed. We would also strongly advocate, for all new barracks, the adoption of open verandahs, as the men like them, and they add to the ventilation of the barrack rooms. Some of the lower portion of the building might be made available for saddlery, and harness for horse artillery, and cavalry respectively. The barracks and cantonment are kept in repair by the executive engineer, and the repairs are mostly executed by native contractors, and oftentimes delay is experienced in consequence of the natural dilatory disposition of the native, want of sufficient supervision, and other circumstances. No officer is responsible for the general sanitary state of the cantonment. The Committee strongly recommend that it should be the *sole* duty of a separate medical officer to attend to the sanitary state of so large a cantonment (including Poona and Kirkee). The walls and ceilings of the barracks are cleansed and limewashed at intervals of three months, and oftener, if necessary. We would recommend that in future barracks be whitewashed "Regimentally," and that lime, brushes, &c., should always be kept in store by the quarter-master. 12. The lavatories at this station are merely open, paved verandah rooms, with tubs placed in them, amply supplied with water. The waste water runs off into tubs placed outside. We would recommend that instead of these, wedge-shaped cesspools of cut stone, guaranteed against leakage, should be adopted, or, which would, perhaps, be better still, iron tubs, japanned or glazed. There are two washing-rooms generally to each barrack room. 13. The regimental cook-room here is a simple rectangular building, with an opening in the roof and walls for the escape of the smoke. The fire-places are nothing but masonry platforms, about two feet high, with iron rests, called choolas, for the cooking-pots. In all these cook-houses the ventilation is so imperfect that the escape for the smoke is insufficient. Water is provided by bheesties. The refuse water is drained into cesspools, which are cleaned out nightly by halalcores or sweepers. Large iron japanned glazed tubs would be better still. The washing and drying of linen in India are invariably done by the natives, who take the clothes away, wash them, and bring them back clean and dry, except during the rains, when the natives have no means of drying them, and necessarily bring them home wet. The Government do not provide the troops with any means of drying the linen. The captains of troops, however, provide, at their own expense, large baskets over pans of lighted charcoal, on which the clothes are placed and dried. The Committee are of opinion that captains of troops should not be put to this expense. 14. A plan of the privies, &c. is transmitted. The privies for Europeans are simple buildings, and will be easily understood by the sketch forwarded. The filth falls into baskets, and is carried away by sweepers, and the urine drains into cesspools. Pans, similar to those recommended for the cook-rooms, would be better than cesspools, and we would recommend that in lieu of the baskets the pans be adopted. The contents of the privies are

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	carried away twice a day by the natives, to a spot about half a mile distant from the barracks. When the wind sets from that quarter, the smell is sometimes complained of. A kiln in which to burn the filth is in course of construction. 15. Each barrack (holding half a troop) is lighted by four single wick oil lamps. In no case is the light given by the barrack lights sufficient for a man to read by, and those men who wish to read are obliged to purchase oil and lamps for themselves. We would recommend that similar lanterns to those used on board of Her Majesty's troop ships (swinging lamps and deck lamps) should be introduced as an experiment. 16. No arrangements for drainage exist in the barracks. All deposits, waste water, filth, &c., are removed to a specified locality by the sweepers. There is no drainage for carrying away the refuse water from the wash-houses, cook-rooms, priviès, &c. In the two new barracks there are two small pits, about nine feet from the end of each building, which are cleaned daily. In the other barracks the water runs out into tubs. The urine is deposited in iron vessels, which are emptied three times a day, by sweepers, into leather bags, and these are carried away by bullocks, and emptied at a proper distance from the barracks. The buildings used as barracks and hospitals are all dry in the dry weather, which lasts nine months, but are wet and damp during the remaining three months. The primary cause of the damp is the excessive amount of moisture in the air during the wet season. Pans of lighted charcoal are placed in the rooms, for as long as may be deemed advisable, when necessary. As before mentioned, all refuse, both fluid and solid, is carried away by the sweepers. There are small cesspools, three feet by three feet by three feet; but, as above mentioned, they are daily cleaned out, and are not in the vicinity of any wells. There are no ditches near the station. 17. The surface cleansing of the cantonment is done by natives, and, so far as the defects stated above will allow, is well done. Everything solid is removed daily, or twice a day, to a spot half a mile distant, to be burnt. The manure is removed daily to a distance and sold. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, and the hedges in the camp are kept cut to a certain height, so as not to interfere with the ventilation of the station. We would recommend that householders should be forced to remove these hedges, and substitute low masonry or brick walls. We are also of opinion that all hedge rows outside, but in the vicinity of the camp, and on either side of the road, leading from Poona to Kirkee, should never be allowed to exceed 3 feet in height. 19. The drainage of the bazaar in this station is less objectionable than is usually the case in most Indian bazaars, and, not being crowded, there is little fault to be found in the ventilation. The river runs within 80 yards of the base of the bazaar, so that the water supply is sufficient. The bazaar is kept clean. Latrines have been much wanted for the station. These have just been sanctioned, but an extra one is specially needed for the bazaar people. The chowdrie of the Kirkee bazaar, which belongs both to the regiment and the station, inspects it daily, to see that it is kept properly clean. The conductor also visits this bazaar four times a month. The dust is carted away to the jungle in the same way as in the Sudder bazaar in Poona, and by the same establishment. The native houses near this station are of fair average construction, and there are no dung heaps nor cesspits within them. No nuisance is experienced in barracks from wind blowing over the native houses. 20. There are no slaughter-houses at Kirkee, the meat for the soldiers being supplied from Poona. 21. The camp bazaar horses are picketed outside and to leeward of the followers lines and the bazaar, in places about half a mile distant from the station, and to leeward of the barracks. The manure is carted away by the surrounding gardeners, tile makers, &c., or taken to the jungle. It is cleared away daily. Horses for private purposes are kept in stabling in the compounds of the house owners, and the manure is disposed of as above. 22. There are no stables, except for sick and delicate horses. The horses of the regiment are picketed out in lines; but these lines are not to windward of either the mens' barracks or the hospital. The manure is removed daily by the native followers, and sold to a contractor. The horses are picketed in open columns of troops (from 30 to 40 horses in each line), distant about 80 yards from the barracks, and about double that distance from the hospital. 23. The quarters for married non-commissioned officers and men are sufficient in number, but extremely bad in construction, except a portion for the superior non-commissioned officers, for whom the accommodation is excellent. There are no married people in barrack rooms.
Officers' Quarters.	1. There are no officers' quarters at this station, but the officers rent houses built for them by speculators in the cantonment. As regards any sanitary improvements we have no suggestions to offer.
IV. Health of the Troops.	1. The station, district, and adjoining native population are healthy. 2. Spleen disease is very rare here, but at the setting in and termination of the rainy season, bowel complaints and fevers of the intermittent and remittent types prevail; during the hot season eruptive fevers, particularly variola, varicella, and rubeola, and during the wet and cold seasons catarrhal and rheumatic affections are prevalent. 3. This healthiness is attributable to the elevation and the trap formation of the surrounding country, its freedom from alluvial deposits, and the general prevalence of westerly or sea breezes, and to good water. 4. The regiment came straight from England, and landed here in October 1858; the men were healthy on disembarking. The chief diseases since have been fever and diarrhœa, and about six deaths from cholera. The married men's quarters, on the right flank, are very bad, ventilation deficient, and during the rainy season they are very damp. 5. The men at this station are not camped out. 6. We have never been in charge of troops at hill stations. The following replies are founded on the opinions of C. Moorhead, Esq., M.D., late acting superintending surgeon at Poona, and published in "Transactions of Bombay Medical Society." His experience and researches are favourable to hill stations for troops, provided a proper season is chosen for sending them; and, if sick or convalescent, a proper selection made. His experience is founded on personal knowledge, and the reports of medical officers stationed at Malcolm Pait, on the Mahableshwur hills, and at Poorundhur. 7. Dr. Morehead states, if the debilitated soldier, who in the plains would recover his health and strength slowly after the removal of positive disease, will (by commencing a residence on the hills in October, or during the hot months, having become fitted for duty) be less liable to fresh attacks of disease, and, when attacked, the disease will be of a milder type, whereas, on the other hand, the continued residence in the plains leaves him predisposed to

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	attacks of the severer forms of disease. The ultimate effect of a freer use of hill climates must be to reduce mortality and invaliding. He disapproves of sending troops during the cold or rainy months, if sick, as liable to be injured by a return of former diseases. 8. Hill stations should decidedly be selected for troops, but only as a change of climate. 9. Convalescents sent to the hills in the cold and rainy seasons are liable to recurrences of organic visceral disease. Again, if troops go to them exhausted by service in the field, they are liable to congestive, inflammatory, and organic visceral diseases, otherwise they are only subject to mild hill diarrhœa, and the general effects of a rarefied atmosphere. 10. Concerning diet, clothing, shelter, exercises, &c., no data are given in Dr. Morehead's report. The inference, however, is clear that, as there is liability to the formation and recurrence of visceral disease, cerebral excitement, and other complaints of the sthenic type, the diet should be of a non-stimulating nature, the clothing adapted to a climate much cooler than that of the plains, the shelter affording perfect protection from fogs, rain, and the direct rays of the sun; the duties and exercises depending upon the improving health of the soldier. 11. From the reports of the medical officer of the Deccan hill stations, it appears that, from the commencement of the month of March to the middle of the month of November the greatest advantage to health will be gained by the debilitated or convalescent from disease at Poorundhur; the rainy portion from June to October is inapplicable to Malcolm Pait. The healthy soldier may reside with advantage at Poorundhur and Panch Gunny at any season. As far as practicable, all ailing men should be afforded one month's residence in the hills; but the period required for complete restoration will vary in different cases, and its determination should be left to the discretion of the medical officer in charge of the sanitarium. 12. Applying the question to the hill stations of the Deccan, as affecting the health of troops returning to the table land on which the military stations are situated, or to other stations in this presidency, Dr. Morehead states that the hill climate from the middle of November to the end of February might not prove injurious; still it possesses no advantages over that of the Deccan, and that season is most suitable for return to all stations in the plains. 13. Proper selection of period, and good ambulance, are the precautions necessary for protecting the health of troops on their leaving hill stations for the plains. 14. Dr. Morehead says the question has been often raised, would a regiment fresh from England, located at an elevation of, say, 7,000 feet, retain its European vigour? Doubtless it would, a deduction being made for a rarefied atmosphere. But this regiment would not be efficient for the contingencies of service in India, and if suddenly called to the plains for service in the hot season, it would show a heavy sick list and a rapid loss of vigour and stamina would ensue. But an improved state of general health will accrue to the soldier in India from an improved sanitary system, including the avoidance in the hot season of the heat of the plains by a more extended resort to hill stations. The maintenance of the greatest degree of health and efficiency for the ordinary contingencies of service in a tropical country, is to be obtained by avoiding, as much as possible, unhealthy localities and seasons, such as localities with malarious characteristics, the hot season all over India, and the rainy season in many parts of it. These points attended to, frequent change (which is most harassing to the soldier) will be quite unnecessary, and can only be deemed even advisable when troops are located in unhealthy districts. 15. The amount of barrack and hospital accommodation provided at hill stations is totally insufficient. There are two recognized sanitaria in the Deccan, viz., Malcolm Pait, established in 1828, and the hill fort of Poorundhur in 1852. European troops have not been located at the former, but there are Government quarters for 16 sick officers, and also 77 private bungalows. Upwards of 300 visitors resort there annually, with such a favourable result to health that, with proper hospital and barrack accommodation, it might be rendered an equally favourable sanitarium for troops, except during the rains, when the fall of rain, about 240 inches, renders it uninhabitable. But at a distance of 10 miles, on the eastern slope, Panch Gunny, at about 500 feet less elevation, with a fall of only 80 inches, would render this circumstance avoidable. At Poorundhur there are two barrack rooms, affording accommodation for 100 men, a very good hospital for 40 sick, a patchery for 10 families, and a small female hospital. The sanitarium may at present be considered sufficient for 130 soldiers and 10 families. 16. An average height of 4,000 feet above the sea affords the most suitable sites for hill stations. 17. The nearest ground (higher than the station) is Poorundhur, distant about 25 miles, and with an elevation of 4,200 feet. Its means of access are very indifferent. There is much atmospheric dryness in March, April, and May, and the rain-fall during the rainy season is 72 inches, when Poorundhur is frequently enveloped in mist. Its mean temperature in the cold season is 67° 5′, in the hot season 75° 5′, in the rainy season 67° 4′, and in October 69° 6′. 18. Surfaces of the trap formation as in the Deccan generally, and also where sand with the detritus of metaphoric rocks prevail, are the most healthy for stations; but where the surface is an alluvial of the peat formation, as black soils, it is most unhealthy, as in Guzerat. 19. Soldiers should on no account proceed to India before 20 years of age, and should land there at the commencement of the cold season, viz., November. In this presidency, when landed in Bombay, troops are first located in barracks situated either in the centre of the Fort or at the end of a spit of land, "Colaba," both of which sites, and the nature of the barracks, have been repeatedly condemned as most unhealthy. The clothing, drills, and marches are according to the season, and the duties are excessively heavy for troops on arrival in such a depressing climate as that of Bombay. If they arrive early in the cold season, they should be at once drafted to their respective regiments, as soon as they have been properly equipped, or to be at once removed to the table land of the Deccan, and to remain there until the opening of the next cold season. Suitable clothing should always be provided for troops immediately on their arrival in Bombay. 20. Troops should be sent to India direct from the home depôts, so as to arrive early in the cold season. Regiments on arrival in Bombay should commence their tour of service in the Deccan table land, as far as practicable. 21. The transport of troops from Bombay to the centre of the Deccan table land is by railway, and from the Deccan to the different out-stations by bullock-train, or marches. The precautions to preserve health are, to march in the cold season; that the marches do not exceed 12 miles, and are made between 2 and 7 a.m., with a halt every fourth march for one day; a

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	careful selection of encamping grounds as regards soil, good water, and avoiding neighbourhoods of large native towns on account of probable presence of epidemic disease; good tents, not crowded, and with tarpauling floors, coffee before starting, and no grog before first meal. 22. A British soldier should not serve in India for a period exceeding 12 years, but the President is of opinion that it should be limited to 10 years. 23. The invaliding boards in this presidency are composed entirely of medical officers, and there is no conflict of opinion between them. We would suggest that these boards assemble oftener to afford a more frequent opportunity for the sick soldier being sent home. 24. Invalids proceeding home should leave India in January or February as the most favourable months, and not later than the first week of March, so as to ensure their arrival in England in June, together with a fine and favourable passage, except in cases of a special nature, when they should go overland at all seasons.
Diseases.	1. Inspection parades for the discovery of incipient diseases, at this station, take place weekly, and oftener. 2. No case of scorbutus has taken place among the troops here. 3. The proportion of cases of hepatic disease usually under treatment is 1 per cent., it is generally combined with dysentery; it is to be attributed to the effects of the climate and constitutional predisposition or intemperance. 4. Dracunculus is occasionally prevalent at this station. The origin of this disease has not been determined, and its propagation is involved in obscurity. 5. The proportion of cases of venereal disease among the European troops is 14 per cent., and among the native troops about 3·5 per cent. To diminish the liability of the soldier to these diseases I would suggest the strict examination from time to time of the prostitute class, and the removal of those diseased from the bazaars. The establishment of lock hospitals would be greatly advantageous to the health of the army. 6. The troops at this station suffer from the following diseases, viz.:— *Fevers*, intermittent, of the tertian and quotidian types, and also from remittent. *Dysentery.*—Acute, the result of chills; and sometimes attributable to habits of intemperance. *Cholera.*—The different forms of Asiatic cholera. *Small-pox* is not frequent. *Rheumatism.*—Frequent. The following is the proportion which admissions and deaths from these diseases bear to the total admissions, and deaths. Total admission from all diseases during the year 884. Admissions from fever 192; 2 deaths. Proportion of admissions of all fevers to total admissions 21·7; of deaths to admissions 1·0 per cent. Cholera, admissions 7, proportion to total admissions 0·9; deaths 3. Small-pox, none. Rheumatism, admissions to total 2·0 per cent.; deaths none. 7. The nosological character of the more frequent zymotic diseases is as follows:—Intermittent fevers, generally of the tertian type. Acute dysentery, diarrhœa, carbuncle, rheumatism, continued fevers, generally mild; gonorrhœa, syphilis, and ophthalmia. These diseases mostly occur before and after the rainy season, and sometimes during the hot months. These diseases are accompanied by an atmosphere generally oppressive, muggy, and loaded with electricity; they are also frequently preceded by thunderstorms. The European troops at this station exhibit no particular predisposition, from personal habits or condition, to these diseases. The poor natives, occupying small huts or otherwise, crowding together, and having a national objection to the admission of air and light into their dwellings, sufficient causes exist to predispose them to the above diseases, especially among the lower castes, owing to their filthy habits of living and eating. 8. The prevalence of epidemic disease among the soldiers is partly due to the following causes. On the march and in the field curiosity, and other causes, inducing both Europeans and natives to go into the towns and villages near the camp, where epidemic disease is generally prevalent, their careless exposure to the mid-day sun even when exhausted after the march, and their drinking the roadside water. In cantonments there is nothing in their duties or occupations to render them liable to this class of diseases; precautions being taken to prevent their appearance. 9. Small doses of quinine have not been given as a prophylactic, at this station, against malarial diseases. 10. Epidemic disease very rarely prevailing among the troops of this station, it is not apparent that any permanent measures are required for its prevention or mitigation.
V. INTEMPERANCE.	1. The soldiers at this station are usually very temperate. The strength of the regiment is about 580, and 3 only have been tried for habitual drunkenness; but 10 others get drunk on every available opportunity, and drink hard. 2. The proportion of admissions into hospital from diseases caused directly by intemperance is 1 in 361. No statistical records are kept in European hospitals to show the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteens as furnished by the commissariat department; but are forbidden to the soldiers in the bazaar. The quality is good, and the quantity allowed to be drawn by each man is one dram. Spirit forms no part of the soldier's ration at the station; but it does both on the march and in the field. The quality is good, and the amount two drams each man per diem; but it is not a habit to give a man a dram before morning parade. Spirit is never given as a ration to convalescents. I am not aware of any drinks, other than intoxicating drinks, being sold at the canteen or in the bazaar. 4. If taken in moderation and diluted, spirits are not injurious to the health; but the drinking of them interferes with the efficiency and discipline of any corps. 5. It would be beneficial to abolish the sale of spirits in all bazaars, but not in canteens. 6. The use of malt liquors or wines are to a considerable degree less likely to produce visceral congestion, the fertile source of all tropical diseases, than spirituous liquors; spirits producing the same effect on the system as the elevated temperature of the tropics. 7. Coffee, tea, lemonade, soda water, &c. are much used at this station; but there are no data to enable me to say what influence they have on health, efficiency, and discipline as compared with spirits and malt liquors. 8. The spirit ration no longer exists in cantonments; but porter is given as a substitute, and with benefit to the health of the troops.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	9. The prohibition of the sale of spirits in canteens in England has answered well. 10. I have no recommendations to make on these points, saving those already advanced. 11. No liquor is allowed to be sold in the bazaar to European soldiers or their wives or children, and all natives acting as soldiers' servants must drink their liquor at the shop. The kelals are responsible for the due observance of these rules. The liquor sellers must buy their supplies from the contractor, and from no other person. No spirits are allowed to be brought into the cantonment, unless covered by a pass, and no liquor is allowed to be sold, except between the hours of 6 a.m. and 8 p.m. The bazaar orders and regulations are seldom infringed, the penalties being very heavy on conviction.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows:—1 lb. bread, 1 lb. meat, beef (mutton twice a week), 4 oz. rice, 2½ oz. of sugar, ⅝ oz. of tea, or 1⅓ oz. of coffee, 1 oz. of salt, 1 lb. vegetables, according to season, but at all times ½ lb. of potatoes, 3 lbs. firewood. The soldiers have three meals per diem, and the only periodical changes are in the vegetables. A responsible inspection of the constituents of the ration is made by the orderly officer and quartermaster. 2. The daily ration is composed as above. The men have three meals a day at this station; viz., breakfast at 8 a.m., bread and tea (the men generally, however, provide themselves with meat, at their own expense, for this meal); dinner at 1 p.m., consisting of soup, meat, and vegetables; tea at 7 p.m. The stoppage per man is 3½ annas. The men have a cup of coffee and a biscuit early in the morning before going to parades, which they purchase, but it ought to form a part of their daily ration. No fruit is allowed as part of the ration. The proportion of vegetables varies according to the season, but at present the one pound is composed as follows, viz., ½ lb. potatoes, ¼ lb. cabbage, and ¼ lb. onions to each man daily. 3. The president is of opinion that a larger proportion of vegetables should be allowed in the hot season. Precautions are taken that no part of the rations is disposed of by the troops, by a non-commissioned officer being made responsible for them until they are served out to the men at the hours appointed for meals. 4. The means and apparatus for cooking available at this station are of the most simple description. Large and small copper vessels, tinned twice a month, and oftener if necessary, resting on iron stands over wood fires, and a spit for roasting. There is an oven in each cook-house, but too large to be of any use. The kitchens are not sufficiently large, and, being overcrowded by native cooks, are not so clean, light, or well ventilated as they should be, but they are amply supplied with water. The food is boiled, curried, stewed, and fried, and the cooking is good, tea and coffee included. By a regimental arrangement, the men have a cup of coffee or tea and a biscuit before a march, but the charge for this is additional to that for the regular ration. 5. Gardens are of no use in India to a cavalry soldier, as his mornings and evenings are always occupied.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress and accoutrements in use here in the cold season are the same as those in England. During the hot weather they consist of wicker helmets with a puggre, two khakee jackets, six pairs of white trowsers, eight calico shirts, two pairs of drawers, six pairs of socks, three flannel waistcoats, and two flannel belts. I consider the present dress as suitable to the climate; but the cloth tunic and trousers should be of a light material. When troops are on field service in the hot season, they should be supplied with cummerbunds, as a protection to the spine and stomach from sun-heat. The guard dress, from 1st October to 15th June, is khakee clothing by day; but at night black or blue trousers, with red serge tunic, occasionally changing to the cloth tunic in cold nights. From 15th June to 30th September, red serge tunic, with black or blue trousers, both by day and night, are worn. The great coat is taken on guard and worn when desirable, and the men mount with packs, but do not carry them on sentry. There are permanent guard-rooms, with sun-shades, for the sentries, large enough to walk under. We would also recommend that a quilted moveable lining be provided to button inside the khakee jacket to protect the spine and loins from the heat of the sun. The present guard dress in the hot weather is khakee, with cloth overalls at night, and wicker helmets during the rest of the year. The men are protected suitably on guard from sun and wet.
Duties.	1. As regards health, it would be advisable that the men should be thoroughly drilled at home before being sent to India. 2. There is generally a mounted drill of about an hour and a half duration about four mornings in the week; after that "stables" for about three-quarters of an hour; and a foot drill in the afternoon twice a week, about three-quarters of an hour in duration. The men do not suffer from drill or work, only from *ennui*. The best hours for drills, parades, and marches are—drills in the cold weather from daybreak till 8 a.m., in the hot weather till 7 a.m., and marches so as to arrive on the camping ground by sunrise. Orders are occasionally issued on these points in the hot weather. The average number of nights the men here have in bed during the week is six. 3. The furthest guard from the barracks is the bazaar guard, about one mile distant. All regular guards last 24 hours. There is a roll-call at 11.30 a.m., at reveille in the morning at 5.30, and names are called over in the barracks. In this part of India the nights are quite healthy, and exposure to the night air has no injurious effect on health.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation available at this station:—North and South Ball Courts, schools with good schoolmasters, and a library and reading-room, by subscription among the men. None is provided by Government; but a grant of 200 old volumes was made in its aid by Government. The following do not exist here for the men, but are much required by dragoons, viz., day room, soldiers' clubs, soldiers' gardens, workshops (except for the ordinary regimental tradesmen). There is no theatre, no skittle ground, no gymnasia. If these were supplied, the means would be sufficient to keep the soldier occupied during the wet season and heat of the day. A dragoon has so much to do, morning and evening, that he is comparatively little inclined to knocking about during the day. Every endeavour, however, as far as persuasion and personal influence can effect, is used to prevent the men exposing themselves to sun and rain. A room should be set apart for a theatre; a reading-room separate from the school-room, as it is found inconvenient to have them combined. If the fives court were covered in, it

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	would afford amusement during the day, and also be suitable for rackets. A skittle ground is highly desirable; a workshop for men to follow their trades is absolutely necessary. Every facility should be afforded to the industrious soldier to follow his trade. At present they have no means for such employment, and of assisting their comrades. Gardens would prove advantageous as a recreation. 2. In addition to the means mentioned above, we would recommend the adoption of a room well supplied with foils, single-sticks, masks, &c., which would be conducive to the men's health, amusement, and efficiency, as dragoons. 3. Savings' banks are instituted, and are found advantageous. 4. There is not sufficient shade afforded by trees, verandahs, &c., to enable the men to take exercise without injury to health.
IX. Military Prisons.	1. There are no military prisons, but we would strongly suggest the adoption of one at this station for the troops of this division. The cells are sufficient in number, but are deficient in arrangements and detail. If they are retained, a house is required for a provost-serjeant, with a wall and railing to encircle them; also a guard-room at the entrance, a shed for exercise and drill, and a cook-house. Privies are absolutely needed.
X. Field Service.	1. There are no local regulations for field medical service, not included in the General Presidency Regulations. 2. According to the existing regulations in the local army, medical officers can only make recommendations, and it rests with the military authorities to carry them out, the medical officer having no authority *per se*. By the new medical code of the Royal army these duties are much better defined. 3. The selection of camping grounds, and the sanitary arrangements, cleanliness, &c. of the camp, rests with the Quartermaster-General's department. Instruction and rules as to the choice of proper sites, water, soils, &c., should be published as a means of guidance. Water is supplied to the men by puckul bheesties, and to the hospital by a permanent establishment, according to strength. 4. Regulations as to field hospitals, ambulances, transport of sick, &c., will be found by a reference to the General Presidency Regulations, and the Medical Codes of the royal and local armies, in the office of the Secretary of State for India.
XI. Statistics of Sickness and Mortality.	The following Tables give the information under this head.

Kirkee.—European Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	H.M. 10th Hussars	680	286	2	—	—	128	3	72	1	309	17	9	1	—	—	755	1	1,559	25	229·2	3·6
1851-52	Do. do.	702	436	6	—	—	103	3	35	—	300	4	3	1	—	—	657	1	1,534	15	218·5	2·1
1852-53	Do. do.	705	664	1	3	—	68	1	33	—	254	1	3	—	—	—	668	1	1,693	4	240·1	0.5
1853-54	Do. do.	691	681	4	—	—	57	—	19	—	195	—	6	—	10	7	630	—	1,598	11	231·3	1·5
1854-55	Do. do.	662	395	1	1	—	31	1	24	2	165	4	9	1	—	—	422	2	1,047	11	158·1	1·6
1855-56	Do. 14th Light Dragoons	720	275	2	1	—	23	1	33	—	64	1	17	—	6	1	606	1	1,025	6	142·3	0·8
1856-57	Do. do.	686	137	1	1	—	16	1	25	—	60	1	24	1	1	—	429	—	693	4	101·0	0·6
1857-58	Do. 3rd Dragoon Guards Do. 14th Light Dragoons Do. 17th Lancers	967	120	—	1	—	66	—	27	3	71	—	6	—	—	—	353	—	644	3	66·5	0·3
1858-59	Do. 3rd Dragoon Guards Do. 6th do. Depot do. 14th Light Dragoons Do. 17th Lancers	1,014	533	5	3	—	86	—	24	1	216	5	155	2	—	—	750	2	1,767	15	174·2	1·4
1859-60	Do. 6th Dragoon Guards Do. 14th Light Dragoons	1,199	392	1	3	—	123	3	47	2	289	7	51	1	7	3	880	1	1,792	18	149·4	1·5

Women and Children.

Years.	Corps.	Women.									Children.								
		Strength.			Treated.		Died.		Ratio per cent. to Strength.		Strength.			Treated.		Died.		Ratio per cent. to Strength.	
		Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.	Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.
1852-53	Her Majesty's 10th Hussars	70	2	72	127	—	3	—	176·3	2·7	114	5	119	112	7	12	1	100·0	10·9
1853-54	Do. do.	64	3	67	92	2	1	—	140·2	1·4	108	6	114	61	7	2	—	59·6	
1855-56	Do. 14th Light Dragoons	48	18	66	19	6	—	—	37·8	—	82	25	107	26	6	1	—	29·9	0·9
1857-58	Do. 3rd Dragoon Guards	3	—	3	—	—	—	—	—	—	2	—	2	—	—	—	—	—	—
	Do. 14th Light Dragoons	52	11	63	—	—	—	—	—	—	97	21	118	1	—	—	—	0·9	—
1859-60	Do. 6th Dragoon Guards	10	1	11	—	—	—	—	—	—	15	4	19	—	—	—	—	—	—

By order of the Principal Inspector-General, Medical Department,
W. C. Coles, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

KIRKEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. A plan of the hospital is transmitted. The site is good, freely ventilated, and healthy; indeed, the most healthy in the neighbourhood. 3. Bhecsties supply the hospital with water in sufficient quantities, as it may be needed. 4. There is no regular system of drainage in the camp, it not being allowed by the Government regulation; but all refuse water and other impurities are carried away by sweepers to such a distance from camp as to ensure perfect impunity from noxious influences. 5. The floors of the lowest wards are raised three feet above the ground, but there is no perflation of air underneath. The roof water sinks into the subsoil. There is no surface drainage or guttering, but from the porous nature of the soil, and the situation of the hospital, the rain fall is rapidly carried away. The hospital is built of brick and lime; the roof is double-tiled, with teak trusses; the walls are single, and the floor paved. The roofs and walls are sufficiently thick to keep the hospital cool. There are verandahs to the inside of the hospital, but they are also required on the east and west outer sides. They answer well as protection from the sun's rays, and are not used for the accommodation of sick, convalescents, and others. The hospital is on one flat.

TABLE of HOSPITAL ACCOMMODATION.

Date of construction - - - - - -	1830
Two additional wards added in - - - - -	1850
Total number of wards - - - - -	6
Total regulation number of beds - - - - -	100

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
6	2 small Wards capable of containing 10 sick each. 2 middle Wards capable of containing 12 each. 2 Wing Wards for 28 sick each. 100 Beds - -	360	24	Mean. 16½	142,560	1,425	86⅔	Ft. in. 1 4	46	7	5

The hospital is placed so as to receive the full benefit of the prevailing winds. The windows open into the wards, and are conducive to ventilation.

6. The ventilation is effected by doors, windows, and cowl ventilators in the roof; but they are scarcely sufficient. A portion of the roof should be raised a foot above the lower part entirely round the building. There are no jalousies or jhilmils.
7. The air admitted to the wards is cooled by kuskus chicks to the windows, saturated with water during the hot season. Punkahs are also required.
8. There is no necessity to warm the air, but stoves in the monsoon might be advantageous. The walls and ceilings of the hospital wards are cleansed and lime-washed every three months, and oftener if necessary.
9. The privies are washed out frequently by the sweepers, and, a deodorizing material being used, are not offensive.
10. Tubs and basins, with an ample supply of water, are alone supplied in the hospital, and permanent lavatories, with shower-baths, are much needed.
11. There are no permanent bathing places for the sick, and are much required; hot and other baths in general use are supplied to them.
12. The Commissariat department wash and dry the hospital linen. Means for drying are much wanted.
13. The storage is sufficient and dry.
14. Iron cots are used in hospital, with a straw mattress. Cocoa-nut shreds ought to be used in place of straw; it would be much cooler and more comfortable, and could be well washed after ordinary cases.
15. The hospital kitchen is at one end of the enclosure. Brass and copper utensils are used in cooking, and these are tinned every month. Diets are properly cooked and varied.
16. The diet tables and returns used in the European hospitals are forwarded.
17. The establishment for attendance on the sick is composed as follows, viz., hospital serjeant, ditto steward, apothecary, 2nd ditto, dresser, compounder, apprentices, and ward boys. These are sufficient.
18. The sanitary condition of the hospital is good. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards.
19. I would suggest the following improvements for the hospital at this station; verandahs round the outside, distinct ward for obstetric cases to be attached to the female hospital with better accommodation for the matron and ward boys, and on account of Kirkee being such a long way from Poona, a small native hospital is much required at the station.
20. Convalescents unable to take walking exercise are carried out in doolies. There is sufficient ground round the hospital, but no shaded walks or seats.
21. There is a female hospital for soldiers' sick wives and children, with an European nurse and native assistant; but the accommodation is too small, which renders it often necessary for the medical officer to attend the women and children in their own quarters.
22. There are no special local hospital regulations not included in the general Presidency Medical Regulations.
23. The medical officer has sufficient power in all matters appertaining to the sanitary state of his hospital, repairs in buildings, change of diet, &c., &c., but in consequence of the crippled state of Indian finances, many recommendations, acknowledged to be desirable, cannot be immediately carried out, on the constant plea of want of funds.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	24. There is no convalescent ward here, but such accommodation would be desirable.
VIII. Burial of the Dead.	1, 2. The burial ground for British troops is rather more than a mile from the station and to leeward of the cantonment. Its area is 8,500 square yards; its soil black soil, and its subsoil moorum. There is no artificial drainage, but the river acts as a drain to it. The ground is hardly so well kept as it might be. 3. The grave space allowed is 7 feet by 3½ feet, and the interval between the graves is never less than 2 feet; the depth is 6 feet. Graves have never been reopened. Interment is compulsory at ordinary times within 12 hours, and during epidemics from six to 12 hours. 4. The grave yard is never offensive. British troops are buried agreeably to the orders of the home army. 5. The dead of camp followers and bazaar people are disposed of as follows, viz., Parsees are removed to towers of silence near Poona, Hindoos are burnt, and Jews and Musselmans are buried according to religious caste. A native Christian burial ground is much needed. 6, 7. No injury accrues to the public health from the present practice, nor have we any improvements to suggest in the way of regulation or otherwise in the burial or disposal of the dead.

(Signed) C. Cameron Shute, Colonel 6th Dragoons,
Commanding Poona Brigade and Station.
Wm. Deeble, Surgeon,
56th Regiment.
W. J. Stuart, Surgeon,
H.M. 25th Regiment Native Light Infantry.

Poona, 5th September 1860.

NUSSEERABAD.

Accommodation	Queen's Troops	Artillery	124
		Cavalry	609
		Infantry	914
	Native Troops	Artillery	178
		Cavalry	208
		Infantry	700

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is a large sandy plain, dotted with cultivation, dwarf trees, and numerous tanks. It is flat and dry, with a range of hills about six miles to the north-west. There is very little wood or jungle in the vicinity. 2. The elevation of the station above the sea is about 1,500 feet. It is from 50 to 60 feet above the adjacent country, and from 40 to 50 feet above the nearest water. There is no adjoining higher ground suitable for a military station. 3. There is a range of hills running north-east and south-west, about six miles from the station, from 300 to 400 feet high. 4. The nearest water is a large tank called "Bhotaya Khera," distant half a mile. There are two other large tanks close to the southern boundary of the cantonment. These tanks are liable to overflow during the rainy season, but cease almost immediately after the termination of the monsoon, the water being drawn off for the purposes of irrigation. The two latter tanks become dry in the cold season, and their beds are cultivated. There are some ravines, but they are the natural watercourses, leading into the different tanks. 5. The station is openly situated, its elevation is higher than the adjacent country, and it is freely exposed to winds. The temperature of the station is not raised to any considerable extent by the buildings being exposed to reflected sun heat. During the hot season, which prevails from the middle of March to the middle of July, the prevailing winds are from the south and south-west. These are scorching, and in order to keep the barracks cool kus-kus tatties are used. During the monsoon the winds are variable and pleasant. In the cold season, from November to March, the winds are from the north and north-east. The troops are healthiest in the hot season and gain strength in the cold. 6. The surrounding country beyond the limits of the cantonment is cultivated. There are no public works of irrigation; artificial irrigation, however, has no bad effect on health. No cultivation is permitted within camp limits, but a very inconsiderable quantity of rice is grown near the Bhotya Khera tank. Indigo and hemp are grown in different parts of the province, but not in the immediate vicinity of the camp. No injury or nuisance is sustained from it. 7. Ajmere, about 15 miles distant, is the only large town near the station, but there are a number of villages at various distances from it. The station bazaar itself has a very large population, amounting to upwards of 15,000. 8. The geological structure of the district belongs chiefly to the metamorphic group of rocks. The sub-stratum consists for the most part of transition gneiss, reached at a depth of a few inches in many places, while here and there the bare rock appears. In some situations the soil is many feet in thickness; it is formed of disintegrated rock, chiefly decomposed felspar (one of its constituents), producing a clay of considerable fertility and moisture. The ground appears never to have been pre-occupied by population. 9. During the dry season water is found from 10 to 50 or 60 feet below the surface, according to situation, and as a general rule at the same depth in the rainy season.

NUSSEERABAD. BOMBAY.

References to Subjects and Queries. | REPLIES.

I. Topography—*cont.*

10. There are no surface springs, and the cantonment being situated high the rain-fall flows readily off. The drainage is from and not into the cantonment, and what little is not carried off by natural and constructed outlets sinks rapidly into the ground. No drainage from higher ground passes into the subsoil of the station.

11. The water supply of the station is derived from wells and tanks. The extent of tank surface within the station is 46,309 square yards, and within half a mile of it 2,899,125 square yards. The tanks fill during the rainy season, and have a fresh supply from rain-falls during the end of December or beginning of January. They nearly all run dry towards the end of the hot season; and if the commencement of the monsoon is delayed, as has been the case this year, great inconvenience, and even misery, is felt by the inhabitants of the bazaar. The European troops at the station are supplied with drinking water principally from a well at a village a mile and a quarter from the barracks during the hot season. Bathing is not allowed in tanks reserved for drinking purposes. The tanks and wells are generally free from causes likely to pollute them. With regard to whether the tanks within or without the station produce malaria, there is but very little of malarial disease within the station, particularly if the cold season quickly follows the cessation of the rains.

12. The amount of water supply for the station is upwards of 21,000,000 of gallons, exclusive of the supply in the tanks without the cantonment limits, and upwards of 4,000,000 of gallons are supplied from wells in which there are springs. The tanks contain rain water, and its use is not injurious to health. There are eight good wells in camp, and one at the village of Dilwarra, about two miles from the centre of camp, which has a most abundant spring, and it is from here that the principal supply of water for Europeans is obtained. In the other wells the water can scarcely be denominated spring water in the strict acceptation of the term, inasmuch as in many instances it contains such a large proportion of salts as to be unfit for domestic use, and might be classed under the head of mineral water. Where the wells are tolerably deep and regularly worked, the water is generally clear and free from smell, but hard and more or less of a brackish taste derived from the salts, but the flavour varies according to the quantity of salts contained, which is seldom constant, even in the same well; at one time the water from a particular well may be palatable, and at another so loaded with saline ingredients as to be useless. A quantity of water was taken on several occasions from a well in the cantonment, used and pronounced wholesome by the natives, and carefully evaporated to dryness, when saline matter, together with some vegeto-animal impurity, was found in the very large proportion of 1 in 200. The salts consist principally of chloride of sodium and probably other chlorides, with various sulphates, chiefly those of alumina and potassa. The water is raised from wells, by means of ropes and buckets, by bheesties, who fill their mussacks, and distribute it as required. It is also conveyed in water carts, and in larger mussacks carried by bullocks.

13. No reply to this query.

14. New stations are usually selected by committees assembled by order of the Commander-in-Chief. A medical officer, usually the superintending surgeon of the division, is one of the members.

II. CLIMATE.

1. A thermometer and rain-gauge are the only available means for conducting and registering meteorological observations.

2. Table of meteorological observations from August 1859 to July 1860 inclusive.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.
1859.			
August	77·5	89·0	77·0
September*	81·0	86·0	76·0
October	79·0	84·0	78·0
November	75·0	84·0	66·0
December	64·0	69·0	59·0
1860.			
January	63·0	65·0	61·0
February	67·5	76·0	59·0
March	76·5	80·0	73·0
April	87·0	91·0	83·0
May	89·5	95·0	84·0
June	93·5	99·0	88·0
July	87·5	91·0	84·0

* During the present month up to the 7th September (1860) the range of the thermometer has been excessively high; the lowest range being 84°, and the highest 94° Fahrenheit.

3. During the hot and cold season the climate is dry; during the monsoon it is moist. The cold season commences in November and lasts till the middle of March; from that to the middle of July is the hot weather. The rains generally cease about the 15th September, during the remainder of which month and October the weather is warm and oppressive. Fogs are rare, and when they do occur it is generally towards the close of the monsoon. Dust storms are very frequent during the hot season and last for hours and sometimes during the whole day and night; they have the effect of cooling the air. The heat during May, June, and July is very great, ranging as high as 102° or 103° Fahrenheit in houses and barracks that are not artificially cooled. The monsoon season is more temperate and less subject to variation, the thermometer ranging from 78° to 86°. During the cold months the cold is very sensibly felt and warm clothing is worn throughout the day. Europeans may be all day in the open air without sustaining any injury from sun. The diet issued to the soldiers in India is of the best quality and can scarcely be improved. The shelter should be large, roomy, and well-

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	ventilated barracks. Light khakee clothing should be worn in the hot months, and the usual warm clothing during the monsoon and cold weather. In the cold season the troops may drill and exercise every day, if necessary, and almost at any time of the day, but during the months of March and April they should exercise early in the morning, so as to be dismissed drill by 7 a.m. Evening drill should not commence before half-past 5 p.m. and not last more than one hour. In May, June, and July there should be as little parading as possible, but during the monsoon the troops may parade as weather permits. The most healthy months are from January to August inclusive. The remainder are the unhealthy months, during which fevers, dysentery, and diarrhœa prevail. 4. The want of good drinking water is the great fault at this station; but taking all things into consideration, there is no district or situation near the station better suited for a military cantonment. 5. Lieutenant-Colonel Holmes has served at Bombay, Poona, Surat, Baroda, Rajcote, Sukkur, and Hyderabad (in Sinde), Kurrachee, Nusseerabad, and short periods at Deesa and Sattara, and is of opinion that Poona, Deesa, and Nusseerabad are the healthiest stations. Sukkur and Hyderabad are decidedly unhealthy. Surgeon-Major Durham has served at Bombay, Shikarpore, and Sukkur in Sinde, Ahmedabad, Kaira, Ahmednuggur, Neemuch, and Nusseerabad, and considers Nuggur and Nusseerabad both healthy stations. Kaira is an unhealthy place. Captain Griffith has had no experience with troops, having been in civil employ nearly the whole portion of his service.
III. Sanitary Condition of Station.	1, 2, 3. A map of the station, with plan of the station and ground plan of the barracks, are forwarded. 4. Table of barrack accommodation. Date of construction of barrack, March 1860. Total number of rooms or huts, 9. Total regulation number of non-commissioned officers and men, 786.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			In.		Ft.	Ft.
9 main rooms - - -	80	200	20	16	64,000	1,000	50	14	24	5	4
Gable of do. - - -		200	20	8/2	16,000						
					80,000						
4 corner rooms (each) - -	2	18½	10	11	2,035	1,017·5	92·5	—	2	4½	4
4 do. do. small (each) -	2	10	10	11	1,100	550	50	—	1	4½	4
Guard room - - - - -	- -	50	16	14·5	11,600	—	—	—	3	4	5
Gable portion - - - - -	- -	50	16	5·25/2	2,100	—	—	—			
					13,700						
Prison cells of quarter guard (each)	- -	16	7·5	10·25	1,230	—	—	—	1 1	4 5	3 3½

5. Doors and windows on all sides. The shutters open upwards into the verandah, and are made of canvass, painted and stretched on frame work. There are verandahs on both sides 159 feet long by 10 feet broad. When barrack accommodation is completed it is not intended that the verandahs should be used as sleeping quarters. Heretofore they have been occasionally used when barracks are under repair or new ones in the course of construction. There are no properly constructed jalousies or jhilmils.

6. The bedsteads are wooden charpoys, laced with either cotton tape or cord; some are of iron, and others of boards and trestles. The beddings are cotton mattresses about three-quarters of an inch in thickness. Each man has three cotton sheets, two blankets (country manufacture), and one cotton rug. This bedding is not adapted to the climate of Nusseerabad during the monsoon, the cotton mattress getting very damp during the rains and the blankets not being sufficiently warm during the cold season. The bedsteads, with the exception of those of iron, harbour bugs, and it would be better that iron bedsteads should be generally used. It is difficult to suggest an improvement in the description of mattresses, for if made of any other material than cotton it would be difficult to convey them on a line of march, unless the stuffing of the mattress were of straw, in which case it could be thrown away.

7. The tents used are of three kinds,—1. European soldiers' double-poled two-walled tent 2. European hospital tent; and 3. European soldiers' single-poled tent.

No. 1 are as follows :—

Inner dimensions, 22½ × 14 × 13¼.	Kanauts (or walls) 6 ft. high		to hold 22 men, 100 cubic feet per man, and 15½ square feet per do.
Outer do. 27½ × 19⅔ × 15¾	do.	do.	
4 doors - - 5¾ × 4.			

No. 2.

Inner dimensions, 22 × 14 × 12½	do.	do.	to hold 20 men, 130 cubic feet per man, 15⅓ square feet per do.
Outer do. 27½ × 19½ × 15	do.	do.	
4 doors - - 5¾ × 4½.			

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	No. 3. Dimensions - 13,5 × 13,5 × 12,5. Kanauts (or walls) 6 ft. high { to hold 13 men, 100 cubic feet per man, 14 square feet per do. 2 doors - 5¾ × 3·5. 8. The barracks are ventilated by means of doors and windows. Of the former there are 16 and of the latter 44 in each; and in addition, there are small apertures in the wall on a level with the floors between each window, and a similar aperture 5 feet above each window. The ventilation is sufficient to keep the air pure by night and day, but it is open to the objection of too many draughts during the monsoon and cold weather. The means for cooling the air in barracks and other quarters are by punkahs and kus-kus tatties. The former is used only in the married men's quarters. It consists of an iron rod about ¾ of an inch in diameter and 6 ft. 6 in. long. To this three iron rings are attached for its suspension, and beneath hangs a fringe of coarse cloth about the same length, 9 inches in depth, weighted with leaden grains about the size of shot, procured from the Ajmere mines. The tatties are made of a framing of whole and split bamboo fastened with string made of a kind of grass. The kus-kus is brought in from the neighbouring villages. 9. The new temporary barracks are constructed as follows:—The foundations and plinth and main walls of stone and lime plastered outside; the interior and partition walls of sun-dried brick plastered with mud, and colour-washed; the roofs are of thatch, supported on date post trusses. 10. The floors are of three kinds, all solid, viz., flagstone, chunam, and moorum, but the former are mostly in use. The ground is first filled in with earth to within 6 inches of the plinth level, which is generally not less than 1 ft. 6 in. above the ground, and frequently as much as 2 feet, and even 2 ft. 6 in. The earth is well rammed, and over it a layer of stone and lime about 4 inches in depth is laid. On this rest the flagstones (dimensions 1 ft. 6 in. by 1 ft., and 2 in. thick), the joints of which are set in chunam. Chunam floors are constructed thus:—Over the layer of earth, which is usually from 9 inches to 12 inches above the ground surface, a bed of dry stone chips 4 inches in depth is laid; on this, again, is a kind of concrete of large and small limestones, mixed with sand, and well pounded together; and on top of all is a layer of plaster 1 in. or 1½ in. thick, of fine lime, which, being well beaten and rubbed to a smooth surface, forms the floor. 11. The barracks being temporary, situated on high ground, the floors tolerably well elevated and well ventilated, besides being roomy, the materials may be said to answer very well. It must be borne in mind that this was not a station for European troops previous to the mutiny, with the exception of a company of European artillery. Her Majesty's 83rd Regiment was the first European infantry that occupied the station, and it was necessary to run up barrack accommodation for them as quickly as possible. On the operations against the rebels being completed, the head-quarters and three squadrons of Her Majesty's 8th Hussars were quartered here. For these also barrack accommodation had to be constructed with all expedition. The country is very deficient in good timber for building purposes, and time did not permit of its being procured from a distance; the consequence is, that the wood work is not what would be ordinarily used. Annual ordinary and extraordinary repairs of barracks and cantonments are executed by the executive engineer, and petty repairs by the barrack department. They are quickly executed. The sanitary state is superintended by the quartermaster-general's department. The walls and ceilings of barracks are always cleansed and whitewashed once a year, and oftener on special requisitions. 12. Each of the men's wash-houses is 18 ft. by 9 ft. by 8 ft. The foundation plinth and superstructure is of stone and mud plastered inside and out with lime, and the roof is of babul wood rafters and bamboo battens, with single date mat and single tiles. They have ridges, hips, and eaves, and flagstone floors set in chunam. The walls are colour-washed a blueish grey; they have one door 6 ft. 6 in. by 3 ft. 6 in., and two fixed Venetian windows 4 ft. by 1 ft. 6 in. The cost of one wash-house is about 260 rupees. Tubs are supplied to each building, and the water is brought daily by the water-carriers. 13. The interior of the old cook-rooms is divided by a centre wall into two compartments, giving accommodation for two barracks; the whole building being of stone plastered with chunam. The roof is of slab stone, and egress for smoke is provided by small apertures in the roof, and also by semicircular openings (four on each side). There are two doorways and four windows. The number of cooking places is 36. There is a fixed establishment of washermen for the European troops and for hospitals; they wash the linen, and dry it on lines fastened to poles, which, with ironing, is all that is required in this country. 14. The contents of privies are removed twice a day by sweepers. The urinals are sluiced with water, and drained into absorbing covered cesspools. 15. These buildings are ventilated by doors and circular apertures in the walls. 16. There are no constructed drains and sewers for the barracks; any water that lodges near there is carried off by surface drainage. Being situated on the highest point of the cantonment, all surface water quickly runs off, or readily permeates. During the monsoon there is always more or less dampness; but for nine months in the year the barracks and hospitals are perfectly dry. The system of drainage that obtains in England is not required in this country, the water being carried off as above described. Each wash-house, cook-house, and urinal is furnished with its own cesspit, the contents of which are removed when requisite. The distance of the hospital cesspool is 125 yards from the nearest men's quarters; but there is a latrine belonging to the quarters themselves which is not 20 yards distant from them. The cesspool is distant 97 feet from the hospital. There are no foul ditches, but there are several natural watercourses, and some constructed ones, which conduct the water to the different tanks. 17. The surface cleansing of the cantonment is performed by sweepers every morning; they collect all rubbish and filth, part of which they carry off in their baskets, and the remainder is carted away. The manure is eagerly bought by villagers and people who keep cattle, who convey it away. 18. The surface of the cantonment is kept free from vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station. The ventilation is very good. 19. The main and cross streets of the bazaar have covered drains on both sides, the whole of

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	which empty themselves into the nullah on the west of the bazaar. There are a few wells used for bathing which require drains; they are in the course of construction. The ventilation on the windward side of the bazaar is good, but towards the east the bazaar is much crowded, especially where the coolies and lower classes reside. There are 25 latrines, kept clean by the sweepers to whom they belong, and who are responsible for their cleanliness; they are constantly inspected by the police. There is at present only one scavenger's cart allowed by Government; it was, however, suggested by a committee that assembled in June last that 5 carts and 5 sweepers should be sanctioned. The drinking water is supplied principally from two tanks north and south of the bazaar. There are 30 wells in the bazaar and its vicinity, but only 6 contain drinkable water, which, with the tanks, generally yield a sufficient supply, except in extraordinary dry seasons, when no drinking water is procurable within a mile of it. Each individual is held responsible for the cleanliness of his premises and the portion of street in the front of his house; and each house has a basket into which the sweepings are gathered morning and evening, to be taken away when the sweeper or scavenger's cart comes round. The crowded part of the bazaar will eventually be opened out as its population decreases, which will be when the public buildings now under construction are completed, and there will be no further employment for them. There are no native houses within half a mile of cantonment limits, which are very extensive. No nuisance is experienced in barracks from wind blowing over the native dwellings.
	20. Two slaughter-yards, where sheep and goats are killed, are within the present bazaar limits; and another for slaughtering bullocks just without and in rear of bazaar: they were all originally outside. The butchers are in both places held responsible for the cleanliness of the yards, and sweepers are kept by them to convey the offal as the animals are killed to a place appointed about three-quarters of a mile to the south-east of camp; from which direction the wind very seldom blows. It is contemplated to remove the slaughter-yards 250 yards in rear of the bazaar, the ground for which has already been marked out.
	21. There are not more than 10 or 12 horses belonging to residents in the bazaar, and these are kept in private stables. The camp followers' and grass-cutters' ponies belonging to cavalry regiments, &c. are picketed outside their lines, and the picketing grounds are kept clear under regimental arrangement; the manure is daily taken away by the milk-men, potters, and villagers.
	22. There are no stables for cavalry or artillery horses. No dung-hills are allowed to collect, the manure being sold and carried away, as before stated. The 8th Hussar horses are picketed to the rear of the barracks, and the line of pickets run perpendicular to the front of the barracks at a distance of 90 yards. The native cavalry horses are picketed in front of their lines; the line of pickets running perpendicular to the front and separated by a broad roadway from the lines. The native battery horses are picketed in the same line as the horses of the native cavalry; the lines of the company are situated on the right flank of the horses. The European infantry barracks are situate between the lines of the native cavalry and the native battery. The pickets of the 3rd Troop Horse Artillery run in front of the barracks and parallel to it. Horses are picketed in line,—a troop occupying a double line—horses facing each other. There is a low wall running in front of the horses to protect the fodder. Along the rear of the line a drain is cut, and the ground on which the horses stand is raised and slopes from the wall in front to the drain in rear; there is a space of 9 feet between each horse, and the breadth of the street is 6 yards. Each horse is picketed by one head and one heel rope.
	23. The accommodation for married non-commissioned officers and men is not yet quite sufficient, but will be provided.
Officers' Quarters.	1. The officers live in a line of bungalows running north and south, and each bungalow is situate in a separate compound. The ventilation is good. Drains run along in front and rear of the compounds to carry off the water, and also along the sides, where it is necessary to make watercourses. The arrangements to keep these clear are in the superintendence of the executive engineer, and are well attended to.
IV. Health of the Troops.	1. The station, generally speaking is healthy, and the same may be said of the district. The native population are usually healthy, except during the season of fevers and when epidemics prevail.
	2. The most prevalent diseases among the native population are, fevers, dracunculus, small-pox, dysentery, and diarrhœa. Diseases of the spleen are of common occurrence after fever. Cholera occasionally makes its appearance, but more rarely than in most parts of India; there has not been a case for three years.
	3. The healthiness of the native population is attributable to the superiority of the climate.
	4. The 3rd Troop Horse Artillery came from Persia and Kurrachee. It joined General Roberts' camp before Kotah in March 1858, and was employed on field service in Central India, and came into cantonment on the 28th April 1859. It has received many volunteers from other regiments to replace those who took their discharge. Since arrival here the principal diseases have been dysentery, fevers, and rheumatism. The 8th Hussars arrived in Bombay from England, and were sent up into Rajpootana on field service. This is the first cantonment occupied by the regiment, and one squadron is at the station of Neemuch. They arrived at Kotah on the 28th March 1858. H.M.'s 28th Regiment was quartered in Bombay for about 13 months, and left on the 24th January 1860. The general state of health of the men in Bombay from May 1859 was decidedly bad, the prevailing diseases being fever and bowel affections; asthenic and cachectic conditions of constitutions became thoroughly established, and the health of the regiment undermined. It was subsequently removed to Poona, where the head-quarters arrived on the 24th January; the left wing having been sent to Ahmednuggur some time previously. At these places some amendment took place, when the regiment was ordered to Nusseerabad. The march of the head-quarters commenced from Poona on the 17th February, and was not completed till the 12th May 1860, when the hot season was prevailing. On arrival at Nusseerabad the health of the men was very indifferent, they have since chiefly suffered from attacks of fever, and relapses have been frequent. There was one bomb-proof barrack

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	that was occupied by the Hussars, that was considered rather unhealthy, it had been a sick horse stable, and was used as a barrack on the emergency. The floor has since been flagged, and there is not so much objection to it. There is ample accommodation for the Hussars without it. 5. Troops are not usually camped out, but during the period of the mutinies, the 3rd Troop Horse Artillery, the 8th Hussars, the 4th Co. 3rd Battery of Artillery, the 1st Lancers, H.M.'s 83rd Regiment (now at Belgaum), and the 12th Regiment Native Infantry were constantly on field service. The 12th Native Infantry were stationed at Deesa before coming to the station, and the head-quarters were there for one year and nine months. Five companies came to Nusseerabad and Neemuch six months earlier. 6. No experience of hill stations. 7. From general observation we (the committee) should say that troops would be less liable to attacks of febrile and other diseases on returning to the plains, provided they have resided on the hills a sufficient time to acquire strength and throw off the attacks in the first instance. 8. We have had but little experience on the subject, but would certainly say it would be advisable to select hill stations for troops. 9 to 13. No experience with troops at hill stations. 14. As a general rule, the longer troops can be located on hill stations the more conducive it would be to their health. Frequent change of station in the plains is beneficial. Men weary of being a long time at the same station, and long for change. 15, 16. No experience of barrack accommodation or sanitaria at hill stations, or what ranges of elevation are most suitable for such stations. 17. With regard to the question as to whether there is any higher ground near the station which could be advantageously occupied as a hill station; the hill fort of Tarra-ghur, 15 miles distant, rising 1,000 feet immediately above the city of Ajmere, and about 3,000 feet above the level of the sea, has very limited space on it, and there would not be room for more than three barracks, to contain one company each. This year it is under trial as a sanitarium, and the reports of it are very favourable. The temperature of it is much lower by day, and is usually from 8° to 10° lower than in the plains. The nights are almost invariably cool, being 17° lower. There are two pathways, one very precipitous, accessible only to men on foot; the other is more circuitous, but mules, camels, and pack bullocks can go to the summit. In case of permanent occupancy this road would have to be improved. 18. A dry gravelly surface with a percolating subsoil for stations will be found most favourable to health, but however satisfactory the condition of the surface may be, if the subsoil retains moisture and the temperature is high, malaria will be more or less abundant according to the degree of heat and amount of previous saturation of the ground. 19. The best age for soldiers proceeding to India is 22 years of age, or whenever their constitution is formed by attaining full growth and strength; and the best period for them to land there is in the months of November, December, and January. If there are barracks available at the station where troops land, they are marched into them; if not and the troops are destined to go up country, they are encamped. Their clothing must, in the first instance, be such as they have brought with them; drills and duties depending on commanding officers; or if a regiment garrisons the place it lands at, it furnishes such guards as are ordered by the commandant's authority. Troops on landing should not be detained in Bombay, but marched to some healthy station, such as Poona; they should also be furnished with light clothing suited to the climate, and a helmet and puggree to wear round it. A depôt has been established at Khandalla, where drafts for regiments are to be sent. 20. Troops should be sent direct from home to India when their health and strength is at the best. European troops should be sent to the hill districts on landing, to accustom the men to the climate, and to all the new habits of life, absolutely requisite to be acquired for preserving health in the altered circumstances in which the soldiers are placed, with regard to food, clothing, and temperature. These circumstances, on first landing in India, under the present system, become fruitful causes of disease, when predisposition has been established to a certain degree by the greatly elevated temperature. 21. The mode of transport to the interior can be more effectually explained by the quartermaster-general's department. The troops should be exposed as little as possible to the sun, and all reliefs and movements should take place during the cold weather, *i.e.*, in the months of November, December, January, and February. 22. With regard to the number of years a British soldier should serve in India, it would be advisable to have reliefs every 10 years. Strong healthy men wishing to volunteer might be allowed to do so for a further period of five years, but beyond 15 years it would not be advisable to keep British soldiers in India. 23. In reference to the mode of conducting the business of medical boards as to invaliding; medical committees or boards, both at the Presidency and out-stations, have rules and regulations for guidance, and they work perfectly satisfactorily. 24. The best time for invalids to leave India for home is during the months of January, February, March, and April.
Diseases.	1. The Europeans are inspected once a week for the detection of local affections and any ailments indicated by the countenance or skin. 2. Generally speaking there is no scorbutic disease among the troops, but cases have occurred occasionally among the native troops. It is attributable to the want of wholesome diet and good vegetables, which latter are now grown in abundance. 3. The proportion of hepatic diseases during the last 12 months has been 4 per cent. to other diseases. The principal causes are intemperance, atmospherical vicissitudes, and exposure to draughts, after being in a profuse perspiration from exercise. It is said that the transmission of pus or vitiated secretion to the liver from an ulcerated intestine is a frequent cause of hepatic abscess, but of this I am by no means certain, as I have seen frequently

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	ulceration of the intestines without abscess, and abscess without ulceration, and often both combined. The preventives are temperance, a cool atmosphere, careful diet, and the avoidance of draughts after profuse perspiration from exercise. 4. The proportion of dracunculus to other diseases has been $\frac{1}{25}$ nearly; the cause is drinking water which contains the ova. Filtering or straining the water before using it would greatly diminish its frequency, if not altogether do away with it. 5. The proportion of venereal diseases to all other diseases in hospital is $\frac{1}{8}$. It would be very desirable to establish lock hospitals. 6. The troops at the station suffer from intermittent, remittent, and continued fever. *Dysentery.*—Acute and chronic. *Cholera.*—There has been no case for the last three years. *Small-pox.*—Distinct and confluent. *Rheumatism.*—Acute and chronic. In the 3rd Troop Horse Artillery, from 28th April 1859 to 27th August 1860, the total admissions were 422, and the total deaths were 34. The admissions from these diseases are in the proportion of 68 to 211 to the total admissions, and the deaths are to the total deaths as 2 to 4. In the 8th Hussars, from the 21st May 1859 to the 31st July 1860, the total admissions were 713, and the total deaths 19. Admissions from the above diseases to total were 231 to 713, and deaths to total deaths 13 to 19. In the 1st Bombay Lancers from 1st March 1857 to 31st August 1860, the total admissions were 1,776, and the deaths 11. Admissions from above diseases to total admissions were 161 to 296, deaths to total deaths 4 to 11. In Her Majesty's 28th Regiment for the quarter ending 30th June 1860, the total admissions were 482, and total deaths 5. Admissions from the above diseases are to the total admissions as 263 to 482, and the deaths are as 5 to 0. In the 12th Regiment Native Infantry, from 1st December 1857 to 27th August 1860, the total admissions were 2,561, and the total deaths 15. Admissions from diseases named above are to the total as 1,385 to 2,561, and deaths to total deaths as 6 to 15. In the depôt Company 4th Battalion Artillery, from 1st December 1857 to 27th August 1860, the total admissions were 493 and deaths 4. Admissions to total admissions were 252 to 493, and the deaths to total deaths were 1 to 4. 7. Small-pox, chicken-pox, and measles are the most frequent zymotic diseases, and they are most prevalent during the months of April, May, and June, when the heat is very great, with hot winds blowing from the south-west. The bazaar is tolerably well drained, and, in most parts, well ventilated. There are a number of wells, but of brackish water. Care is taken to keep the bazaar clean, and, considering the amount of population (upwards of 15,000), there has been very little sickness in it. There are no peculiar habits among the troops or native population which predispose to these diseases; they are incidental to the country. 8. The prevalence of epidemic disease is not influenced by the soldier's duties and occupations in barracks, but when undergoing fatigue in the field the soldier is more liable to the influence of those diseases. 9. Small doses of quinine have not been tried here as a prophylactic against malarial diseases. 10. Great precaution should be taken in keeping the cantonments clean; removing all vegetation from the vicinity of the barracks; having always an abundant supply of water for the men, for washing purposes; providing roomy accommodation for the troops, so that the barracks may not be crowded; being very particular in the inspection of the rations supplied to the men, and should the epidemic be cholera or small-pox, to allow of as little communication as possible between the bazaar and the barracks. It may be necessary in some cases to remove the troops, or a portion of them, to another encampment, where the disease is not so prevalent.
V. Intemperance.	1. The soldiers at the station are usually temperate, and there are very few drunkards. 2. The medical officers find that it is very difficult to say what is the proportion of admissions into hospital from diseases caused directly or indirectly by intemperance, as it does not prevail to any extent, and there are no absolute temperance men, that is, men who abstain totally. Drunkenness is always punished as an offence. 3. Distilled spirits, *i.e.*, arrack or rum supplied by Government, are sold at the canteen, but not in the bazaar to European soldiers, and the quality is good. A man may draw one quart of porter and one dram of arrack daily; or two drams of arrack and no porter. Spirit is no part of the ration for soldiers at the station, on march, or in the field. The men are not allowed a dram in the morning. Spirit is not, as a rule, given as a ration to convalescents; it depends upon the medical men to recommend it or otherwise. No other drinks are sold at the canteen which are injurious to health. 4. A moderate use of spirits is not injurious to men in health. Whether it should be given or not to convalescents depends upon the individuals. The use of spirit has no effect on efficiency and internal discipline, but the abuse would be detrimental. 5. The moderate use of spirits is not injurious; to abolish it altogether would be objectionable, as in so exhausting a climate as India a certain amount of stimulant is required. 6. Either malt liquors or wines may be taken with benefit or be injurious, according to the constitution of the men using them. Wines are not within the reach of soldiers; malt liquors also are expensive, and not procurable when on field service or on the line of march. There remains the spirit ration, which it is better that the men should receive of a wholesome quality from the canteen than drink such as is procurable in the villages. 7. Tea, coffee, and ginger-pop are used at the station, but lemonade and soda-water are too expensive except when supplied at the public expense in the hospitals. With regard to their effect on health, efficiency, and discipline, as compared with spirits, it is the abuse and not the use of the latter which affects the former. 8, 9, 10. It would not be beneficial to abolish the spirit ration, whether for soldiers or convalescents, and to substitute for it beer, tea, or coffee, &c., neither would it be beneficial to prohibit the sale of the former in the canteen, and permit only the latter to be sold there. No recommendations to suggest.

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	11. The canteen and bazaar regulations is very voluminous; they are contained in Section X. of the 3rd Appendix of Jameson's Code, a copy of which the committee suggest should be forwarded to the Royal Sanitary Commission.
VI. DIET.	1. The ration for Queen's troops and European troops in the Indian army is the same, and consist of 1 lb. bread, 1 lb. meat (beef or mutton), ⅛ oz. of tea, 2⅓ oz. sugar, 4 oz. rice, 1 lb. vegetables, ½ oz. salt, 1 dr. pepper, and 3 lbs. of wood daily per man. The rations are inspected every morning by the orderly officer; and quartermaster, and mess orderly and corporal of each troop or company, and if disapproved of, a committee of three officers inspect it. 2. A complete ration, including vegetables, is provided, and the troops have three meals a day; there is, however, a slight difference of time between the different regiments,— Breakfast being from 7 a.m. till 7.15 a. m. Dinner „ 12 noon „ 12.45 p.m., and Supper or tea „ 5 p.m. „ 6.15 p.m. The value of a full ration is 3 annas and 4 pice per diem, which the soldier is entitled to receive as compensation when the ration is not supplied. The proportion of vegetables in a ration is 1 lb. 3. The vegetable element, though sufficient in quantity, is too frequently, in this country, deficient in anti-scorbutic properties. The fruits and vegetables, *e.g.*, limes and oranges, cabbages and radishes, the highest in the scale as prophylactics, are not to be procured in any quantity during the hot season; or the natural families to which they belong (aurantiaceæ and cruciferæ) will not flourish at all in some localities; it therefore becomes a question whether in such stations as Nusseerabad and Deesa it would not be conducive to the general health to issue a certain proportion of lime juice as a ration during the months of April, May, June, and July, in addition to the onions, pumpkins, and bad potatoes, all of comparatively small value as preventives of scurvy. It will usually be found that the scorbutic tendency will manifest itself after the hot season, and before fresh vegetables have become sufficiently abundant to be easily procurable. 4. The means available for cooking are, cooking pots, gridirons, stew and frying pans, spits, &c. Being of copper, they are tinned regularly once a month. The kitchens cannot be said to have a very clean appearance in this country, inasmuch as there are no chimnies to the cook-houses, and the walls are generally blackened by the smoke, which makes its escape from various apertures, which also serve the purposes of windows. The apertures, together with the doors, form the means of ventilation. The kitchens to two new barracks, lately built, are of different construction, having an upper ventilating roof, with a clear space of two feet for the egress of smoke, The food is both boiled and roasted. The cooking seems to meet with very general approval, and is perhaps as varied as it is possible to be. In addition to the soup, the daily ration of meat is sufficiently ample to admit of small messes in each company, such as kabobs, chili fry, mutton pie, Irish stew, curry, and beef-steak pudding. The tea is reasonably good, and very many of the men are in the habit of taking coffee early in the morning. Tea and coffee can always be obtained by the men before a march, and advantage is almost always taken of the refreshment. 5. Gardens for the cultivation of vegetables by the soldiers are already established. The 28th Regiment and the Horse Artillery have gardens for that purpose. The men are allowed to cultivate plots on their own account, or may cultivate larger plots in partnership.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements in the Hussars, are a wicker helmet, full-dress tunic, cloth overalls, stable jacket, forage cap with cover, white summer tunic, white overalls, cloak, sword, and carbine, pistols for troop serjeant-major and trumpeter, pouch and sword belts, and six-revolvers for non-commissioned officers, Wellington boots and spurs, shoes, and sabretache. In the infantry, one great coat, one cloth tunic, one pair of black cloth trousers, one serge frock, one pair of blue serge trousers, one wicker helmet with padded cover and turban, one forage cap with cover, one pair of English boots, and two pair of country, waist and pouch belt, frog for bayonet, two ammunition pouches and cap pouch. In the Horse Artillery, a full-dress jacket, undress or shell jacket, metal helmet, forage cap, wicker helmet, cloth overalls, cloak, sword, pistol, pouch and sword belts, and pouch, spurs, Wellington boots and country shoes, khakee tunics and overalls. The present dress is suitable to the climate and the soldiers' duties by day and night, if varied according to the seasons. It is also suitable for stations in the hills and plains if varied as found requisite. Malaria does not exist in elevated stations; elevations of 4,000 feet and upwards are supposed to be beyond fever range. Well chosen stations are as free from malaria as the absence from marshes, jungles, and cultivation can make them. In marching, the numerous fires that are generally made around the camp are great preventives of malaria. These fires cannot well be too numerous, and camp followers should be encouraged to keep them up on all route marching; but when troops are in pursuit of an enemy, fires must be repressed.
Duties.	1. It would be of the greatest advantage if every soldier was thoroughly drilled before commencing his career of Indian service. The drill of a recruit in this country is necessarily prolonged over a considerable period from the small portion of each day which can be set aside for the purpose. Many weakly constitutions suffer from even the short daily exposure necessary, or a habit of frequently coming to hospital for trifling causes is acquired, also it may be a permanent distaste for all drill exercise. Instruction in the necessary duties at home would be a suitable service for the young soldier from 18 to 21½ years of age, and would conduce to the development of the frame until the constitution acquired sufficient strength better to withstand the influences of climate. 2. The usual routine of a soldier's duties are—in Her Majesty's 28th Regiment, morning drill from 5 to 6 a.m., three times a week; roll calls, 5 to 5.30 a.m., twice a week; medical inspection 5 to 5.50 a.m. once a week. Divine service, one hour every Sunday. Evening roll call from 5 to 5.30 p.m., daily. Morning ditto, in barracks, at 10 a.m. daily, except

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	Sunday. When the barracks are inspected and the men paid, on Wednesday evening a marching order parade. In the Horse Artillery there are field exercise parades from 1½ to 2 hours; sword drill half an hour; field piece drill 40 minutes; marching drill ¾ of an hour; heavy ordnance drill 40 minutes; equitation drill one hour; stables, morning and evening, one hour each; also duties, guards, night pickets, and day line duties. In the Hussars they have field drill, mounted, from 1½ to 2 hours; skirmishing, advance and rear guards, and posting pickets from 1½ to 2 hours; sword and carbine exercise for ¾ hour; riding drill, under riding master, one hour; also duties, guard, and night patrol. The men do not suffer from drill, provided judgment is exercised in not working them at sickly periods, or exposing them to the sun in hot weather. The best hours for drill and parades are from 4.30 a.m. to 5.30 a.m., according to the time of year, and the same hours for the evening. Marches must be regulated according to the distance. In hot weather troops should not be out later than 7 a.m. The march of cavalry may be calculated at 3¾ miles per hour, and of the infantry at 2¾ miles per hour. The Hussars have 8 nights in bed; the Horse Artillery have 5 nights; the 28th Regiment 10 nights; the 1st Lancers 1¾ nights; the 4/3 Artillery 3 nights; and the 12th Regiment Native Infantry 4½ nights in bed. 3. The 28th Regiment have three guards, at distances of 812, 1,000, 1,625 yards from the barracks; all other European guards are regimental, and within the limits of their own lines. Day guards last 24 hours; night guards or pickets mount at sunset and are relieved at daybreak, the time varying according to length of day. There are two roll calls by day and one by night. Night guards have no bad effect on health.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station. There is one ball court, but there should be two others for the 8th Hussars and 28th Regiment. There are some skittle grounds, and others will be made. Schools, with schoolmasters, exist, but school-rooms have to be built. There are also libraries, and portions of barrack accommodation are used as reading-rooms; proper accommodation is not yet provided. No day rooms or soldiers' clubs are established; but there are soldiers' gardens, worked by the men, according to their own fancy. There are no workshops, except the usual regimental ones. There is a theatre, and soldiers constantly perform in it, and there is also a gymnasium, where both officers and men meet once a week to play cricket, quoits, and skittles. Races, both pony and foot, take place, and also jumping and other gymnastic exercises. When a sufficient fall of rain has occurred, so as to cool the earth and cause vegetation, the rainy season is not usually hot, and the days being often cloudy, the men can take outdoor exercise with impunity. There are sources of amusement enough to occupy them, but it would be a great benefit if workshops of different descriptions were established, in which the men might be encouraged to work at such trades as they may have acquired, and be remunerated for their labour. There is restriction against exposure to sun and rain out of barracks when off duty, when considered necessary, and the object is to preserve health. 2. There should be two double ball courts erected, one for the European infantry and one for the cavalry regiment at the station. Avenues of trees should be so planted as to give shelter for skittle and quoit grounds, for air and exercise are absolutely necessary to many men for the preservation of health. Good reading rooms should be built. Workshops of various kinds, such as tailors', shoemakers', carpenters', joiners', and watchmakers', should be established, and as much regimental work as possible should be done in these shops. Government work should be given to them to the extent of their ability to execute without detriment to their duties as soldiers. Where the heads of trades are not nominated by Government, the different trades should be allowed to select their own master. Work must be allowed to be entirely voluntary; the men to be permitted to work for as long or as short a time as they like. No coercion should be used, and the remuneration to depend on the amount of labour. 3. Savings' banks are already established, and have proved advantageous. 4. There is not sufficient shade from trees or other means to enable the men to take exercise without injury to health during the day. This has only become a station for Europeans since the commencement of the mutinies.
IX. Military Prisons.	1. There is a new range of cells built for the European regiment of infantry, and which are at present used by the European cavalry regiment also. The range requires a verandah to its west side, that face being exposed to the heat of the sun and to the scorching hot winds during the hot season. These are solitary cells, and therefore cannot be crowded. The only other places of confinement are the prison rooms of the quarter guards of regiments. When men are sentenced to long periods of confinement and hard labour, it is requisite to send them to Bombay.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations, which latter are strictly enforced. 2. The medical officers on field service or the line of march have little or no power. On the line of route from station to station encamping grounds are defined by the quartermaster-general's department; they are usually the most healthy spots, affording abundant supplies. When moving after an enemy, the route, of course, depends upon the direction the enemy have taken. To this, of course, the medical officers can have nothing to say. In ordinary marching, should the men feel fatigued, the medical officer might recommend a halt whenever requisite. If troops are encamped on the same ground for any length of time, the medical officer may recommend a change of site for sanitary reasons. It is his duty to make requisitions for the carriage of the sick as such is required. 3. As before observed, encamping grounds on the line of route from station to station are laid down by the quartermaster-general's department as the most eligible in every respect. Water is brought to the tents and hospitals by the water-carriers, of whom there is an increased establishment to every regiment when on field service or on the line of march. Ventilation is always well preserved by pitching the camp, where circumstances admit of it,

References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	in as open and airy a position as possible. The power of the medical officer is confined to the charge of the sick, and any suggestions he may make regarding them should always meet with attention. The rules and regulations for route marching are explicit, and only require to be attended to. 4. The arrangements in the Presidency for field hospitals, transport of sick, &c., are laid down in the Presidency code of Regulations for the medical department.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The information under this head is given in the following table:—

NUSSEERABAD.

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857-58	3/14 Royal Artillery - H.M.'s 83rd Regiment -	453	435	4	13	2	32	2	17	1	68	2	14	2	3	2	263	—	845	15	186·5	3·3
1858-59	Do. 95th do. - Do. 8th Hussars - Do. 83rd Regiment -	1,301	1,198	23	9	—	81	3	83	4	361	20	71	22	—	—	1,397	6	3,200	78	245·9	5·9
1859-60	Do. 8th Hussars - Do. 83rd Regiment -	1,658	1,179	12	4	—	114	4	67	7	333	12	49	4	4	—	1,553	2	3,303	41	199·2	2·4
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	3rd Co. 2nd Battn. Artillery -	104	58	3	—	—	6	—	2	—	56	4	10	—	3	—	142	1	277	8	266·3	7·6
1851-52	3rd do. do. -	102	69	—	—	—	7	1	6	—	28	—	6	—	2	—	141	—	259	1	253·9	0·9
1852-53	3rd do. do. -	110	90	—	1	—	4	—	7	1	35	1	15	—	—	—	134	—	286	2	260·0	1·8
1853-54	2nd do. do. - 3rd do. do. -	116	50	1	1	—	2	—	5	—	22	—	8	—	—	—	122	—	210	1	181·0	0·8
1854-55	4th do. do. -	115	90	3	—	—	1	—	1	—	39	2	6	2	—	—	85	1	222	8	193·0	6·9
1855-56	4th do. do. -	105	49	2	—	—	—	—	3	—	12	—	8	—	—	—	42	—	114	2	108·5	1·9
1856-57	4th do. do. -	99	18	—	1	—	1	—	6	—	16	1	5	—	—	—	86	—	133	1	134·3	1·0
1857-58	2nd Troop Horse Brigade -	69	115	—	1	—	6	—	2	1	11	1	2	—	—	—	68	—	205	2	297·1	2·9
1858-59	2nd do. do. -	141	133	2	1	—	5	—	14	1	48	3	10	—	1	—	145	1	357	7	253·1	4·9
1859-60	3rd do. do -	122	54	1	1	—	10	—	11	—	25	1	—	—	2	1	182	—	285	3	233·6	2·4

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	1st Regiment Light Cavalry - 21st do. Native Infantry 23rd do. do. -	1,884	1,221	8	2	—	27	1	7	—	181	4	14	3	1	—	923	4	2,376	20	126·1	1·0
1851-52	1st do. Light Cavalry - 21st do. Native Infantry 23rd do. do. -	1,930	947	5	4	—	14	2	8	1	159	2	9	—	—	—	993	1	2,134	11	110·5	0·5
1852-53	3rd do. Light Cavalry - 3rd do. do. - 21st do. Native Infantry 23rd do. do. -	1,973	1,238	9	13	—	24	3	6	—	169	3	20	—	—	—	873	1	2,348	16	119·0	0·8
1853-54	3rd do. Light Cavalry - 7th do. Native Infantry 10th do. do. - 21st do. do. - 23rd do. do. -	1,760	877	5	20	—	37	1	2	—	137	2	25	—	1	1	763	2	1,862	11	105·7	0·6
1854-55	2nd do. Light Cavalry - 3rd do. do. - 7th do. Native Infantry 10th do. do. -	1,839	1,527	2	15	—	56	4	5	—	161	3	12	1	—	—	1,157	2	2,933	12	159·4	0·6
1855-56	2nd do. Light Cavalry - 7th do. Native Infantry 10th do. do. -	2,039	979	2	13	—	53	1	3	—	233	3	29	1	—	—	1,083	5	2,393	12	117·3	0·5
1856-57	1st do. Light Cavalry - 2nd do. do. - 7th do. Native Infantry 10th do. do. -	2,020	803	2	15	—	77	1	17	—	207	2	20	1	—	—	1,106	4	2,245	10	111·1	0·5
1857-58	4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry	625	424	2	4	—	13	1	5	—	62	—	19	1	—	—	485	5	1,012	9	161·9	1·4
1858-59	Detachment 1st Co. 4th Battn. Artillery. 4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry Detachment 13th Regiment Native Infantry. 3rd Co. Sappers and Miners -	1,072	821	2	6	—	47	2	4	—	119	—	21	—	—	—	757	5	1,775	9	165·5	0·8
1859-60	4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry	1,247	917	3	4	—	39	1	4	1	88	2	18	1	—	—	832	1	1,902	9	152·5	0·7

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. European.	Strength. Indo-European and Native.	Strength. Total.	Treated. European.	Treated. Indo-European and Native.	Died. European.	Died. Indo-European and Native.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.	CHILDREN. Strength. European.	Strength. Indo-European and Native.	Strength. Total.	Treated. European.	Treated. Indo-European and Native.	Died. European.	Died. Indo-European and Native.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1852-53	3rd Co. 2nd Battn. Artillery - -	12	1	13	34	1	—	—	269·2	—	21	2	23	18	—	—	—	78·2	—
1853-54	3rd do. do. - -	10	2	12	12	—	1	—	100·0	8·3	21	3	24	20	—	—	—	83·3	—
—	4th do. do. - -	9	7	16	—	—	—	—	—	—	15	4	19	—	—	—	—	—	—
1854-55	4th do. do. - -	7	7	14	11	4	1	—	107·1	7·1	20	4	24	17	3	—	1	83·3	4·1
1855-56	4th do. do. - -	7	7	14	3	4	—	—	50·0	—	16	4	20	3	—	—	—	15·0	—
1858-59	2nd Troop Horse Brigade - -	3	2	5	—	—	—	—	—	—	8	—	8	—	—	—	—	—	—

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department, Bombay, 22nd December 1860.

W. C. COLES, Assistant Surgeon, Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. At present there are no regular hospitals for European troops, with the exception of one for the troop of Horse Artillery. Barrack buildings are occupied by Her Majesty's 8th Hussars and 28th Regiment as hospitals, and they are in every respect like the other barracks. The hospital of the Horse Artillery is situated 850 yards from the nearest point of the bazaar, and due west from it. The hospital of the 28th Regiment is 1,000 yards distant from the same point west north-west, and the hospital of the 8th Hussars is 2,500 yards north-west by north. Plans and estimates for a suitable capacious European hospital have been called for, and when sanction has been given the buildings will be commenced. The site is open and freely ventilated, and equally healthy as to elevation and freedom from malaria and other nuisances with the rest of the barracks. 3. An ample supply of good water is brought to the hospitals daily by bheesties. 4. The drainage is the same as described with respect to the rest of the barracks. 5. The floor of the hospital is raised 1 foot 6 inches above the surface of the ground. There is no perflation of air underneath the floors, which are all solidly constructed. The roof water runs off. The rain which falls on the buildings (the foundations of which are slightly raised) is carried off by the inclination of the ground on each side to small channels partly natural and partly artificial, which all tend ultimately to the western slope of the very gentle undulation, on the highest part of which the barracks are built. The materials of construction of the hospitals are the same as the barracks, and they are similarly supplied with verandahs. When the number of sick exceeds 85, the least important cases occupy the verandahs, together with any men detained in hospital in consequence of trifling ailments. The hospital consists of one flat only. Table of hospital accommodation. The date of construction of the present Artillery Hospital, formerly the Church bungalow, is unknown. (The church was built about 35 years ago and was adapted for hospital purposes since the mutinies). Total number of wards, 8. Total regulation number of beds, 41.

Wards or Hospital Huts. Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.					Feet.	Feet.
Main room - -	14	60	17·82	20	21,384	1,527	76	18 inches.			
Verandah, 1 - -	6	60	11·82	17·5	12,425	2,070	118	"			
Do. 2 - -	6	46	11·82	17·5	9,525·8	1,587	90	"			
Do. 3 - -	6	79	7·75	13·5	8,265·3	1,377	102	"			
Do. 4 - -	6	58·66	7·75	13·5	6,137·3	1,022	75	"			
1 room marked "A" on plan.	Surgery	13	11·82	17·5	2,692						
2 Do. "B," each -	1	17·82	7·75	13·5	1,864·4	1,864	138	"			
4 Do. "C," each -	1	11·82	7·75	13·5	1,236·6	1,236	19	"	3	4·0	3·25
1 Do. "D," each -	1	19	7·75	13·5	1,987·8	1,987	147	"	1	2·5	1·82

The whole range of barracks is admirably placed so as to receive the full benefit of the prevailing wind during the hot weather. The windows open upwards, and their arrangement and construction are conducive to ventilation.

6. The means of ventilation are ample, and consist of doors, windows, and apertures in walls. There are no jalousies or jhilmils.
7. The hospitals are cooled in the same manner as the barracks.
8. There are no means of warming the wards other than by closing the doors and windows. The walls and ceilings of the wards are cleansed and limewashed as often as the requisition is made.

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	9. The ordure is removed from the privies several times a day by sweepers, and the privies are soused with water, and the cesspool into which urine falls is emptied daily. They are not offensive. 10, 11. The lavatory arrangements of the hospital are said to be insufficient, but it must be borne in mind that the barrack is only temporarily fitted as a hospital. The means of ablution for sick men are certainly inconvenient as far as the lavatories are concerned. There are four wooden tubs and four gindees to each lavatory; there are also 40 crockery basins for washing purposes in the hospital. 12. There is an establishment of three washermen to each European regiment, who wash and dry the linen; they have always been considered sufficient. 13. The storage is said to be insufficient, the hospitals to each regiment being temporary. 14. The bedsteads in use in the hospitals are chiefly wooden charpoys, laced with broad cotton tape, but there are also some iron cots. The mattresses and pillows are stuffed with straw. The sheets and coverlids are of cotton, and the blankets European and country. 15. The kitchens are the same as those to the other barracks. The fire-places are of stone and mud plastered with lime, and the means for cooking consist of cooking pots, gridirons, frying pans, and spits. They are sufficient for the purpose. The diets are properly cooked, and varied as circumstances permit; but the want of good vegetables is sometimes felt. 16. The diet rolls, tables, &c. are according to the Medical Code of the Bombay Presidency. 17. By the regulations the following establishment is allowed to a regiment of European cavalry or infantry, or a battalion of artillery complete:— 1st class servants—1 apothecary, 1 steward, 1 assistant apothecary and steward, 3 apprentices, and 1 serjeant. 2nd class hospital servants—1 matron, 1 assistant ditto, 1 native writer, 1 compounder, 1 dresser, 2 stewards' servants, 1 shop servant, 10 ward coolies, 5 bheesties, 3 dhobies, 2 tailors, 5 sweepers, 1 head cook, 2 assistant cooks, 1 leech man, 1 barber, and 10 dooly bearers. 18. No epidemics have broken out in the regimental hospitals, nor have hospital gangrene or pyæmia appeared. 19. The hospitals should be larger, better raised, and better fitted up, but as has been observed the buildings are only temporarily occupied as hospitals. 20. The convalescent system cannot be satisfactorily carried out, inasmuch as there are no wards for the purpose. When men have been discharged from hospitals, however, they are considered at convalescents in barracks, placed on barrack rations, paraded every morning for inspection at hospital, and marched out under a non-commissioned officer for morning and evening exercise. 21. In the 28th Regiment two compartments of the married men's quarters are set aside as a hospital for the sick wives and children of the men of the regiment. In the 8th Hussars they are attended at their own quarters. The hospital arrangement for this purpose is incomplete, regular hospitals not having yet been built. 22. There are no local hospital regulations which are not included in the General Presidency Medical Regulations. 23. The control of the medical officer is complete as regards change of diet and consumption of medical comforts, and whenever repairs are required to hospital or its out-offices, his requisitions are always attended to. 24. With regard to accommodation for convalescents, a proper European hospital has not yet been provided. By the regulations there should be both a convalescent and a female ward, and there will be great advantage from such accommodation.
XIII. BURIAL OF THE DEAD.	1. The graveyard is 812 yards from the nearest point of the lines, which are those of a native infantry regiment on the extreme left, 1,250 yards from the Horse Artillery lines, 1,750 yards from the nearest barrack of European infantry, and 3,000 yards from the nearest barrack of the 8th Hussars. It lies due west from the nearest point; south-west from the centre of the lines, and south-south-west from the lines on the extreme right. The prevailing winds are from the south-west. 2. The burial ground is almost a square; its area is 29,172 square yards; it is enclosed by a wall and is carefully kept. Water percolates into the subsoil or evaporates. 3. The graves are 7 feet long, 3 feet broad, and 6 feet deep, with an interval of 3 feet between each. They are never re-opened. The hours of burial are 6 a.m. and 5.30 p.m.; those dying during the night are buried the following evening, and those that die during the day on the following morning. This is a general rule, but interments frequently take place at lesser intervals, and during epidemics as quickly as arrangements can be made. The natives burn their dead in the morning after sunrise and in the evening just before sunset. Incremation takes place as soon as possible. 4. The grave yard has never as yet proved offensive, though it is to the windward of the camp. It will, however, be necessary to remove it to another position before long, as the garrison of this station has been increased by two European regiments beyond what were ever cantoned here before. British troops are buried with funeral honours. 5, 6, 7. With regard to the disposal of the dead of camp followers and bazaar people, Mahomedans bury them, and their principal burying ground is 2,000 yards from the nearest barrack, and direct eastward of it; the smaller burial ground is 820 yards from the centre of the line of barracks, and due west from it. A large proportion of the Hindoo population burn their dead; their burial ground is 1,650 yards due east from the bazaar, and 3,250 yards from the nearest point of the lines, which are on the left. No injury to the public health has as yet accrued from the present practice, and no improvement in the mode of burial is suggested.

(Signed) J. HOLMES, Lieut.-Colonel, Commanding at Nusseerabad.
A. DURHAM, M.D., Surgeon-Major, H.M's. 1st Bombay Lancers.
JULIUS G. T. GRIFFITH, 2nd Captain, Acting Executive Engineer, Nusseerabad and Neemuch Division.

22nd September 1860.

DEESA.

Accommodation - { European Troops - { Artillery, one troop, horse - 184; Infantry, one regiment - 928 } ; Native Troops - { Cavalry, one squadron - 151; Infantry, one regiment - 930 } }

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat and sandy, gradually sloping from north southwards, sufficient only to convey the water of rivers rising in northern Rajpootana to the Gulf of Cambay. There is no wood, jungle, or water in the vicinity. 2. The station is said to be about 400 feet above the sea-level. It is on the same level as the adjacent country generally. The present cantonment not being on equal ground, the adjacent race-course presents a better spot. Its elevation is equal to that of the highest portion in cantonment, and its space is ample. 3. The nearest high land is the Jassore range, running through Rajpootana from north south-westerly, and terminating within 15 or 16 miles of Deesa. Mount Aboo is the highest point near Deesa, it is believed. The trigonometrical survey not having been published, its height is not exactly known. 4. The nearest water is the river Bunnass, which bounds the western side of the cantonment. The vicinity is not liable to overflow of water. There are many ravines but no water pits. 5. The station is open and freely exposed to the winds, but in some parts of the cantonment the arrangement of the buildings prevents the full benefit of exterior ventilation being felt. The temperature is not raised by reflected sun heat. The S.W. wind or sea breeze blows from about the middle of March to the end of June, but reaches this station as an exceedingly dry scorching wind; wet and dry bulb thermometers often showing a difference of 30° F. and upwards. Apoplexy not unfrequent at this season. Winds are more variable from the beginning of July to the end of September, but generally from the south and west. This is the wet season, and bowel complaints and fever are the most prominent ailments. Between October and March northerly winds are most frequent, and four months of this period are dry, cool, and bracing. 6. The surrounding country is uncultivated on the western side only. There are no works of irrigation near the station, and no cultivation of either rice, indigo, hemp, or flax. 7. The nearest civil population is the Sudder bazaar, which is inside the cantonment, and suburbs extend outside. The interior population is about 9,000. 8. As to geological structure, the upper soil is white friable earth. The subsoil red earth with limestone. The ground was first cleared for occupation as a cantonment. 9. Water is found at a depth of from 60 to 70 feet below the surface during the dry season, and from 50 to 60 feet from the surface in the wet season. 10. The rain-fall and surface water flows readily away, sinking into the subsoil. The drainage from higher ground on the east flows through the subsoil of the cantonment. 11. The water-supply of the station is derived from wells. There are no tanks. 12. The water is abundant, clear, agreeable, and devoid of smell. Its chemical composition has not been determined, but the saline or mineral ingredients seem to be inconsiderable, and the water would appear to be almost free from organic matter of any description. It is drawn for use in leathern bags, lowered over rollers, and pulled up by bullocks, and is distributed by bullocks and carriers. The wells might be larger in diameter and worked by machinery. Better water cannot be obtained. 13. No other topographical points besides those mentioned above. 14. Not aware of the manner in which stations are selected.
II. Climate.	1. There is a government observatory. 2. The following table gives the meteorology from January 1st, 1857, to December 31st, 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean daily range.	Mean Maximum.	Mean Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks, Clouds, Dew, Storms, &c.
	In.	°	°	°	°	°	°	°	In.				
Jan. -	29·667	63·9	29·4	79·1	49·6	57·6	57·6	103·9	0·60	N.E.	—	30	Ci, cu, ci-s, moderate agreeable.
Feb. -	29·587	69·8	31·5	85·4	53·9	74·6	61·5	109·1	0·20	N.	—	25	Ci, cu, then clear, moderate, agreeable.
Mar. -	29·561	80·4	32·5	94·1	61·5	84·5	66·9	118·4	—	N.	—	29	Ci, cu, moderate, agreeable.
April -	29·452	86·6	31·0	101·5	70·5	91·8	72·2	126·1	—	W.	—	29	Cu, cu, ci-s, moderate, agreeable.
May -	29·518	91·3	27·9	105·6	77·7	92·5	78·3	126·8	—	S.W.	—	30	Cu, s, ci-cu, moderate, agreeable.
June -	29·347	89·3	21·5	100·2	78·7	89·9	78·9	122·1	3·79	S.W.	—	25	Cu, s, ci-cu, moderate, agreeable.
July -	29·328	87·7	14·6	93·2	78·6	85·4	79·3	120·3	8·62	S.W.	—	20	N, cu-s, high winds, sand and dust.
Aug. -	29·437	82·2	11·6	87·1	75·5	81·1	77·2	106·4	6·21	S.W.	—	17	Cu-s, ½ gales, with clouds of dust and sand.
Sept. -	29·550	82·6	15·2	88·5	73·3	81·9	76·4	114·2	5·15	S.W.	—	24	Cu-s, ½ gales, high winds.
Oct. -	29·677	81·2	30·3	92·7	62·4	83·5	72·0	122·0	—	N.W.	—	30	Ci-cu, ci-s, moderate, agreeable.
Nov. -	29·769	84·1	35·7	89·1	53·4	80·4	64·0	115·5	—	N.	—	29	Ci-cu, cu-s, high winds agreeable.
Dec. -	29·849	68·5	34·4	82·4	48·0	70·6	58·0	108·4	—	N.	—	30	Ci-cu, cu-s, high winds, agreeable.

DEESA. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. As regards the influence of the climate on health, the extreme heat and dryness of the climate in the hot season are very exhausting, and the atmosphere is often loaded with dust, as much apparently from some electric disturbance or peculiarity as from the force of the winds. During the wet season the fall of rain is inconsiderable, and as the soil is very sandy the water rapidly disappears. There is therefore little excessive vegetation or dampness, and though fever is a frequent disease, yet it is seldom severe, while cases of dysentery are rare. The climate must be considered rather healthy, but it is nevertheless so exhausting that troops should not serve longer than two years at a time in the station. Recruits should not be sent to it till they have been seasoned in the milder climates of Poona, Khandala, or Kurrachee. There are no peculiar precautions necessary as regards clothing, diet, &c. But during the hot winds khakee is too thin a covering to protect the surface against such rapid evaporation, and coats of this material should be made with two folds in the back. From the beginning of April to the end of August the meat is necessarily of inferior quality from the want of grass for the cattle. The healthy months are November, December, January, February, March, and April. The unhealthy months are May, June, July, August, September, and October. The prevailing and fatal diseases during the latter months are apoplexy, fever, and bowel complaints, affections of the liver not being uncommon. 4. In Mount Aboo there is an elevated plain known under the name of "Ooria," near 5,000 feet above the sea, sufficiently large to accommodate at least the wing of a regiment. Ground has been selected on the same hills, about three miles from this plain, as the site of a new sanitarium for 200 men. 5. The stations at which I have served are Gazeepore, Agra, Wuzeerabad, Sealcote, Mhow, and Deesa. Gazeepore and Agra are objectionably situated on the bank of a river, and the latter possesses a very hot climate, and was not at all adequately drained. The ratio of mortality from apoplexy, dysentery, and fever is accordingly comparatively high. Sealkote has hitherto enjoyed a high character for salubrity, and Mhow, both as regards climate and salubrity, has long been a favourite station.
III. SANITARY CONDITION OF STATION.	1. 2. 3. Plans appended. Barracks constructed in 1828. Eleven rooms for 800 non-commissioned officers and men. The following table gives the details:—

Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Beds above Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Feet.			Feet.		Feet.	Feet.
3 - - each	80	200	23½	19	89,300	1,116¼	58¾	1 7/12	28	5½	3½
8 - - each	70	176	23½	19	78,584	1,122 6/10	59	1 7/12	24	5½	3½
Guard Room -	various	41	20	16½	13,530	—	—	—	—	—	—
Prison Cells. 12 - - each	1	9	9	11	891	891	81	—	—	—	—

5. The windows are on opposite sides of the rooms, and open outwards. There are verandahs on all sides; average width 10 feet, height 14 feet. They are occupied as sleeping quarters by soldiers at their own discretion. There are venetian shutters to the windows.
6. The bedsteads consist of iron trussels and boards. Bedding, one munda mattrass, with two covers for same; two cotton sheets and two country blankets. The soldier in India is well found in these particulars.
7. Structure of tents unknown. The dimensions of huts now occupied by troops in cantonment are as follows:—Soldier's tent, 14 feet square, with walls 6 feet high, poles 12¼ feet high. Cubic contents about 1,580 feet. Superficial area 196 feet. Total occupants 20 (16 men, 4 serjeants), giving 79 cubic and 9·8 superficial feet per man.
The hospital tent is 16 × 22 feet. Pole 12 feet high. Walls 6 feet high. Cubic contents 2,818 feet, which at 25 men gives about 112 cubic feet per man. Rowties for natives are 14 × 10 × 9 feet high, with semicircular ends. Cubic contents 1,090 feet nearly. Superficial area 293 feet, giving, at 14 men, about 78 cubic and 21 superficial feet per man.
8. Ventilation of barracks is effected by punkahs, doors, and windows, and ventilators in the roof. The ventilation is scarcely sufficient for a crowded barrack.
Punkahs and tatties are used for cooling the air. The tatties are frames of bamboo, spread over with a layer of roots of "kuskus" grass, placed in front of doors and windows, and kept continually wet by pouring water over them.
9. The barracks are constructed of burnt bricks and mortar. Roof teak wood, double tiled.
10. The floors are of concrete, raised about 2 feet above the level of the ground on the average. No passage for air beneath.
11. As regards construction, loftier barracks would be preferable, and further ventilation in the roof and walls. The floor should be of paved stone, and in no part less than 3 feet above the ground. Arrangements for privies and urinals should be entirely changed, so as to require no underground drainage.
The barracks are kept in repair by the public works department. Ordinary repairs, or such as are necessary to maintain the buildings, are made annually. Petty repairs are made on requisition by the party in charge of the building. Repairs are executed as quickly as they can be with the labour and materials procurable. Neither are very good.
The walls and ceilings are limewashed at no stated period. Limewashed whenever required.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12. To each barrack is attached a washing room. There are no conveniences, however, to show in a sketch. There are two plunge baths (50 feet by 20) for the European regiment, and one smaller one for the troop of horse artillery in the cantonment. 13. (Cook-houses of the usual construction.) Natives are employed as washermen, and the work is done satisfactorily at a charge of 8 annas per month to each soldier. 14. (No description of privies or their mode of drainage, only a sketch appended.) 15. Three oil lamps allowed for each barrack room. Two kept burning all night. 16. Barracks drained by small underground drains about ½ foot square, leading to circular cesspools about 2 feet diameter and 10 feet deep. These last are emptied as found necessary. The drainage is not sufficient. No part of the barrack is damp. The fluid refuse of the barracks sinks into the subsoil. There are no foul ditches near the station. 17. As regards surface cleansing, no refuse or manure of any description is allowed to remain on the surface. Coolies and carts are employed daily to remove any filth which may be deposited between the barracks or on the officers' lines. 18. There is little or no vegetation on the surface of the cantonment, except during the rainy, season, and even then it is not excessive as in most other stations, which have a damper climate. Weeds and growth of every kind are cleared away on the recommendation of the station sanitary officer. The ventilation of the station or bazaar is not interfered with by old walls, and hedges are cut down periodically to assigned limits, as well as cleared of grass and weeds. Branches of trees are lopped off annually to a distance of six or seven feet from the ground. 19. The bazaar extends as a single street mainly along the bank of the river Bunnass, which, with the addition of open channels or surface drains, serves to carry off superfluous water. Ventilation is defective, owing to the structure of the houses, and in some places the absence of plan in their relative position to each other. The water supply is abundant and good. Cleanliness is defective, except in the main street. There are no latrines, and the natives resort to distant nullahs, and to the banks of the river. The crowding is in proportion to the poverty of the people, who are ill clad and worse fed; yet there has been no epidemic disease among them during the past year. Every precaution is taken to guard against injury to the public health, by enforcing a habit of general cleanliness throughout the bazaar, as well as by removing every sort of rubbish and filth, the presence of which might induce disease. Dungheaps are a never failing condition of native life in India, and whether there are cesspits depends on the nature of the ground and the state of the weather. Nuisance is experienced in the natives lines from wind blowing over the native dwellings. It could be obviated by taking up other ground for the native lines, which are too close to the bazaar and too confined in space. 20. Animals are slaughtered in the sudder bazaar, close to the river. The skins of the animals are cured near the ground by a rough and summary process. The dung is carried off as manure to the enclosed patches of ground under cultivation along the margin of the river, and the offal is eaten to a shred by the low caste or poorer portion of the inhabitants. 21. The horses of the bazaar people and of camp followers are either picketed in the compounds or premises of their owners, or occupy some portion of their houses set apart as shelter. The same regulations as to general cleanliness are observed, and the salubrity of these stables is preserved by causing the proprietors to remove the manure to a place beyond the limits of the cantonment, from whence it is carried away by the villagers as manure for their fields. 22. The troop horses are picketed in the open in front of the men's barracks, which are in front of the officers' lines, and these last are in front of the hospital. The manure in dry weather is sold. The stabling ground is a quadrangle about 400 feet by 300 feet. It is about 150 feet in front of the barracks, and there are about 1,400 feet in front of the hospital. 23. There are 84 married quarters for the European regiment and 14 married quarters for the troop horse artillery. Married people do not occupy barrack rooms with the men.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good, being kept clean by the occupants. There are no details as to drainage, none being provided. Officers should have quarters provided by the Government, a monthly rent being deducted. A suitable arrangement of officers' quarters in conjunction with the soldiers' lines would tend much to a healthier condition of cantonments; were all quarters Government property, there would be no dilapidated ruins of fallen houses, &c. as are remarkable here.
IV. Health of Troops.	1. The native community is healthy both in this station and in the district generally. 2. The prevailing diseases among the native population are diarrhœa, fever, intermittent and remittent, but spleen disease is not common. Epidemics have not hitherto occurred, but this year cholera has visited many villages in the surrounding districts, and cases of small-pox are occasionally presented. 3. The healthiness of the district is attributable to a dry climate, a sandy, rapidly absorbent soil, good water, absence of excessive vegetation, and of the sudden changes of temperature, which elsewhere, when accompanied with a moist atmosphere and other causes, produce dysentery, fever, &c. 4. The European field artillery, after two years' field service in Central India, arrived at the station in June 1859, in indifferent health, having suffered from fever and apoplexy, and since that date, fevers, boils, and guinea worm have been the most prevalent diseases. The European infantry arrived at Poona in the autumn of 1857, and enjoyed good health till November 1858, the prevailing diseases being fever and bowel complaints; arrived at Deesa in December 1858, and in the early part of 1859, and has since been in indifferent health having suffered from fever, apoplexy, diarrhœa, and cholera. No part of the men's accommodation at the station is obviously more unhealthy than the rest. 5. The troops are not camped out here. 6. I have not been in charge of troops at hill stations.

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References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*cont.*	7. In former times the health of troops resident for some time on the hills was occasionally compromised by want of variety and deficiency of vegetables in the soldiers' rations, as well as by defective conservancy arrangements and indifferent barracks. Scurvy, scorbutic dysentery, general cachexia, and anæmia were the results. Last year a company of the regiment returned to Deesa, after a year's residence in the sanitarium at Mount Aboo, and the men have since suffered from intermittent fever, which they contracted at Aboo, as a consequence of the defective nature of the barracks and their unhealthy malarious position. The only two cases, and both fatal, of heat apoplexy which occurred this year were presented in the same company, the men having been predisposed apparently to the disease by the fact of passing the previous hot season in the comparatively cool climate of the hills.
	8. I approve of hill stations for troops.
	9. There are diseases peculiar to hill stations. Some of these stations are not beyond the limits of malarious fever, while others predispose to diarrhœa, known as "hill trot." It must be added also, that most diseases of an organic nature are aggravated by hill climates.
	10. At hill stations, the precaution as regards shelter and duties must be matter of simple experience, having reference to peculiarities of climate and locality in each case. But defective diet, bad barracks, and imperfect hygienic conditions have hitherto served occasionally to cast some discredit on hill stations. The company above referred to joined the regiment from Aboo not only reduced and anæmic from the influence of the malarious poison, but somewhat scorbutic also, and it appears that mutton was the only meat issued to this company for 12 months.
	11. The best period for residence at hill stations is from the 1st April to the beginning or middle of November. The shortest period within which troops could be benefited by a hill residence would be one such season.
	12. If detained in the hills for more than two hot seasons consecutively, troops would probably arrive in the plains predisposed to apoplexy, cholera, and the more severe forms of fever; and if the conditions of life have not been favourable in regard to diet, barrack accommodation, and hygienic arrangements, they might bring with them a tendency to dysentery or diarrhœa, and a scorbutic deteriorated state of the blood.
	13. Troops should be removed from hill stations in November, and all undue exposure avoided during the ensuing hot season.
	14. The highest standard of health would be secured to troops by locating them in the hills from April to November, and in the plains from November to the end of March, alternately. On the plains frequent change of station is beneficial to the spirits, when the change is not from a good to a bad station, for on this point both officers and men are sure to entertain an opinion of some sort; beneficial to health if the march be made in cold weather, and no epidemic disease, such as cholera, prevail, but moving troops late in the season and over cholera-affected districts should be avoided, as likely to cause considerable loss.
	15. The barracks and hospitals at Kussowlie and Subathoo are considered defective in structure and plan, and inferior to those at Dugshai. At Aboo, the two barracks have been erected in a malarious gulley, surrounded on three sides by steep high hills, and communicating by a ravine into a large lake, not more than about 200 yards distant, and they are built of temporary materials, wattle and dab.
	16. No experience as to the best elevation for hill stations.
	17. The nearest hill station is Mount Aboo, 45 miles distant, approached to the foot of the hills by a level sandy road, and thence ascended by a bridle-path in about two hours. The climate has proved favourable to residents, and to the children of the Lawrence Asylum. The elevation varies from 4,000 to 5,000 feet.
	18. In India, where surface moisture is such a frequent source of disease, the more absorbent or pervious to water the subsoil for a station is, the more healthy is the station; but no locality should be selected as the site of a station in which the standing point of water is near the surface; and the banks of rivers should be avoided.
	19. The best age for a soldier proceeding to India is from 22 to 25; and the best time for landing in India is from November to January.
	20. One year's residence in the Mediterranean would be an advantage for troops intended for service in India. As regards the Bengal presidency, it would be advisable to send troops on landing to the hills and to the up-country stations; and in the Bombay presidency it is desirable to locate the troops at Poona, Kirkee, Khandala, or Kurrachee, before sending them into the hotter climates of Central India or Guzerat.
	21. No reply.
	22. British troops should serve 10 years in India. The mortality in this country is generally high during the first year's service, after which it continues less considerable for some years, while in men between 10 and 15 years' service, the death-rate becomes much increased.
	23. As regards medical boards, the opinion of the Station Invaliding Committee is very generally respected by the Presidency Board; but surgeons of regiments should be allowed to keep their invalid list open as late as possible in the year, for, if the Station Committee assemble in October, and men do not proceed to the Presidency till December, it is obvious that some cases in the meantime may present themselves which may with propriety be added to the list.
	24. Invalids should leave India for home in the end of January, if sent by the Cape; in the end of March, if sent by the overland route.
Diseases.	1. Disease inspections are held every Saturday morning, or oftener, if necessary.
	2. There is no scorbutic disease at the station.
	3. The proportion of cases of hepatic disease in the British infantry regiment last year was nearly 4 per cent. of the total admissions; and in the European artillery, not quite 3 per cent. Excessive heat and sedentary habits conduce to the disease. Young men who have not passed a previous hot season in the country, and old residents, are most subject to it.
	4. Dracunculus does not appear to be a disease of the district, except very rarely.

References to Subjects and Queries.	Replies.
IV. Health of Troops—*Diseases—cont.*	5. The proportion of cases of venereal disease in the British infantry regiment was 13 per cent. of the total admissions; and in the artillery regiment, 25 per cent. A lock hospital should be established, and put in charge of the staff surgeon of the station. 6. The epidemic diseases at the station are:— *Fever* of the intermittent and remittent types is the most prevalent disease. *Dysentery* is not a common disease at the station. *Cholera* has appeared twice in the British infantry lines since December 1859, and up to this date (August 1860) has carried off about 26 men. *Small-pox* is occasionally seen in the bazaar. *Rheumatism* is not a prevalent ailment. In the British infantry regiment the number of admissions from fever between the 1st April 1859 and the 31st March 1860 was 918, or nearly 50 per cent. of the total admissions; the number of deaths 14, or 48 per cent. of the total deaths. The number of admissions for dysentery was 34, or 1·7 per cent. of the total admissions; the number of deaths 2, or nearly 7 per cent. of the total deaths. The admissions from cholera were 5 and deaths 4, or nearly 14 per cent. of the total deaths. The admissions from rheumatism were 49, or 2·4 per cent. of the total admissions. In the European artillery the admissions for fever during the same period were 18 per cent.; for dysentery, 2 per cent.; for rheumatism, 4 per cent. of the total admissions. No deaths and no cases of cholera. 7. As regards nosological characters:—In the hot dry months of April, May, and June, fever is generally either ephemeral or continued; the latter often complicated with gastric irritation or tendency to head symptoms. In the wet season and autumn the disease assumes the intermittent and remittent forms. Diarrhœa is most frequent in wet weather, and is generally of a painless, watery character, seldom passing into dysentery. Cholera is excessively fatal, marked by early profound collapse, rather than by severe cramps or copious evacuations. These diseases have not been especially prevalent among the native population, and it has hitherto enjoyed complete immunity from cholera. It is true that the sanitary condition of the bazaars and native dwellings is at all times unsatisfactory and imperfect, yet it would appear that the exposure of all descriptions of filth—human excreta—to the free air of heaven is a great improvement to the civilization which implies the use of cesspools, sinks, urinaries, and drains, such as are exhibited at this station. Last year indifferent meat, and the bad description of vegetables, tended to impair the *physique* of the European troops, and the defective conservancy system in use, as regards cesspools, ablution rooms, sinks, urinaries, and drains, may have tended to produce zymotic disease. 8. There is nothing in the nature of the soldier's duties or occupations in the barrack to encourage epidemic disease, or to increase its prevalence on the line of march or in the field. 9. Small doses of quinine have not been tried as a prophylactic. 10. For the mitigation or prevention of epidemic disease, all liquid and solid excreta should be removed direct from the camp twice a day, the fluid from the privies, urinaries, and ablution rooms being received into iron vessels with this view. Sinks, cesspools, and drains should be entirely abandoned in the conservancy arrangements of the station; in fact, should be strictly forbidden, as dangerous to health. Placing the barracks in echellon (instead of in lines one behind another), over an extensive space of ground, would have tended to limit the prevalence of epidemic and zymotic disease in this station.
V. Intemperance.	1. The soldiers at this station are usually temperate. There are about two per cent. confirmed drunkards. 2. The proportion of admissions to hospital, directly or indirectly caused by intemperance, is not more than two per cent. A statistical table, showing the effect of intemperance on disease and crime, cannot be made out with sufficient accuracy, and in any case the result would be valueless, except in connexion with periods of service in the country, for the drunkard is most often an old resident, and long residence in India is itself an element in excessive mortality rates. Drunkenness is punished as an offence. 3. Spirits are sold in the canteens: The quality is good. In the artillery company, the consumption is scarcely one dram for each man per diem. In the infantry, during the last six months, it has amounted to two gallons eighteen drams per each man. The use of spirits is optional, and no dram is issued before morning parade. Two drams are allowed daily in the barracks and in the field. Spirits are not issued to convalescents. There are no injurious drinks other than intoxicating drinks, sold in the canteen or bazaar. 4. The consumption of spirits is injurious, if more than one dram be taken daily. It is not conducive to the internal discipline and efficiency of the corps. 5. Spirits are not given as part of the ration. Its use is entirely optional, and some men seldom or never touch it. A second dram should never be allowed in barracks, and the use of spirits should be abolished. 6. Malt liquor is essential to preserve the troops in health and vigour, but spirits are not necessary for this purpose. Of the use of wine, there is no experience. 7. Coffee, tea, lemonade, &c., are much used as drinks. Their influence is beneficial, but one material disadvantage attends the use of these drinks, as well as of spirits and malt liquor, namely, that of drawing the men into crowds in a confined space, for two or three hours in the evening, often the most oppressive part of the day, and that in which apoplexy is especially liable to occur. 8. It would be beneficial to suppress the use of spirits altogether, and to substitute beer, tea, coffee, &c. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteens and to permit only beer, tea, coffee, &c., to be sold.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	10. In regard to recommendations; if the spirit ration be allowed, it should be issued only once a day. Canteens are usually thrown open two or three hours before tattoo every evening, and, unless the accommodation is very capacious indeed, the result is overcrowding to a great extent, and fever, apoplexy, and a general increased prevalence of disease, endemic or epidemic, is the sure consequence. Moreover, as it is found practically impossible to limit the consumption of each man to the quantity of liquor he is entitled to draw, or to ascertain that he drinks the liquor he procures, it is obvious that if spirits be issued at night, drunkenness must be in many cases the necessary result. 11. As regards canteen and bazaar regulations, the orders laid down in Jameson's code and appendices are carried out at the station.
VI. DIET.	1. The ration for European troops consists of 1 lb. bread, 1 lb. meat (mutton twice a week), 1 lb. vegetables, 4 oz. rice, $\frac{5}{7}$ oz. tea (one-third green, two-thirds black), 2½ oz. sugar, 1 oz. salt. Last autumn it was found necessary to substitute 4 oz. dhol twice a week for 4 oz. of rice, in order to add variety to the vegetable elements of the soldiers' diet, and to make up the amount of nitrogen deficient in the meat of the season. The rations are inspected by the orderly officer. 2. There is a complete ration given, but the meat is indifferent from April to the end of August. The soldier has three meals a day; breakfast, at 8 a.m.; dinner, at 1 p.m.; supper, at 5 p.m.; a portion of the meat is grilled, curried, &c., for breakfast. The remainder is cooked for dinner. The stoppage amounts to fivepence per diem. 3. The ration is susceptible of improvement. Meat of improved quality is required in the summer and autumn months, and during the latter vegetables of a proper description (which are sometimes wanting) are desirable. The rations are inspected at meal times by the orderly officers. 4. There are cookhouses well ventilated through the roofs, each having a structure of masonry extending along the centre of the room, and provided on each side with numerous cells for cooking utensils, the latter being of copper, and tinned inside twice a month, or oftener when deemed necessary. There is one master cook and 4 or 5 assistant cooks for each company. Most of them are Portuguese. Their cooking is good, and the dishes embrace curries, stews, grills, puddings and pies, &c. in great variety, and according to the taste of the men themselves. Tea and coffee are well prepared. The men have coffee on the march. 5. Soldiers' gardens for the cultivation of vegetables could be advantageously established near the station. The land assigned for this purpose should be allotted by companies; a free supply of water and tools should be available. The assistance of native labour should be provided in all the rougher operations, and sheds built to shelter the men at times from the sun and rain. Prizes might be offered with advantage for the best show of vegetables, and an equivalent for the amount of vegetables supplied might be deducted from the daily stoppage, to enable the soldier to purchase for himself eggs, butter, milk, &c.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. In the European infantry each soldier has one forage cap, one wicker helmet with turban, six cotton shirts, two flannel shirts, or two belts, two pairs of woollen socks, four pairs of cotton socks, cloth tunic, serge tunic, cloth and serge trousers, two coats and two pairs of trousers of khakee, three pairs of boots, and one great coat. The European artillery are equally well provided. The present dress is suitable for the climate and duties. The wicker helmet with turban, the serge frock, and trousers supply deficiencies which formerly existed; but the khakee coat is too thin to protect the spinal column from the excessive heat of the sun, and should have two folds of the cloth in the back. Waterproof capes and English boots should be available for men exposed to the wet during the monsoon months, whether in the plains or in the hills. The guard dress is determined by season. Serge coats and trousers are now generally worn during the rains, and great coats when necessary. Khakee clothing is worn in the hot dry months, and warm clothing in the cold season.
Duties.	1. It would be advisable as regards health that the men should be thoroughly drilled before being sent to India. 2. In the infantry the usual duties consist of morning and evening parades, one hour after sunrise and one hour before sunset. The artillery are generally occupied in the morning for 2½ hours on parade and stable duties, and in the evening for one hour at stables. The guards night and day are light and the duties in no way injurious to health. The infantry have from 7 to 10 and the artillery from 4 to 5 successive nights in bed. 3. The most distant guard is not more than one mile from the barracks. The day guards last for 24 hours, and each sentry is on duty four hours by day and four by night at two different periods of two hours each. There are roll calls at meals, at morning and evening parades, and at tattoo. The night guards are light and not manifestly injurious to health.
VIII. INSTRUCTION AND RECREATION.	1. The means of instruction and recreation consist of ball court, schools, libraries, workshops, soldiers' gardens. The last two are not kept up, however. There are no skittle grounds, day rooms, or soldiers' clubs, theatre, or gymnasia. Were all these provided perhaps it would tend to give occupation. At present not. The men are not allowed to leave their barracks during the heat of the day from the beginning of April to the commencement of the rains. The results, all things considered, are doubtful. There are advantages and disadvantages. 2. It would be advisable, by way of improving the means of recreation, to make up the deficiencies in the above list. Sheds should be constructed to protect the troops in the skittle grounds and gymnasium. A day room, provided with refreshments, would prove most useful, and divert the men from the canteen, about which they are so much addicted to crowd in the evenings. 3. The institution of soldiers' savings' banks is advantageous. 4. There is not sufficient shade from trees, sheds, verandahs, &c., for men taking exercise.

References to Subjects and Queries.	REPLIES.
IX. MILITARY PRISONS.	1. The solitary prison cells are ranged in two lines within a square, surrounded by a wall about 10 feet high. These buildings stand upon elevated foundations, are lofty, and are ventilated by iron bars in the doors, and by holes in the walls near the roofs. They have proved (and it is a fact worth noting) remarkably healthy, though quite unprotected from the sun and hot winds.
X. FIELD SERVICE.	1. There are no local regulations for field service. 2. Camping grounds for troops on the line of march are laid down on ordinary occasions in "routes," furnished by the quartermaster-general's department; and representations from medical officers with regard to pitching the camps, halting, changing ground, &c., would, except in cases of military emergency, receive due consideration. 3. The senior medical officer is *ex officio* sanitary officer of the station, and his recommendations as to encamping any portion of the troops, as well as his sanitary suggestions generally, have hitherto been, as far as practicable, attended to. 4. No reply.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following form gives the statistics of sickness and mortality:—

DEESA.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	QUEEN'S TROOPS.																					
1850-51	H. M.'s 8th Regiment - - Do. 86th do. - - -	998	522	4	—	—	81	2	84	1	238	8	10	1	9	2	706	5	1,670	23	167·3	2·3
1851-52	Do. 8th do. - - -	1,001	498	4	—	—	82	3	144	2	232	3	25	1	—	—	721	4	1,702	17	170·0	1·6
1852-53	Do. 8th do. - - -	984	487	7	1	—	93	1	103	2	160	6	29	2	—	—	632	3	1,505	21	152·9	2·1
1853-54	Do. 83rd do. - - -	33	16	—	6	—	9	1	1	—	6	—	3	—	—	—	28	—	69	1	209·0	3·0
1854-55	Do. 83rd do. - - -	340	185	—	1	—	116	1	36	—	84	—	23	2	—	—	355	—	800	3	235·2	0·8
1855-56	Do. 83rd do. - - -	475	291	1	3	—	42	—	18	—	31	2	28	2	—	—	282	2	695	7	146·3	1·4
1856-57	Do. 83rd do. - - -	822	460	—	—	—	50	3	40	1	63	3	24	4	2	2	624	3	1,263	16	153·6	1·9
1857-58	11th Company Royal Engineers H. M.'s 83rd Regiment - - Do. 89th do. - - - Do. 95th do. - - -	686	252	1	1	1	48	2	13	—	116	1	13	2	1	—	438	1	882	8	128·5	1·1
1858-59	Do. 33rd do. - - - Do. 89th do. - - -	619	474	3	3	—	70	1	19	1	90	2	21	5	—	—	461	—	1,138	12	183·8	1·9
1859-60	Do. 33rd do. - - - Depôt H. M.'s 83rd Regiment -	878	945	14	1	—	70	—	95	4	252	4	38	5	5	4	684	—	2,090	31	238·0	3·5
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	1st Troop Horse Brigade - - 4th do. do. - -	108	45	1	—	—	12	—	4	—	25	1	13	—	3	3	129	—	231	5	213·8	4·6
1851-52	4th do. do. - -	109	57	2	—	—	5	—	6	—	22	1	13	—	—	—	151	—	254	3	233·0	2·7
1852-53	4th do. do. - -	109	179	1	—	—	7	1	3	—	28	2	8	—	—	—	116	1	341	5	312·8	4·5
1853-54	4th do. do. - -	101	64	—	2	1	6	—	8	—	21	—	7	1	—	—	129	—	237	2	234·6	2·0
1854-55	2nd do. do. - - 4th do. do. - -	107	80	—	1	—	14	—	11	—	71	4	10	—	—	—	142	—	329	4	307·4	3·7
1855-56	2nd do. do. - -	99	43	—	—	—	9	—	5	—	47	—	9	—	—	—	149	—	262	—	264·6	—
1856-57	2nd do. do. - -	91	54	—	—	—	2	—	5	1	17	1	3	—	1	—	91	—	173	2	190·1	2·1
1857-58	2nd do. do. - - 1st Company 2nd Battalion Artillery - - - -	17	18	—	—	—	—	—	3	—	6	—	1	—	—	—	25	—	53	—	311·7	—
1859-60	1st Troop Horse Brigade - -	121	103	—	—	—	25	—	17	—	60	—	13	1	—	—	351	—	569	1	470·2	0·8

NATIVE TROOPS.

1850-51	Left Wing 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	1,045	227	1	13	—	11	—	2	—	89	3	17	—	2	2	537	2	898	8	85·9	0·7
1851-52	Detachment 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	1,056	291	2	3	—	25	3	2	1	96	1	20	—	—	—	404	1	841	8	79·6	0·7
1852-53	Detachment 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	923	488	3	4	—	22	—	1	—	58	—	12	1	—	—	388	—	973	4	105·4	0·4
1853-54	Squadron 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry - 23rd do. do. - -	1,066	325	3	8	1	28	—	1	—	87	3	8	1	—	—	506	3	963	11	90·3	1·0
1854-55	Squadron 2nd Regiment Light Cavalry - - - - Do. 3rd do. - - Left Wing 23rd Regiment Native Infantry - - - -	757	194	2	1	—	5	—	2	1	48	2	15	1	—	—	236	3	501	9	66·1	1·1
1855-56	Squadron 3rd Regiment Light Cavalry - - - - 12th Regiment Native Infantry - 23rd do. do. - -	744	223	7	—	—	25	3	2	—	53	2	8	—	—	—	325	—	636	12	85·3	1·6
1856-57	Squadron 3rd Regiment Light Cavalry - - - - 12th Regiment Native Infantry -	840	143	2	5	—	26	1	1	—	34	1	3	1	—	—	317	2	529	7	62·9	0·8
1857-58	Squadron 2nd Regiment Light Cavalry - - - - Wing 17th Regiment Native Infantry - - - -	667	150	—	17	1	11	—	2	—	30	1	9	—	—	—	362	—	581	2	87·1	0·2
1858-59	Squadron 2nd Regiment Light Cavalry - - - - 17th Regiment Native Infantry 31st do. do. -	782	367	12	8	—	20	1	—	—	89	2	5	—	1	—	406	4	896	19	114·5	2·4
1859-60	3rd Company 3rd Battalion Artillery - - - - Squadron 1st Regiment Light Cavalry - - - - 31st Regiment Native Infantry -	680	345	3	—	—	33	1	4	—	64	1	11	1	—	—	460	—	917	6	134·8	0·8

DEESA.
BOMBAY.

WOMEN and CHILDREN.

Years.	CORPS.	Women. Strength. European.	Women. Strength. Indo-European and Native.	Women. Strength. Total.	Women. Treated. European.	Women. Treated. Indo-European and Native.	Women. Died. European.	Women. Died. Indo-European and Native.	Women. Ratio per Cent. to Strength. Treated.	Women. Ratio per Cent. to Strength. Died.	Children. Strength. European.	Children. Strength. Indo-European and Native.	Children. Strength. Total.	Children. Treated. European.	Children. Treated. Indo-European and Native.	Children. Died. European.	Children. Died. Indo-European and Native.	Children. Ratio per Cent. to Strength. Treated.	Children. Ratio per Cent. to Strength. Died.
1852-53	H. M.'s 8th Regiment	92	2	94	82	2	5	—	89·3	5·3	174	7	181	85	2	6	1	48·0	3·8
1853-54	Do. 83rd do.	51	—	51	65	—	2	—	127·4	3·9	77	—	77	57	—	1	—	74·0	1·2
1854-55	Do. 83rd do.	29	—	29	32	—	1	—	110·3	3·4	51	—	51	16	—	—	—	31·3	—
1855-56	Do. 83rd do.	92	—	92	88	—	2	—	95·6	2·1	155	—	155	125	—	9	—	80·6	5·8
1856-57	Do. 83rd do.	92	—	92	—	—	—	—	—	—	156	—	156	151	—	19	—	96·6	12·1
1857-58	Do. 89th do.	11	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1858-59	Do. 33rd do.	40	1	41	52	2	1	1	131·7	4·8	67	1	68	53	—	1	—	77·8	1·4
1859-60	Do. 33rd do.	54	—	54	88	—	1	—	162·9	1·8	90	—	90	110	—	14	—	122·2	15·5
1852-53	4th Troop Horse Brigade	9	7	16	7	4	1	—	63·7	6·2	14	15	29	8	1	1	1	31·0	6·8
1853-54	4th do.	7	6	13	18	4	—	—	169·2	—	14	15	29	18	11	2	1	100·0	10·3
1854-55	2nd do.	7	5	12	—	1	—	—	8·3	—	7	12	19	—	—	—	—	—	—
1855-56	2nd do.	6	4	10	6	6	—	1	120·0	10·0	9	6	15	14	10	—	3	160·0	20·0
1856-57	2nd do.	5	3	8	6	6	—	—	150·0	—	10	6	16	8	2	—	—	62·5	—
1859-60	1st do.	11	1	12	9	10	1	—	158·3	8·3	11		12	2	1	1	—	25·0	8·3

By order of the Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General Medical Department,
Bombay, 22nd December 1860.

References to Subjects and Queries.	REPLIES.

XII. HOSPITALS.

1. Plans, &c., of hospital.
2. The European regimental hospital is about 1,600 feet north-east of the barracks, and immediately in rear of the officers' lines. The troop hospital is 1,400 feet north-east of the horse artillery barracks, and also in rear of the officers' lines. The bazaar occupies the S.W. extremity of the cantonment. The site of the European hospital is the highest and best in the cantonment. The officers' lines are too close, and obstruct the breeze. The artillery hospital is on lower ground, and at a similar disadvantage as regards the breeze. There are no nuisances, malaria, &c., in the vicinity.
3. The water supply is abundant and wholesome.
4. The drainage is similar to that described for the barracks.
5. The ward floors are raised about 1½ feet above the ground. No ventilation underneath.

The roof water sinks into the subsoil. There is no surface drainage or guttering round the hospitals.

The hospitals are built of similar materials to the barracks. The walls are single. No complaint has been made as to heat from the roofs; were the walls higher, however, it would tend to coolness. There are verandahs 10 feet wide all round, sufficient to afford shelter from the sun's rays. The front or closed verandah of the British infantry hospital has, under circumstances of great pressure, been partially occupied, but platforms were erected on the recommendation of the medical officer, on which tents are constantly pitched for the accommodation of convalescents. The hospitals consist of one floor. They were constructed in 1827–28, and contain 12 wards and 505 beds.

The following table gives the details of the accommodation:—

Wards.	Regulation Number of Sick per Ward.	Dimensions of Ward. Length.	Dimensions of Ward. Breadth.	Dimensions of Ward. Height.	Dimensions of Ward. Cubic Contents.	Cubic Feet per Bed.	Superficial Feet per Bed.	Height of Beds above Floor.		Windows. Number.	Windows. Height.	Windows. Width.
		Ft.	Ft.	Ft.	Feet.			Ft.	In.		Feet.	Feet.
No. 1	6	25	25	17⅓	10,937⅓	1,822 9/10	104 3/10	1	7	—	—	—
No. 2	12	55	25	17⅓	24,062⅓	2,005⅓	114⅓	1	7	4	6¼	3½
No. 3	12	55	25	17⅓	24,064⅓	2,005⅓	114⅓	1	7	6	6¼	3½
No. 4	12	55	25	17⅓	24,062⅓	2,005⅓	114⅓	1	7	6	6¼	3½
No. 5	12	55	25	17⅓	24,062⅓	2,005⅓	114⅓	1	7	4	6¼	3½
No. 6	6	25	25	17⅓	10,937⅓	1,822 9/10	104 9/10	1	7	0	—	—
Female wards 7	4	18	18	16	5,184	1,296	81	1	7	2	6¼	3½
Female wards 8	4	18	18	16	5,184	1,296	81	1	7	1	6¼	3½
Female wards 9	8	30	18	16	8,640	1,080	67½	1	7	6	6¼	3½
Horse Artillery.												
No. 1	16	75½	23	22	38,203	2,387 6/10	108½	1	7	12	5¾	3¾
No. 2	7	20	23	22	10,120	1,445 1/10	65 7/10	1	7	4	5¾	3¾
Female ward 3	6	20	19	17¼	6,555	1,092½	63½	1	7	4	5¾	3¾

The hospitals are not so placed as to receive the full benefit of prevailing winds. The windows open outwards; they are of Venetian construction.

6. The hospitals are ventilated by ventilators in the roof, punkahs, doors and windows. The ventilation is generally sufficient, but not superior to that obtained by better construction.
7. Punkahs are used for cooling the air.
8. No means of warming are required.

Limewashing of wards is used whenever required; there is no stated interval for doing this.

9. The privies are detached from the hospital, and are adjacent to cesspits similar to those of the barracks.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	10. In the artillery hospital, the lavatory arrangements are insufficient. In the infantry hospital, they consist of sheds projected from the rear verandah, fitted up with tables, basins, chatties and towels. The water supply is abundant, and the arrangements are sufficient, but not satisfactory, as the sheds interfere with the ventilation of the wards. 11. The means of bathing consist of chatties, tin baths, and basins, not sufficient nor convenient. 12. Native washermen employed by the month take away the hospital linen, and wash it at the river side, or at rain water pools. 13. The hospital storage is sufficient and dry. 14. The hospital bedsteads are made of iron, bottomed with iron plates or strong cotton tape, and are excellent. The bedding consists of counterpanes, blankets, sheets, mattresses, stuffed with rice straw, or cotton; but hair or cocoa-nut fibre would be preferable materials. 15. The means of cooking are like those described for the barracks,—cells in masonry, copper pans, pots, kettles, &c. The cooks are Portuguese or natives, and do their work tolerably well, varying the cooking as required, and acting under the superintendence of the hospital steward, and an orderly from the regiment. 16. Diet tables, &c., the same as in all other hospitals in the Presidency. 17. The attendance on the sick is ample and sufficient. In the European regiment it consists of an apothecary, steward, assistant apothecary, medical apprentices, compounder, matron, assistant matron, hospital serjeant, and the second class hospital servants, as detailed in the monthly returns of sick; orderlies from regiments being employed during epidemic disease, or in particular cases of importance. The artillery hospital is equally well provided for. 18. The sanitary condition of the hospitals is excellent. No epidemic has originated in the wards. No instance of pyæmia or hospital gangrene; ulcers and wounds heal rapidly. 19. All sanitary defects have been corrected on the representation of the medical officer; thus, ventilators have been constructed in the roofs of the privies; a dead wall in each of the wings forming the subsidiary buildings has been removed, and new ablution rooms have been constructed. But the hospital accommodation is too limited. Two small wards are required for cases of contagious disease, and for insane or drunken men, and one ward is required capable of accommodating 20 convalescents. 20. The hospitals stand in large spaces enclosed by hedges in which convalescents exercise morning and evening along walks shaded by trees. Horse exercise is allowed in the artillery when deemed necessary. 21. There is a separate hospital for women and children. The present arrangements in this respect are satisfactory. 22. There are no local hospital regulations. 23. Representations on all subjects connected with the hospital, sick, &c., have been made from time to time, as occasion required, and they have invariably received prompt attention. 24. There are no convalescent wards or hospital, but as the hospitals are too small, accommodation for convalescents, both artillery and European infantry, is necessary. It may be mentioned that the artillery hospital has no apothecary's quarters, no dead house, and no guard house, and that the men on guard occupy a corner of the front verandah of the hospital, where they eat, drink, and smoke at their discretion.
XIII. Burial of the Dead.	1. The British burial ground is inside the cantonment, and is well open to every breeze. 2. The area is about 2¾ acres. Soil, white earth; subsoil, red earth with limestone. Drainage, surface and rapidly sinking into the subsoil. 3. Grave space 3 feet wide; same distance between the graves. In ordinary cases the depth of graves is 6 feet. During epidemics it is 7 to 8 feet. Graves have never been re-opened in late experience, and the re-opening of them is only admissible for the remains of relatives of parties previously interred. Burial takes place within 24 hours after death at ordinary times. During epidemics, 16 hours after death, or 12 hours after, if practicable. 4. No graveyard is now offensive. When a soldier dies, a casualty report is forwarded by the medical officer to the officer commanding and the chaplain, in which the hour for burial is named. At that time the deceased is removed in a hearse (closed), and accompanied to the graveyard by his company and former friends. 5. The Mussulmans bury their dead in an appointed spot on the western extremity of the bazaar, near the bank of the river. The Hindoos burn their dead near the bed of the river, and the ashes being afterwards collected, are thrown into the water and washed away. 6, 7. No injury to the public health from the present practice of burial, and no improvements to suggest.

(Signed) T. Williams, Brigadier,
Commanding Deesa Field Brigade.
W. Hanbury, Surgeon, H.M. 33rd Regiment.
John R. Maunsell, Captain Engineers,
Executive Engineer, Deesa and Aboo.

Deesa, 4th September 1860.

ASSEERGHUR.
BOMBAY.

ASSEERGHUR.

Accommodation { Queen's Troops—Infantry { H.M. 95th Regiment. The new barracks will hold 100 men when finished.
Native Troops—Infantry. Nine pendalls, about 50 men each.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is wild, and cut up by ravines. To the west, and at a greater distance to the S. and S.E., it is mountainous; the rest is hilly. The surface is generally dry, but water lies for many months in the ravines. The station is in the centre of a belt of jungle, 20 miles in breadth. 2. The station is about 800 feet above the level of the sea. The nearest water is in the tanks of the fortress, which are kept filled. The river Taptee flows past at about 8 miles' distance. There is no higher or healthier ground adjoining the station. 3. The nearest hills are about 3 miles from the fortress; their summits are, however lower than the station. 4. There is no liability of the water overflowing in the vicinity. There is much broken ground, but this has no effect upon the health of the troops. 5. The station is very open, and much exposed to winds. The temperature of the station is raised by the reflected sun-heat from the rock formation universally prevalent in the fort. The winds are very variable; both the east and west winds being violent, the latter most prevalent. 6. Very little of the surrounding country is cultivated within a radius of 6 miles. There are no works of irrigation near the station. Neither rice, indigo, hemp, or flax are cultivated near the station. 7. Burhampore is at a distance of 13 miles. 8. The geological structure of the district consists chiefly of trap rock; there is very little soil, the surface is morum. The station does not occupy new ground. 9. From the nature of the surface, water cannot be dug for. There are many rocky caverns winding through the village, as well as in the station; these are nearly dry in the hot season, but are full of water in the rains. 10. The rain-fall partly flows away into the principal nullahs, and the remainder evaporates in pools. There is no adjacent higher ground the drainage from which passes into the sub-soil of the station. 11. The water supply of the station is derived from tanks and rain-fall; these tanks being open, and generally well filled. The tank surface is 163,000 square feet in the fort, and about 7,000 square feet in the lower fort and village. The tanks contain *datura stramonium, hyoscyamus niger*, the nim tree, or *melia azadirachta*, a valuable febrifuge, &c., &c.; and all along the banks of the Taptee and close to the station may be found every kind of game, a large species of antelope, the *tigris felis*, the bear, the somber, the bison, &c. One tank is used for drinking and bathing; for the former the natives slightly clear away the surface. The water near the N. I. pendalls "15 to 20," emits effluvium during the rains; if the tanks were drained and the water cleared out this might be prevented. From the amount of minute vegetable matter in the open tanks, malaria must emanate, especially before the rains; yet this is a healthy station, and generally free from fever. 12. The water supply is sufficient for 3,500 inhabitants, inclusive of the water in the fort. There are not sufficient means at the station for analyzing the water; it is moderately hard; there is no microscope. The water in the sweet well reserved for Europeans is good, but that in the tanks is very bad, though not considered so by the natives when filtered, and the tanks are preserved for the use of the garrison, and used only for drinking. The water is raised and distributed by the mussacks of water carriers. There is no better supply to be had. Probably the supply of good water might be increased by making fresh wells in the rock. 13. The ruined walls of old native edifices might be pulled down, as they only serve as screens for an accumulation of native filth. 14. New stations should be selected by engineers and medical officers; elevated ground, with geological facilities for drainage and the formation of wells and tanks, and the cultivation of gardens should be selected; and all jungle should be destroyed within a circumference of half a mile on all sides of any new station.
II. CLIMATE.	1. The only instruments at the station for conducting or registering meteorological observations are a thermometer, pluviometer, and a rain gauge. 2. No observations or meteorological tables have been kept. 3. The climate is excellent, moderately dry, and not very variable; it is not affected by tree planting or canal irrigation. It has an excellent influence on the health of the troops, who require in this station no diet, shelter, or clothing beyond that which they receive at other stations in India. The precautions to be used with respect to drill, duties, &c. are the same which common sense dictates, and is practised in other parts of the country. The first quarter of the year is the most healthy season, and the third quarter the most unhealthy, although the difference is hardly appreciable; fever of a remittent type is prevalent in the third quarter. 4. There is no other district adjacent to the station which would offer a superior position, or be more conducive to health. 5. Assistant-Surgeon Irwin, of H.M. 28th regiment of Foot, has served in Bombay, Nussick, and Asseerghur; the first he considers quite unfit for the British soldier; the second, a much healthier station, but much visited by epidemics of cholera; the third, salubrious and conducive to health. Col. H. James, commanding Asseerghur, states, he was attached and did duty with the 1st battalion of 10th N. I. at Poona, from April to September 1821; in October he joined the 2nd battalion 9th regiment N. I. at Severndroog,

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	and followed the fortunes of that regiment (which, on the reorganization of the army on the 1st May 1824, became the 18th regiment N. I.) until February 1845; it was then at Sinde, when he left on medical certificate for England, and rejoined his regiment in 1847, and commanded it for 8 consecutive years until December 1855, when he was sent home from Aden on medical certificate. He served at most stations in the Bombay Presidency. The men were at all times healthy, except when attacked with cholera *en route* from Kulladgee to Belgaum in 1837; the regiment went to Baroda, and remained six years, during which time it was very healthy. At Aden the men suffered from scurvy the first year (1855-6); 14 officers were on sick certificate in England; 8 officers and 2 medical men left it for Aden. Sinde and Aden are the only 2 insalubrious stations; none are positively injurious.
III. Sanitary Condition of Station.	1 to 4. Plans of the station and surrounding country are transmitted. Very few drains. All refuse is thrown over the fort wall. The barracks are in course of construction for 100 men. The detachment of H.M. regiment since their arrival have occupied a fine old mosque, which will accommodate about 50 men; at present it is very crowded, with 73 men; the remainder of the detachment (20) reside in a house formerly the staff-serjeants' quarters, which is in a dilapidated state. Had the one barrack been completed, with its conveniences, the cost of which would have been about 300 rupees, the Europeans would have been supplied with splendid quarters. The right half barrack is finished, with the exception of the glass, and will accommodate about 50 men when completed; but the work of all public buildings is stopped by order of the Government. 5. The windows in the new barracks are on opposite and adjacent sides, all round the verandah; to these there are glass window shutters; and the walls of the main room are pierced with arches, without frames, and have walls built in them to the height of 4 feet. The verandah is carried round the building, and is 10 feet wide; it is not yet occupied. There are neither jalousies or jhilmils. 6, 7. There are no tents used in the garrison. 8. In the new barracks there is a ventilator, open on four sides, on the summit of the roof; all other ventilation is effected by having the walls of the sleeping apartments furnished with numerous arches which open into the verandah. The means of ventilation is decidedly sufficient to keep the air pure by night as well as by day. There are no other means adopted for the purpose of cooling the air. 9, 10. The new barracks are built chiefly of brick, partly of stone and lime. The floors are intended to be of stone; their surface will average 5 feet above the ground level; there is no passage of air beneath. 11. The walls of the barracks should be made of brick, 3 feet thick; the verandahs 4 yards in width; a double roof to the barracks, the outer roof being elevated 1 foot from the inner one, and of a smaller area; thus allowing a free current of air from below upwards, and *vice versâ*. It is the duty of the engineer officer, should he be at the station, or in his absence the fort adjutant, to keep the barracks and cantonments in repair. The work is performed by contract, and the medical officer is responsible for the general sanitary state of the cantonment. The walls and ceilings of the barracks are cleansed and lime-washed inside every 6 months; outside every 12. 12. A marginal sketch of the men's lavatories is appended to the plan transmitted. The water is supplied by hand, and drained into a cesspool near the building. 13. A marginal sketch of the cookhouses in the barracks is transmitted. The means of drainage is by removing the refuse water by hand from a reservoir outside. There are no conveniences for washing or drying linen. 14. A marginal sketch of the privies and urinals is attached and transmitted. 15. The only means of ventilation adopted for outbuildings is by the windows and doors being open; the former being upon vertical hinges in the usual way. The barracks are lighted by oil in earthen lamps. 16. The construction of sewers and drains has not been considered as yet in the new barracks; but the sewerage will be probably removed by hand. One of the tanks on the west side of the fort is unsavory at certain seasons of the year. No part of the buildings used as barracks or hospitals is in the least damp. The refuse is in all cases thrown over the fort wall. There are no foul ditches near the station. 17. There is one open space of ground near the main guard and parade ground, where all the native women of the station defæcate; this is cleaned by the mehter once a day, but the smell which arises is always offensive, and would nurture epidemic diseases, especially cholera, should it break out. The refuse, as is usual in all cases, is thrown over the fort wall. No case of cholera has as yet occurred, although it is prevalent in the Pettah below, and in the adjoining villages. 18. The surface of the cantonment is kept free from vegetation. The ruins of the old palace on the west side might with great advantage be pulled down and removed, as it only serves as a screen for filth, and would improve the health of the station. 19. The sanitary condition of the bazaar is satisfactory; it is well drained and ventilated, well supplied with water, and kept clean. The sweepers carry away all the dirt, dry leaves, &c. collected. A policeman ought to be entertained to enforce the regulations in the fortress bazaar. The native houses near the station are built in all shapes and of all sizes in the Pettah, and are irregular, like all old villages; there are neither dungheaps or cesspools within them; but no nuisance is experienced from them at the barracks. 20. Bullocks are slaughtered in the Pettah, about a mile below the fort; one sheep occasionally slaughtered in the fortress for the use of the European residents. No nuisance is experienced in the station from the condition of the slaughter-houses. 21. There are no arrangements for the stabling or picketing of bazaar horses, or those of camp followers. 22, 23. There are neither picketing grounds or stables for the artillery or cavalry horses at the station. There is no accommodation whatever for married non-commissioned officers or men; and there were two of H.M. 28th regiment who occupied barrack rooms with the men, and one of H.M. 95th regiment who does so now.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is good and airy; being on a slope, the rain runs off immediately. All houses should be tiled; all grass roofs positively prohibited.

ASSEERGHUR. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. HEALTH OF TROOPS.	1 to 3. The surrounding district and native population are essentially unhealthy. Cholera and fever are prevalent. This may be attributed to the excessive filthiness of the habits of the native population, and the total absence of all sanitary enforcement. 4. H. M. 28th detachment were at Bombay previous to arriving at this station, at which they remained 1 year, leaving that place on December 10th, 1859. They suffered from fever and dysentery, and arrived January 10th, 1860. Their health was good on arrival at this station. They have chiefly suffered from fever since. 5. The troops are not camped out. 6, 7, 8. Hill stations always to be preferred; they are more healthy for the troops. 9 to 11. Not aware of any diseases peculiar to hill stations which the troops are liable to be attacked with on going to them. The hot seasons are best adapted for residence in hill stations. The shortest period of residence to enable troops to receive the full benefit of the hill stations would be 4 months. 2. No injury to the troops by a longer residence. 3. There are no special precautions required for the protection of the health of the troops on leaving hill stations for the plains. 4. Hill stations are the best for the troops, their periods of service on the plains being brief and well-timed as to season, &c. Frequent change of station would be beneficial, respective of season. 5. The barrack and hospital accommodation is sufficient for the troops at hill stations I have had experience of. 6, 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 8, 19. The British soldier should land in India under 22 years of age, and during the months November, December, and January. Precautions should be taken to clothe them suitably upon landing, giving them abundance of vegetable diet, prohibiting dram drinking almost to interdiction, and promoting healthy and interesting exercise. 20. Troops should be sent direct from the home depôts to India. If they land in the hot weather they should be gradually acclimatised by a preliminary residence in hill stations. 21, 22. A British soldier should not serve more than 5 years at a time in India. 23, 24. Invalids should leave India for home during the cold season.
Diseases.	1. There is a regular weekly inspection parade for the discovery of incipient diseases. 2. There has been a tendency to the development of scorbutus in H. M. 28th detachment, owing to deficiency of the vegetable element and the rations; this might be remedied by allowing the men to cultivate gardens. 3. The proportion of cases of hepatic disease is about 4 per cent. It is attributable to the climate, and may be considered as a primary affection; not aware of any prophylactic measures. 4. No case of dracunculus has occurred at the station. 5. Cases of venereal disease are few and far between. 6. The troops at this station suffer from endemic diseases, such as remittent, intermittent, and common fevers, acute and chronic dysentery, and acute rheumatism. No case of cholera or small pox has occurred; neither has there been a death. 7. Zymotic diseases have been so rare that no distinct axiom can be drawn as to their general nosological character. 8. The prevalence and extent of epidemic disease in this country is influenced considerably by the absence of healthy occupation for both mind and body, as also by the long and tedious marches which the troops are subjected to. 9. Small doses of quinine have not been administered at the station as a prophylactic against malarial diseases. 10. Thorough and efficient surface cleansing of the station and its vicinity, good drainage, the occasional cleansing of tanks from superabundance of vegetable matter, and the strictest attention (and this is often disregarded) to avoiding overcrowding the men in barracks would be the best means of preventing or mitigating epidemic disease at the station.
V. INTEMPERANCE.	1. The soldiers at this station are generally temperate; there are only between two or three confirmed drunkards. 2. The proportion of admissions into hospitals caused by diseases the direct result of intemperance is 1 per cent.; there are none caused indirectly. Having arrived only four months since at the station there are no statistics prepared of the amount of sickness, mortality, or crime at the station caused by intemperance, total abstinence, or temperance; besides the number of men is only 79 Europeans. Drunkenness is punished as an offence. 3. Distilled spirits are sold in the bazaar, but European soldiers are not allowed to buy them. The quality is: arrack, $\frac{19}{25}$ths; water, $\frac{6}{25}$ths. Spirits form part of the soldier's rations at the station, on the march, and in the field. No spirits are issued on the march before sunset; one dram is allowed in the morning before breakfast. This practice is not detrimental to their health in the cold season, but good strong hot coffee would be a good substitute in the hot season. One dram is given at the discretion of the medical officer. 4. Malt liquor is decidedly preferable to spirits for troops and covalescents; spirits are not generally issued or allowed by the medical officer to convalescents. The consumption of spirits throughout India is not conducive to the efficiency and internal discipline of the corps; yet the 95th detachment here has not been materially affected by it. 5. Decidedly agree in abolishing the issue of spirits, except on the march, substituting an equivalent of beer or porter for the dram. 6. Malt liquors, to the extent of one quart per day, are decidedly beneficial to the soldier in the habit of drinking fermented liquors, and are far superior to spirituous liquors in conserving health. 7. No coffee is issued at the station; tea is used in moderation; ginger beer is the only effervescing drink used, and that very moderately. Their use is much more conducive to health, efficiency, and discipline than the use of spirits, or excessive consumption of malt liquors.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	8. It would be most decidedly beneficial to the health of the troops on the station if the spirit ration was abolished. Let beer and coffee be substituted. 9. It would be emphatically beneficial to prohibit the sale of spirituous liquors in the canteens to the troops. 10. No further recommendations on these points.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is exactly the same, consisting of:—1 lb. bread, 1 lb. beef or mutton, 1 lb. mixed vegetables, 4 oz. rice, 1 oz. salt, $\frac{5}{7}$ oz. tea (mixed), 2½ oz. sugar. The ration is inspected by the officer of the day, and the quarter-master sergeant. 2. A complete ration is provided; stoppage 1 rupee 4 pice per month; 3 meals per diem. One pound of mixed vegetables enters into the constitution of the ration. 3. It would be a considerable improvement in the ration if 1 cup of coffee and a hard biscuit were given to each man in the early part of the morning, before parade; the men having to rise very early in tropical climates, and at present have to go through fatiguing drills, &c. on an empty stomach, having to wait until 8 p.m. for breakfast. 4. The rations are cooked on an open fire-place by native cooks. The kitchens are at present dirty, and not well ventilated. They are, however, undergoing alterations, and will be white-washed when finished. They are well supplied with water. The food is roasted. The cooking is properly carried out, and tea and coffee properly prepared by the native cooks. When practicable the men on march have coffee issued to them after the first halt, 1 hour after leaving the old camp ground. 5. Gardens for the cultivation of vegetables by soldiers would have to be 3 miles away, each time descending and ascending the hill, the ground being also stony all around, and very little water obtainable 2 months after the monsoon.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress and accoutrements at this station consist of khakee clothing by day and large clothing by night, during the summer months, from 1st April to the middle of the monsoon in August. Cloth clothing is worn during the winter months or cold season, from September to April. The soldier's clothing is sufficient and suitable to the climate. The wearing of flannel next the skin should be enforced; the helmet should be made of wicker-work, and covered with pith 1 inch in thickness. The guard dress consists of khakee clothing, and the wicker-work helmet and cotton turban. English cloaks are the only protection from wet.
Duties.	1. Owing to the enervating, relaxing effects of the climate on Europeans, drill would be better and more readily learnt at home, and the figure better set up, than in India. 2. The usual routine is drill 1 hour after sunrise, which is beneficial to the men's health; it is the best time for drill. Marches should be performed so as to reach the new camp ground as soon as possible after sunrise. The men have on the average 4 or 5 nights in bed during the week. 3. Guards are mounted between 200 and 300 yards from barracks, and are relieved every morning. The roll is called after revéillée and before each meal. No additional precautions are requisite at this station for the performance of this duty.
VIII. Instruction and Recreation.	1. The means of recreation and instruction at this station consist of a ball-court, which is out of repair, a company library, and a theatre in a private house. There are no skittle-grounds, day-room, or soldiers' clubs, workshops, or gymnasia, consequently the men are not sufficiently occupied during the wet season or during the heat of the day. Restrictions are placed on the men as to exposure to the sun and rain when off duty, which, when carried out effectively, conduce to their health. 2. I would suggest the putting of the ball-court in working order, allowing fishing in the tanks, providing skittles and a skittle-ground, and encouraging quoits, leap-frog, &c. 3. Soldiers' savings' banks advantageous. 4. There is no shade from trees or sheds. In the new barracks, the verandahs are ample and well adapted for walking exercise.
IX. Military Prisons.	1. There is no military prison; the cells are good in a sanitary point of view.
X. Field Service.	No information under this head.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The hospital is situated in the most elevated locality in the station, near the barracks. There are no stables. It is remote from the bazaar of the fort, which is very small. The civil houses are very few. The site is open and airy, and the ventilation is not obstructed by any buildings; the site of the hospital is in all respects healthy. 3. The water from 1 well only is good, but as this is reserved for Europeans only there is an abundance for them. Filtration of the water through charcoal and sand is a cheap and easy method of purifying it; and the practice should be instituted and enforced. 4. There is no drainage, but refuse matters and sewage are removed by the native sweepers. 5. The height of the lowest wards in the hospital above the ground is 4 yds. 1 ft. 9¾ in. There is no perflation of air beneath the floors. The roof water sinks into the subsoil. The hospitals being situated on elevated ground, the slope carries off the water rapidly and sufficiently. There are no drains or gutters around it. The hospital is built of brick, mud, and timber, and brick tiles. The roofs and walls are single but sufficiently thick to keep the hospital cool. There are verandahs on three sides, the length of which is 35 yds. 1 ft. 10 in., the breadth 2 yds. 2 ft. ½ in., and the height 3 yds. 5 inches; these are used by sick patients during morning and evening, when able to take such exercise. The hospital

ASSEERGHUR.
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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	consists of only one flat. It is placed so as to receive the benefit of prevailing winds. The windows open in the centre, from above downwards, being divided into two lateral halves. Date of construction, 1859. Total number of wards, 6. Total regulation number of beds, 21.

Wards or Hospital Huts, No.	Regulation No. of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. No.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Feet.			Ft. in.		Ft.	Ft. in.
General Ward -	8	47 10¾	27 6	17 6¾	21,573	2,696	Each bed covers a space of 14 feet.	—	14	7½	3 9½
Fever ditto - -	3	27 5½	12 0¾	13 9¾	4,214	1,404					
Opthalmic ditto -	4	27 5½	21 4¾	17 6¾	9,639	2,409					
Detained ditto -	3	27 5½	12 0¾	13 9¾	4,214	1,404					
Civil large ditto -	2	26 0	13 7¾	17 6¾	5,746	2,873					
Ditto small ditto -	1	13 7¾	12 2¼	13 9¾	2,028	2,028					
Surgery - -	—	11 4½	11 0	13 9¾	—	—					
Engineer's Measurement:											
Large General Ward	—	48¼	26	18	22,581	1,129	63	1½	14	6	4
Opthalmic ditto -	—	27	21¼	18	10,327	1,291	72				
Fever ditto - -	—	27	11⅙	12	3,618	1,206	100				
Scabies ditto - -	—	27	11⅙	12	3,618	724	60				
Strangers' ditto -	—	25¾	13¾	18	6,373	1,275	71				

6. The ventilation in use in the wards is by means of doors and windows, which are sufficient; no punkahs are used here. There are neither jalousies or jhilmils.
7. There are no means of cooling the air in the wards.
8. There is no necessity for warming the hospital wards. The walls and ceilings are cleansed and lime-washed twice a year interiorly, and once a year exteriorly.
9. There is 1 privy closely adjacent to the hospital; it is made of brick, and quite sufficient. There is no system of drainage; the mehter cleans them twice daily; they are not offensive.
10. There is 1 ample bath room for bathing and washing; this is sufficient for the requirements of the sick that the hospital can contain.
11. There is a large tub which is used for bathing by the sick, also a mussack bath, convenient and sufficient.
12. The washerman cleanses and dries the hospital linen, and performs this duty satisfactorily.
13. The storage is sufficient.
14. The bedsteads are constructed of iron with tapes (which are washed once a month) for supporting the mattresses.
15. The hospital kitchen is commodious, being adjacent to the hospital. The means and apparatus are abundant, tinned copper ghindies being the vessels employed the cooking of diets is properly done and sufficiently varied.
16. A copy of the diet table and diet roll is transmitted; all the other forms, &c. are those prescribed by the new hospital regulations for Queen's troops.
17. The attendance upon the sick is provided by a plentiful supply of ward coolies, dressers, &c., but a European soldier, when requiring it, can have the attendance of a comrade by permission of the medical officer. There is an acting hospital serjeant resident in the hospital.
18. During my experience (4 months) the sanitary condition of the hospital has been very good; no epidemic disease, hospital gangrene, or pyœmia have appeared in the wards.
19. There are no deficiencies or sanitary defects, excepting the very dirty and unwhitewashed condition of the hospital out-houses.
20. There is no special provision for the exercising of convalescents. The hospital dhoolie is occasionally used in the evening by convalescents. There are no shaded walks or seats for the sick. When able the sick take exercise in the hospital compound in the evening.
21. The soldiers' sick wives and children are treated in their own quarters; the present arrangement is sufficient as only 1 woman 1 child are present with the detachment.
22. There are no special local hospital regulations.
23. Practically speaking the medical officer has no power in matters connected with the sanitary state of his hospital, for although he may make suggestions he cannot enable them to be carried out with that energy and speed which the vital subject of preserving the health of the British troops demands. As regards diet, medical comforts, &c. at this station, his powers are ample.
24. There are no convalescent wards in the hospital. The number of British troops being so small (only 100 here) there is no necessity for them.

XIII. BURIAL OF THE DEAD.

1. The station is very limited and the burial ground is within the station and about 200 yards from the main guard. The prevailing winds, especially at night, blow from this ground over the main guard and native prison and the present barracks.
2. The area of the burial ground is 11,400 square feet, its soil is morum; and it is carefully kept.
3. The burial ground in the station is on the west side, but is not a nuisance. A space of 6 feet by 3 feet is allowed for each grave and an interval of about 3 feet between them. The graves are about 3 feet deep, and are never reopened excepting to erect a tomb of masonry. Only 1 corpse is buried in a grave. Interment takes place generally 24 hours after death, as the body decomposes quickly, at ordinary times; in cases of cholera immediately. There is no burial ground for native troops.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	4. I have not detected any offensiveness arising from the graveyard. 5. The dead belonging to camp followers and bazaar people are buried or burnt according to caste, outside the fortress. 6. I have not detected any injury to the public health arising from the practice. 7. I should suggest a burial ground being established below the fort, at a distance of half a mile from the pettah, since within such a very circumscribed space as the fort occcupies, a great accumulation of interred corpses must eventually tell on the health of the residents, especially in a tropical climate.

(Signed) H. James, Colonel, commanding Asseerghur.
John S. Allanby, M.D., Assistant Surgeon, H.M. 82nd Regt.

1st May 1861.

SHOLAPORE.

Accommodation.
- Queen's Troops—Artillery 75
- Native Troops
  - Artillery 75
  - Cavalry 411
  - Infantry 910

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is completely open and gently undulating; in some parts the undulations being very slight. The soil of the station is gravelly, with an underlying rock of sandstone; while that of the adjacent country consists of black, or what is termed cotton soil. There is no wood or jungle whatever, and the supply of water in the vicinity is very limited. 2, 3. The elevation of the station above the sea is 1,821 feet, but it is on much the same level as that of the adjacent country. The nearest water is a large tank, to the north of the artillery lines, the surface of which is 48 feet below barracks, and 44½ feet below the hospital floor level. Within 30 miles of this station there is no higher ground than the camp of Sholapore, and we are unable to state whether an extra elevation of 200 feet, which is obtainable at that distance, would be attended with any corresponding advantages to health and situation. The higher ground referred to is a tract of table land. 4. With the exception of a nullah which overflows its banks during the rainy season, and forms a marsh 3½ miles from camp to the north-east, the nearest water is the Seena river, which bends in such a form as to be within 13 miles of the camp to the east and eight to the south. The overflow from the nullah generally takes place in September and renders the road impassable for three or four days, but probably the adjacant country remains flooded for ten days or a fortnight. There is some slightly broken ground, some small ravines, and one or two water pits in the vicinity of the cantonment, but they have never been found injurious or in any perceptible manner to affect the health of the station. 5. The station is completely open and exposed to the prevailing winds, and none of the buildings exposed to reflected sun heat. The sea breeze is not felt at Sholapore, and the only wind which may be said to be disagreeable is that from the east. It is during the prevalence of this wind that fevers, ague, &c., usually occur. 6. The surrounding country is cultivated principally with dry crops, such as jowarree, bajree, grain, linseed, and cotton. There are no works of irrigation near the station, and no sensible effect has been found from the very slight artificial irrigation that is carried on in the vegetable gardens in the vicinity of the station. There is no ground suitable for rice cultivation within six miles of camp, at which distance there are only a few acres under cultivation. Indigo is not grown, nor is the preparation of hemp or flax carried on near the station. 7. The town of Sholapore, containing nearly 60,000 inhabitants, is within a mile of the station to the north. 8. The geological structure of the district consists of trap rock, generally speaking, covered by a bed of reddish kunkur, on which rests the regur or black cotton soil. There are also to the south, small ranges of low flat-topped hills, composed of laterite, remarkable as rising above the low trap formations amid which they are situated. We have no reason to believe that the ground which the station occupies has ever previously been occupied by population. 9. During the dry season the wells are dry, and water would not probably be met with in any quantity at a less depth than 80 feet below the surface, but during the rainy season water may be found at a depth of from 20 to 30 feet, varying in quantity according to the rainfall. 10. We believe that water from superficial springs flows readily away. A portion sinks into the pervious subsoil, and is so drained off; it does not ooze out after once being absorbed, and except in tanks, there is no spot where it can lie on the surface and evaporate. There is some slightly higher ground in the vicinity, but owing to the nature of the surface of the ground about the camp, the surface drainage is very effective. 11. The water supply is derived from wells fed for the most part by the percolation of the water stored in tanks on a higher level. Water for other than drinking purposes is stored in open tanks, and the surface of those within the station, when full, covers 152,736 square yards. Unless there is heavy rain in the months of April or May these tanks are liable to dry up, but it is five or six years since either of those at Sholapore were quite dry, still there is a great difference in the quantity of water stored immediately after the monsoon and the quantity in the tanks just before its commencement. Besides the grasses of different descriptions, and rushes, which line the banks of the tank to the north of the station adjoining the fort, the water contains flos aqua, and the infusoria which accompany them viz. the encapsuled amabæ, also oscillatoria and œdogonium. The water in the tank near the artillery lines may contain some organic matter, but it is free from plants, owing to its basin being of rock. Arrangements are made to guard against the water in any tank used for drinking purposes being also used for bathing, and these arrangements are, as far as practicable, enforced. The only well which would be liable to pollution from leaves or other matter falling into it, is protected by a roof, constructed of durable materials; and precau-

SHOLAPORE. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	tions are taken to prevent any foul drainage or surface impurities draining into the tanks containing drinking water. If there should have been a scarcity of rain, and the water of the tank near the town fall so as to expose the ground and admit of the decomposition of the flos aqua, the houses on its bank have proved most unhealthy, and it is difficult to suggest means for preventing such nuisance.

12. The amount of really good water available for the station is limited, and in 1853 there was a scarcity of it. The drinking water is very good and soft. Its specific gravity, when filtered, is 1000·4, and the approximate number of grains of solid matter in a gallon is 30. It is altogether colourless; and with regard to its microscopical character, a bottle of water that was sent to Bombay to be tested was reported to contain nothing but a little shiny film of organic matter. It may, therefore, be inferred that it is very pure. The quality of the water is considered to be very good, and in no way injurious to health, but, as previously stated, the supply is limited. The water is raised from wells, generally speaking, by leathern vessels used by bheesties. It is not improbable that a better supply of water might, at a large expenditure, be obtained, but the means to be adopted for securing such must in a great measure be experimental.

13. We have no other topographical points to offer bearing on the health of the station.

14. It is, we believe, customary for the Government to decide who shall be appointed for the duty of selecting new stations. We think that considerable care is bestowed on the subject, and all possible means to guard against failure resorted to; still we are of opinion that it is a matter of very serious difficulty to decide whether a spot which is in every way found to be favourable for a native population should be equally so for the European constitution, and for this reason consider that in every case there should be a temporary before a permanent location.

II. CLIMATE.

1. The only instruments at present available for meteorological observations are the thermometer and pluviometer.

2. The following meteorological table is the result of 10 years' observations, from January 1850 to December 1860, as far as the instruments available have admitted of their being taken :—

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Winds. Direction.	Winds. Force.
	°	°	°	°			
January -	74·5	10·2	79·6	69·4	·08	E.	Moderate.
February -	77·9	11·6	83·7	72·1	·46	Variable.	Calm.
March -	84·5	12·3	90·7	78·4	·333	W.	Gales.
April - -	88·7	8·5	93·0	84·5	1·92	N.	Gales.
May - -	87·9	10·8	93·3	82·6	2·273	N.W.	Stormy.
June - -	83·3	8·5	87·6	79·1	3·680	W.	High winds.
July - -	80·5	5·9	83·5	77·6	4·255	W.	do.
August -	80·2	6·6	83·5	76·9	6·223	W.	Moderate.
September -	80·5	7·6	84·3	76·7	6·770	W.	Monsoon.
October -	79·7	7·1	83·3	76·2	4·715	N.E.	Calm.
November -	77·1	7·5	80·9	73·4	1·411	N.E.	Calm.
December -	71·8	11·9	77·8	65·9	·496	N.E.	Calm.

3. The climate of Sholapore is warm and dry during the greater part of the year, the average temperature for the year being about 80°, and the lowest not under 65°, and the mean maximum 93°, thus showing a considerable range. The mercury obtains its highest elevation in the month of May, and its lowest in December. The greatest variability of temperature occurs in March, when the mean is 12° during the 24 hours, and the least variability is observed in October, the mean then being 7°; the mean daily range for the whole year being 9°. The greatest rain-fall has been 40 inches, and the least 13. Fogs occasionally occur during the months of February and March, towards evening. Tree-planting has been carried out to so small an extent that its effect can scarcely be appreciated. The atmosphere is pure, and during the greater part of the year highly rarefied. The high winds that prevail at certain seasons tend in a great degree to purify the air, and remove noxious vapours and effluvia; the absence of the conditions which are necessary to the production of malaria conduces also to this result. Hitherto the station has ranked high in the scale of localities at which European troops have retained their health; we are not aware that any particular kind of diet is necessary. Shelter, of course, should be of a superior description; but as regards clothing, we do not consider any change or addition requisite. The early morning and evening parades at the regulated hours, decreasing the amount of drill during the hot weather, are matters which have been duly considered, and the regulations in force under this head for the guidance of commanding officers are most judicious. The most healthy months are February, March, and April, and the most unhealthy are July, August, December, and January. The prevailing diseases during the months of July and August are intermittent fevers of the quotidian and tertian types, and diseases of the stomach and bowels (chiefly diarrhœa and dysentery). The prevailing diseases in the months of December and January are intermittent fever, congestion of the internal organs, and functional hepatic disorders.

4. We have no reliable data to base an opinion as to the advantages of any district near the station which might prove more conducive to health than that of the station.

5. The president, during a service of 41 years, has served at every military station in the Bombay Presidency, except Mhow and Deesa. He believes Baroda and Ahmedabad to be the most unhealthy, and Poona the most healthy. The senior medical member of the Committee, during a service of 28 years, has served at most of the stations of the Bombay army, and considers Ahmedabad and Baroda the most unhealthy, and Neemuch the most healthy station. The junior medical member has served longest at Deesa, Mhow, and Sholapore, and considers Deesa and Mhow decidedly the most healthy. The engineer officer has served at Poona, Belgaum, and Sholapore only, during a service of seven years. The stations above named stand high in the scale of salubrity.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, 3. A map and plan of the station, with a ground plan of the barracks, are transmitted. 4. Table of Barrack Accommodation. Date of construction, 1830. Total number of rooms or huts { 3 barrack rooms, 1 used as harness room. Total regulation number of non-commissioned officers and men, 75 to 80.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet.	Feet.	Feet.			Inches.		Feet. In.	Feet. In.
2 (no ceilings)	40	96 6	24	11	39,372	984·3	42·9	18	22	5 4	3 8
Guard room -	9	29 10	16	11	5,350	594	53	18	3	3 6	4 6
Prison cells -	1	12 6	12¼	13¼	2,028	2,028	153	Are ventilated by means of air holes in the walls and by ventilators in the roof.			

5. The windows are ordinary plank shutters, three in number, two of which open horizontally for the lower half, and one vertically for the upper half. They are on opposite sides of the rooms. The barracks have a verandah on one side, but it is never used as sleeping quarters. There are no jalousies or jhilmils.
6. The bedsteads used in barracks are either planks on iron trestles or wholly of iron. In the tents, straw is served out. The bedding consists of a felt cushion, blankets, sheets, pillow stuffed with coir, and a carpet to tie up the whole in.
7. The following table gives the dimensions, &c. of the tents used in camp:—

Description of Tents.	Dimensions.		Space allotted to each Man.			Materials of which compose
	Superficial Area.	Cubical Space.	Number of Men to each Tent.	Superficial Area.	Cubical Space.	
	Sq. ft. in.	Cub. ft. in.		Sq. ft. in.	Cub. ft. in.	
Tent, hospital, European soldiers' double-walled - - - - - -	330 0	2,655 0	12	27 72	221 432	Cloth dungaree, double, outer white; lining either blue, red, or yellow. Poles, some of bamboo, some of teak.
Do. Staff Serjeants', N.P. - - -	100 0	717 272	1	—	—	
Do. European soldiers' double-poled - -	330 0	2,655 0	22	15 0	120 0	
Do. do. single-poled - -	112 6	1,157 12	13	8 8	88 0	
Do. Native, double-poled - - -	361 0	1,114 11	30	12 0	37 139	
Do. do. hospital - - - -	330 0	2,655 0	12	27 72	221 432	

8. In barracks, ventilation is effected by means of ventilators of different descriptions, fixed to the ridge of the roof. No measures are taken for ventilating tents beyond the doors, and taking precautions against crowding within them. The ventilation of the sepoys' huts is left entirely to themselves; but the ventilation of the guard-room is secured in the same manner as the barracks. Considerable attention is paid to the subject of ventilation, and all Government buildings are periodically inspected by responsible officers. The air in barrack rooms is cooled by "kuskus tatties," which are kept continually wet. A tatty 7 feet by 4 feet would cost 4 rupees, and a bheestie at 7 rupees per mensem, and one coolie at 3 rupees 8 annas, would be able to keep watered the windows and doors of a barrack for 100 men.
9. The barracks are constructed of burnt bricks and lime, with thatched roofs. The principal material made use of in the construction of tents is a description of cotton cloth called "dungaree," of which there are 4, 5, or more folds in the top and walls. Huts are constructed by the sepoys themselves out of an allowance made them by the Government, and are of the poorest description, being mud walls, averaging 10 feet square, and 5½ in height, with a thatched roof.
10. Floors are invariably raised above the ground level, but there is no passage of air beneath. If not paved with stone they are made of clean gravel and sand well watered and rammed; the surface being plastered once a week, or oftener, with cowdung.
11. Regarding the material of which the barracks at this station are constructed, we have no objection to raise, believing it to be an established fact that thatched roofs are cooler than those that are tiled. As to the construction it would be quite possible to improve the design, as the present buildings were erected some 30 years ago; but whether such alterations and improvements would increase their salubrity very materially we cannot pretend to say, the hospital reports being most favourable. Still, we are of opinion, that if additional accommodation for lavatories was available, the comfort of the men would be very materially increased. All repairs to barracks and buildings in the cantonment, and the repairs of all roads, &c. are executed by the executive engineer; the responsibility of the general sanitary state of the cantonment resting with the barrack-master under the orders of the brigadier commanding. The walls and ceilings of barracks are cleansed and limewashed once every six months.

SHOLAPORE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	12. There are properly speaking no lavatories, the men washing themselves in one end of the verandah of the barrack; but at a short distance from the barrack there is an excellent plunge bath 30 by 20, and 4½ feet deep at one end and 8 feet deep at the other. This bath is well supplied with water from a reservoir, and constantly changed, the bath being emptied by a drain leading to the bed of a nullah about 100 yards off. 13. The cook-houses are of the ordinary description made use of in this country, merely a cooking range with iron tripods for camp kettles; the ingenuity of the cooks supplying all deficiencies of apparatus. Water is supplied by bheesties, and the refuse water is drained away into sinks at the corners outside, which, when full, are emptied by sweepers and others retained for the purpose, and the contents removed to a distance. All arrangements for washing and drying linen are left to the regimental dhobies, and the present system is unobjectionable. 14. The contents of the privies are immediately removed, and the urinals frequently cleansed with lime, and the buildings themselves are all that could be desired. We believe it to have been established that it would not do to allow either cesspits or urinals to remain unemptied for any length of time, and the actual design of a privy in the absence of such pits and urine basins is immaterial. 15. These buildings are sufficiently ventilated by honeycomb tiling in the walls, but are not lighted at night. 16. There are no sewers or drains whatever in the vicinity of the barracks; all refuse water, &c. being removed as before mentioned. There is no part of any of the buildings in any locality damp. The drainage is sufficient; the only fluid refuse of the barracks is from the men's lavatories, which is thrown out on the surface and evaporates; all other fluid refuse, as before stated, being removed. No cesspits exist, the litter heaps being the only things of the sort near the men's quarters and hospital, but as the manure is removed daily, they can scarcely be designated a nuisance; no smell being perceptible even in the immediate vicinity. There are no foul ditches. 17. The surface cleansing within the cantonment and its vicinity is efficiently done, an establishment being kept up for the purpose, and the work at some part or other of the camp carried on daily. The refuse manure, &c. is carted to different distant localities, and burnt or buried. 18. The surface of the cantonment is kept free of vegetation; no old walls, thick hedges, &c., or other obstructions to the ventilation of the station, exist. 19. The bazaar is clean, well drained, and ventilated. The water supply is derived from wells which, though not affording a very ample supply in the immediate neighbourhood, still no scarcity is complained of except during seasons of drought. Existing regulations secure cleanliness and efficiency in all sanitary arrangements, and though no paid establishment exists for this purpose (owing to the military bazaars here not being very extensive), the sanitary condition appears to be all that is desirable. In large bazaars not removed to any great distance from native towns, probably, improvements in the sanitary police would be necessary, but none in our opinion is called for at Sholapore. A superintending officer looks after the native houses in the Sudder bazaar; no other native houses exist near the station, nor any dung-heaps or cesspits. None of the native houses are to the windward of the barracks. 20. There are two slaughter-houses within the bazaars of the cantonments, which are kept clean by means of a fund created for that purpose, called the slaughter-house fund. Each butcher slaughtering an animal pays a small fee, which is devoted to the above purpose, and to the carrying away out of camp all offal and refuse. Strict supervision is exercised over all slaughter-houses; and a peon is constantly in attendance to prevent nuisance, either in them or the adjoining meat markets. No nuisance from these places has been complained of. 21. No person is allowed to picket an animal of any description in or near a road, except in places devoted to the purpose, which last are visited daily to see that there is no accumulation of litter. The manure is, generally speaking, made into fuel, which is done in open and uninhabited places far from any houses. This fuel is valuable, from the scarcity and consequent high price of wood. 22. At this station the artillery and cavalry horses are (with the exception of those that are sick) picketed in the open and appear very healthy. The dung-heaps are, together with the litter, quickly removed by the buffalo keepers, to whom it is sold, and we have reason to believe that they give it to the buffaloes as a portion of their food. The picketing grounds are clean and remarkably well kept. 23. No married people occupy barrack rooms, but such quarters as do exist at this station for married soldiers are not creditable to the Government. Suitable buildings have been estimated for, but no steps appear likely to be taken for securing the erection of the buildings.
Officers' Quarters.	1. The officers' quarters at this station consist of detached bungalows. The drainage and ventilation of these buildings, we believe, are suited to the wants of the officers. We have no improvements to suggest, as the regulations provide for the removal of any unhealthy or dilapidated quarters situated within the cantonment limits.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are generally healthy, excepting epidemics. 2. The civil surgeon at Sholapore (a resident of nine years) states that the most prevalent are quotidian, intermittent fever, diarrhœa, dysentery, and guinea worm. Cholera and small-pox occur epidemically at certain seasons, but seldom to a great extent; and less among the inhabitants of the cantonment and town of Sholapore than amongst those resident in certain parts of the districts. Diseases of the spleen are not of very common occurrence. 3. The causes to which the diseases prevailing among the native population may be attributed are, principally, exposure to alternations of temperature without proper covering, improper or insufficient food, neglect of ordinary sanitary precautions in the arrangements of their dwellings, abuse of intoxicating drugs, and the impurity of the water during the hot season. Their immunity from many diseases is referable to the character of the soil, freedom from jungle and other sources of malaria, and the general equability of the climate. 4. The artillery came from Poona, where they had been for six months, and which they left on the 7th January 1858. Their state of health there was good, the regiment having chiefly suffered from fever. On arriving at Sholapore they were in good health, and since then intermittent fevers have been the cause of the greater number of admissions into hospital.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	The cavalry came from field service at Jhansi, where they had been for 18 months, and which they left on 2nd December 1859 in good health. Fever was the most prevalent disease there as here, but their health since arrival has been generally good. The native infantry came from Dharwar, where they had been for two years and eleven months. The state of their health there was good, the regiment having chiefly suffered from intermittent fevers and diarrhœa. The prevailing diseases since arrival at this station have been fever and dracunculus. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops are never camped out. 6 to 13. No experience with troops at hill stations. 14. Frequent change of station we consider would be decidedly beneficial to troops. 15, 16. No experience of hill stations. 17. We are not aware that there is any high ground near the station which could be advantageously occupied as a hill station. 18. Cannot say which is the healthiest or unhealthiest class of surface and subsoil for stations. 19. Soldiers should not proceed to India before they are 20 years old, but as soon after that age as possible. Troops should land in India between the months of November and January, and recruits should be sent at once to the Deccan, in order to preserve their health. 20. Troops intended for the Bombay Presidency, if they were sent immediately to the Deccan, might, without any evil consequences, come direct from home to India. It would be advisable that new troops on landing should be sent to a station where there is another regiment that has served some time in India, whether it be in the plains or on the hills, but the latter would be preferable. 21. The usual mode of transport into the interior is by marching early in the mornings at the rate of 10 miles a day, with occasional halts, the men invariably passing the day under canvass. We cannot recommend any additional precautions, and, provided the season of the year is favourable, the health of troops on the march is, we may say, proverbially good. 22. No experience to say what is the number of years a British soldier should serve in India. 23. We think that medical boards should assemble in every division with the deputy inspector-general as president, when practicable, whose decision shall be final. In the event of the deputy inspector-general not being president of the divisional committee, the opinion of such committee should in no case be final. 24. The end of December or the beginning of January is the time of year for invalids to leave India for home, if proceeding by the Cape of Good Hope route.
Diseases.	1. There are no inspection parades at the station for the discovery of incipient diseases. 2. There have been cases of scorbutus in the European artillery and native cavalry and infantry, but were attributable to service in Persia, Central India, and previous disease. They have all recovered. 3. Hepatic disease does not exist at this station. 4. The proportion of cases admitted of dracunculus for the last year is 6·75 per cent. It is attributed to the men drinking and bathing in impure water, but we cannot suggest any prophylactic measures. 5. The proportion of admissions from venereal disease to the total admissions for last year has been 2·25 per cent., and the proportions of constantly sick from venereal disease to the total sick has been 1·04 per cent. for the past year. The establishment of lock hospitals would not prove disadvantageous. 6. We have not had any epidemic at this station for some time. The prevailing diseases are fevers of the intermittent quotidian type in a mild form. There have been but few cases of rheumatism. The want of correct data prevents our giving the proportion which admissions and deaths from fevers, dysentery, cholera, small-pox, and rheumatism, bear to the total admissions and deaths. 7. The principal zymotic diseases met with amongst the native population of Sholapore are, of endemics, intermittent fever, which generally assumes the quotidian type; of epidemics, cholera in its spasmodic form, and choleraic diarrhœa. Of contagious diseases, small-pox and measles are the most frequent. Intermittent fever prevails more or less in the months of November, December, and January, which are characterized by hot days and cold nights, a strong drying easterly wind, and hot sun. The months of May, June, July, and August, during which cholera prevails, are for the most part hot, cloudy, and oppressive, with occasional showers of rain, and a highly electrical condition of atmosphere. When small-pox and measles prevail, which is in the months of March and April, there is nothing observable in the state of the air, the temperature being equable and warm, and the atmosphere clear. We are not aware, however, that the diseases above enumerated are more prevalent in one locality than another. Imperfect ventilation of their dwellings, scanty unnutritious diet, and neglect of the ordinary sanitary precautions, are the causes which predispose the native population to the attacks of the above-mentioned diseases, and conduce to a larger rate of mortality than would otherwise obtain here. 8. No reply to this question. 9. Quinine has not been tried at the station as a prophylactic against malarial disease. 10. The measure to be taken for the prevention or mitigation of epidemic disease is removal from the spot where the disease is prevalent.
V. Intemperance.	1. The soldiers at the station are temperate, only two men out of the 76 forming the artillery company being confirmed drunkards. 2. The medical officers cannot prepare the statistical table of the effect of total abstinence temperance, and drunkenness on the amount of sickness, mortality, and crime at the station having been generally in charge of native troops, with an occasional temporary charge of detachments of Europeans. Drunkenness is always punished as an offence. 3. Spirits, supplied by the commissariat department 24 degrees below proof, are sold in the canteen, also brandy and gin under certain regulations. It is strictly against orders for a bazaar shopkeeper to sell liquor of any sort to a soldier. A man may have either two drams of spirits or two quarts of malt liquor, or one dram of spirits and one quart of malt liquor; but he cannot have two drams of spirits and one quart of malt liquor, or two quarts of malt liquor and one dram of spirits, without permission. Spirit is no part of the soldier's ration at the station, on march, or in the field; he pays for it on all occasions, and has one quart of porter and one dram of spirits on payment. The commissariat department, however, cannot always supply porter; and when such is the case, two drams of spirit per diem are

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	supplied on payment. The canteens are not opened for spirits until evening, in quarters. On the march the grog is generally served out as soon as possible after arrival on the new ground, say 8 a.m., the men usually preferring it at this hour. No ill effects are attributed to this practice, particularly as the men do not go out much in the sun after morning's march. Spirit is never given as a ration to convalescents. No injurious drinks other than intoxicating drinks are sold in the canteen; but in the bazaar, where soldiers manage to get drink notwithstanding all endeavours to prevent it, all manner of compounds are sold, which, if not decidedly poisonous, must be injurious to health. 4. The consumption of spirits is, we think, injurious to health, and cannot conduce to the efficiency and internal discipline of the corps. 5. It would be beneficial to abolish the spirit ration. If this were not advisable, it might with advantage be restricted considerably. 6. The influence of malt liquor on health is more beneficial than spirits. 7. Soda water, lemonade, and ginger beer (a very objectionable drink, in our opinion, being made with toddy, or the date-tree juice, to insure the "pop,") are sold by a few shopkeepers in the bazaars, but, owing to similar articles being attainable in the coffee-shops, no large sales are made, and, except during the hot months, the quantity consumed is not large. We would recommend that the soldier should be supplied with malt liquor in moderate quantities, and the oftener in the day the better. 8, 9. It is difficult to say whether it would be beneficial or otherwise to suppress altogether the spirit ration, and to substitute for it beer, tea, or coffee, &c. There are some men in every company who cannot do without spirit; and if the ration of wholesome spirit from the canteen was withheld, they would procure most poisonous compounds from the bazaar, which are there sold so cheap that a man may become intoxicated for a couple of pice (one penny). 10. No recommendations are made on any of these points besides such as are contained in the foregoing replies. 11. The canteen and bazaar regulations are those contained in Section X. 3rd Appendix, Jameson's Code, which are in general use in the Bombay Presidency.
VI. DIET.	1. The composition of the daily ration for Queen's British troops and European troops in the Indian army is as follows:—1 lb. bread, 1 lb. meat, 4 oz. rice, 1 oz. salt, 2½ oz. sugar, $\frac{12}{21}$ oz. black tea, $\frac{5}{21}$ oz. green tea, 3 lbs. wood, and 1 lb. vegetables. No periodical changes are made that we are aware of. The commissariat officer is directly responsible for the quality of the rations issued to the troops, but they are also inspected by the orderly men, told off for the duty by the quartermaster-serjeant, and by the orderly officer of the day. The inspection is made early in the morning, when the provisions are brought. 2. Vegetables are provided as above, but no fruit. The men breakfast at a quarter to 8 o'clock a.m., dine at a quarter to 1 p.m., and have supper at sundown. At breakfast they have tea, bread, and meat; at dinner, meat, vegetables, and bread, if they choose; and at supper, bread and tea. The stoppage for the ration is 3 annas 4 pice daily, in addition to which 6 pice, or half an anna, are stopped daily for providing them with extra vegetables. 3. The addition of milk to the ration would be beneficial in our opinion. The rations are given in charge to the orderly men after being inspected, and it is the duty of the orderly men to make over the same to the cooks, and look after their work in preparing the same for the men. 4. The cook-rooms are Government buildings, the cooks being paid by the men, as soldiers do not cook for themselves, generally speaking, in this country. The copper camp kettles, supplied by Government, are the only means of cooking available. The kitchens are kept clean, well lighted, well ventilated, and sufficiently supplied with water. The food, as a rule, is boiled or stewed, the cooks dressing each man's dinner, as far as practicable, according to his wish; for instance, one man may like a curry, and two or three a pie, which are thus prepared by the cooks. The cooking is properly done, and sufficiently varied; tea and coffee are efficiently prepared; but the men who wish for it carry the latter from the coffee-shop. We believe that if the men wish for tea, coffee, or other refreshment before a march, they have to make their arrangements for it. The coffee-shop keeper at this station sends round the coffee for the barracks at 4 o'clock a.m., so that the men may have it before parade, if they wish; probably similar arrangements would be made on the march. 5. Soldiers' gardens could be advantageously established, if the men would take the trouble of working in them; some of the men have them already. Gardens for the cultivation of vegetables could be only advantageously established under Government control, and the soldiers be paid for working in them.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The European soldier wears a cloth jacket or tunic, and serge or cloth trousers, as warm clothing, and a rusty drab coloured loose khakee (jacket and trousers) as light clothing, with a wicker helmet, having a padded cover of khakee and a forage cap as head-dresses. The only belt they wear is a waist-belt, from which is suspended the sword. The present dress, having been suggested and adopted by urgent necessity, is suitable to the climate, especially the khakee clothing. The wicker helmet is an admirable head-dress. It would be impossible to have one particular suit of clothes which would be adapted to day and night duties and the cold and hot seasons. As a general rule, we consider that if cotton shirts were done away with as regimental necessaries, and flannel shirts substituted, it would be an improvement, and the advisability of obliging each man to wear a flannel belly-band cannot be questioned. At present the men mount guard in khakee, and put on cloth shell jacket and serge trousers at picket mounting. The only sentry by day has a verandah to pace up and down in.
Duties.	1. Being of opinion that it is very desirable for the European constitution, that the soldier should arrive in this country as soon after attaining the age of 20 as possible, we consider that the health of the recruit would subsequently be beneficially affected by his being drilled after arrival in India. 2. The routine of a soldier's duties is as follows:—A man who has finished his drill attends morning parades (which last an hour) on five days in the week; his tour of guard comes round once in four, five, or six days, according to the number of men present; when not on guard, he cleans his arms and accoutrements if they require it; makes up his kit on the cot and shelf, according to regulation, has to attend afternoon roll call and answer to his name

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	in barracks at tattoo roll call. The men do not suffer in any way from drill. The best time for drills and parades is early in the morning, all the year round; for marches, in the cold weather, early in the morning; and in the hot weather at sunset. At present the men have four nights in bed during the week to one on guard or picket. 3. The only European guard is mounted not 50 yards from barracks. The guard stays on for 24 hours, the picket for less than 12 hours. There are roll calls by day, but none later than tattoo at night. Night guards at this station are not at any time of the year injurious to health, and we are unable to suggest any additional precautions in performing this duty.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station:—There is a ball court, also a skittle ground, which in our opinion ought to be roofed. There is a library, which is lighted at night, and a school, but no trained schoolmaster. No day rooms or soldiers clubs exist; there are however plots of ground which the soldiers can cultivate; but there are no workshops, theatres, or gymnasia, and the means are not sufficient to keep the men occupied during the wet season and the heat of the day. The men are restricted from exposing themselves to the sun and rain when off duty, and the restriction is attended with considerable benefit to health. 2. Workshops for all common trades, which are a great desideratum, should be established, and also gymnasia; one large and lofty open shed might be constructed and so arranged as to afford the extra accommodation required. 3. Soldiers' savings' banks would be decidedly advantageous, provided workshops were established, in which the men might carry on a profitable business in trades in which they might be skilled, such as tailors, shoemakers, carpenters, &c. We consider that such an arrangement might have a good effect in inducing many to be industrious and keep out of the canteen. 4. There are no trees or sheds to enable the men to take exercise without injury to health during the day, and the verandah space is too limited to be of any use.
IX. Military Prisons.	1. Considering the climate of this station, we consider the prison cells small and badly ventilated.
X. Field Service.	1. There are no local regulations for field medical service. 2. The medical officers have no power whatever as regards the line of march of troops, bivouacking, camping, &c. 3. We would recommend that the senior medical officer should accompany the assistant quartermaster-general to select the site of the camp. The medical officer at present has no power in these matters. 4. The arrangements adopted in the Presidency for field hospitals, ambulances, transport of sick, and hospital supplies are according to the Presidency Medical Regulations.
XI. Statistics of Sickness and Mortality.	The following is the information under this head:—

Sholapore.

European Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M. 56th Regiment	61	10	—	—	—	5	—	—	—	4	—	1	—	—	—	5	—	25	—	40·9	—
1858-59	Do. 3rd Dragoon Guards Do. 17th Lancers Do. 18th Royal Irish Do. 33rd Regiment Do. 56th do.	201	153	2	—	—	9	—	12	—	33	1	3	—	—	—	149	1	359	4	178·6	1·9
1859-60	Do. 3rd Dragoon Guards Do. 18th Royal Irish Do. German Legion	314	978	3	2	—	37	—	25	2	115	7	9	1	20	9	235	—	1,421	22	452·5	7·0
	European Troops in the Indian Army.																					
1850-51	1st Company 1st Battalion Artillery	105	23	—	—	—	3	—	1	—	4	—	—	—	—	—	24	—	55	—	52·3	—
1851-52	Do. do.	105	127	1	—	—	3	—	1	—	13	—	4	—	—	—	75	—	223	1	212·3	0·9
1852-53	Do. do.	111	171	1	—	—	11	—	3	—	14	1	3	—	—	—	67	—	269	2	242·3	1·8
1853-54	Do. do.	105	114	1	2	—	10	—	6	—	32	—	1	—	—	—	86	—	251	1	239·0	0·9
1854-55	1st Company 2nd Battalion do.	33	31	—	—	—	2	—	2	—	19	1	—	—	—	—	32	1	86	2	260·6	6·0
1855-56	Do. do.	95	101	—	—	—	5	—	18	—	25	—	1	—	—	—	105	—	258	—	271·5	—
1856-57	Do. do.	58	30	—	—	—	1	—	6	—	6	—	—	—	—	—	55	—	98	—	168·9	—
1857-58	Detachment 4th Troop Horse Brigade Detachment 2nd Company 2nd Battalion Artillery 3rd Company 2nd Battalion Artillery	67	26	—	—	—	2	—	2	—	11	—	3	—	—	—	54	—	98	—	146·2	—
1858-59	Do. do.	98	22	—	—	—	7	—	2	—	20	—	6	—	—	—	65	—	122	—	124·4	—
1859-60	Do. do.	84	174	—	—	—	6	—	2	—	17	1	1	—	1	1	42	—	243	2	289·2	2·3

SHOLAPORE. BOMBAY.

References to Subjects and Queries. | REPLIES.

XI. Statistics of Sickness and Mortality—*cont.*

NATIVE TROOPS.

	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
1850-51	20th Regiment Native Infantry; Detachment Poona Irregular Horse	874	134	1	9	—	—	—	—	—	35	—	—	—	—	—	154	1	332	2	37·9	0·2
1851-52	20th Regiment Native Infantry	826	129	1	3	—	4	—	—	—	29	—	3	—	2	1	186	—	356	2	43·0	0·2
1852-53	20th do. do.	847	222	1	1	—	3	—	3	—	52	3	5	—	—	—	212	—	498	4	58·7	0·4
1853-54	3rd do. do.; 20th do. do.	798	192	—	1	—	7	—	—	—	72	2	3	—	—	—	307	—	582	2	72·9	0·2
1854-55	3rd do. do.	797	439	1	—	—	8	1	2	—	53	—	8	—	—	—	272	—	782	2	98·1	0·2
1855-56	3rd do. do.	820	157	2	—	—	9	1	1	—	53	—	6	—	—	—	265	3	491	6	59·8	0·7
1856-57	6th Company 4th Battalion Artillery; 3rd Regiment Native Infantry	855	213	1	5	—	11	—	1	—	77	—	10	—	—	—	380	—	697	1	81·5	0·1
1857-58	3rd do. do.	976	214	3	32	—	23	1	2	—	47	—	4	—	7	1	292	—	621	5	63·6	0·5
1858-59	Left Wing 3rd Regiment Light Cavalry; 3rd Regiment Native Infantry; 28th do. do.	949	249	1	9	—	13	—	—	—	61	1	6	—	—	—	360	—	698	2	73·5	0·2
1859-60	3rd do. Light Cavalry; 28th do. Native Infantry	1,079	1,375	1	5	—	19	2	5	1	97	3	8	1	10	2	493	5	2,012	15	186·4	1·3

WOMEN AND CHILDREN.

Years.	CORPS.	Women. Strength. Europeans.	Women. Strength. Indo-Europeans and Natives.	Women. Strength. Total.	Women. Treated. Europeans.	Women. Treated. Indo-Europeans and Natives.	Women. Died. Europeans.	Women. Died. Indo-Europeans and Natives.	Women. Ratio per cent. to Strength. Treated.	Women. Ratio per cent. to Strength. Died.	Children. Strength. Europeans.	Children. Strength. Indo-Europeans and Natives.	Children. Strength. Total.	Children. Treated. Europeans.	Children. Treated. Indo-Europeans and Natives.	Children. Died. Europeans.	Children. Died. Indo-Europeans and Natives.	Children. Ratio per cent. to Strength. Treated.	Children. Ratio per cent. to Strength. Died.
1852-53	1st Company 1st Battalion Artillery	8	6	14	12	13	—	—	178·7	—	16	8	24	11	6	2	—	70·8	8·3
1853-54	Do. do.	7	8	15	21	—	3	—	140·0	20·0	16	8	24	10	5	2	—	62·5	8·3
1854-55	1st Company 2nd Battalion Artillery	14	8	22	7	6	—	—	59·0	—	14	11	25	4	3	—	—	28·0	—
1855-56	Do. do.	9	9	18	25	10	1	—	194·4	5·5	30	34	64	29	35	2	1	100·0	4·6
1857-58	3rd Company do.	8	5	13	—	—	—	—	—	—	14	8	22	—	—	—	—	—	—
1858-59	Do. do.	10	5	15	3	2	—	—	33·3	—	19	10	29	3	—	1	—	10·3	3·4

By order of the Principal Inspector-General, Medical Department.

W. C. COLES, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department, Bombay, 30th January 1861.

XII. HOSPITALS.

1, 2. The site of the European artillery hospital is open and freely ventilated, and everything that could be desired. The native infantry and cavalry hospitals are, we think, sufficiently commodious and well ventilated.

3. The hospital is supplied with excellent water from a well distant half a mile. It is conveyed to the building by puckal bheesties, and there does not seem to be any necessity for improving it in this respect.

4. All fluid refuse is removed from the vicinity of the hospital by an establishment of sweepers and others, kept up for the purpose. There are no drains or sewers whatever.

5. The lowest wards are raised one foot above the ground and are solid. There is no contrivance for the free perflation of air underneath the floors, and taking into consideration the site, the committee is of opinion that no such contrivance is called for. Owing to there being a gentle slope on all sides of the hospital, the roof water is quickly got rid of, and obviates the necessity for any provision for conveying it away. The surface drainage about the hospital is sufficient to carry away the rain-fall rapidly. The walls of the hospital are constructed of burnt bricks and chunam, with a double-tiled roof having ventilators. Neither the walls or roof are double, but the verandahs all round the building are well shaded, and the hospital kept sufficiently cool. The verandahs are eight feet broad, and with the addition of bamboo matting weather frames afford sufficient shelter from the sun's rays. Being shut in, they afford accommodation for the exercise of convalescents, and are, from want of room, made use of for other purposes. This objectionable practice will cease as soon as the extra ward, sanctioned by Government, is erected. The hospital accommodation is on the ground floor only.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	Table of Hospital Accommodation. Date of construction, 1830. Total number of wards - - - - 3 Total regulation number of beds - - - 28

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.			Inches.		Feet. In.	Feet. In.
2 - - -	10	31 6	24 0	14 9	11,150·5	1,115·05	75·6	18	4	5 4	3 10
1 for women -	8	30 2	21 10	17 0	11,196·43	1,399·5	82·3	18	6	7 6	4 5

The hospital is placed so as to receive the full benefit of the prevailing winds. The windows are of the ordinary construction, and might be altered so as to open vertically (for the top half) as well as horizontally with great advantage.

6. Iron revolving cowl ventilators are fixed to the ridge of the roof, and appear to secure efficient ventilation. There are no jalousies or jhilmils, but the glare is kept out by the bamboo matting weather frames, or sun shades.

7. The air admitted into the wards during the months of April and May is cooled by means of kuskus tatties.

8. There are no means of warming the wards. The wards and ceilings are whitewashed and cleansed every three months, and whenever found necessary.

9. The privies are properly cleansed, and all that is offensive daily removed by sweepers. They are not more offensive than the best of such places usually are in this country.

10. The lavatory arrangements might be greatly improved, and the health and comfort of the sick would be greatly enhanced thereby. The present arrangements appear to be a make shift.

11. There is a bath room to the hospital, but all apparatus is entirely wanting, to the great discomfort of the soldier.

12. The washing and drying of hospital linen is left to the regimental dhobies, and no inconvenience apparently results therefrom.

13. The hospital was erected 30 years ago, and the accommodation of course is in every way susceptible of improvement; but with regard to the storage, looking to the generality of such buildings in this country, we have nothing to condemn strongly in the European artillery hospital here.

14. The cots in the hospital are generally of iron, with straw mattresses laid on them. No improvements in these are suggested.

15. The means and apparatus for cooking are primitive, but such as have been found best adapted for the Indian cook.

16. Diet tables, diet rolls, &c. are according to regulation.

17. The provision for attendance on the sick is good and sufficient.

18, 19. The sanitary condition of the hospital is good, no epidemic diseases of any kind have appeared. No improvements are suggested.

20. The accommodation for exercising the convalescents is limited to the verandahs adjoining the hospital ward.

21. Although there is a ward for women in the compound they prefer remaining in their own huts, and with their children are usually attended there by the medical officer. No resident matron is allowed for the hospital, but considering the small number of women and children, and provided suitable quarters for the married people were erected (which the committee believes is in contemplation) the present arrangement is conducive to comfort, and in no way objectionable.

22. There are no special local hospital regulations enforced at the station, not included in the General Presidency Medical Regulations.

23. All recommendations made by the medical officers with reference to the sanitary state of the hospital, &c. are immediately attended to.

24. There are no convalescent wards or hospital at this station, nor would they be of any advantage, considering the small number of Europeans present.

XIII. Burial of the Dead.

1. The British burial ground is situated in the station, but it does not appear to be badly placed as regards the prevailing wind.

2. Its area is 14,000 square yards, and its soil is alluvial, lying on rock. The drainage is efficient, owing to the ground being placed on the sloping bank of a nullah. The ground is well kept.

3. The grave space allowed is 7ft. by 3ft., and the interval between graves 6 feet; the depth is 5 feet. Graves are scarcely ever re-opened, and no more than one body is buried in the same spot. Interment is compulsory at ordinary times, and during epidemics within 12 hours after death. The conditions of interment and cremation of native troops are the same. The native burial and burning grounds are looked after by the barrack department under the orders of the brigadier.

4. The graveyard has never been offensive. The regulations with regard to the burial of British troops are strictly enforced.

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References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead—*cont.*	5. The dead of camp followers or bazaar people are burnt or buried at localities set apart for the purpose in the vicinity of the camp. 6, 7. No injury appears to have accrued to the public health from the present practice, and no improvements are suggested in the burial or disposal of the dead, as the existing arrangements provide for all requirements under this head.

(Signed) J. S. DOWN, Brigadier, Commanding at Sholapore. } President.
PARR W. HOCKIN, Surgeon Major, H.M. 3rd Reg. Bombay Light Cavalry.
W. W. GOODFELLOW, Captain, Bombay Engineers.
L. S. BRUCE, Assistant-surgeon, 28th Reg. Bombay Native Infantry. } Members.

11th October 1860.

SURAT.

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Accommodation	Queen's Troops	Infantry. Detachment H. M. 4th Foot (non-commissioned, rank and file) can be accommodated in the Castle.	European officers	3
			Married families	3
			Non-commissioned, rank and file	170
	Native troops	Artillery, non-commissioned, rank and file		36
		Infantry, H. M. 16th Regiment Bombay Native Infantry, non-commissioned, rank and file		938

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is open and flat, dry during the cold and hot seasons, swampy during the monsoon. There is but little wood or jungle in the neighbourhood, but an abundance of water. 2. The elevation of the station is 33 feet above the level of the sea, but is on a level with the adjacent country. It is 18 feet above the level of the Taptee river. There is no higher ground adjoining the station. 3. The low hills of Rajpeepla commence at Vusrance, 29 miles to the north-east and by east of Surat. The nearest mountain is Songhur, about 42 miles east of Surat, and the nearest table-land is 40 miles in the same direction beyond Songhur and at the top of the Rondabarree Ghaut. The height is the average of that of the Western Ghaut. 4. The nearest water to the station is the Taptee river, which forms the north-west boundary of the camp, and sometimes overflows, and the camp is then completely under water from one to ten feet in depth. There is neither broken ground, ravines, nor water-pits near the station. 5. With the exception of the eastern boundary, which is framed by the town, the camp is open and well ventilated. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. From March to October the sea breeze prevails, and during the remainder of the year the land wind is predominant. The effects produced upon different individuals by these two winds vary considerably, but generally speaking fever is most prevalent during the appearance of the land winds. 6. The country surrounding the station is cultivated. There is no artificial irrigation, but a few gardens which are watered from wells, nothing more. Rice is not cultivated nearer than four miles from the camp. No indigo is cultivated near the station, but hemp is prepared about four miles off on the other side of the town; no nuisance is experienced from it in the camp. 7. The large and populous city of Surat forms the north-east boundary of the camp. 8. The geological structure of the surface of the station is a black soil, varying in depth. Beneath is a thick clay, in which a large quantity of lime-stone gravel is found (morum), and beneath that again, at the depth of 18 or 20 feet, basalt. 9. Water is found at a depth varying from 20 to 30 feet in the dry season, and the wells have about five or six feet more water in them during the monsoon. 10. A small portion of the rain-fall is absorbed into the soil; more runs off by artificial and natural drainage, but some quantity lies on the surface till it evaporates. There is no higher ground adjacent. 11. The water supply of the station for drinking purposes is derived from wells, the river is also occasionally used by the natives for bathing. There are no tanks either in the station or near it. The wells are not liable to pollution from leaves or other matter falling into them; no foul drainage or surface impurities are allowed to drain into them; no nuisance or malaria proceeds from the wells. 12. There is not a well containing good drinking water in the station, every one being more or less impregnated with salt. Some of the water is very foul and appears to be impregnated with sulphureted hydrogen gas; but there are two wells beyond the limits of the camp from which tolerably good water can be obtained. There is no record of its chemical analysis, but it may be said to be decidedly brackish: its microscopic characters are unknown, nor can they be ascertained by any instrument at the station. The water within camp limits is so bad that no one thinks of drinking it; it is raised by hand in leather buckets. Fresh and good water might be obtained in abundance by means of pipes laid from a point about 10 miles up the river from the station; this might also be made available for the inhabitants of the city. 13. It would be advisable to remove the native lines, which are very old and in a hollow, and have long been condemned by competent authorities, to a spot a little to the left of the Domus road, which is a few feet higher than the present situation. It may be observed, that if the slightest inundation occurs the lines are the first flooded. 14. New stations are selected by a mixed committee composed of officers from the quartermaster-general's department, and also engineer and medical officers, but what weight is attached to the opinions of the various departments is unknown.

References to Subjects and Queries.	Replies.

II. Climate.

1. The only meteorological instruments at the station are a thermometer, rain gauge, and weather cock.

2. Table of meteorological observations from 1st January 1850 to 1st January 1860.

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.
1850–60.				
January - -	72·9	28·2	87·3	59·1
February - -	76·9	22·1	91·3	69·2
March - - -	84·1	27·6	97·7	70·1
April - - -	88·0	24·6	100·5	75·9
May - - -	89·4	20·4	100·4	80·0
June - - -	87·1	14·2	94·3	80·1
July - - -	84·0	12·0	89·9	77·9
August - -	82·5	8·4	87·0	78 6
September - -	83·3	12·8	89·9	77·1
October - -	82·6	19·9	92·8	72·9
November - -	78·1	23·6	90·5	66·9
December - -	74·3	25·0	87·5	62·5

3. For about nine months in the year the climate may be said to be decidedly moist, the wind coming from the direction of the sea, which is only about 10 miles distant. It is never very cold, and the temperature rises considerably as elsewhere during the months of April and May. There is but little, if any, fog in the camp, though it is sometimes observed on the other side of the river, which is somewhat on a lower level. There is no irrigation to speak of, therefore the climate is not perceptibly influenced by it. There are occasional dust storms, but generally speaking the atmosphere is free from dust, as the wind blows from the sea chiefly over cultivated lands. No medical officer present having been in Surat more than a few months, no trustworthy information can be afforded as to the effect produced on the health of the troops by the above climatic characteristics. From the end of the monsoon, that is to say, from the beginning of October to the middle of December, is the most unhealthy period of the year, when intermittent fever is the prevailing disease.

4. Domus, on the sea shore about 10 miles west of Surat, possesses the following advantages over this station:—The air is cooler and purer, and there is an abundance of good water in tanks, which if proper care is taken would contain water all the year round.

5. The following is a list of stations in India at which I have served, viz.:—Poona, Ahmednuggur, Dharwar, Belgaum, Kurrachee, Vingorla, Asseerghur, Nassick, Sattara, Bombay, Surat, Broach, Ahmedabad, Sholapore, Rajcote, Bhoog, Hyderabad (Sinde), Jacobabad, Sukkur, Shikarpore, Neemuch, Nusseerabad, Mhow, Dhoolia, Mulligaum, and Tanna. Of these the first 10 may be said to be salubrious climates, and Neemuch and Mhow, the next best adapted to health. The most injurious to European constitutions are probably Jacobabad, Suckur, Shikarpore, and Nusseerabad.

III. Sanitary Condition of Station.

1, 2, 3. Map and general plans of the station and surrounding country, with plan of the barracks, are transmitted.

4. Table of barrack accommodation. Date of construction of barrack unknown, the barrack being part of the Castle buildings, which were constructed before the English took possession of Surat. But they were adapted for the residence of the European troops in 1857, by providing for light and ventilation. Ten pendalls for Native Infantry were constructed in 1824, and the other four in 1840.

Total number of rooms or huts:—Barrack rooms for European troops, 4. Pendalls for Native Infantry, 14.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
In the Castle.		Feet.	Feet.	Feet.	Feet.			Feet.		Feet.	Feet.	
One on the south side of the Castle.	63	157	25	11 mean	43,175	685·318	58·582	1½	28 {15 / 13	5 / 6 5	3 / 3	This gives a total of 132 European troops, but if the commissariat store room in the Castle were removed, and the existing rooms turned into barracks, about 170 men might be accommodated on emergency.
North-east Tower - -	25	75 mean	20 mean	8	12,000	480	60	1½	{6 / 4	5 0 / 6 5	4 / 6	
Barrack No. 24, south-east Tower.	25	100 mean	15	9	13,500	540	60	1½	7	4·5	4·5	
Barrack No. 12, now used as School-room.	19	73	16	16 mean	18,688	983·58	61·474	1½	6	4·25	2·50	
14 pendalls for Native Infantry.	67 men in each pendall, including native officers.	200	21	10·25 mean	43,050	642·538	62·687	No cots are provided for these men.				
Guard Rooms.									This is a barred opening.			
For Europeans - -	8	26	15	12	4,680	585	48¾	1½	1	3	3	
Quarter Guard Room for Natives.	20	28	21	11 mean	6,468	323¼	29½	No cots provided for these men.	4	4·25	3	
Prison Cells.												
For Europeans, 4 rooms -	2	18 mean	8 mean	10	1,440	720	72	1½	1	1½	4	
For Natives, 1 room -	10	21	15	9 mean	2,835	283½	31½	No cots provided for these men.	2	2	3	

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides, opening from below, being attached above by hinges to the window frames. There are neither verandahs, jalousies, or jhilmils. 6. The cots used in barracks are of wood, with country bedding, cotton cloth, stuffed with straw, serge blankets, and country counterpanes and sheets. In the tents the beddings are on the ground. 7. This question having reference to the structure and dimensions of tents used in camp will be answered by the quartermaster-general's department at the army and division head-quarters. 8. Ventilation is effected in the barracks through the door and windows. These barracks are in the Castle, about 14 feet above the ground. The tents are ventilated by opening doors and walls; the huts through the doors, and the guard-rooms by doors and windows. The ventilation is quite sufficient. Punkahs are used for cooling the air in the barrack rooms, at a cost of about 12 rupees each, but as the allowance for pulling them is only 25 rupees a month, the full number allowed cannot be worked. 9. The barracks are composed of stone or brick masonry, the tents of Dungary cloth, and the huts of split bamboo walls and daubed with mud, &c. For further particulars see the plan transmitted. 10. Half the floor of the barracks on the south side of the Castle and the floor of the barracks in the south-east tower, as well as that of the barrack room, No. 12, are of chunam, and the floors of the remaining barracks are of teak planks. The floors of the native huts are of mud and are nine inches above the ground. All the barracks but one, No. 12 (now used as a school room, and whose floor is three feet above the ground) are on the first story, and from 13 to 20 feet above the general level of the ground. There is a free passage of air beneath the latter; but no ventilation through them. 11. There are no regular barracks for Europeans at this station. The room allowed for each man in the pendalls is not sufficient. The barracks are kept in repair by the engineer department, and the works are quickly executed. The fort adjutant, under the orders of the commanding officer, is responsible for the general sanitary condition of the camp. The walls and ceilings of the barracks are cleansed and limewashed twice a year generally, on requisition from the commanding officer of the station. 12. There are no regular washing places built for the men, but the eastern corner (ground floor) of the barracks on the south side of the Castle is used for that purpose. There are five tubs, and they are supplied daily with fresh water by bheesties. The drainage is carried out through the walls into the river. 13. A plan of the barrack cookhouses is transmitted. There are provided one set of copper cooking utensils for every 10 men, and they are tinned monthly. Water is supplied by bheesties. All the clothes are sent to the washermen. 14. A plan of the privies is transmitted. They are provided with iron pans, which are emptied by sweepers into the river; the urinals have a drain which discharges into the river direct. 15. Two lights burn in these buildings all night and two till tattoo. The ventilation is effected by several ventilators at the top of the roofs. 16. There are separate drains and sewers in each of the barracks to carry off to the river the dirty water, &c. The dimensions of these vary from 4 in. diameter (drains of round tiles) to 8 in. by 8 in. (brick and chunam sewers). The distance between the barracks and the river is from 100 to 350 feet. The drainage is sufficient, and no part of any building used as a barrack or hospital is damp. There are no cesspits or foul ditches. 17. All refuse matter is removed from the surface of the cantonment daily, and thrown into the river. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls or thick hedges, &c., interfering with the ventilation of the station or bazaar. 19. The drainage and ventilation of the bazaar are as good as possible. The water supply is obtained from wells about the camp. The bazaar is kept clean, and, to preserve this, is subject to the regulations as laid down in general orders. It is very small. No alterations to suggest. There are very few native houses near the station, and there are no dung-heaps or cesspits within them to cause any nuisance to the camp. When the wind blows over the native town it is considered unhealthy; when it blows from the north, it passes over a bank, which is laid bare at low water, and from which noxious vapours arise. The only quarter from which it blows, and is considered to be healthy, is from the south-west. 20. The animals for the use of the troops are slaughtered in the town about half a mile from the Castle, and no nuisance is experienced. 21. The bazaar is very small, and no horses are allowed in it. 22. There are no stables constructed at this station for artillery or cavalry horses, nor any picketing grounds arranged. 23. There are quarters at the station sufficient only for three married non-commissioned officers or men; married people do not occupy the barrack rooms with the men.
Officers' Quarters.	1. The officers' quarters in the Castle are very salubrious, but officers' lines in the camp are quite the reverse. The situation of the latter being bad, no improvement could be effected, except by building better houses, which nobody could afford. All the above questions under the head of Sanitary Conditions, unless otherwise specified, relate to the troops in the Castle.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and the adjoining native population, are generally unhealthy. 2. The diseases most prevalent among the native population are spleen disease, small-pox, and cholera. 3. The unhealthiness of the native population may be attributed to want of cleanliness, from the ruinous state of the town and the filthy habits of the natives, imperfect drainage, and the bank referred to before. 4. Detachment 4th Foot arrived here from Ahmedabad on the 28th December 1859. There were at that station 17 men for one year and eight months, and 38 men for ten months; they left it on the 21st December 1859. State of their health there very good, and on their arrival here they were healthy; but since then fever has been a

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	prevalent disease. The 16th Regiment Bombay Native Infantry were at Shikarpore for 13 months, and left that station on 20th January 1858, having suffered there from intermittent fever. Their state of health on their arrival here (26th February 1858) was very weakly, and they have suffered since their arrival from intermittent fever, diseases of the bowels, &c., &c. There is no part of the men's present accommodation at this station more unhealthy than another. 5. The troops are occasionally out in tents during an epidemic, and this is found to be very beneficial. 6. No medical officer here has been in charge of a hill station. 7. Troops at hill stations are less liable to fever and other diseases on return to the plains, which result is to be attributed to the improved state of their constitutions from residing on the hills. 8, 9. Hill stations are approved of for troops. Mount Aboo is the only one with which we are acquainted, and weak men on arrival there are liable to attacks of fever and diarrhœa. 10. Warm dry clothing, wholesome diet, regular exercise, and good shelter, are indispensable precautions to be observed for the men resident in hill stations. 11, 12. The period best adapted for a residence in the hills is from the beginning of March to the middle of July, or the first fall of rain. No experience to prove what period of residence would be injurious or beneficial to troops. 13. The ordinary protection from the sun must be observed for protecting the health of troops on leaving hill stations for the plains. 14. As a general rule it would be better to locate the troops in the hills with short service on the plains. Frequent change of station also would be decidedly beneficial. 15. No answer to this question. 16, 17. The elevation above the sea most suitable as a site for a hill station is about 4,000 feet. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. Red sandy soil, with scant vegetation, is the best adapted for stations. The soil here is black loam, with a subsoil of clay, and is very unhealthy. 19. I consider the best age for soldiers to proceed to India to be from 19 to 27, and they should land here from about the middle of November to the beginning of January. I would recommend recruits on first landing in India to avoid intemperance and exposure to the sun. 20. With reference to Bombay, troops on landing should be immediately despatched to the high table land of the Deccan. 21. No experience as to the mode of transport of troops from the port to the interior. 22. The number of years a British soldier should serve in India is 10. 23, 24. No experience as to the manner of conducting medical boards, as regards invaliding. Invalids should leave India for home during the months of January and February.
Diseases.	1. There are regular inspection parades every Saturday morning for the discovery of incipient diseases at this station. 2, 3, 4, 5. There has been no case of scorbutic disease among the troops of this station, nor any of hepatitis amongst the Europeans, and only one with the natives, since the arrival of the regiment. Dracunculus is of rare occurrence here. The proportion of the constantly sick from venereal diseases to the total sick in hospital from all other diseases, is very small, both with Europeans and natives; but the establishment of lock hospitals would be beneficial. 6. The following are the diseases from which the troops, European and native, suffer, viz.— Fever.—Intermittent and common; remittent occasionally occur. Admissions - Europeans 70 - Natives 815 Deaths - ,, none - ,, 5 Dysentery.—No cases have occurred with Europeans, and with natives it is rare. Admissions - Europeans 1 - Natives 29 Deaths - ,, none - ,, 1 Cholera.—Only 1 case among the Europeans. Admissions - Europeans 1 - Natives 11 Deaths - ,, 1 - ,, 4 Small-pox.—Epidemic affections are rare. Admissions - Europeans none - Natives 5 Deaths - ,, ,, - ,, none. Rheumatism.—Is common among the natives; rare among Europeans. Admissions - Europeans 2 - Natives 70 Deaths - ,, none - ,, none. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:— Admissions - Europeans 74 - Natives 930 Deaths - ,, 1 - ,, 10 7. No answer can be returned to this query from want of experience. 8. Occupation and amusement are the most likely preventives of epidemic disease. 9. No doses of quinine have been given at this station as a prophylactic against malarial disease. 10. With regard to the preceding points, I would recommend a better system of drainage; but on account of the absence of good water, the station is not suitable for a camp.
V. Intemperance.	1, 2. The soldiers at this station are temperate, and there are no confirmed drunkards. There are no admissions into hospital from diseases occasioned either directly or indirectly from intemperance. There are no cases of drunkenness; but it would always be punished as an offence.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	3. Soldiers are allowed to buy 2 drams of arrack, or 1 dram and 1 quart of porter at the canteen; there is no proper restriction in the bazaar. The spirits are good; they do not form any part of the soldier's ration, either at the station or on the march, it is not known if they do in the field. The men do not take a dram before morning parade. Malt liquor is given as a ration to convalescents in quantities varying from half a pint to a quart daily; but spirits are not. Nothing is allowed to be sold in the bazaar to Europeans, and nothing but arrack, porter, and beer are sold in the canteen. 4. The consumption of spirits is decidedly injurious to health; not so that of coffee and malt liquor. A moderate use of the former (spirit), however, is not injurious to Europeans. 5, 6. It would be advisable to abolish spirits as a ration, and substitute malt liquor in its stead. The same in respect to canteens. Malt liquor is recommended as being beneficial. 7. Coffee, tea, lemonade, soda water, &c., are not much used here. These articles are decidedly superior to spirits, but malt liquor in conjunction with them would be beneficial. 8, 9, 10. Beer, porter, tea, and coffee should be substituted for the spirit ration, and it would be beneficial to prohibit the sale of spirituous liquors in the canteens, and permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. I have no other recommendations to make on these points. 11. The detachment here has no regular canteen.
VI. DIET.	1. The composition of the ration for Queen's British troops, and European troops in the Indian army, is as follows, viz.:—bread 1 lb., beef or mutton 1 lb., wood 3 lbs., onions 4 oz., potatoes or other vegetables $\frac{3}{4}$ lb., rice $\frac{1}{4}$ lb., salt 1 oz., tea (green) $\frac{8}{21}$ oz., and black $\frac{10}{21}$ oz., sugar $2\frac{1}{2}$ oz., 1 quart of porter, 1 dram of arrack, or 2 drams of arrack liquor paid for by the soldiers. There is an inspection of the constituents of this ration made every morning by an officer. 2. The rations provided for the troops are free of expense. The soldier has 3 meals a day, breakfast, dinner, and tea; nothing after that. 1 lb. of vegetables, which are varied according to the season, enters into the daily composition of the ration. 3. I have no improvement to suggest in the composition of the soldier's ration. An orderly corporal attends the issue, hands it over to the cooks, and sees it is not disposed of. 4. The usual copper cooking utensils are supplied to the detachment, and are found quite sufficient for the purpose. The kitchens are clean, well lighted, and well supplied with water; the food is cooked as the men wish it, is properly done, and sufficiently varied. No coffee is supplied to the men except on a march, when they have tea, coffee, or other refreshment half way. 5. Gardens could not be established at the station in consequence of the water being bad.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements consist of 1 cloth tunic, 1 pair cloth trousers, 3 pairs boots, 1 serge tunic, 1 pair serge trousers, 4 white and 2 blue shirts, 1 pair white trousers, 2 pairs blue trousers, 6 pairs socks, 2 khakee tunics, 2 pairs khakee trousers, 1 helmet, 1 forage cap, 2 flannel belts, 2 towels, 2 blacking brushes, and clothes brush, 1 small book, a comb, spoon, knife, fork, razor, soap brush, button brush, button stick, 1 piece of soap, 1 of pipe clay, 1 of sponge, a mess kettle with cover, knapsack and straps, 1 pair knee caps, 1 pair braces, 1 blacking box, 1 neck tie, 1 cotton bed, a blanket, a sheet, a rug, and 2 cap covers. I consider the present dress as suitable to the climate, and a great improvement on the old dress. For the hot weather a helmet and khakee are worn; for rainy weather, serge tunic and barrack change pantaloons and forage cap with covers; for cold weather full dress tunics and cloth pantaloons. The guard room is very badly ventilated, but the best available position for the guard is the Castle.
Duties.	1. No answer from want of experience. 2. The soldiers at this station parade every morning for an hour with arms and accoutrements, and in the evening for half an hour three days in the week setting up drill, roll call for the remainder. The men do not suffer in health from this. The times for parades, &c. should be so regulated as to avoid the sun as much as possible, and in the rains the men should not be exposed to the damp ground; the same rules should be observed in marching. The troops at this station average six nights in bed out of the week. 3. Each sentry is on duty eight hours out of the 24, and he is relieved every two hours, both day and night. The sentries are in the barracks. There are 7 roll calls day and night. 1st morning parade, 2nd breakfast, 3rd dinner, 4th evening meal, 5th parade, 6th half-past 7 o'clock, 7th tattoo. The men do not suffer from night guards.
VIII. INSTRUCTION AND RECREATION.	1, 2. The following are the means of instruction and recreation at the station. There is no ball court, but there is a skittle ground, and a school. There are neither library or reading room, day room, soldiers' clubs, soldiers' gardens, workshops, theatre, or gymnasia; in fact the means to keep the men occupied during the wet season or heat of the day are insufficient. In the hot weather the men are not allowed to go out after 8 o'clock in the morning till 5 in the afternoon, and in the cold weather till 4 in the afternoon. Establishing the above places for recreation, instruction, and amusement, I would suggest as a great desideratum. 3. Soldiers' savings' banks exist here, and are found advantageous. 4. There is not sufficient shade from trees, sheds, verandahs, or other means to enable the men to take exercise without injury to health during the day.
IX. MILITARY PRISONS.	1. The cells in the Castle have been condemned, and there are none in the camp.
X. FIELD SERVICE.	No information under this head, as the questions do not seem to apply to Surat.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The information under this head is given in the following table:—

SURAT.

EUROPEAN TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M.'s 86th Regt.	55	63	—	—	—	6	—	2	—	25	—	5	—	2	—	29	—	132	—	240·0	—
1858-59	2/11 Royal Artillery Detachment H.M.'s 83rd Regiment. Detachment H.M.'s 92nd Highlanders.	55	112	1	2	—	8	—	8	—	37	4	4	1	—	—	37	—	208	6	378·1	10·9
1859-60	Detachment 4th K.O. Regiment.	66	271	1	—	—	1	—	7	—	26	2	7	—	—	—	52	—	364	3	551·5	4·5

NATIVE TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	15th Regiment Native Infantry. 29th Regiment Native Infantry.	793	406	2	3	—	1	—	4	—	93	10	10	2	15	4	248	1	780	19	98·3	2·3
1851-52	3rd Company 4th Battalion Artillery. 29th Regiment Native Infantry.	716	451	2	5	—	10	—	5	—	25	1	—	—	—	—	221	4	717	7	100·1	0·9
1852-53	2nd Company 3rd Battalion Artillery. 3rd Company 4th Battalion Artillery. 29th Regiment Native Infantry.	852	694	1	2	—	17	2	1	1	51	3	11	—	—	—	139	5	915	12	107·3	1·4
1853-54	2nd Company 3rd Battalion Artillery. L.W. 9th Regiment Native Infantry. 29th Regiment Native Infantry.	605	205	3	4	—	8	—	4	1	44	1	3	1	28	10	109	2	405	18	66·8	2·9
1854-55	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	706	642	1	2	—	12	—	5	—	94	—	6	—	35	23	218	2	1,014	26	143·6	3·6
1855-56	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	692	1,119	4	—	—	14	1	9	1	63	1	6	—	3	2	219	—	1,433	9	207·1	1·3
1856-57	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	519	519	—	—	—	40	1	8	—	48	—	5	—	8	4	287	1	915	6	176·3	1·1
1857-58	1st Company 3rd Battalion Artillery. 2nd Company 3rd Battalion Artillery. 16th Regiment Native Infantry.	534	262	11	—	—	3	—	1	—	60	3	—	—	—	—	127	—	453	14	84·8	2·6
1858-59	16th Regiment Native Infantry. Detachment 9th Regiment Native Infantry.	998	1,295	13	7	—	33	2	3	—	206	2	6	—	—	—	623	2	2,173	19	217·7	1·9
1859-60	16th Regiment Native Infantry.	655	826	5	13	—	16	—	1	1	108	1	2	—	11	4	416	—	1,393	11	209·4	1·6

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 22nd December 1860.

W. C. COLES, Assistant-Surgeon,
Secretary.

XII. HOSPITALS.

1. Plan of the hospital is transmitted.
2. The barracks and hospital are in the Castle and close to one another, and the native infantry hospital is a house formerly a private building. There are no stables. The Castle hospital is surrounded on three sides by the native town; but the native hospital is isolated from any building. Both hospitals are well ventilated, and there are no high walls or trees to interfere with the ventilation. The European hospital is not in a healthy position; the native is healthy enough, and free from nuisances.
3. The water supply is abundant, and as good as can be got in the neighbourhood.
4. There are several drains, and they are all cleansed daily by the sweepers, and in the native hospital the impurities are removed by sweepers. The river, which is the outlet for the sewage, is situated 30 yards from the Castle hospital and 130 yards from the native infantry hospital.

SURAT.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII Hospitals—*cont.*	5. The wards of the hospital in the Castle are 21 feet above the level of the ground, and they have a free perflation of air underneath the floors. The down-stair ward of the hospital for native infantry is two feet above the ground, and as it has a mud floor there is no free passage of air beneath it. The two upper wards are 14 feet above the ground, and they have a free perflation of air beneath. The roof water of the Castle hospital falls on a chunam terrace beneath, whence it is at once drained off into the river, and that of the hospital for native infantry falls on the ground around it; but most of it makes its way to the river, without sinking into the ground. There is no obstruction to the free surface drainage round both hospitals, the ground of the Castle hospital rain-fall having a natural slope, and a gutter is kept open during the monsoon for the proper drainage of the native infantry hospital. The walls of the Castle hospital are of brick and chunam masonry, the floors of chunam, and the windows are provided with Venetian and glass shutters, &c. See plans of this and the native infantry hospital transmitted. Verandahs are used in the native hospital, but there are none in the European; those in the former are used for the sick when required. The European hospital has an upper story, and the native infantry hospital has one also, but it cannot be used.

Table of hospital accommodation.

Date of construction unknown, as the European hospital is part of the Castle, which, as before mentioned, was constructed before the English took possession of Surat, and the native infantry hospital was formerly a private building.

Total number of wards, for Europeans, 2; for native infantry, 3.

Total regulation number of beds, for Europeans, 18; for native infantry, 24.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.			Feet.	Feet.		Feet.	Feet.
In the Castle. For European Troops - } 1	10	38	20	10	7,600	760	76	1½	8	6	4
No. 15, 1	8	29	20	12	6,960	870	72½	1½	4	6	3·5
on the Cantonment. For Natives. Down-stair ward	12	46·25	21·5	13	12,926·87	1,077·24	82·86	1½	8	4·5	5, mud floor.
Ward on upper story.	6	23	21·5	12	5,934	989	82·42	1½	6	6·25	4·25

Both hospitals are placed so as to receive the full benefit of prevailing winds. The buildings at present occupied as hospitals were not constructed as such, but have been selected as the most suitable.

6. The ventilation is good in both hospitals. There are no jalousies or jhilmils.

7, 8. There are no means of cooling the air admitted into the wards, and none are required for warming it, it being hot enough already. The walls and ceilings of the hospital wards are cleansed and whitewashed every three months by Government general order.

9. There are no regular privies or urinals in the European hospital; night-stools are used and emptied by the sweepers. The native hospital has a range of privies near it, which are daily cleaned out. There are no cesspools, but the privies are highly offensive in consequence of imperfect cleansing.

10, 11. The lavatory arrangements in the hospitals consist of bath tubs in sufficient quantities, and the means of bathing the sick are convenient and sufficient.

12, 13. The washing and drying of the hospital linen are done by native washermen. The storage is sufficient and dry.

14. The bedsteads and bedding used in the hospital are the same as those in use in barracks.

15. The place used as a kitchen is a small dark apartment, insufficient for the object intended, but the best place that could be selected. The cooking pots are regularly tinned once a month, and the cooking of the diet is properly done.

16. The returns of the diet tables, diet rolls, &c. cannot be furnished by the European detachment, and the diet table is the same as will be furnished by the head-quarters of the regiment, as well as all other forms. The native hospital returns are transmitted. There are no diet tables in the native hospital.

17. For the European hospital a serjeant is allowed; and in all the other establishments are natives, as allowed by Government, consisting of two ward boys and a dresser for a detachment of that strength. For the native hospital an orderly is allowed, and men are selected to attend on the sick when required.

18. The sanitary condition of both hospitals is good, and there has been no outbreak of any epidemic disease.

19. The building of the European hospital is unfit for the accommodation of European patients. The native hospital is not sufficient for the accommodation of the regiment, and new hospitals should be erected in suitable situations.

20. There are no provisions made for the exercise of convalescents, either European or native; but the former may walk on the ramparts and the latter in front of the hospital.

21. There are no female wards, but the women are attended by the medical officers at their own quarters, which latter are badly ventilated. The buildings in the Castle do not admit of any improvement.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	22. There are no special local hospital regulations in force at this station, not included in the general presidency medical regulations. 23. As regards the sanitary state of his hospital, repairs in buildings, change of diet, &c. the medical officer's suggestions are always attended to. 24. There are no wards or hospital for convalescents, but such accommodation would be advantageous.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is two miles from the Castle, and about four miles from the camp, and cannot affect the sanitary condition of either. 3, 4. The grave space allowed is according to the size of the deceased. Graves are six feet deep, and have a six feet interval between each. [It is presumed that no answers are required to queries 2, relating to the area, subsoil, and drainage of burial ground, or 4, which relates to the state of the graveyard, and precautions to prevent nuisances.] 5. The dead of camp followers and bazaar people are buried or burnt, according to caste. 6, 7. No injury accrues to the public health from the present practice, and no improvements are suggested.

(Signed) Keith Jopp, Major,
Commanding the Garrison of Surat.
S. M. Pelly, Surgeon,
H. M. 16th Regiment, Bombay Native Infantry,
Senior Surgeon at Surat.
H. F. Hancock, Captain,
Acting Executive Engineer, Surat.

14th November 1869.

HYDERABAD, SINDE.

Accommodation.
- Queen's Troops.
  - Artillery, 2 Companies, { 11 Non-commissioned Officers. 155 Rank and File.
  - Infantry, 3 Companies, { 12 Non-commissioned Officers. 202 Rank and File.
- Native Troops.
  - Artillery, { Nos. 5 and 9, Light Field Battery, attached to the above 2 Companies; 7 Non-commissioned Officers, 111 Rank and File.
  - Infantry, 1 Regiment, { 48 Non-commissioned Officers. 642 Privates.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is undulating, sandy, and dry. There is a little wood on all sides. 2. The station is elevated 99·35 feet above the sea, and 40½ feet above the adjacent country. The nearest water is the river Indus, about three miles from cantonment, and some small nullahs, which are filled by the annual inundation of the river. There is no higher or healthier ground near the station. 3. The nearest mountain is about 20 miles from cantonment on the opposite side of the river Indus; it is elevated about 800 feet above the station. 4. Immediately below the plateau on which the cantonment of Hyderabad is, and close to the native infantry lines and officers' quarters, there is a sheet of water, but this only exists during the inundation. The vicinity is only liable to overflow during the inundation of the river Indus, which lasts about four months. There is some broken ground near the station, but it does not affect the health of the troops. 5. The station is freely exposed to the winds: the temperature is raised by the buildings being exposed to reflected sun-heat. Cold and variable winds affect the health of the station more or less. 6. The surrounding country is cultivated during the inundation. There are works of irrigation near the station, but not within cantonment limits. They have no effect on health. Indigo is not cultivated, nor the cultivation of hemp or flax carried on near the station; in fact all cultivation is prohibited within certain limits. 7. The native town of Hyderabad lies on the eastern side of the station, and adjoining it. 8. The district has a range of low calcareous hills running parallel to the river Indus at a distance of about three miles. On the northerly point of these hills stands the station of Hyderabad, having an elevation of about 40 feet above the adjacent country; with this exception the district consists of sandy plains and alluvial deposits from the river Indus. The soil is generally of extreme fertility if well watered, but if left uncared-for the surface soon turns to firm and drift sand. In many places the water is brackish, and throughout Sinde wells are maintained by very feeble springs. Most wells can be exhausted in 12 hours by a well-worked Persian wheel. The ground on which the camp stands was not previously occupied by population before the present station was formed on the plateau. 9. Water is usually found below the plateau at about 20 feet in the low season, and 15 feet in the high season. 10. The small annual fall of rain in Sinde does not affect the wells, but the rise and subsidence of the Indus does. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived principally from wells which are filled by the river Indus during the inundation. The water is stored in an open tank, the surface of which is about 80,000 square feet. The tank is full during the inundation, but almost dry during the months of May and June. There are neither plants nor animals in the tank, the water of which is not used for bathing purposes. The tank is not liable to pollution by leaves or other matter falling into it, neither does any nuisance or malaria proceed from it.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	12. Some of the wells are brackish, but in the majority good water is found. A few during the hot weather become dirty and offensive from not being properly attended to; but in others, less used, purer water is at all seasons obtainable. The chemical composition of the water I do not know, but that in common use is soft in character, dissolving soap readily. Although I have never examined it microscopally, I have no doubt it swarms with animal life. The quality is undoubtedly good and wholesome, and the supply abundant. 13. Hydrabad is situated on the most northerly of a chain of low calcareous hills running north by east, between the rivers Indus and Fullailee; on a bare plateau of small extent at the foot of the hill on which the town is built, and to the westward of it are cantonments, and between this plateau and the river Indus, and on a lower level, there extends a thinly-wooded plain of an average breadth of three miles, part of which is flooded at certain seasons of the year by water from the river to the east of the town. Eastward of the town, between the elevation of the hill on which it is built and the banks of the Fullailee, there is a plain of nearly one mile average breadth, which has a greater elevation than that existing between the main river Indus and the hill. At a certain season of the year the water of the Fullailee is dammed and made available for the purposes of irrigation, at which time the bed of the river is almost dry, but at other times there is a large body of water, and it is then that the western plain between the cantonments and the Indus becomes flooded. I have not observed in one year's experience that malarious fever is more common among the troops of the station during the one period than the other; nor do I know whether the inhabitants of the houses in the town, which are situated near the river Fullailee, are more subject to fever and other diseases when the river becomes dry than at another time, or than those occupying houses at a greater distance; but the houses in the cantonments on the edge of the plateau overlooking the westward plain extending to the Indus, and which is periodically flooded, are considered unhealthy. 14. I am not aware what amount or kind of inquiry is gone through before new stations are selected.
II. CLIMATE.	1. Beyond a Fahrenheit's thermometer in use in every hospital, I am not aware of any meteorological instruments available at the station; an instrument to determine the amount of rain is easily made when required. 2. Table of Meteorological Observations for two years, from 1st Jan. 1856 to 31st Dec. 1857.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
Jan.	—	64°·2	12°·5	70°·5	58°	64°·2	56°	—	·55	N.E. & N.W.	Variable & Moderate.	—	Generally cloudy, rain on two occasions.
Feb.	—	71·2	15·8	77·8	62·	71·2	60·	102	·46	S.W., N.E. & N.	Moderate.	—	Cloudy in the early part, heavy with dews in morning, several dust storms, rain on occasions.
March	—	80·7	17·	89·	71·8	80·7	66·5	115	—	S.W. & W.	High.	—	Cloudy on 10 days, hot winds prevalent, dust storms prevail, and sometimes last three or four days.
April	—	86·5	16·7	93·9	77·6	86·5	72·	117	·62	S.W. 25.	High.	—	Two or three cloudy days with lightning in the evening, hot and sultry, several dust storms, on one occasion violent sandsquall, followed by thunder, lightning, and rain with hailstones.
May	—	91·	16·	99·	83·	91·	76·3	122	—	S.W.	High.	—	One or two cloudy days, hot winds blowing, with plenty of dust. Mornings and evenings cool.
June	—	92·2	14·1	99·3	85·2	92·2	79·	123	—	S.W.	Calms, High.	—	Several hot and sultry days in early part. Windy nights, dust storms frequent.
July	—	90·6	10·5	94·5	84·	90·6	81·	114	1·87	S.W. & W.	High.	—	Generally cloudy. One dust storm followed by thunder and heavy rain. Rain fell on 4 occasions.
Aug.	—	88·	10·4	92·6	82·2	88·	80·	108	14·79	S.W. & W.	More moderate.	—	Cloudy. Rain fell on 13 days in 1856.
Sept.	—	85·	9·3	89·5	80·2	85·	78·	104	2·07	S.W., W.N.W.	Moderate.	—	A few cloudy days before rain-fall. Violent sand squall followed by rain. Calm, sultry, cloudy weather common during this month.
Oct.	—	82·4	14·	89·5	75·5	82·4	73·	113	—	S.W. 23 N.E. 8.	Calm.	—	Dew in the nights and mornings common during this month. Days clear, and sun's rays scorching.
Nov.	—	72·5	15·	80·1	65·	72·5	61·2	103	—	N.E., N.W. & S.W.	Moderate.	-	Fine weather. Mornings and evenings cold.
Dec.	—	65·5	15·	73·	58·	65·5	57·	92	—	N.E.	Variable.	—	Early part clear fine weather, latter part cloudy accompanied by several slight dust storms.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The atmosphere is exceedingly dry, even when heavy showers of rain fall about July and August. There is little moisture in the air, and evaporation goes on rapidly for seven months of the year, from the middle of March to the middle of October. The heat is extreme in these months, and during the day a hot breeze blows from the westward, and dust storms are frequent; but the nights and mornings are clear, cool, and refreshing, except in September and October, when all the 24 hours are disagreeably oppressive. In December and January, the weather is pleasant and bracing. In the cold season, morning fogs in the neighbourhood of the Indus are frequent; but they are altogether confined to the banks of the river. With regard to irrigation, the alternate flooding and drying of the land, which is its result, must, according to the ordinary theory, be a fertile source in the production of malaria; but I have no means of knowing whether malarious fever prevails to a greater extent in the district now than formerly. Dust storms, which are very frequent during the hot months, are local. I am not aware of any impure admixtures affecting the atmosphere over large areas of country; but I should imagine that at times malaria was pretty widely diffused. The depressing and exhausting tendency of the hot season has a decided influence in predisposing Europeans to disease, although I scarcely think that of itself it proves an exciting cause. Animal food cannot be procured of first-rate quality in the hottest weather, and from the short space of time in which it becomes bad, it is frequently eaten in a tough indigestible state. Bread, too, of good quality is made with great difficulty in the hot season; and the first description speedily gets sour. Protection from the sun is at all times necessary for the health of the troops, and sun-shades ought to be substantial and effective. The men on duty should not wear the same clothing at night as during the day, and the night clothing ought to be of woollen material. The most unhealthy months are at the changes of the seasons. On the approach of the hot weather, malarious fevers, with lassitude, debility, and chronic affections of the abdominal viscera prevail; while at the change from the hot to the cold, the same diseases of a more inflammatory type are common. 4. There is no district near this station, the climate of which is more conducive to health than that of Hydrabad. 5. Colonel Hough has served at the following stations: Mhow, Poona, Sholapore, Kuladgee, Belgaum, Bombay, Kirkee, Ahmedabad, Kurrachee, Gharra, Hyderabad, Sinde, Shikapore, Sukkur, and Dera Ghazee Khan. He considers that all are healthy, but that Mhow agrees best with his constitution. Captain Houghton has served in Rajcote, Kurrachee, Hyderabad, Sinde, Kolapore, Poona, Sattara, Belgaum, Sholapore, and Bombay, and considers them all healthy. Belgaum agrees best with his constitution.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, surrounding country, and barracks are transmitted. 4. Table of barrack accommodation. Date of construction, 1854–55. Total number of rooms or huts, 10 blocks compose the European barracks. Total regulation number of non-commissioned officers and men, 1,000.

Barrack Rooms.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
10	96	172	24 + 12 + 12 48	Mean. 21¼	177,504	1,849	86	About 1½ ft.	38	2	4
Guard Room -	6	26½	18½	20	9,805	1,634⅙	81¾	1½	4	3½	6½
Prison Cells -	1	10	10	16	1,600	1,600	100	—	2 1	2½ 2	2½ 1

5. The windows are on all sides. There are verandahs on four sides of the barracks 8½ feet wide; but they are never used as sleeping quarters for soldiers or others. There are also properly constructed jalousies.
6. The bedsteads and bedding, &c., are of the usual description used in all barracks.
7. The following are the dimensions of the tents for European soldiers, viz.:—

Double-poled tents - . -	23	15	12	5⅔.
Single-poled tents - -	15⅔	15	11¼	5⅔.

The cubic space per man in the double-poled tents is 125 feet, and the superficial area is 14 feet.

8. The barracks, guard-room, &c., are ventilated by means of ventilators in the roof of the buildings. These are quite sufficient to keep the air pure by night as well as by day. The air admitted into the barrack-rooms is cooled by means of punkahs and tatties, well watered during two months.
9. The barracks are constructed of pucka brick and lime, with a roof of queen-post trusses, and tiled.
10. The floors are partly of pucka brick, and partly of stone, of an average height of 2½ feet above the ground; but with no ventilation at the bottom.
11. The barracks at this station are large and comfortably built of brick, with tile roofs. Thoug more durable, this material is far inferior to mud, as it is more easily heated, and retains the heat much longer. A great improvement, too, doubtless would be in having all the barracks upper-storied, or built on arches, in which case there would never be any inducement for the occupants to sleep in the open air, and from the well-known habit of malaria in keeping towards the surface of the earth, I have no doubt the cases of fever would be greatly diminished. The huts for the native troops are much too small, especially as regards the height of the walls. The tents are all that could be desired, consistent with portability. The barracks are generally cleansed and limewashed twice a year, or whenever they seem to

HYDERABAD, SINDE. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	require it; the hospital every quarter, or oftener if necessary. The drainage in the European lines is in every respect satisfactory, and the surface water, &c., is received into cesspits. Dampness is unknown in any house in the station. The cesspits are situated in the rear of each barrack, there being one to each. The dimensions are about 5 feet deep, by 4 feet 6 inches in diameter. They are so constructed of solid workmanship, that they can be thoroughly cleaned, which is done every night, the contents being carried in skins on bullock backs to a distance. The privies are cleansed twice a day by sweepers, and deodorising substances are occasionally used. There is no well within half a mile of them. In the native lines the cesspits are smaller, but more numerous, and in more convenient places close to the huts. They too are regularly cleaned twice a day, and the contents thrown about in the close vicinity of the cesspits; but as the cleaning is daily attended to, anything edible is immediately picked up by birds or dogs, and as evaporation is rapid, there is no nuisance. There is great room for reform in the privies attached to the lines of one of the native regiments. They are regularly cleaned by sweepers; but as all matter is deposited on the ground, the cleaning process cannot be efficiently performed, and the liquid substances are allowed to sink into the subsoil, so that the earth is thoroughly saturated, and a noisome odour constantly pervades the surrounding atmosphere. The other refuse of European and native lines is collected into heaps, and removed every morning by scavengers' carts, which carry it to some distance, where it is burnt. On the whole, the sanitary condition of the station is satisfactory. 12, 13, 14. Plans of the lavatories, the barrack cook-room, and the privies are transmitted. The linen is washed by native washermen, who are sufficient for the wants of the station. 15. The buildings are ventilated by openings in the roof of each block, and lighted by oil lamps. 16. The barracks are principally drained naturally with small gutters to carry off all water, &c. about five yards from the buildings. These means are sufficient. Neither the barrack or hospital is damp. The fluid refuse of the barracks is received into cesspits, which are about 500 yards from the nearest tank. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is performed by men kept for the purpose by Government, under the superintendence of the staff officer. The filth is carried away in carts, and burnt in kilns kept for that purpose. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station, bazaar, &c. 19. The drainage of the bazaar is principally natural. Water is bought by residents for their own use. There is no crowding in the bazaar, and it is always kept clean by sweepers, employed by Government for that purpose. The condition of the native houses near the station is good. There are no dung-heaps, &c. permitted within them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Animals for the use of the troops are slaughtered in the Sudder bazaar, about a mile from barracks. 21, 22. Horses are not picketed near the station, but those of the artillery occupy a picketing ground about 200 yards from the men's barracks in the open air, and about one mile from the hospital. 23. The married quarters for non-commissioned officers and men are quite sufficient. Married people do not occupy barrack-rooms with the men.
Officers' Quarters.	1. There are no public quarters for officers at the station, they are all private.
IV. HEALTH OF THE TROOPS.	1. The station and district are not by any means unhealthy, but when disease does occur a change is generally necessary for recovery. The adjoining native population too is healthy, but they are said to suffer severely from fever and vesical calculus, which latter disease is very common among them. 2. Small-pox and measles are epidemic occasionally here. Malarious fevers often associated with spleen disease prevail at all seasons, but chiefly in the autumn. Poverty and filth are the sources of many and varied diseases. 3. The alternate inundation and drying of the soil must be a fertile source of malaria. The simple habits of the people tend to preserve them in health, but total disregard for ventilation in their dwellings and poverty make a scorbutic tendency prevalent. 4. The men of the 3rd Company 1st Battalion Artillery have joined from Belgaum, Deesa, and Ahmednuggur. They were about five years at Belgaum, where they enjoyed excellent health. They left on 18th October 1858, and arrived here on 30th November 1858, in good health. Soon after arrival a number of cases of Guinea-worm occurred; but the men have been and are healthy, though cases of malarious fever, thermatic and hepatic affections do occasionally occur. The 1st Belooch Battalion Native Infantry had been on field service in Hindoostan for more than two years previous to their arrival at this station on 21st May 1859. During that period thermatic diseases and fevers prevailed, the latter less frequent than since their arrival here, but the cases more severe. A great number of men were then always returned as sick from being foot sore, which is not to be wondered at, as they march in ammunition boots, without stockings. But, strictly speaking, the regiment was healthy. Since arrival here, cases of malarious fever have predominated, and rheumatic affections, chiefly of a syphilitic origin, while cases of dysentery and intractable ulcers are common. Were the habits of Beloochs less debauched and more cleanly, the health of the regiment would be perfect. There is no portion of the barracks nor of the native lines more unhealthy than another. 5. The artillery are camped out once a year for a month or so for practice, without detriment to their health. 6, 7. No experience of hill stations. 8. I approve of hill stations for troops. The higher the situation of any station in India, within a certain range, undoubtedly the healthier and more agreeable it is. 9. There are no diseases peculiar to hill stations with which troops are liable to be attacked on going to them. 10. Wholesome diet, with a moderate allowance of stimulants, woollen clothing next the skin (especially at night), shelter from the sun's rays, light duties, and active inspiriting exercises are conducive to health in hill and all other stations.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	11. The seasons best adapted for a residence in the hills depends on the locality, and the period of residence required in order to receive benefit, on the nature and stage of the disease.
	12. The longer an invalid resides in a climate adapted to the cure of his disease and favourable to his constitution, the more robust he will become, and the better able to serve in the plains. Acclimatation is a myth, as generally understood. Habits and customs suitable to the place of residence only require to be adopted.
	13. Every possible precaution to prevent excesses of any kind, and more particularly exposure to the sun, is required to protect the health of troops on leaving hill stations for the plains.
	14. European troops generally are fond of change of station. It is certainly not advisable to keep them long in unhealthy districts; and for these I should strongly advocate frequent reliefs. But, unless an epidemic be raging, the stations of native troops ought to be changed as seldom as possible.
	15. No reply to this query.
	16. The elevation above the sea most suitable for hill stations is about 5,000 feet.
	17. Some of the hills surrounding the station have been proposed as sites for sanitaria, but difficulty of access and want of water render the carrying out of such a project impracticable, except at an enormous expense.
	18. No experience of hill stations.
	19. The best age for a soldier to proceed to India is from 20 to 22 years, when growth and development of the system have well advanced, and they should land here early in November. On landing they should be moved to a healthy district near the port of disembarkation and out of the way of all temptations. No fatiguing duties or drill should be imposed on them, nor should a long march be entered upon. Good sun hats and suitable clothing of woollen texture should be supplied at home and served out for use as soon as the troops come into a warm latitude. Cloth clothing of every description should be entirely abolished in the plains of India.
	20. Troops should be sent direct from the home depôts to India. The mortality of the first years of service could, I think, be considerably diminished by a more careful selection of the men at home, by sending no man to India until he has learned obedience, and been fully initiated into all the duties of a soldier, by visiting with severe punishment any transgression of rules on first arrival here, and favouring all sorts of amusement and recreation to keep the men contented and happy. On march the distance should not exceed 10 or 12 miles a day. Coffee before the march should never be omitted.
	21. No transport of troops takes place from this station.
	22. A British soldier may serve as long in India as in any other part of the world. Two-thirds of Indian stations are as healthy as any in Europe, provided the habits be adapted to the country.
	23. Medical boards are absurdities. Every medical man, if imbued with a kindly feeling, considers it necessary if at all consistent with his views to uphold the opinion of a brother in the profession. The opinion of one honourable, upright, and well-qualified medical officer is of more value than those of a thousand boards.
	24. Invalids proceeding home should leave India about March, or so as to arrive in England at a genial season of the year.
Diseases.	1. There are no inspection parades here for the discovery of incipient diseases, nor are they necessary.
	2. The European troops at this station have no tendency to scorbutic disease, nor will they have so long as they are so well dieted as at present. Among the native troops it does not prevail to a great extent, but cases frequently occur, generally in men who have large families, or in those who waste their money and live poorly. Among the rural population the disease is common, but the cases are not extreme.
	3. In a company of European artillerymen (average strength 74), there have been only seven admissions from hepatic disease during late years, but I know that other cases have occurred associated with other diseases under which they have been classed. In most cases there is no doubt that free living and indolent habits induce the disease, but in others it is difficult to assign any origin. Everything that contributes to sobriety and activity, both of body and mind, must have a good effect in diminishing this disease. Among natives acute affections of the liver are not common, whereas chronic enlargement is not rare.
	4. Just after arrival here a number of cases of dracunculus occurred in the men of the 3d Company 1st Battalion of Artillery, but since then not a man has suffered from it, nor have I ever seen a case here in a native. No precautions to suggest.
	5. Among the artillerymen a very small proportion of venereal disease is ever under treatment, frequently not a case; but among the natives more than half the sickness of the regiment is more or less attributable to this disease. So far as European troops are concerned it is scarcely necessary to establish a lock hospital, and I am doubtful if one would have much effect in diminishing the frequency of this disease among the sepoys.
	6. The troops at this station suffer from diseases chiefly of the endemic class; quotidian, intermittent, and remittent fevers are the most common; and the tertian and quartan types are not rare. Among the troops during the last twelve months there occurred the following diseases and deaths :—

Europeans, Strength, 74.	Dysentery, 5 cases. No deaths. Fevers, 17 cases. 1 death. Rheumatism, 16 cases. No death. No case of small-pox. Ditto cholera.
Natives, Average Strength, 887.	Fevers, 159 cases. No death. Dysentery, 21 cases. 2 deaths. Rheumatism, 65 cases. No death. Small-pox, 1 case. No cholera.

References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*Diseases—cont.*	7. Cases of zymotic diseases have not prevailed here for a long time. There are always sporadic cases of small-pox, &c. in the town. These diseases are most prevalent in the autumn, when a muggy heavy atmosphere prevails, and breezes are less frequent than at other times. No particular locality has been distinguished as prolific of zymotic diseases. A native of India is a most extraordinary animal, who builds walls and partitions in his habitation and obstructs ventilation, while at the same time he makes receptacles for filth, and these habits greatly foster the above diseases. 8. No epidemic disease has prevailed here for some time. 9. Small doses of quinine have not been given on a large scale as a prophylactic against malarious diseases here. 10. Strict attention to all sanitary matters should be paid in order to prevent or mitigate epidemic disease. No overcrowding of barracks. Making more commodious and extended the accommodation of native troops, more especially as regards the height of the walls of tents; and above all, removing dilapidated houses and putting a stop to the overcrowding of buildings, characteristic of every native town.
V. INTEMPERANCE.	1. The soldiers at this station are temperate, and there are very few confirmed drunkards in the artillery. 2. Drunkenness is always punished as an offence. 3. Distilled spirits are sold both at the canteen and bazaar, and are good in the former but very bad in the latter. A cunning man may procure any amount. Spirit is supplied on payment at the station, on the march, and in the field. The dram before morning parade depends upon the will of the commanding officer. As regards the health of the men it is quite unnecessary. The smallest or largest quantities imaginable of spirits may be given to convalescents, at the discretion of the medical officer. Filthy lemonade, &c., not tending to promote digestion, are sold in the bazaar. 4. The consumption of spirits by troops can be done without, and certainly is not conducive to internal discipline. 5. I would recommend Government to abolish the spirit ration, restrict the sale in the canteens, and prohibit it altogether in the bazaar. 6. Malt liquors and wines are not so deleterious as spirits. 7. Coffee, tea, lemonade, &c. are used at this station, and are not nearly so detrimental as spirits or malt liquor. 8, 9. It would be beneficial to suppress the spirit ration altogether, except in the case of convalescents, at the discretion of the medical officer. 10. I would punish severely every case of drunkenness, and give every inducement to the men to abstain, by providing them with varied sources of amusement and recreation. 11. No reply to this query.
VI. DIET.	1. The soldier's ration at this station is as follows:—Beef or mutton, first sort, 1 lb.; fine white wheaten bread, first sort, 1 lb.; vegetables of sorts, half of which are potatoes, 1 lb.; rice, 4 oz.; tea, $\frac{10}{21}$ oz. black, and $\frac{5}{21}$ oz. green; (or coffee, $\frac{13}{7}$ oz.); salt, 1 oz.; sugar, $2\frac{1}{2}$ oz.; and wood, given free, 3 lbs. Beef is the usual meat ration, but where good mutton is procurable it is given twice a week. Potatoes sometimes cannot be had. The rations are inspected by the orderly officer every day before issue, and by the commanding officer once a week, or oftener. 2. A complete ration is provided for the troops, and the stoppage, or rather the money a man gets if he does not draw his ration, as in the case of a married man, is 3 annas 4 pice daily. When the ration does not cost Government this amount, the surplus is given to the soldier. The soldier has three meals a day; viz., breakfast at 8 a.m., of meat, bread, and tea or coffee; dinner at 1 p.m., meat, vegetables, bread, and a pint of porter to those who choose to purchase and bring it from the canteen; and tea, a little before 5 p.m., consisting of bread and tea. Such men as choose to do so can purchase a meat supper and coffee in the coffee shop. 3. I do not think the men make away with any part of their ration, excepting the rice, which is sometimes changed for milk, butter, eggs, and pepper. The rations are excellent. 4. The cooking is done by hired cooks, generally Portuguese. There are three to a company; a master-cook and two mates. The cooking utensils are of copper, tinned once a month, and consist of stewpans, fryingpans, large tea kettles, and camp kettles. The cook-houses are detached from the main buildings, and are well suited to natives but not to Europeans. The floors are of stone; and everything about the kitchens is inspected daily by the orderly officer. The cooking is very good; and tea and coffee are properly prepared. The variety in the cooking is according to the fancy of the mess, and is very considerable. On the line of march the men can always have a cup of coffee from the coffee shop on payment. 5. It would be impossible to establish gardens for soldiers here, there being no water near the barracks.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are of the description usual in India, and suitable to the climate. Khakee cotton clothing is the most excellent dress ever devised for hot weather in India. The guard dress here is, from March to November, khakee cotton clothing and wicker helmet in the day time; forage cap at night; and from November to March, cloth shell jacket, serge trousers, and forage cap, without cover. The sentries are protected from sun and wet by a broad verandah.
Duties.	1. As far as the health of the men is concerned, I think it is advisable they should be drilled in India; for by the way in which he lives during the first year of a man's life in India, his habits in the country are in a great measure formed. It is remarkable how much more healthy a recruit is at drill than an old soldier who has come out instructed. The recruit's time is fully occupied, and by the time he has passed his drill he has had sufficient experience of the climate to make him careful.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements and Duties—*Duties—cont.*	2. An artillery soldier has to turn out at daylight, and five times a week attend drill, which lasts one hour, three-quarters of an hour, or half an hour, according to the drill, and the season. I have never known a man suffer in health from this. Guards come round to a man once in seven days. The men have usually six nights in bed in the week, when we are up to our full strength. 3. All our guards mount within 100 yards of the barracks, and last for 24 hours. A picquet lasts from sunset till daylight next morning, and each sentry mounts for two hours. There is a morning roll call at parade hour, and one half an hour after daylight, a tattoo roll call, and the last roll call at night. There are also short roll calls, as they are termed, for men without good-conduct badges. Night guard is the most trying part of a soldier's duty in cantonment; but I think all the precautions that can be taken to make it as little detrimental to health as possible are already taken.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation as this station:—A ball court, a skittle ground, a school, with a good schoolmaster, a library, and reading-room, much too small, and insufficiently lighted, the lights being paid for by the men. We have a cricket club, and the men also play a good deal at a game called long bullets. The men have in the hot weather (save those who can read) positively nothing to do. There is no restriction to exposure to the sun, and I have always found the men less anxious to expose themselves when there is no such restriction. 2. I would recommend the establishment of large airy workshops at the station, and am confident they would prove a boon to the soldier. Were arsenal, commissariat, and engineering officers instructed to give as much work to the men as they would undertake, I think they would get the work better, and as cheaply done as at present, while it would be a great boon to the soldier, by occupying his time and by enabling him to feel he was doing good. A good reading room, well lighted at night, is a great want, and a more suitable supply of books. A money allowance to be made for this. All manly games should also be encouraged. 3. We have savings' banks for soldiers already established here. They answer admirably. 4. There are no trees near barracks, but the men can walk about in the north verandahs, without exposure, if that can be called exercise.
IX. Military Prisons.	There is no crowding in the military prisons at this station, and the ventilation is good.
X. Field Service.	1. There are no special local regulations for field medical service not included in the General Presidency Regulations. 2. The practical working of medical officers on the line of march consists in attendance on the sick, and in procuring a sufficient supply of carriage. Medical officers are at liberty to offer an opinion on the salubrity or otherwise of the ground selected for bivouacking or encamping; but it depends altogether on the officer commanding, whether the medical officer's suggestions are attended to. 3. The selection of encamping grounds, and general camp regulations, rests with the commanding officer and his staff, the medical officer exercising a careful supervision over the salubrity of the situation, effects of the water, &c. 4. The selection for field hospitals depends on the country or locality in which operations are being conducted. The transport of sick generally consists of doolies, spring carts, and stretchers; the latter formed of two bamboo poles, with strong canvas in the centre. Regulations bearing on these matters are to be found in the Medical Code.
XI. Statistics of Sickness and Mortality.	

HYDERABAD.

European Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Disease of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	L. W. H.M.'s 8th Regiment	523	303	1	—	—	13	—	51	—	90	—	13	—	—	—	367	—	837	1	160·0	0·1
	R. W. " 64th Do.																					
1851-52	Wing " 64th Do.	446	322	10	—	—	23	—	49	—	144	5	15	1	—	—	379	1	932	17	208·9	3·8
1852-53	R. W. " 64th Do.	443	1,542	28	—	—	15	—	17	—	79	1	21	3	—	—	198	1	1,872	33	422·5	7·4
	R. W. " 83rd Do.																					
1853-54	R. W. " 83rd Do.	370	316	—	—	—	18	3	6	—	50	1	11	2	—	—	185	—	586	6	158·3	1·6
	R. W. " 86th Do.																					
1854-55	R. W. " 86th Do.	249	143	—	—	—	17	—	29	1	135	1	9	1	—	—	226	1	559	4	224·4	1·6
1858-59	Detachment 46th Do.	125	50	—	—	—	21	—	6	—	45	1	3	—	—	—	122	—	247	1	197·6	0·8
	Detachment 51st Do.																					
1859-60	Detachment 64th Do.	139	28	—	—	—	7	—	12	2	20	1	9	—	—	—	129	—	177	3	127·3	2·1
	European Troops in the Indian Army.																					
1851-52	1st Troop Horse Brigade	23	3	—	—	—	—	—	1	—	6	—	4	—	—	—	25	—	39	—	169·5	—
1854-55	2nd European Regiment Light Infantry	170	32	—	—	—	8	1	14	1	23	—	12	—	—	—	109	—	198	2	116·4	1·1
1855-56	4th Troop Horse Brigade, 4th Company 1st Battalion Artillery, 2nd European Regiment Light Infantry	905	530	5	—	—	61	3	50	2	218	4	115	5	—	—	693	3	1,667	22	184·1	2·4
1856-57	2nd Do. Do.	520	1,267	11	—	—	51	2	14	—	127	9	68	7	—	—	419	—	1,946	29	374·2	5·5
1857-58	3rd Troop Horse Brigade, 4th Company 1st Battalion Artillery	52	76	—	—	—	5	1	4	1	12	2	2	—	—	—	54	—	153	4	294·2	7·6
1858-59	3rd Company 1st Do. Do., 4th Company 1st Do. Do.	85	52	—	—	—	3	—	8	—	17	1	6	—	—	—	87	—	173	1	203·5	1·1
1859-60	3rd Company 1st Do. Do., Detachment 1st European Regiment Fusiliers	131	42	1	—	—	14	1	13	—	34	—	6	—	—	—	147	1	256	3	195·4	2·2

HYDERABAD, SINDE. BOMBAY.

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	2nd Company 4th Battalion Artillery - 28th Regiment Native Infantry - 29th Do. Do. - 2nd Belooch Battalion -	1,968	1,005	7	1	—	40	2	7	—	122	2	17	1	2	—	1,170	2	2,364	14	120·1	0·7
1851-52	2nd Company 4th Battalion Artillery - 1st Belooch Battalion - 2nd Do. - 1st Grenadier Regiment Native Infantry - 28th Regiment Native Infantry -	2,587	1,205	7	29	—	47	1	7	—	260	7	28	3	19	9	1,503	10	3,098	37	119·7	1·4
1852-53	4th Company 3rd Battalion Artillery - 2nd Company 4th Do. - 6th Regiment Native Infantry - 28th Do. - 1st Belooch Battalion -	1,751	2,838	16	—	—	62	3	9	1	159	9	18	—	—	—	863	1	3,949	30	225·5	1·7
1853-54	4th Company 3rd Battalion Artillery - 6th Regiment Native Infantry - 1st Belooch Battalion -	1,880	977	4	4	—	43	4	4	—	129	5	19	1	—	—	672	12	1,848	26	98·2	1·3
1854-55	4th Company 3rd Battalion Artillery - 6th Regiment Native Infantry - 1st Belooch Battalion -	1,855	749	3	31	4	33	4	—	—	111	2	14	—	—	—	719	4	1,657	17	89·3	0·9
1855-56	5th Company 4th Battalion Artillery - 6th Regiment Native Infantry - 13th Do. - 1st Belooch Battalion -	1,417	880	3	24	—	55	3	2	1	205	2	6	—	—	—	803	5	1,975	14	139·3	0·9
1856-57	5th Company 4th Battalion Artillery - 13th Regiment Native Infantry - 2nd Belooch Battalion -	1,199	1,460	4	23	—	85	2	5	—	146	2	9	—	—	—	547	—	2,275	8	189·7	0·6
1857-58	13th Regiment Native Infantry -	692	536	2	15	—	27	1	2	—	44	—	13	1	—	—	363	—	1,000	4	144·5	0·5
1858-59	3rd Belooch Battalion -	777	217	1	—	—	142	4	1	—	83	—	8	—	—	—	541	1	992	6	127·6	0·7
1859-60	1st Do. - Wing 3rd Do. -	1,039	234	1	2	—	43	1	1	—	89	2	18	—	—	—	788	3	1,175	7	113·0	0·6

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. Europeans.	WOMEN. Strength. Indo-Europeans and Natives.	WOMEN. Strength. Total.	WOMEN. Treated. Europeans.	WOMEN. Treated. Indo-Europeans and Natives.	WOMEN. Died. Europeans.	WOMEN. Died. Indo-Europeans.	WOMEN. Ratio per Cent. to Strength. Treated.	WOMEN. Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	CHILDREN. Strength. Indo-Europeans and Natives.	CHILDREN. Strength. Total.	CHILDREN. Treated. Europeans.	CHILDREN. Treated. Indo-Europeans and Natives.	CHILDREN. Died. Europeans.	CHILDREN. Died. Indo-Europeans and Natives.	CHILDREN. Ratio per Cent. to Strength. Treated.	CHILDREN. Ratio per Cent. to Strength. Died.
1853-54	Wing H.M.'s 83rd Regiment -	51	—	51	65	—	2	—	106·5	3·2	77	—	77	57	—	1	—	74·0	1·3
1859-60	Detachment H.M.'s 64th Do. -	9	1	10	13	1	—	—	140·0	—	15	2	17	6	—	—	—	35·2	—
1854-55	2nd Bombay European Regiment Light Infantry -	45	4	49	54	4	2	—	118·3	4·0	67	4	71	50	1	7	—	71·8	9·8
1855-56	Do. Do. -	52	4	56	49	4	2	—	94·6	3·5	70	7	77	41	6	2	—	61·0	2·5
1859-60	3rd Company 1st Battalion Artillery -	9	4	13	13	6	—	—	146·1	—	26	9	35	27	4	1	1	88·5	5·7

By order of the Principal Inspector-General Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

W. C. COLES,
Assistant Surgeon, Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. A plan of the hospital is transmitted. 2. Its distance from the barracks is 600 yards in rear, and its position as regards the Sudder bazaar is north-west, as also of the native town. The site is open, healthy, and in no way obstructed. 3. The water is wholesome, and the supply abundant. 4. Refuse water and other impurities are carried away by open drains, discharging into cess-pools, which are regularly cleaned out. 5. The wards are raised three feet above the ground, but there is no perflation of air beneath them. Provision is made for carrying away the roof water; the whole of it does not sink into the subsoil. There is an open drain all round the hospital, which carries away the rain-fall rapidly. The hospital is built of pucka brick and lime, with a tiled roof, having a false verandah, which is intended to keep the wards cool. The hospital is supplied with double verandahs in front and rear, and single ones on the sides. They afford sufficient shelter from the sun's rays, but are not used for the accommodation of sick, convalescents, or others.

References to Subjects and Queries.	REPLIES.

XII. Hospitals—*cont.*

Table of Hospital Accommodation.
Date of construction, 1854–55.
Total number of wards, 5.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.			
		Length.	Breadth.	Height.	Cubic Contents.
		Feet.	Feet.	Mean.	
No. 1	—	222	24	28	149,184
„ 2	—	43	24	28	28,896
„ 3	—	77	24	28	57,744
„ 4	—	97	24	28	65,184
„ 5	—	45	16	18	12,960

The hospital is so placed as to receive the full benefit of prevailing winds. There are no windows to the hospital, but doors, the construction of which is conducive to ventilation and coolness.

6. There are sufficient ventilators, with Venetian shutters, to keep the wards cool and free of odour.
7. During the hot season the air is cooled by passing through kus-kus tatties, placed opposite the doors and kept constantly wet with water. The wards are well supplied with punkahs.
8. There are no means for warming the air admitted to the hospital. The walls and ceilings of the wards are cleansed and limewashed yearly, or oftener if thought desirable by the medical officer.
9. The privies are situated on the northern and southern extremities of the hospital, and constructed of pucka brick and lime, with flat roofs. They are placed on cesspools, which are carefully cleansed, and deodorizing substances are made use of. They are not offensive.
10, 11. There are no lavatory arrangements for the sick in hospital other than a tub or hip bath, which is neither sufficient nor convenient.
12. The linen of the hospital is washed, and dried by being exposed to the sun, which is quite sufficient.
13. The storage is sufficient and dry.
14. The cots are made of wood, standing about 2½ feet high. The part on which the bedding rests consists of broad tape lashed from the side and end pieces of wood, and is occasionally undone and washed. The beds are stuffed with chopped straw, which is from time to time renewed.
15. The position of the kitchen is east of the ward. The cooking utensils are of copper, tinned over, and the means are sufficient.
16. Diet tables, rolls, and other returns are given in the Medical Code of Regulations since January 1861.
17. Ward boys are allowed by Government for attendance on the sick, and a comrade can always be procured, or a nurse on the requisition of the medical officer. This establishment differs according to the strength of the corps or detachment.
18. The sanitary condition of the European hospital is good, and no epidemic, as far as I know, has prevailed in it.
19. The storehouses and apothecary's quarters are situated too near to and in wrong position as regards the hospital.
20. There is no ground or walk for convalescents. An unweildy and uncomfortable cart is allowed by Government to each corps or detachment of the sick for the exercise of convalescents, but it is taken little advantage of by the men.
21. There is a small female hospital, and a matron for each corps or detachment; but in an unhealthy season the accommodation would be deficient.
22. There are no special local hospital regulations not included in the General Presidency Medical Regulations.
23. The medical officer can of course prescribe diet and medical comforts as he thinks fit, but any extraordinary expenditure is subject to the sanction of the Deputy Inspector General; and the same with regard to repairs or alterations.
24. There is no hospital or ward for convalescents, nor is any such required.

XIII. BURIAL OF THE DEAD.

1. The burial ground for British troops is about one mile from and to the north-east of the station. The prevailing wind, with regard to the station, is generally from south-west or north-east.
2. The area of the ground is about 200 square yards, and its soil is sandy. There is no drainage, and decomposition takes place rapidly. The ground is surrounded by high walls so as to render it perfectly secure.
3. There is no specified grave space, but there is usually an interval of 3 or 4 yards allowed between the graves, which are usually about 7 or 8 feet deep, and are never re-opened. Interment, as a general rule, takes place 12 hours after death.
4. The graveyard is never offensive. Whenever a man dies, if it be any time before 2 or 3 in the day, the funeral takes place next morning, with all the usual ceremonies.
5. The dead of bazaar people are buried or burnt, according to caste.
6, 7. No injury accrues to the public health from the present practice, nor are any improvements to be suggested.

(Signed) L. S. HOUGH, Lieut.-Col., Commanding Hyderabad.
W. R. HOUGHTON, Captain,
Staff Officer, and Officiating Executive Engineer.
C. GORDON ASHER, M.D., Assistant Surgeon,
Civil Surgeon, Hyderabad.

20th February 1861.

Examined by A. F. Cunynghame, Major-General,
Commanding in Sinde.

KURRACHEE.

Accommodation:
- Queen's Troops:
  - Artillery, 1 Troop, Horse, complete.
  - Infantry, 1 Regiment of Her Majesty's Service, complete.
  - Infantry Barracks, (Queen's Depôt) for 423 men.
- Native Troops:
  - Artillery, 1 Company, Golundaze (Native Artillery).
  - Infantry, 2 Regiments.
  - Infantry, Sappers and Miners, Lines for 1½ Companies.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station consists of a sandy valley, the dry bed of a river being in the lowest part, with belt of trees and cultivation; the ground is sloping, and, in the distance, sandy hills. An inland salt-water swamp 5½ miles square approaches within a quarter of a mile of the cantonments, and lies between them and the sea, which is 3 or 4 miles distant on the south-west margin of the valley. This point is the inlet of the swamp, which is here about a quarter of a mile broad. In the lowest part of the valley there is the belt of trees, which is, however, not very extensive, and also some cultivation.
	2. The elevation of the station above the sea is about 27 feet, but somewhat lower than the adjacent country, except towards the river Lyaree and the sea. The dry bed of the former, which is about half a mile distant, is 16 feet below the station, and the salt-water swamp is about 20 feet below the level. Clifton and Manora point, at the entrance of the harbour, are higher and probably healthier than the station. The former is 2½ miles and the latter 6 miles from the cantonments, and their elevation above the sea is about 100 feet, and 70 feet above the station. Both are occupied, but are too limited for military purposes.
	3. A low mountain chain, running westward to the sea and rising to an elevation of about 800 feet, is situated about 6 miles distant from the station on the north and north-west aspect.
	4. The sea is distant about 3 miles. The bed of the river Lyaree, which is usually dry, is about half a mile from the station. When rain falls the bed is then filled with water, but this is very seldom. Wells are, however, pretty numerous in the lower part of the valley: There are also a few open tanks, but these are often dry. The vicinity of the station is not liable to overflow. No broken ground, ravines, or water pits exist near worthy of notice.
	5. The station is open and well ventilated, and from the usually strong winds that blow any elevation of temperature by the exposure of the buildings to reflected sun heat must be inconsiderable. The station is not exposed to cold and variable winds. Land and sea breezes prevail in spring and autumn, but with no particularly marked effects on health.
	6. The surrounding country is uncultivated except on the eastern bank of the river Lyaree. No works of irrigation exist. There is no cultivation of rice or indigo, nor is the preparation of hemp or flax carried on near the station.
	7. The town of Kurrachee is distant 2½ miles from the station, and contains a population of 22,000.
	8. The ridges of the amphitheatre are mostly limestone, abounding in fossils, the lower hills being composed some of sandstone and some conglomerate. Below is blue clay, resting on the sand and conglomerate of the miocene period. The surface on the more level parts is alluvial, clayey, and in some parts gravelly, the subsoil being clay, sand, and gravel. The station occupies new ground.
	9. Water is found at about 12 to 20 feet below the surface during the dry season, and in the bed of the river at 2 feet. Rain feldom falls, and when it does it soon flows off.
	10. There are no surface springs, and the drainage from higher ground mostly runs off, and the surface dries immediately.
	11. The water supply is derived from wells. There are 2 or 3 tanks, but their extent of surface is inconsiderable. Being dependent on the rain-fall they are seldom full, generally being quite dry. There is nothing conspicuous in the nature of the plants or animals they contain. No tank used for drinking purposes is also used for bathing, nor are they liable to pollution from any source. No nuisance or malaria proceeds from any tank within or without the station.
	12. There is no lack of water in the wells, the supply never having been known to fail, and some wells would yield a larger quantity. The water is rather dull in colour, and has an earthy taste, but is without smell. It contains chloride of sodium, sulphate of soda, sulphate of lime, sulphate of magnesia, carbonate of lime, and carbonate of magnesia, and the best wells contain nearly one two-thousandth part of saline matter. The quality is not good, and it is injurious to health; the quantity, however, as before stated, is not defective. It is raised by Persian wheels and hand buckets, and distributed by water carriers in skins and by casks in carts. Water should be brought from the Mulleer river, about 11 miles distant, or from the Indus.
	13. In the salt swamp adjacent, which covers an area of 5 square miles, all the conditions necessary to the production of mephitism exist.
	14. With regard to the selection of sites for stations, it is believed that no particular rule exists, but there is a rule in reference to the selection of sites for new buildings, especially barracks, pendalls, and hospitals. The committee of selection, consisting generally of the officer commanding the station, an engineer officer, assistant quartermaster-general, and a medical officer appointed for the latter purpose might also determine the sites for stations.
II. CLIMATE.	1. The means and instruments available at the station for conducting and registering meteorological observations are 1 anemometer, 1 pluviometer, 1 mountain barometer, 1 Daniell's dew point hygrometer, 1 Regnault's ditto, 1 standard dry bulb thermometer, 1 standard wet bulb thermometer, 1 heat thermometer, 1 minimum in grass thermometer, 1 maximum in air thermometer, 1 minimum in air thermometer, 1 maximum wet thermometer, 1 minimum wet ditto.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	2. Table of 5 years' meteorological observations, 1856 to 1860.

Months.	Barometer. Mean.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Wind, Dew, Storms, &c.
January - -	30·157	62·13	74·54	49·79	67·94	56·70	90·86	0·38	E.	0·85	—	Occasional showers of rain and some dust storms.
February - -	30·075	67·18	79·31	55·04	70·46	61·63	96·01	0·28	E.N.E.	0·96	—	Occasional showers of rain, dust storms, heavy dews.
March - -	29·981	73·67	85·51	61·86	79·43	67·95	101·78	—	N.W.	0·99	—	Dust storms, cloudless, dews.
April - -	29·898	84·37	88·91	69·81	83·56	72·88	102·86	—	W.byN.	2·55	—	Do. do.
May -	29·728	83·77	91·11	75·82	86·61	78·85	102·30	—	W.	2·38	—	Almost cloudless, dust storms, dews.
June - -	29·621	87·48	94·95	80·00	88·57	80·66	106·82	0·02	W.	1·56	—	Overcast, occasional passing showers of rain.
July - -	29·576	88·05	92·17	79·51	86·41	79·71	98·27	1·78	S.W.	1·19	—	Do. do. with occasional squalls.
August - -	29·658	82·08	87·66	76·78	82·83	77·54	95·26	1·54	N.	1·18	—	Overcast, sultry, occasional squalls.
September - -	29·811	81·24	87·41	75·65	82·52	76·40	99·02	0·44	N.W.	1·17	—	Several rainy days, overcast mornings and nights, some days dust storms.
October - -	29·970	79·41	89·77	68·80	83·38	73.43	106·33	—	N.W.	0·52	—	Almost cloudless, hot winds, dust storms, fogs, and dew.
November - -	30·044	73·19	86·75	57·61	78·88	62·81	106·55	—	N.	0·38	—	Do. do. mornings moist.
December - -	30·155	65·16	78·52	57·76	71·39	59·27	94·30	0·20	N.E.	0·59	—	Dews, dust storms, cold nights.

3. The climate is good. The month of November is characterized by dryness, July and August by humidity. The maximum of heat, about 86° to 94°, occurs in May and June, the intermediate spring and autumn months, viz., March, April, October, and November, being variable; December, January, and February, being the cold months. Fogs appear at times during the variable seasons, especially when they touch the extremes of the cold season. From May till September is the hot season, during which time strong westerly monsoon winds prevail. Damp cannot be said to exist at any time. Tree planting is but little attended to, less perhaps than it ought to be. There is but little irrigation, and what exists has no influence on climate, but the place is very often obnoxious to dust. Mephitism may also extend in a diluted form from the delta of the Indus to the station. Intermittent fevers show the noxious quality of the climate, and to these may be added hepatitis and diarrhœa as resulting from its influence. Cholera of late years has not existed. Scurvy is often severer amongst natives. The best diet, with the free use of vegetables, ample accommodation in space, clothing of a light texture in the hot season and warmer in the cold, should be provided. Drills, duties, and exercises ought to be more moderate in the hot season. The comparison of a good many years gives, as the result, the greatest mortality to the months of May, June, and December, but the sickness prevails rather at the changes of the season than when fairly set in. The deaths, mostly of chronic cases, are not coincident with the greatest sickness. The prevailing diseases are fevers and affections of the bowels.

4. There is no district in Sinde more conducive to health than that of the station. Ghizree is a mere experimental sanitary station, and owes its superiority to elevation and proximity to the sea. Manora, the promontory that forms the western boundary of the harbour, is perhaps the most healthy spot in Sinde, but it is too small for troops and inconvenient for supplies. It is also without water, like Ghizree.

5. I have served at Bombay, Tanna, Poona, Mulligaum, Surat, Baroda, Sukkur, Hyderabad, and Kurrachee. Of these stations, Baroda is the worst; Tanna, Sukkur, Hyderabad, and Bombay are bad; Poona and Mulligaum good; and Kurrachee the best. This last owes much to improved sanitary arrangements generally and in some of the barracks and hospitals.

III. Sanitary Condition of Station.

1, 2, 3. A map of the adjacent country, and plans of the stations, and barracks, are transmitted.

4. Table of Barrack Accommodation.

Date of Construction.	Names of Buildings.	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. No.	Height.	Width.	Doors. No.	Height.	Width.
	Barracks.			Ft.	Ft.	Ft.				Ft. In.		Ft.	Ft.		Ft.	Ft.
1847	Artillery Barracks -	3	50	136	24	18	58,752	1,175	65¼	1 7	18	7¼	4¾	4	11	4¾
1854	European New Barracks	10	100	277	24	23	152,904	1,529	66½	1 7	—	—	—	50	11	4
1843	Depôt Barracks -	9	47	179½	30	14	75,390	1,604	114½	1 7	21	5	3½	3	7½	4½
1847	Native Infantry Lines -	40	25	143	18	9¼	23,809	952	103	—	—	—	—	32	6¼	3
1846	Beloochi Lines - -	16	50	175	17½	9¼	28,328	566¼	61	—	—	—	—	50	6¼	3½
1845	Sappers' Lines - -	6	25	124	15	8¼	15,345	613¾	74¼	—	—	—	—	28	5	2½
1851–4	Colundaz Lines -	5	20	132	10	9	11,880	594	66	—	—	—	—	11	6	3

KURRACHEE.
BOMBAY.

Table of Barrack Accommodation—*continued.*

Date of Construction.	Names of Buildings.	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. No.	Height.	Width.	Doors. No.	Height.	Width.
	GUARD ROOMS.															
	Artillery Barracks.			Ft.	Ft.	Ft.				Ft. In.		Ft.	Ft.		Ft.	Ft.
1847	Quarter Guard - -	1	7	24	19	16½	7,524	1,075	65	1 7	5	5	4	1	7½	4
	European New Barracks.															
1854	Quarter Guard Room -	1	16	66	24	16½	26,136	1,634	99	1 7	—	—	—	12	8	4
1854	Hospital Guard Room -	1	7	18	18	15¼	4,941	706	46	1 7	2	4	3	4	8¾	4
1855	Solitary Cells Guard Room - -	1	7	18	18	15¼	4,941	706	46	1 7	2	4	3	4	8¾	4
	Depôt Barracks.															
1843	Quarter Guard Room -	1	14	56	24	16	21,504	1,536	96	1 7	1	5	4	5	8	4
1845	Solitary Cells Guard Room - -	1	7	18	12	13½	2,916	416	31	1 7	2	4	3½	2	7	4½
	Native Infantry Lines.															
1847	Quarter Guard -	1	18	29	16	12¼	4,459	248	20	—	3	4	3	1	7	4½
	Belooch Lines.															
1850	Quarter Guard -	1	16	29	16	15	6,960	435	29	—	3	4	3	1	7	4½
	Sappers' Lines.															
1855	Quarter Guard - -	1	4	15	15	12	2,700	675	56	—	2	4	4	2	7	4½
	PRISON CELLS.															
1847	Artillery Barrack Cells	2	1	10	10	17	1,700	1,700	100	1 7	—	—	—	1	7	4
1855	European New Barrack Cells - - -	12	1	10	10	17	1,700	1,700	100	1 7	1	3½	3	1	6¾	3
1845	Depôt Barracks Cells -	6	1	12	12	17	2,448	2,448	144	1 7	1	3½	2½	1	9	4
1859	Native Infantry Lines Cells - - -	2	1	10	10	12	1,200	1,200	100	—	—	—	—	1	6	3

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides. There is a verandah 10 feet wide on both sides of the barracks, but it is never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads in use are boards on iron trestles. 7. The tents are made of strong Dungaree cloth. 8. The barracks, &c., are ventilated by openings in the roof, by fixed venetians in the walls, high up on both sides, by badgheers (windshafts), and by keeping the doors and windows open as much as possible. The ventilation is sufficient to keep the air pure night and day. No means are resorted to in order to cool the air of barrack-rooms, the sea-breeze being generally ample. 9. The barracks are constructed of stone and lime, the tents of canvass, and the huts of sun-dried mud bricks. 10. The floors are constructed of cut stone in the permanent barracks, and chunam and earth in others. They are raised 3 feet above the level of the ground in the former, and vary in the latter from 3 feet to 6 inches. There is no passage of air beneath. 11. The materials and construction of barracks, tents, and huts are suitable for the climate. The barracks are kept in repair by the Public Works Department, and the cantonment by the station staff officer, and in bazaar limits by the cantonment magistrate. The repairs are quickly executed. The commanding officer of the station is responsible for general sanitary state of the cantonments. Walls and ceilings of barracks are cleansed and lime-washed every six months. 12, 13, 14. Plans of the cook-houses, privies, and lavatories are transmitted. The washing and drying of linen is performed by washermen, and these means are sufficient. 15. The privies are ventilated by doors and openings in the roof. The barracks are lighted at night by oil lamps. 16. There are no main drains and sewers to the barracks; the system pursued is that of immediate removal. The surface and other drainage is conveyed into cesspools close to the buildings, which are emptied as soon as filled. No part of the barracks or hospitals is damp. The cesspits are about 2 feet in diameter by 3 feet deep, and their distance from the wells varies according to the position of the barracks, but none are sufficiently large to taint any well or tank. These cesspits are close in the rear of the men's quarters and hospital, and, as before stated, are emptied as soon as filled. There are no foul ditches. 17. The surface cleansing of the roads, waste ground, and the outsides of compounds is performed by sweepers under the barrack department, and is efficiently done. Owners of houses are responsible for cleanliness inside their own compounds. 18. There is no vegetation in the station, nor any old walls, &c., to interfere with the proper ventilation of the station, bazaar, &c. 19. There is no drainage in the bazaar, all filth being removed daily, and the bazaar kept as clean as the limited number of sweepers will allow. It is very crowded. The sweepers carry away the filth in carts to the kilns, where it is burnt. An increased number of sweepers

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	is required. The sanitary condition of the native houses near the station is for the most part good. They have cesspits, but the contents are emptied daily. No nuisance is experienced in barracks from the wind blowing over the native houses. 20. Animals for the use of soldiers are slaughtered about a mile from the station, and the offal is used as manure. No nuisance is experienced from the slaughter-houses. 21. Horses of parties authorized to let carriages on hire are located in stables and compounds attached to houses in cantonment. Care is taken that these places are kept in a state of cleanliness; if found otherwise a fine is inflicted. The manure is carried out of camp, like all other refuse. 22. All the horses, with the exception of the sick, are picketed in the open air. The sick stable consists of a quadrangle of sheds open to the inside, with an uncovered court-yard in the centre. The lines are immediately in the rear of the men's barracks, and a hundred yards to the north of the hospital, but to windward of it, and immediately in front of the married men's quarters. There are no dung-heaps, and the litter is removed daily to a distance of 500 yards by the troop-carts; the dung is carried off as it drops. The horses are picketed at intervals of four yards, with streets between them. 23. There are sufficient quarters for married people, and none occupy barrack-rooms with the men.
Officers' Quarters.	1. There are no public officers' quarters. The houses belong to private individuals, from whom the officers are obliged to rent them, according to proximity to the lines. The officers' houses at the north end of the camp are too small and very close together. Owners should be encouraged to improve their property, and some of the worst structures should be cleared away to admit of a freer circulation of air in that neighbourhood.
IV. Health of the Troops.	1. The station, district, and adjoining population are healthy, but sickness occasionally shows itself at the great changes of the year; that is, towards the beginning and close of the hot season. 2. Fevers, accompanied and followed by spleen disease and bowel affections, as also scurvy and ulcers, are the most prevalent diseases among the native population. 3. The healthiness of the natives is attributable to the salubrious situation, soil, proximity to the sea, and the monsoon winds; their unhealthiness to the swampy margin of the sea, and perhaps also to the Indus. The drinking water is the cause of the scurvy and diarrhœa. 4. The 64th Regiment and Troop Horse Artillery arrived about two years ago from field service. One Foot battery arrived about two years ago, and the other about a year since, from Bhooj. The native regiment came from Bombay about 1½ years ago. In the depôt recruits pass from England to the Punjab, and invalids and time-expired men from the latter to England. There is no precise information as to any striking peculiarities of disease before or since arrival at the station. A portion of the men's present accommodation is more unhealthy than the rest, the unhealthy portion being the old barracks, which are far too small. 5. The troops at the station are never camped out. 6, 7, 8. I have no experience of hill stations except personal, but approve of their selection for troops. The hill-station is to the plain as the open air to the hot-house. 9. No reply. 10. Ample accommodation, good food and water, with absolute cleanliness, would probably render many evils in hill stations. 11 to 16. No experience with the troops at hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. The surface and subsoil of this station are healthy. 19. Soldiers proceeding to India should be 20 years of age, and land there in November. On landing detachments proceed to the depôt barracks and regiments to their own barracks. Clothing adapted to the season is provided, and drill, &c., carried out, as in other regiments. Recruits, on landing, should be provided with good accommodation, suitable clothing, good food and water, and have moderate drill only, especially if not drilled before. Amusements should be provided, and they should be discouraged from drinking habits. 20. Troops should proceed direct from the home depôts to India, where, if they land in November, they might remain with their regiments, going to the hills for the hot season. 21. The mode of transport from port to the interior by water, embarking at Keemara or Ghizree (according to season) in steamers and flats; but sometimes men march to Tatta on the Indus, 60 miles, and embark there. About 11,000 men have passed up in the last six years, and it does not appear that any loss has been sustained. 22. A British soldier should serve 20 years in India. 23. There is no conflict of opinion at medical boards as regards invaliding. Medical officers compose the board. 24. Invalids leaving India for home should depart in January, February, or March.
Diseases.	1. There are weekly inspection parades at the station for the discovery of incipient diseases. 2. Scorbutus has existed, but is rare in European troops; among natives it is more prevalent, and has at times proved fatal; it exists also in recruits landed from England, about 10 per cent. being infected; it is attributed principally to the water, inferior accommodation, and bad food, such as putrescent fish. Good water and good food are the remedies. 3. Hepatic disease affects Europeans at the rate of 3 per cent.; but scarcely 1 per cent. of natives are affected by it. It is originated by heat and the use of spirits, and also accompanies the severer fevers and dysentery. Pure air and disuse of spirits, modified clothing and exercise, such as drills, but not so as to fatigue, are the prophylactic measures for diminishing its frequency. 4. Dracunculus does not exist here unless imported. 5. In European regiments about 20 per cent. of the total sick are affected with venereal disease. In the artillery 10 per cent., and in native regiments 3 per cent. only are affected. The expulsion of prostitutes from bazaars, the removal of the restriction on marriage, and the education and religion of the soldier, are the safeguards against the disease. Lock hospitals have advocates, but were put down at the instance of the highest ecclesiastical authority.

KURRACHEE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	6. The troops at the station suffer from the following diseases of the epidemic and endemic class :— Fevers.—Intermittent, remittent, and continued. Dysentery.—Occasionally. Cholera.—But not since 1852. Rheumatism.—Occasionally. The proportion of admissions from the above diseases to total admissions is about 45 per cent. in Europeans, and 50 per cent in natives. The deaths to total deaths are about equal in Europeans and natives; viz., 33 per cent. 7. Small-pox is usually of a mild form in natives. Measles has been severe in its attacks. Croup is rare, but sometimes fatal. Diarrhœa is mild, and dysentery little known, except in children. Cholera, except sporadically, has not appeared since 1852. Scurvy affects the gums with ulceration, and the legs with hard and painful swellings, sometimes with cold, and sometimes with a hot sensation, and generally pain in the limbs; when fatal there are anœmia, præcordial pains, and syncope, death being often sudden. Fevers are mostly intermittent, the lighter cases being of the tertian type; the severer cases quotidian; remittent, or continued, generally of a milder form. Erysipelas is rare, and mostly very slight, but it has proved fatal. Syphilis is not generally untractable. Phagedœna has been seen at times. Zymotic diseases are not prevalent at any particular seasons, but vicissitudes of weather, such as the changes in spring and autumn, seem to influence fevers. The most prominent phenomena which precede or accompany their appearance are the variation in the force and direction of the winds, and humidity and increased range of temperature. Wherever ventilation in the bazaars is most interrupted fever prevails to the greatest extent. The smallest barracks are found similarly obnoxious to this disease. Bad food and bad dwellings with the natives, and fatigue with the troops, predispose them to fever. 8. There is nothing prejudicial in the nature of the soldier's duties or occupations in barracks, or habits on the march and in the field. Occasionally duties may be hard and too little sleep allowed. In habitual fever, hepatic, or visceral disease, spirit drinking must be fatal. 9. Quinine has not been tried at this station as a prophylactic against malarial disease. 10. To mitigate epidemic disease here the swamp should be extirpated, and the vegetation thinned; this latter, however, does not affect the troops. Strict attention should be paid to the kilns which are used for consuming refuse and all waste matter which collects in the cantonment. Better barracks should also be built in lieu of the old and small barracks.
V. INTEMPERANCE.	1. The soldiers at the station are generally temperate, confirmed drunkards being only about 1 per cent. 2. There is no information to be procured from the records of the hospital to enable us to say what is the proportion of diseases caused by intemperance, except as regards delirium tremens, which varies, but may be stated at about 1 per cent. Drunkenness is punished as an offence. 3. Distilled spirits are sold at the canteen and in the bazaar, but there is a prohibitory order against the sale of them to European soldiers in the latter place. Spirit is no part of the ration for soldiers either at the station, on march, or in the field. Morning drams are not allowed. Spirit is not given to convalescents except when prescribed. No drinks injurious to health, other than intoxicating drinks, are sold in the canteen or bazaar. 4. There is no reason to suppose that spirit is conducive to health, and it certainly often proves injurious. It is not conducive to efficiency and internal discipline. 5. With regard to the question whether it would be beneficial to the health of troops to restrict or abolish the use of spirituous liquors and their sale in the canteens or bazaars, so long ago as 1836 the Government gave this announcement,—" We attach great importance to " the measure recommended by the medical board for preserving the health of the European " troops under our Government, viz.,—the substitution, as far as practicable, of tea, coffee, " &c., for ardent spirits, and the establishment of temperance societies." Beer and porter have been imported and sold in the canteens in order to beat spirits out of the field. 6. There is only one degree of difference as to the influence on health in the use of malt liquor or wines as compared with spirituous liquors. 7. Coffee, tea, lemonade, and similar drinks are much used at the station; these are not injurious, but spirits and malt liquors are. 8. There is no spirit ration, and the use of other beverage is encouraged. 9. It might be beneficial to prohibit the sale of spirituous liquors in the canteen, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops; but the prohibition should not be too suddenly introduced, lest confirmed drinkers of spirits should be driven to purchase clandestinely a more deleterious kind of liquor elsewhere. 10. We would recommend that the prohibition should not be made applicable to soldiers now in the service, but commence with recruits on first landing in India. 11. The canteen regulations of the 3rd European regiment prohibits the admission of any liquor, except that furnished by the commissariat, and the issue of any spirituous liquor, wine, or beer, directly or indirectly, to any native or follower of the regiment, nor can any liquor be taken away from the canteen except under an order from the commanding officer. No man on duty, drunk, or undergoing punishment, is permitted to enter the canteen, nor are any women or children admitted. The canteen is open from 12 to 1 o'clock for the issue of porter only, and from sunset until the quarter bugle for the issue of spirits and malt liquor. A supply of cool filtered water to be kept for the use of the men. Crowding is forbidden in the canteen. Every man is allowed one dram of spirits and a quart of porter daily. No spirits are issued on any occasion before the usual dinner hour, nor is a man allowed more than one dram of arrack, or one quart of malt liquor at one issue, which must be paid for with ready money. The canteen of Her Majesty's 64th regiment is open from half-past 11 till 12 o'clock, a.m., for the supply of malt liquor, and from 12 till a quarter to 10 o'clock p.m. for men of the regiment off duty. It is open from half-past two p.m. for the issue of spirits to those men who did not receive malt liquor before dinner, and from sunset to quarter to the first post for issue of one dram of spirits to each man. The quantity issued to each man is one quart of malt and one dram of spirits daily. All liquors are paid for. No water to be brought into the canteen for mixing with the arrack, except in presence of the officer on duty. The bazaar regulations prohibit the sale of liquors there without a licence. No liquor can be sold to European soldiers, or any person amenable to the articles of war under the rank of warrant officer, without a licence.

References to Subjects and Queries.	REPLIES.
VI. DIET.	1. The ration for Queen's troops and European troops in the Indian army is the same, and consists of meat 1 lb., bread 1 lb., rice 4 oz., salt 1 oz., tea $\frac{3}{8}$th lb., vegetables 1 lb., firewood 3 lbs. Mutton is given twice a week, and beef five times, and the vegetables as the products of the station may be. An inspection of the ration is made by the commissariat agent, regimental quartermaster, quartermaster-serjeant, orderly officer, and occasionally by the officer commanding the regiment or corps. 2. A complete ration, including vegetables, is provided for the troops, but no fruit. The stoppage is 3 annas 4 pie, or 5*d.* per diem. A soldier has three meals a day, viz.,—breakfast at 8 a.m., consisting of tea or coffee and bread, with part, perhaps, of the meat ration. Dinner at 1 p.m., consisting of meat, vegetables, and bread, and a supper of tea and bread. The proportion of vegetable which enters into the constitution of the ration is about one-third its weight. 3. The ration is ample for ordinary times; but fruits or other vegetables may be requisite in excess when scurvy prevails. There are no particular arrangements taken to prevent the disposal of the ration. 4. The means and apparatus for cooking are detached kitchens, one camp kettle containing seven gallons, one baking dish, and a three-gallon tea kettle for every 10 men. The cooks are Portuguese. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled for dinner, and the cooking is properly done, and sufficiently varied. In some regiments the men have tea or coffee before a march, but there is no general rule for this, nor could any hold good. 5. Soldiers' gardens could not be established here.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements are as follows:—

RETURN of the ARMS, ACCOUTREMENTS, and REGIMENTAL NECESSARIES of FOOT ARTILLERY, EUROPEAN SOLDIER, GUN LASCAR, and DRIVER.

Camp Kurrachee, 7th October 1860.

—	Arms and Accoutrements.									Regimental Necessaries.																		
	Belts, Buff, Sword, Shoulder, N.I.	Belts, Buff, Sword, Cavalry complete, with Slings.	Belts, Buff, Waist, Artillery, with Sword Frog and Mountings.	Belts, Leather, Waist, Artillery Drivers, with Frogs.	Slings, Knapsacks, Setts.	Scabbard and Swords, Cavalry N.P.	Scabbard and Swords, Foot Artillery, Europeans.	Scabbard and Swords, Gun Lascars and Drivers.	Scabbard and Swords, Serjeants or Havildars.	Wicker Helmets, complete.	Tunic Cloth.	Shell Jackets.	Cloth Trowsers.	Serge Trowsers.	Great Coats.	Forage Cap with Chin Strap.	White Cotton Covers.	Khakee Covers.	Khakee Jackets.	Khakee Trousers.	White Cotton Shirts.	Check Cotton Barrack Change.	Flannel Waistcoats or Belts.	Pair White Cotton Socks.	Pair Worsted Socks.	Towels.	Pair Braces.	Pair Boots.
Europeans, each	-	1	1	-	1	1	1	-	-	1	1	1	1	2	1	1	-	2	4	4	4	2	3	4	2	4	2	-
Gun Lascars, each.	1	-	-	-	1	-	-	1	1	-	-	1	1	-	1	1	2	1	1	1	-	-	-	-	-	-	2	-
Artillery Drivers, each.	-	-	-	1	-	-	-	1	-	-	-	1	1	-	1	1	-	2	2	2	-	-	-	-	-	-	2	1

(*continued.*)

—	Regimental Necessaries.																												
	Pair Half Boots.	Sleeping Carpet (6 Feet by 2½).	Numda Mattress.	Cotton Covers, Mattress.	Sheets.	European Blanket or 2 Kumblee Blankets.	Pillow Cover.	Cotton Cases for Pillow.	Saddle-bag (Linen) for white Kit.	Haversacks.	Jumboo, with Plate and Cover.	Lota.	Comb.	Brushes.	Razor, Brush, and Soap and Sponge.	Button Stick and Brush.	Marking Sticks.	Knife, Fork, and Spoon.	Holdall.	Account Book.	1 Gun Stopper.	Barrack Change Trousers.	Meerazies.	Dooputtas.	Dhotees or Paijaum.	Razai.	Canvas Bag.	Oil Rag.	White Trousers.
Europeans, each	2	1	1	2	2	1	1	2	1	1	1	-	1	3	1	1	1	1	1	1	1	-	-	-	-	-	-	1	-
Gun Lascars, each.	2	1	-	-	2	-	-	-	-	1	-	1	-	3	-	1	1	-	-	-	-	2	3	1	2	1	1	-	1
Artillery Drivers, each.	1	1	-	-	2	-	-	-	-	1	-	1	-	3	-	1	1	-	-	-	-	2	2	1	2	1	1	-	-

W. S. HATCH, Capt., Bt.-Major,
Commanding 4/3 Artillery, with No. 7 Light Field Battery.

KURRACHEE. BOMBAY.

References to Subjects and Queries.	REPLIES.

VII. Dress, Accoutrements, and Duties—*cont.*

LIST of CLOTHING for a EUROPEAN INFANTRY SOLDIER.

	No.	Articles.	
Furnished by the State.	1	knapsack and slings	Agreeably to patterns furnished by Government.
	1	dress cap	
	1	red coatee (dress)	
	1	shell jacket (undress)	
	1	pair trousers (woollen cloth)	
	1	great coat	
	1	canvass bag	
Furnished by the soldier.	2	khakee tunics	Agreeably to sealed patterns approved of by the Commander-in-Chief.
	2	pairs khakee trowsers	
	4	white shirts	
	2	check ditto	
	3	banyans (flannel)	
	4	pairs socks (cotton)	
	2	ditto (worsted)	
	2	pairs braces	
	4	towels	
	2	khakee covers for dress cap	
	1	forage cap and strap	
	2	khakee covers for ditto	
	3	pairs of shoes	
	1	clothes brush	
	2	shoe brushes	
	1	hair brush	
	1	comb	
	1	razor, brush, and soap	
	1	button stick and brush	
	1	marking stick	
	1	sponge	
	1	holdall	
	1	knife, fork, and spoon	
	1	account book	
	1	mess tin, with cover	
	1	gun stopper	
	1	oil rag	
	1	sleeping carpet (6 feet by 2½)	
	1	numda mattress	
	2	cotton covers for ditto	
	2	sheets	
	2	kumblee blankets	
	1	coir pillow	
	2	cotton cases for ditto	
	2	pairs of small brass or iron hooks, 1 inch long, to be sewn on the right and left sides of the coatee and shell jacket, to sustain the waist-belt.	

NATIVE INFANTRY SOLDIER.

	No.	Articles.	
Furnished by the State.	1	knapsack and slings	Agreeably to sealed patterns approved of by the Commander-in-Chief.
	1	red jacket (dress)	
	1	red jacket (undress)	
	1	pair trousers (woollen cloth)	
Furnished by the soldier.	1	great coat	
	3	pairs trousers (white linen)	
	2	ditto (black cotton)	
	1	epaulettes or wings for dress coat	
	1	Kilmarnock forage cap	
	1	chin chain and chin strap	
	2	white cotton covers for forage cap	
	2	pairs shoes	
	2	pairs braces	
	1	clothes brush	
	1	shoe brush	
	1	button stick and brush	
Found by the soldier.	1	oil rag	
	1	ruzzai	
	2	meerazeis	
	1	dhoputta (2½ yards long by 2½ feet in width)	
	2	chudders	
	2	dhoties or paijamas	
	1	sleeping carpet (6 feet by 2½ feet)	
	1	brass lota (small, 5½ inches wide, 3½ deep, and cord)	
	1	brass lota (larger size)	
	1	tuvwa (iron, 9 inches wide)	
	1	thaler (brass, 9 inches wide)	
	1	kuttora (brass)	
	1	chimcha (brass)	
	1	chinta (iron)	
	1	canvass bag, agreeably to pattern	
	2	pairs small brass or iron hooks, 1 inch long, to be sewn on the right and left sides of the jacket, to sustain the waist-belt.	

HORSE ARTILLERY GUNNER.

No.	Articles.	No.	Articles.	No.	Articles.
1	forage cap and chin strap.	2	pairs braces.	1	clothes brush.
2	khakee covers.	2	pairs boots.	2	shoe brushes.
2	white helmet covers.	1	pair of shoes with clasps.	1	razor, brush, and strop.
1	pair of cloth overalls, leathered.	1	pair of chain straps.	1	sponge.
3	pair of khakee overalls.	1	numbda.	1	button stick and brush.
3	khakee coats.	2	cotton covers for ditto.	1	marking stick.
4	white shirts.	1	coir pillow.	1	knife, fork, and spoon.
2	barrack change ditto.	2	pillow cases, cotton.	1	holdall.
3	stomachers.	1	saddle bag, lined.	1	account book.
4	pair white cotton socks.	1	haversack.	1	khakee cover and turban for wicker helmet.
2	ditto, worsted ditto.	1	jamboo, plate, and cover.	1	wicker helmet.
4	towels.	1	hair brush and comb.		

ACCOUTREMENTS.

1 pouch belt and pouch. | 1 sword belt.

HORSE ARTILLERY GUN LASCARS.

1 undress jacket, cloth.	2 ditto cap covers.	2 brushes.
1 ditto overalls.	2 pair of shoes.	1 lota.
2 khakee jackets.	1 button stick.	1 cooking pan.
2 ditto overalls.	1 sponge.	2 talees.

ACCOUTREMENTS.

1 sword belt. | 1 pouch belt.

The present dress is suitable to the climate, and for the soldiers' duties by day and night, and no improvements are suggested. The dress for the guard in the hot season is drill dyed earth colour (khakee), and for the cold season, woollen. There are sun shades and boxes for the sentries, and well built guard houses for protection from sun and wet.

Duties.

1. A man should be thoroughly drilled at home before being sent to India.
2. The usual routine of a soldier's duties is,—morning parade for half an hour in the hot weather, and an hour in cold, Sundays and holidays once a week excepted; guard happens every 6 days. The duties do not affect the men's health. The best time for drills, parades, and marches is in the morning and evening, varied a little in time, according to season. The men have 6 nights in bed during the week.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	3. Guards are mounted in the barrack square or within 100 yards of the barracks. Night guards last 12 hours; day and night guards 24 hours. There are roll-calls thrice daily, and occasionally others. The men do not suffer in health from night guards.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station:—There are ball courts, skittle grounds, schools with schoolmasters, library, and reading room. There are workshops and a theatre, but the former are not efficient, and the latter receives no aid from Government. There are no day rooms, soldiers' clubs, gardens, or gymnasia. The above means are not sufficient to keep all the men occupied during the wet season and heat of the day. A restriction is placed on the men when off duty as to exposure to sun and rain, when such is thought necessary, and with beneficial results. 2. Soldiers should be encouraged to work at their original trades or to acquire some useful occupation. Gymnastic exercises, under qualified instructors, should be available. Were restriction on marriage removed, and the standing of the soldier raised, many would find the best employment and recreation in the care, instruction, and amusement of their families. 3. The institution of soldiers' savings' banks would be advantageous. 4. There is no shade from trees at the station, but there are good verandahs, though little fit for exercise.
XI. Military Prisons.	1. The cells for prisoners are well built and ventilated. The space is ample for one man in each cell, but not for more without crowding.
X. Field Service.	1. There are no special local regulations for field medical service not included in the General Presidency Regulations. 2. The medical officer has no positive power as regards the conduct of the line of march, camping, &c., but if consulted he would give his advice. If he thought an error was committed he would point it out; or, if he believed that health suffers from existing arrangements, he would seek to have them altered. 3. The arrangements for preserving the health of troops, in the selection of camping ground, and general sanitary regulations, are all provided for in the general regulations of the service. The senior medical officer is looked to for advice in sanitary matters. Something more positive, some initiatory power, should be vested in the medical officer of each corps or civil or military station. The medical officers, in fact, should be the eyes, and the quartermaster-general's department the hands of the army, empowered to maintain, and ever busy in maintaining a perfect military sanitary police. 4. Field hospital arrangements (see Appendix).
XI. Statistics of Sickness and Mortality.	The following tables give the required information under this head.

KURRACHEE.

European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	H.M.'s 8th Regiment " 64th Do. " 83rd Do.	1,724	491	5	—	—	139	8	141	3	446	11	47	4	—	—	1,081	4	2,345	35	136·0	2·0
1851-52	" 64th Do. " 83rd Do.	1,629	610	11	—	—	169	7	67	1	666	49	78	7	19	12	942	5	2,551	92	156·5	5·6
1852-53	" 64th Do. " 83rd Do.	1,681	2,798	37	1	—	193	10	69	4	418	10	110	12	1	—	866	8	4,456	81	265·0	4·8
1853-54	" 64th Do. " 83rd Do. " 86th Do.	1,313	2,053	4	2	—	174	4	97	2	306	4	70	2	16	8	1,004	3	3,722	27	283·4	2·0
1854-55	L.W. H.M.'s 83rd Regiment H.M.'s 86th Regiment	1,187	519	1	—	—	132	4	82	5	360	10	32	1	—	—	840	2	1,965	23	165·5	1·9
1855-56	" 86th Do.	297	97	3	—	—	43	1	52	2	148	2	8	—	—	—	248	—	596	8	200·6	2·7
1857-58	" 4th K. O. Regiment " 51st Regiment	661	196	2	—	—	5	—	5	1	40	2	—	—	—	—	144	—	384	5	58·0	0·7
1858-59	" 46th Do. " 51st Do.	656	238	9	—	—	23	1	24	1	93	1	3	—	1	1	358	—	740	13	112·8	1·9
1859-60	" 64th Do.	958	294	1	1	—	76	3	33	1	247	3	62	1	—	—	752	2	1,465	11	152·9	1·1
	European Troops in the Indian Army.																					
1850-51	1st Troop Horse Brigade	42	23	—	—	—	6	—	9	—	26	2	7	—	—	—	71	—	142	2	338·0	4·7
1851-52	Do. do.	120	32	—	—	—	13	—	16	1	66	2	7	—	—	—	148	—	282	3	235·0	2·5
1852-53	Do. do.	144	95	3	—	—	13	—	12	—	42	—	10	—	—	—	127	—	299	3	207·6	2·0
1853-54	Do. do. 2nd Bombay European Regiment Light Infantry	405	82	—	—	—	72	2	33	—	85	2	22	1	6	3	305	4	605	12	149·3	2·9
1854-55	1st Troop Horse Brigade 4th Do. do. 4th Company 1st Battalion Artillery 2nd Bombay European Regiment Light Infantry	698	196	3	—	—	77	3	46	—	192	7	51	1	—	—	461	3	1,023	17	146·5	2·4
1855-56	4th Troop Horse Brigade 4th Company 1st Battalion Artillery 1st European Regiment Fusiliers	1,067	199	3	1	—	82	2	70	4	201	6	78	—	—	—	876	2	1,597	17	149·6	1·5
1856-57	4th Troop Horse Brigade 4th Company 1st Battalion Artillery 1st European Regiment Fusiliers Depôt, 2nd European Regiment Light Infantry	1,124	466	1	—	—	103	4	73	7	222	2	92	2	—	—	926	3	1,882	19	167·4	1·6

KURRACHEE.
BOMBAY.

EUROPEAN TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1857-58	3rd Troop Horse Brigade 1st Company 2nd Battalion Artillery 4th Company Reserve Artillery 1st European Regiment Fusiliers 2nd European Regiment Light Infantry	802	1,277	6	—	—	70	4	75	8	244	6	33	2	—	—	602	7	2,307	33	287·6	4·1
1858-59	4th Reserve Artillery Depôt, 1st European Regiment Fusiliers	191	207	—	—	—	22	—	27	—	95	3	40	—	—	—	315	3	706	6	369·6	3·1
1859-60	2nd Troop Horse Brigade 1st Company 3rd Battalion Artillery 4th Company 3rd Battalion Artillery 1st European Regiment Fusiliers 3rd European Regiment	969	404	1	—	—	81	3	65	4	279	6	68	2	10	2	1,006	9	2,003	27	206·7	2·7

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 5th Regiment Native Infantry 19th Regiment Native Infantry 27th Regiment Native Infantry	1,864	902	9	4	—	35	5	8	—	133	3	12	1	6	4	545	4	1,645	26	88·2	1·3
1851-52	6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 5th Regiment Native Infantry	1,704	690	4	15	—	21	1	3	—	121	1	13	—	13	3	576	9	1,452	18	85·2	1·0
1852-53	3rd Company 4th Battalion Artillery 6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 6th Regiment Native Infantry 8th Regiment Native Infantry 14th Regiment Native Infantry 22nd Regiment Native Infantry 28th Regiment Native Infantry	1,605	1,555	11	10	—	57	3	7	—	158	5	12	1	1	—	734	6	2,534	26	157·8	1·6
1853-54	3rd Company 4th Battalion Artillery 8th Regiment Native Infantry 14th Regiment Native Infantry	1,891	569	4	56	—	74	3	4	—	198	1	25	—	—	—	847	6	1,773	14	93·7	0·7
854-55	3rd Company 4th Battalion Artillery 5th Company 4th Battalion Artillery 2nd Grenadier Regiment Native Infantry 8th Regiment Native Infantry 14th Regiment Native Infantry	1,714	659	6	10	—	65	8	3	—	262	1	19	—	—	—	864	7	1,882	22	109·8	1·2
1855-56	2nd Grenadier Regiment Native Infantry 8th Regiment Native Infantry 16th Regiment Native Infantry 1st Belooch Battalion	1,974	1,268	2	2	—	96	8	10	—	385	6	31	1	—	—	1,294	10	3,086	27	156·3	1·3
1856-57	14th Regiment Native Infantry 16th Regiment Native Infantry 1st Belooch Battalion 2nd Do.	1,757	2,017	8	1	—	171	8	11	3	225	6	15	1	—	—	1,083	5	3,523	31	200·5	1·7
1857-58	3rd Company 4th Battalion Artillery 14th Regiment Native Infantry 21st Regiment Native Infantry	1,606	1,630	8	28	—	90	9	3	—	236	4	10	—	—	—	797	4	2,794	25	173·9	1·5
1858-59	1st Grenadier Regiment Native Infantry 14th Regiment Native Infantry 21st Regiment Native Infantry Detachment 30th Regiment Native Infantry 1st Extra Battalion	1,581	831	3	37	—	82	4	3	—	133	—	13	—	—	—	701	3	1,800	10	113·8	0·6
1859-60	1st Grenadier Regiment Native Infantry Wg. 3rd Belooch Battalion 1st Extra Battalion	1,377	637	7	11	2	131	4	4	—	136	1	14	—	—	—	1,175	11	2,108	25	153·0	1·8

WOMEN AND CHILDREN.

Years.	CORPS.	Women.									Children.								
		Strength.			Treated.		Died.		Ratio per Cent. to Strength.		Strength.			Treated.		Died.		Ratio per Cent. to Strength.	
		Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.	Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.
1852-53	H.M.'s 64th Regiment	91	—	91	104	—	3	—	114·2	3·3	118	—	118	85	—	4	—	72·0	3·8
	" 83rd Do.	96	—	96	218	—	9	—	227·0	9·3	131	—	131	190	—	24	—	145·0	18·3
1854-55	R.W. H.M.'s 83rd Regiment	59	—	59	120	—	4	—	203·3	6·7	32	—	32	153	—	5	—	478·1	15·6
	H.M.'s 86th Regiment	92	5	97	116	3	4	—	122·6	4·1	183	7	190	234	6	19	—	126·3	10·0
1859-60	" 64th Do.	83	4	87	86	4	3	—	103·4	3·4	166	10	176	101	15	8	—	65·9	4·5
1852-53	1st Troop Horse Brigade	8	8	16	11	7	—	—	112·5	—	14	12	26	1	2	—	—	11·5	—
1853-54	Do. do.	8	9	17	14	7	—	—	123·5	—	10	14	24	1	3	1	3	16·6	16·6
	2nd European Regiment Light Infantry	50	5	55	29	2	3	—	56·3	5·4	71	9	80	38	1	10	—	48·7	12·5
1854-55	4th Troop Horse Brigade	7	6	13	15	1	—	—	123·0	—	14	15	29	31	46	1	—	265·5	3·4
	4th Company 1st Battalion Artillery	3	5	8	—	—	—	—	—	—	1	4	5	—	—	—	—	—	—
1855-56	4th Troop Horse Brigade	7	7	14	6	10	—	—	114·3	—	13	12	25	9	7	1	1	64·0	8·0
	4th Company 1st Battalion Artillery	3	4	7	7	6	—	1	185·7	14·2	3	3	6	2	1	—	1	50·0	16·6
	1st European Regiment Fusiliers	38	29	67	40	28	—	1	101·4	1·5	47	35	82	32	15	4	2	57·3	7·3
1856-57	1st European Regiment Fusiliers	40	26	66	60	38	—	3	148·4	4·5	53	36	89	45	24	4	6	77·5	11·2
	Depôt, 2nd European Regiment Light Infantry	45	2	47	31	—	—	—	65·9	—	71	2	73	37	—	1	—	50·6	1·3
1857-58	4th Company Reserve Artillery	1	2	3	1	2	—	—	100·0	—	—	6	6	—	5	—	—	83·3	—
	Depôt, 1st European Regiment Fusiliers	35	22	57	38	28	—	—	115·7	—	50	35	85	40	11	4	1	60·0	5·8
1858-59	4th Company Reserve Artillery	2	1	3	4	1	2	—	166·6	66·6	—	—	—	—	—	—	—	—	—
	Depôt, 1st European Regiment Fusiliers	40	26	66	35	9	1	—	66·6	1·5	53	41	94	77	33	16	4	117·0	21·2
1859-60	1st Company 3rd Battalion Artillery	5	3	8	5	—	—	—	62·5	—	9	5	14	3	—	—	—	21·4	—
	4th Company 3rd Battalion Artillery	5	2	7	4	—	—	—	57·1	—	2	6	8	—	1	—	—	12·5	—
	2nd Troop Horse Brigade	11	2	13	16	1	—	—	130·7	—	21	6	27	15	—	1	—	55·5	3·7
	3rd European Regiment	28	13	41	31	7	—	—	92·7	—	32	16	48	36	3	7	2	81·2	18·7

By order of the Principal Inspector-General, Medical Department,

W. C. COLES, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department, Bombay, 30th January 1861.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. The hospital for the permanent infantry is well removed from the barracks, but all the others are near to them. There are no stables, but the artillery hospital is very close to where the horses are picketed. The general hospital is nearest to the bazaar, which is 200 yards distant. The others are remote from it, and, with the exception of one native hospital, from the residents' houses also. The sites are pretty open and freely ventilated, with the exception of the hospital above named, and generally healthy as to elevation, drainage, &c. 3. There is an abundance of water, though not of good quality; but a project for a permanent supply of good water for Kurrachee is under consideration. 4. There is no drainage, all refuse, solid or otherwise, being removed daily by sweepers.

TABLE of HOSPITAL ACCOMMODATION

Date of Construction.	Names of Buildings.	Wards or Huts.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.			Doors.		
				Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.	No.	Height.	Width.
				Ft.	Ft.	Ft.	Ft.			Ft. In.		Ft.	Ft.		Ft.	Ft.
1847	Artillery Barrack Hospital	1	28	79	24	28	52,288	1,867	68	1 7	10	5½	4	5	9½	4
1854	New European Barrack Hospital	1	100	368	24	18	158,976	1,589	88	1 7	9	5	4	58	10¾	4
1843	Depôt Barrack Hospital	1	100	314	31	14	136,276	1,362	97	1 7	32	5	3½	12	7½	4½
1844	Native Infantry Lines Hospital	1	100	128	19	13	31,616	316	24	1 7	26	4	3	4	6	3
1855	Belooch Lines Hospital	1	100	160	22	18	63,360	633	35	1 7	16	5	4	8	7	4

URRACHEE, BOMBAY.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	5. The wards of the hospitals (with the exception of one native hospital) are raised about 3 feet above the ground, but there is no perflation of air beneath. No provision is made for carrying away the roof water, some of which sinks into the subsoil, the rest flowing away. There is no surface drainage or guttering round the hospital. The rainfall at Kurrachee is small. The older hospitals are constructed of sun-dried bricks, and the new one of stone. The general hospital and one native hospital have double roofs and walls, but the others are single. They are all mostly as cool as private dwellings. The hospitals are provided with verandahs from 8 to 12 feet in breadth, which are a sufficient protection except from the morning and evening sun. In the general and native hospitals, which have double roofs and walls, the verandahs are inside. The closed verandahs are only used for the accommodation of sick, &c., when the wards are crowded. The open ones are never used for that purpose. With the exception of the last built hospital for the infantry barracks, all the hospitals consist of one flat only. The hospitals are so placed as to receive the full benefit of the prevailing winds. The windows open vertically in halves, and their arrangements and construction are conducive to ventilation and coolness. 6. The wards are ventilated by doors, windows, and openings in the roofs. These means in the new hospitals are adequate, but are not so in the old. There are no jalousies or jhilmils. 7, 8. No apparatus for cooling or warming the air in wards exists. The walls and ceilings of the wards are cleansed and lime-washed once every three months. 9. The privies are immediately in rear of the hospitals, and are provided with cesspools, which are cleansed daily, and quick-lime put into them. They are not offensive if carefully kept, but they admit of improvement. 10, 11. Sheds supplied with tubs are provided for the men to wash in. Slipper baths are used as required for bathing the sick, but are neither sufficient or convenient for the purpose. 12. Washermen wash and dry the hospital linen apart from the hospital, and are sufficient. 13. The storage is sufficient and dry. 14. Iron bedsteads, which were long since recommended, are in use, but not universally. They are 6 ft. 5 in. by 2 ft. 8 in. by 1 ft. 6 in. Wooden cots are also used in the European hospital, and entirely in the native hospitals. They are 6 ft. 4 in. by 2 ft. 10 in. by 1 ft. 2 in., and are made of squared timber laced with cotton tape. The bedding is suitable, and consists of straw in bed-cases, with pillows of the same; sheets, blankets, and quilts according to season. Every bedstead should be of iron, the wooden ones harbouring vermin. 15. The kitchens which are near the hospital are open and well-aired rooms. The cooks are Portuguese, and the apparatus like that used in the regiments. In this respect the hospitals resemble private families, but the younger and inferior cooks, from being paid less, are found in hospitals. 16. Diet tables, diet rolls, &c., are transmitted. 17. A hospital serjeant is attached to every hospital for European troops, under orders of the medical officer; a matron and assistant matron being provided for the female hospital. There are 10 native ward boys, and when the sick exceed 80 in number one additional boy for every 8 patients, and one also, at the discretion of the surgeon, for every bedridden patient, and frequently a comrade in extreme cases. The attendance is sufficient in number but often inferior in kind, and embarrassment arises whenever there are fresh regiments or fresh ward boys; difficulty also from ignorance of the language. In native hospitals there is a hospital orderly, usually a havildar (serjeant), and the bedridden are attended by comrades, who obtain leave from duty for the purpose. 18. The new hospital is the only one which is adequate. The depôt hospital is not large enough, and one native hospital has been condemned more than once. The artillery hospital is good, but requires an upper story, and the general hospital is in want of many improvements. Phagedœna and gangrene have been witnessed, for which occasional crowding may perhaps account. Phlegmasia dolens has occurred, but not in hospital, and no case of pyœmia nor any epidemic originating in hospital have been seen. 19. Want of space is the great defect. Better adaptation of privies and baths, more open space in the walls for ventilation, and an experienced matron to superintend the cooking and distribution of diets in the wards would be most desirable. 20. There is no fenced ground with shaded walks and seats for the exercise of convalescents. They walk in the vicinity of the hospital or verandah, or go out in an ambulance cart in the evenings. 21. Separate hospitals for women and children are built near to the hospitals in European regiments, and are provided with matrons and assistant matrons and ward women. No such arrangements exist for native corps. The present arrangements are satisfactory for the Europeans. In every station for native troops a hospital for females with a maternity hospital ought to be established. 22. There are no local hospital regulations not included in the General Presidency Medical Regulations. 23. Matters appertaining to the sanitary state of hospitals, &c., are all presented in the regulations, and there is little latitude of action for the medical officer. His suggestions may be acted upon or not by higher authority. 24. There are no convalescent wards or hospitals, but when there are several wards one may be used for convalescents, but hospital rules in their integrity should be uniformly administered.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is one mile from and to leeward of the station. Its area is 600 square feet, the soil and subsoil are of clay, sand, gravel, and argillaceous earth. There is no drainage, but decomposition takes place quickly, and the ground is carefully kept. 3. The grave space allowed is, for adults 7 feet by 2 feet; for children 4 feet by 1 foot 6 inches, and the interval between each grave is 3 feet. Graves are 5 feet deep; they are never re-opened. Interment takes place at ordinary times from 12 to 24 hours after death, and during epidemics within 6 hours after decease. Mussulmans and the poorer classes and the lower castes of Hindoos bury their dead. Other classes of Hindoos burn them. Cremation and burial grounds are about 2 miles from the camp. The graves, which are never re-opened or used for more than one corpse, are deep but pretty close. The dead are quickly disposed of. There are no regulations on these points but the customs of the people.

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead —*cont.*	4. The new burial ground has never been offensive, but in the old burial ground, now seldom used, quick-lime was occasionally resorted to. 5. The dead of camp followers and bazaar people are disposed of in the same manner as native soldiers. 6, 7. No injury accrues to the public health from the present practice, and no suggestions for improvement can be offered.

(Signed) H. STILES, Colonel and President.

Members. { D. GRIERSON, M.D., Surgeon Major, Staff Surgeon.
J. DE MESURIER, Captain, Executive Engineer.

A. F. CUNYNGHAME, Major-General, Commanding Sinde Division.

4th January 1861.

APPENDIX 1.

FIELD GENERAL HOSPITALS.

1. Whenever it may become necessary, in consequence of the increased number of sick and wounded men during war or distant campaigns, to have recourse to field general hospitals in fixed situations, one or more such hospitals are to be established accordingly, upon the general principles, in regard to supplies of medicines, diet, and necessaries, prescribed for regimental hospitals.

2. As soon as the officer commanding the troops shall have determined, in communication with the deputy inspector-general, on the place at which a field hospital is to be established, and the number of patients to be transferred to it from the regimental hospitals in camp, or for whom it might be advisable to prepare hospital accommodation and necessaries, instructions are to be forthwith issued to the commissariat for the immediate preparation and supply of all articles, including cots, for the sick and wounded, with the requisite establishment of hospital servants furnished by that department, according to the statements to be prepared by the inspector-general of hospitals, and sanctioned by the officer commanding the troops.

3. As the hospital establishments of European regiments, of which the sick and wounded are sent to field hospitals, may admit of being for a time diminished, as many servants and as much clothing and bedding shall accompany sick and wounded men sent from the hospitals as can, in the judgment of the deputy inspector-general, be spared, with reference to the present exigencies or prospective wants of such regimental hospitals.

4. The commander-in-chief, when with the army, will, in the same orders which direct the formation of one or more field hospitals, authorize the provision by the proper departments of all articles necessary for the purpose, and the entertaining of the requisite establishments. When the commander-in-chief is not present with the army, or a division of it, the officer commanding will issue orders to the above effect, under discretional authority, to be previously consigned to him.

5. Medicine indents are to be prepared by the surgeon or medical staff officer, who may be selected for the charge of a field hospital, under the instructions of the deputy inspector-general, by whom they are to be countersigned, for such supplies of those articles as may be deemed necessary, and can be spared from stores in camp in the first instance, until further supplies can be drawn from the stationary depôts, or the indents shall be made on the stationary depôts, in the event of its being practicable, in consequence of previous arrangement, for the first demands to be thence supplied in proper time.

6. Whenever the probable time and place at which it may become necessary to establish one or more general hospitals, for the reception of the sick and wounded during war, can be anticipated by the commander-in-chief, or the officer commanding the troops, the earliest intimation will be given to the commissariat and the nearest medical depôts, in order that the attention of officers in charge of those departments may be directed to the probable demands that will be made upon them, or according to the nature and probable duration of the service in prospect. Adequate supplies for one or more general hospitals will accompany the army in the first instance, or be intermediately brought forward to such advanced situations as may be found convenient.

7. The expense that may be incurred in furnishing petty stores, necessaries, &c., by the hospital storekeeper is to be charged in a contingent bill monthly, liable to be attested upon oath when required. These bills are to be countersigned by the surgeon or senior medical staff officer in charge of the hospitals in which the articles charged for shall have been expended (or for which they may have been provided, in the case of any remaining on hand at the end of each month), and also by the inspector-general of the division in testimony of their correctness, to the best of the knowledge and belief of these officers; statements, in the form of indents, which are to accompany the bills for payment, are also to be signed by the surgeon of the hospital, setting forth the several articles which have been required from time to time for the use of the sick and wounded.

8. An advance of cash will be made on this account, in the first instance, on the application of the surgeon or medical staff officer, who may be appointed to the charge of the hospital, to be made through the deputy inspector-general, and a sum equal to the amount required for the monthly disbursements is to be advanced by the paymaster, or the collector, where there may be no pay officer at hand, upon timely application being made by the hospital storekeeper, through the surgeon in charge of the hospital. The amount to be adjusted as usual in other cases of moneys being advanced by collectors on account of military disbursements.

9. A medical staff, consisting of a surgeon for the general charge and superintendence of the field general hospital, with a salary of Bombay rupees 600 per month, exclusive of the usual pay, batta, and tent allowance of his rank, with as many surgeons or assistant surgeons for the duties thereof as may be necessary, and can be spared, together with an assistant surgeon for the appointment of hospital storekeeper to the general hospital, will be appointed by the commander-in-chief, to whom a list of those most available shall be submitted by the medical board or by the deputy inspector-general, if those appointments be made immediately in the field; care being taken in all such cases not to remove from the charge or duties of regimental hospitals either the surgeon or assistants, to the prejudice of the management and requisite duties of those hospitals respectively; and to provide for this eventual arrangement and other calls for medical aid during war, a sufficient medical staff will always be appointed in the first instance, when practicable, to do duty with every considerable division of the army that may be ordered to take the field.

10. The assistant surgeon who may be appointed to act as hospital storekeeper to a general hospital shall invariably, in addition to that charge, afford such personal medical attendance to the sick as may be required of him by the surgeon in charge of the hospital.

11. An officer or other agent of the commissariat department will attend every field general hospital that may be thus established during war, as well for the purpose of furnishing and maintaining the requisite hospital equipments and diet for the sick, as for supplying provisions to the men who may be discharged from the hospital fit for duty until they shall rejoin their corps.

12. An apothecary and steward, with such other first-class servants as may be necessary, are to be appointed, on the recommendation of the deputy inspector-general, to each field general hospital that may be established during war; and such a number of second-class servants as he may deem proper shall be drawn from the commissariat for the same purpose.

13. The establishments that may be allowed for field general hospitals, as well as the establishments fixed for the medical depôts in the field, are to be mustered on the first of each month by deputy inspector-generals or the commanding officers on the spot, or officers properly authorized,

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as the case may be, and regular muster rolls are to be prepared for all those establishments, and to be attested in the usual manner by the mustering officer, whoever he may be.

14. The pay of hospital servants employed in field general hospitals is to be drawn from the commissariat, and paid according to the rules prescribed on the subject for regimental hospitals.

15. An officer from each corps is always to be sent in charge of the sick, when they amount to 20 men, who may be sent from regiments or corps of Europeans to field general hospitals, and a sufficient number shall remain on that duty until it may be necessary to accompany the men when ordered to rejoin their corps.

16. Whenever men may be discharged from field general hospitals as no longer requiring medical attendance, yet in the opinion of the surgeon requiring some modification of their ordinary diet, rations of provisions, if Europeans, will be supplied to them by the commissariat, on provision rolls framed on this principle, to be presented daily by the commissioned or non-commissioned officers under whose charge they may be placed; and the provisions to be thus supplied may be made to vary from the articles usually issued to troops in health, according to the state of convalescence of men thus circumstanced, and for whom certificates are to be furnished by the medical staff who may have attended them in the field general hospital, describing the diet, &c. most proper for the men whilst in progress for their corps, according to which the provision rolls are to be prepared, and the certificates above mentioned are to be countersigned by the officer in charge of the men, and delivered as vouchers to the commissariat department, stoppages being made from the men on this account, agreeably to the regulations on this subject, when rations or messes are furnished for men not in hospital, or under such further regulations as circumstances may render expedient.

17. The regulations respecting hospital stoppages from Europeans, as detailed in section 5, are applicable to and are to be particularly attended to by the medical officers in charge of field general hospitals, and when men are discharged from them they are, as in regimental hospitals, to be furnished by them with the regulated certificates.

Arrangements in the Field before and after Action.

18. When the force to which a medical officer is attached is placed under circumstances rendering it likely that in the course of service it may be engaged with an enemy, the medical officer will arrange with the adjutant, or staff officer of his charge, for the attendance at the hospital or his own quarters of the band men, to the end that they may be by him instructed in the application of field tourniquets.

19. He will explain to them their use, mode of application, &c., and will satisfy himself that they are in so much fitted for the duties they may soon be employed in.

20. While the troops are moving on, medical officers will follow their respective corps with all the empty sick carriage, &c., but as soon as they deploy, or form for action, all, excepting one medical officer for each brigade or body of equal strength, will move a short distance in the rear, out of the range of musketry, and will there make their preparations for succouring the wounded, and performing any operations that may be then necessary; cordials, &c. should be at hand, and all instruments and dressings, &c. ready to be used.

21. In the rear of each brigade and within range of musketry, one medical officer (in general, an assistant surgeon and the junior present) will, as above stated, be stationed for the purpose of checking any alarming hemorrhage, and expediting the removal of wounded men to the stations in the rear.

22. For this purpose the doolies and other sick carriage will be placed under his orders, and the band men and others will assist the wounded from the ranks to the place where the medical officer is stationed, and from thence into the doolies.

23. To all the band men and others employed in this duty field tourniquets should, previous to the action, have been issued. No men are to be allowed to go into doolies who can possibly walk to the rear.

24. The surgeons or medical officers of regiments are, as has been stated, to be stationed at a short distance in the rear, but out of the range of musketry, and there the wounded will be dressed, and all cases requiring immediate operations be attended to; at these posts bheesties with water will be placed, and from thence all men sent to field general hospitals will be despatched.

25. These posts are to be in as sheltered situations as possible, and if not very easily seen, to be distinguished by some flag or other conspicuous object.

26. If any town or village be situated in the rear not far from the scene of action, in which there are houses or buildings calculated to receive wounded men, straw, &c. for bedding, and abundance of water, &c., should be provided and kept in readiness for them, and to this at least all those severely wounded ought to be removed.

Removing Sick or Wounded to the Rear or to Field General Hospitals.

27. The quantity of carriage rendered disposable by the consumption of stores of every kind is invariably to be notified to the deputy inspector-general, or medical officer performing his duty with the force, or in their absence to the medical officers with corps, to the end that it may be taken advantage of in the transport of sick or weakly men; and in the same manner when carriage so rendered disposable is sent to the rear, it ought to be employed in the conveyance of men to field general hospitals.

28. By taking advantage of these opportunities the force can be easily disencumbered of its chronic cases.

29. To enable deputy inspectors-general and medical officers to perform this part of their duty without inconvenience, the place of destination, with notice of the exact day and hour when such carriage is to proceed to the rear, ought to be intimated to medical officers.

30. In addition to those means of moving sick to the rear, or at times when these do not exist, advantage must be taken,—

1st. Of the doolies and sick carriage belonging to their charge.

2nd. Of transport belonging to the country.

31. When it can possibly be avoided, the first ought never to be detached, unless for short distances, or excepting when stores of some description, such as medicines, instruments, &c., are to be brought up from the rear; and in both these cases the most positive directions should be given for its immediate return.

32. The transport of the country should be divided into classes, as doolies, cots, &c., for those unable to ride or go in carts, &c., and carts, bullocks, &c., for the slighter classes.

33. Medical officers must always, in person, class off their sick, and apportion the different modes of conveyance for individuals.

34. When water carriage is to be had, it is incumbent on the medical officers to ascertain whether the boats are decked, open, or capable of being protected by awnings, and the cases should be allotted to them according to their condition.

35. Regimental surgeons should be directed to take advantage of every opportunity which offers for sending to the rear their chronic cases. Acute cases should be kept as long as possible with their regiments, or at least so long as there remain any symptoms to subdue.

36. No case should be sent to the rear for reception into field general hospitals which can be conveniently treated in the regimental hospital, with the probability of the soldier soon being made effective.

37. All convoys of sick sent to the rear should, according to their magnitude and the importance of the cases sent, be accompanied either by a medical officer or subordinate medical servant.

38. They ought to move at proper hours and by such routes as may have been laid down for them.

39. Care should be taken that every sick soldier sent to the rear has his blanket, watch cloak, warm clothing, and knapsack with him.

40. In case a subordinate medical servant only be attached to the convoy, he is to report himself to any medical officer that may pass him on the march, and in any case of difficulty is to request the assistance and advice of any medical officer who may be within reach.

41. The medical officer into whose charge the subordinate medical servant will deliver the men is to report the state in which they were received, with any casualties that may have occurred on the way.

42. During any halt of the convoy the clothes and bandages, &c. of the men ought to be well washed and aired &c., and the persons of the men themselves should be made as clean as circumstances will permit.

Field Service Allowance of First and Second Class Servants.

—	For a European Regiment.	For a Native Regiment.
Apothecary - - -	1	—
Steward - - - -	1	—
Assistant Apothecary - -	1	—
Apprentices - - -	—	—

Field Service Allowance, &c.—*continued.*

	For a European Regiment.	For a Native Regiment.
2nd Class.		
Serjeant	1	—
Dresser	1	—
Matron	1	—
Assistant Matron	1	—
Writer	1	—
Compounder	1	—
Store Servants	2	—
Shop do.	1	—
Ward Coolies	10	—
Bheesties	5	—
Dhobies	3	—
Tailors	2	—
Sweepers	5	—
Head Cook	1	—
Assistant Cook	2	—
Leechman	1	—
Barber	1	—
Dooley bearers	10	—
1st Class.		
First Assistant	-	1
Second Assistant	-	1
Apprentices	-	2
2nd Class.		
Sweepers	-	2
Bheesties	-	2
Goorgah	-	1
Cook	-	1
Dhobie	-	1
Dooly bearers	-	5
One Dooly to	20	100
One Spring Cart to	100	500

Doolies are intended for the worst cases, spring carts for those not so seriously ill or wounded.

An additional dooley and spring cart are allowed when the strength exceeds by more than one-half that entitling to one of each.

Doolies and spring carts are supplied by the ordnance department on indent; dooly bearers, all other sick carriage, and carriage for hospital stores are furnished by the commissariat department on indent.

Separate indents are required for carriage for the sick, as dooley bearers, &c., and for carriage for hospital stores, &c.

Commanding officers can indent on the commissariat for extra sick carriage to the extent of five per cent. of strength, without special sanction of the commander-in-chief. Indents in duplicate must specify the nature of the sick carriage, its necessity under certificate of medical officer, period for which required, &c., countersigned by the deputy inspector-general; and if no commissariat at hand, by obtaining the necessary carriage otherwise and charging for the same by contingent bill.

Appendix 2.

From D. Grierson, M.D., Surgeon Major, Staff Surgeon to the President of Committee on Questions of Royal Sanitary Commission.

Sir,

I have the honour to request of you the favour to transmit along with the information furnished by the Committee the following observations, made on my part in accordance with the permission granted in the last paragraph of the instructions issued for the guidance of the Committee.

2. Were this the first time I had turned my mind to the considerations about to be entered on, I should think it presumption to submit them now. The case is different; and as with me the subjects have both a history and a special character, I shall proceed to deal with them in a chronological order, as well as in an expository method.

3. The subjects I wish to speak of are intemperance, prostitution, accommodation for troops, and medical police.

4. From October 1832 till July 1835 I served in the Indian Navy, and observed facts connected with the issue of spirits to the men which led me to submit a statement on that and other subjects to the Superintendent of the Indian Navy, then Sir Charles Malcolm, and to urge a diminished supply. The reply was, "In every part of your "arrangement regarding the allowance of spirits, the super-"intendent fully concurs, and it is very satisfactory to him "to have so many proofs adduced as you have done in "favour of a reduced quantity." In the year 1838, in connexion with a detachment of Her Majesty's 40th regiment, the subject was again forced on my notice, but without practical result. In regard, however, to the canteen system, and especially that part of it which provides for the accumulation of profits by the sale of spirits, and the expenditure of these profits for what were called charitable objects, the note I made of it was, "Thus, by a most sin-"gular arrangement, the very vice of the soldier is made to "provide for him in the day of his misfortune, and he is "tempted, under the delusion that what he spends is not "all lost, or at least benefits others, to part with his money, "ruin his health, and acquire those habits which may ren-"der him a torment to others or effect his own destruc-"tion." Since those days indirect ways have been taken to diminish the taste for spirits and the use of them. It was, indeed, before that time, namely, in the year 1830, that spirits, as part of the soldier's ration, had been abolished; but in 1847 the introduction of porter and beer was intended to promote the same object. Coffee shops are strictly enjoined by the canteen regulations, and regimental libraries have been established, and have been justly thought to conduce to the same result; and to these means, and in the same category, are to be added ball alleys, skittle courts, and work shops. While these indirect methods have been tried, it would seem as if it were not generally known, to judge by one of the questions put by the Commissioners, that the more direct voluntary plan of temperance societies had been discouraged and suppressed in the army. This was done many years ago, and in consequence no means at present exist to enable any one to supply a comparison of the ratio of sickness in abstainers and among those who use spirits. But comparisons of this kind were made in former years, and it may be well to produce one of them. The following statement is taken from the *British and Foreign Medical Review*:—"A temperance society was established "in the Cameronian regiment in 1837 at Fort William. "The surgeon, Mr. Bell, reports most favourably of the "results. The admissions into the hospital were, of the "society, 1 in 25, of the rest of the regiment 1 in 11. The "deaths in the regimental hospital were, in 1837, 26, and "in 1838, 22; whereas for 14 years previously the mortality "had been nearly 72 per annum. The consumption of "spirits has diminished from 14,000 gallons (which was "the amount consumed on the arrival of the regiment in "India) to 2,516 gallons. Liver complaint has diminished "from 111, 140, and 135, as in 1832, 1833, and 1834, to 82 "and 50 in 1837 and 1838. It also appears that by tem-"perance two-thirds of the sickness has been removed."—Ed. *M. Jour. of Med. Science*, No. VI., June 1, 1841.

To this exhibition of facts, the result of abstinence, it is impossible to add force; neither can one forbear to deplore that so promising a movement was nipped in the bud. This is not the place to offer many remarks; yet it is desirable to allude to other changes. It was thought a very great and beneficial advance when in 1830 Lord Hardinge, then Sir H. Hardinge, abolished the spirit ration; and this merited the commendations it received when spoken of as an act of wisdom and courage. Perhaps but for this other measures would have followed more slowly. Be this as it may, in 1837 good-conduct pay became an institution; in 1844 savings' banks; in the year 1846 flogging was limited to 50 lashes as a maximum; and in the following year the sale of spirits, as distinguished from the issue, was put a stop to in canteens; service on enlistment was limited to 10 years; and regimental schools were introduced.

A century and a half ago, that soldiers were a body of men distinct from the body of the people, governed by different laws, whose only principle was blind obedience, and that they could not be made obedient to the allurements of rewards, as coercion, generally speaking, is the surest principle of all vulgar obedience, were approved maxims; and at a much later period it was publicly stated that "the "worst men were the best soldiers." The changes above alluded to are evidences that the ancient prejudices and practices of an evil day are gone for ever; but the question is, what effect have these changes had on the habits of the soldiers as regards drinking? It may be conceded at once that they have been beneficial; that they have not gone far

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enough there is reason to believe. I take up a medical journal published last year, and I find that in one regiment three canteen serjeants perished of *delirium tremens* in 18 months. The surgeon remarks, "The canteen serjeantcy "seems to be allotted as a kind of reward to the steadiest "and best men of the longest service, whose previous good "conduct, however, seems literally unequal to the great "temptation of a free access to liquor." This reminds one of the maxim, *Nemo mortalium unquam fuit repente turpissimus.* I have seen within three years one soldier brought to hospital a corpse who, drunk, a prisoner, and being taken to the guard-room, tried to escape, and was killed on the spot by one of the guard, who threw his bayonet at him; and I saw another who had just been killed by a drunken antagonist, with whom he had retired from the barracks to end a brawl by fighting. Within the same time, in one year, I treated for *delirium tremens* 10 men in a company of artillery of about 100 strong. The staff hospital receives the warrant officers of the arsenal, commissariat, and brigade-major's establishment, the men of which departments, it is believed, may be considered the picked men of the service; yet from amongst them, a small class, in the last four years there have been 9 admissions for *delirium tremens*, and one of these members of this class perished in this horrible disease. In mentioning these men, I have chosen, as a proof of drunkenness, extreme cases; but this procedure, the only tangible one, is open to no objection, for every case of *delirium tremens* represents, besides a deplorable individual instance, an undefined but certain amount of drunkenness—it may be 10, 50, or 100 to 1. Proofs, however, are scarcely needed, for I suppose no one conversant with the subject will deny that the great majority of military crimes owe their origin to the love of drink or the consequences of indulgence in it.

It remains to inquire if anything can be done to lessen intemperance. The preceding narrative points out temperance societies as an efficient beneficial agency, and these ought to be encouraged. Men are influenced by example. Example derives force from numbers. A society developes this force and displays it, and is a quiet antagonist of drunkenness and a protest against it; it is a rallying point, and will always attract some to support the cause it represents, from amongst those who esteem it more noble to overcome evil with good than to be overcome by it, and better to assume an attitude of opposition to this special evil than to be indifferent. Instruction, amusement, and occupations are all subsidiary means of raising the character of the men, and enabling them to despise debasing pleasures and resist seductive habits; and it ought to be be received as a maxim that when any one is addicted to vice, unless a feeling of opposition to it be raised in the man's own mind, prevention will only stimulate ingenuity, and punishment suggest greater caution in the means and measure of indulgence; but the eradication of drunkenness from the army depends not on desultory indirect efforts. It must be the result of a system; such a system, it is conceived, is possible, and has nothing of an active or aggressive character about it; it has rather a negative character. Its chief feature is to let the men alone, and if evils arise from this inaction, then it would be required to deal with them as evils. The present system is erroneous and inconsistent, to say nothing of lacs of rupees lost in condemned porter, or of the 5,000*l.* per annum paid simply for coverings of mat to protect the transport boats on the Indus, to say nothing of the impracticable nature of the present plan in time of war, or the huge monopoly. Spirits were at first allowed to soldiers on the wrong principle, that the addition of spirits improves the quality of the water when bad, or makes it innoxious when hurtful; and what was granted at first as a bounty was soon claimed as a right. There is neither room now for the illusion nor ground for the claim of right, and what is wanted is that the State cease to be a great hotel keeper, and abandon all those allurements to their customers, such as charitable donations out of the canteen fund, the provision of balls, quoits, and other necessaries for games and amusements, supplied from the same source, which throw a covering over the nakedness of the system, and impart to it an interest not rightly belonging to it. Until this is done there is an inevitable inconsistency in the fact that Government supply, as every one must allow, daily opportunities and means of drinking to the soldier, and, as most think, really train him in many instances to become a drunkard, and then punish him when his passions, habits, and infirmities lay him open to faults and negligences, or stimulate him to more active crimes. Let Government abolish the canteen, and stand aloof from the provision and sale of liquor, and then the officers of Government can come in contact with offenders, not only without embarrassment, but deal with them strengthened by the awe inspired by a just and venerable authority. In this case in all its functions Government would be in direct opposition to drinking habits, as well as the evils they lead to. The contrary is exemplified now. Liquor paid for by the soldiers is provided by Government, and though paid for by the soldier, yet access to it is a privilege, the privation of access a punishment; and by restrictions and indulgencies, multifarious interferences, minute and misspent care, a fictitious interest is created in what ought to be left to stand simply in its own nakedness and ill desert. Not only in dealing with crime does the present system lead to embarrassment, a prior charge lies against it, as it affects moral responsibility. When drink is provided by Government, when peculiar advantages are procured to the soldiers by the profits of drink, human nature were no more human nature if drinking, accompanied with so many adventitious recommendations, were not the rule in a regiment, and if example, so highly commended and sanctioned, did not beget an imperious fashion, and lead young and old, with exceptions no doubt, captive at her will. In this state of things young soldiers are scarcely left free, especially after the punishment like privation of liquor, while at drill, and surrounded by influences, all of which appeal to them in behalf of the practice, it is no wonder if the soldier soon learns to drink, and falls a prey to a habit which soon gets beyond control. To redress evils of this kind once fostered is impossible; to prevent them for the future demands, and is worthy of, the greatest solicitude, and the means to accomplish this end, as before stated, seems to me to be that the Government stand aloof, that no dazzling halo be cast around drinking practices, and no sanction be lent to what is too often a commencement of moral delinquency, and what must be often dealt with in its results as a crime; besides, when the soldier has neither sanction nor facility for drinking provided, he is fairly and honourably cast on his own responsibility, his interests are in his own keeping, he is dealt with as a man, not a pupil; his noble instincts are appealed to, he yields to the appeal, and instead of a descent of progressive debasement, he enters on a course of progressive amelioration. The result of this negative action on the part of the Government will immeasurably benefit the soldier, add strength to the army, shed lustre on a wise administration, and remove a national reproach.

As there is always a presumption in favour of established usages, so no innovation upon them can be proposed that is not met by objections. Possibly some may yet urge that alcohol gives strength and adds to productive energy; some less probably may say that alcohol protects from diseases to which soldiers are exposed, especially fevers. These were once favourite arguments, but if pressed by the fact of ill consequences resulting from drinking, the advocate of alcohol would profess to obviate them by proposing the dilution of spirits, or substitution of beer and porter for spirits. But as these measures have been tried and drunkenness yet exists, the great, if not only argument, now is that the canteen secures good liquor, and if done away with the men would resort to shops or taverns where bad liquor would be procured and the health of the men injured. The reply to this is the difference implied in the terms good and bad, when used in respect to liquor, is not what the words themselves signify. It is a difference not of contrast but comparison, not of kind but degree. Whatever change would follow, therefore, in regard to liquor, is one not absolute but limited, both in the quantity of liquor and in the effects produced by it. It may next be observed that soldiers do not use bad liquor rather than good as a matter of taste. They use what is cheap and easily procured. A monopoly, if it secures a good commodity, compels unscrupulous men to seek hazardous and precarious gain by illicit and spurious substitutes. Competition, by bringing the good commodity to a lower level, cuts up the root of the illicit traffic, and the measure proposed, therefore, contains, in itself, the remedy for the evils alleged as likely to follow it, or rather will prevent the occurrence of them. But again, the objection has no force, for this reason, crimes and disease exist already in the regiments; either, therefore, these evils originate in the canteen or they do not; if they do, it is a reason to abolish them; if they do not, they arise from sources beyond the limits of the regiments, and if so, and this will hardly be denied by any one, then the very evil dreaded exists already. Illicit liquor is procured by illicit means, and the health of the men injured by spirits used beyond the prescribed degree. The objector then must show, not that men would get bad liquor, but that they would get it worse or in greater quantity than they do now, but this he cannot show; on the contrary, it has been rendered evident that were the canteen abolished, the evil would be diminished or cease.

The conclusion come to then is, that the canteen should be abolished, men left free to drink or not as they choose, the military crime of drunkenness discouraged, and, if need be, punished, and drunkards, if they be found under the new system, weeded out of the army.

PROSTITUTION.

In the letter before alluded to, addressed to Sir Charles Malcolm, attention was directed to a practice which had long existed in the Indian navy. What I mean is the countenance of prostitution. When a ship was in harbour boats might be seen in the evening lying near full of prostitutes, when, at a given signal, permission being granted to come alongside, the sailors might then be seen rushing to the boats, each to select his partner for the night, as a butcher might be imagined to select fat lambs from a flock. This fact is valuable as an indication of public opinion, but I mention it to the credit of Sir Charles Malcolm, that a system so abhorrent to right feeling, and so prejudicial in many ways, was no sooner thus officially brought under his notice than it was abolished.

Again, about the year 1840–41, being then a regimental assistant surgeon, I pointed out the evils resulting from the residence of prostitutes in bazaars, the suffering to individuals induced by it, the loss to the State, and the advantages that would result from their expulsion. My representations, I believe, never reached head-quarters, but were met by the military authority, and resented as an interference with what did not concern me, and by the medical, as being a matter with which it was not felt there was any call to meddle. It was but three or four years before this that the lock hospitals, so called, had been abolished by order of Government, at the instance urgently repeated of the Bishop of Bombay, and supported by the strong arguments of the then Metropolitan of India. Regret was very generally felt and often expressed at this abolition; hence the indifference or hostility with which any further step was encountered.

It was not till lately, about two and a half years ago, that I felt again disposed to take up or justified in referring to this matter in an official manner. In an evil hour, and in ignorance apparently of what had been done in former times, in the extinction of *Lal Bazaars*, and of the late orders of Lord F. Fitzclarence, it was resolved to institute what was called a venereal dispensary at Kurrachee. I will not relate the history of this short-lived institution. It is my object rather briefly to show the objections I entertained and urged against it. It was pointed out that for 500 years at least the law of England regarded the prostitute as a criminal, that this was also the law of India, by the enactments of its Supreme Council, and that it was the law of the military bazaars of the Bombay Presidency; that the object of legislation has uniformly been not the regulation of an admitted evil, or the protection in any way of those who favour or commit it, but the punishment of the offenders and the suppression of the crime. It was shown that Christianity condemned prostitution, and the remonstrances of Bishop Carr and of Bishop Wilson were quoted which they urged against lock hospitals. It was then added, what is rooted in religion and embodied in law must also be seated in human nature, unless indeed the first be fictitious, and the second usurp a power and an office where neither are rightfully due. But this conclusion cannot be drawn in this instance; for so long as modesty, integrity, self-restraint, honour, chastity, are reputable qualities of the individual, commendable and excellent, so long must it of necessity be that the dissolute, those abandoned to the sway of one of the basest passions, the sexual appetite, shall be held as evil-doers, corrupt and corrupters by practice and example, enemies to social well-being, fallen or who ought to fall from the privileges, protection, and enjoyments of society. It is the voice of reason and of nature, that if we would cherish whatever is loveliest and dearest in our estimate of human character, we must set the stamp of reprobation on all that tends to diminish its production, to render precarious its continuance, to impair its lustre, or to annihilate its existence. Nature, religion, and law, then, all concur in visiting the prostitute with their peculiar penalties—moral, spiritual, and legal, and heavy is the responsibility of those who lightly set them aside. To do so, in truth, is to take the opposite view altogether, for if we once depart from the wholesome principle of viewing the prostitute as a criminal and as a violater of moral law, what little soever notice we bestow, it is countenance bestowed; and how little soever we regulate her affairs, it is protection and reward.

But it might be objected,—it is not reasonable to deny the woman aid in her distress, any more than to forbid assistance to be given in any case where the imprudence of the sufferer has been the occasion of his malady. To this it is replied, all sufferers from disease, though themselves the cause of it, address an irresistible claim to the sympathy and aid of the physician. On this there is, there can be, no dispute. Patients suffering from *delirium tremens* are cared for with the greatest solicitude; and so are women labouring under venereal disease, nor is less done for the greatest of all criminals, the man who with sacrilegious hands has violated in his own person the sanctuary of life. But no rational man can fail to have some respect to the consequences of his acts, and in the instances advanced, or any other of the like kind, when a comparison is instituted, it is easy to see that a special peculiarity attaches to the case of the unfortunate female. In other instances, the victims of self-inflicted disease, when restored to health, are thrown upon their own responsibility. The health and improved condition they have gained form no necessary preparation for the unavoidable issue of renewed vicious indulgence. The lesson which teaches the connexion of vice and suffering has been brought home to personal experience; on this may be grounded an exhortation and appeal to a mind consciously awakened to see the nearness and magnitude of a danger hitherto little appreciated; and the conviction which springs from these truths is happily found to be not always unavailing. But the restoration to health of the female is the very condition of the resumption of her nefarious occupation, and, qualified again as she is to this resumption, her necessities impel her. She may feel the sense of responsibility keenly, may weep over the past experience of her sorrows, may shudder at the prospect the future offers to her; but we have qualified her to tread the path she trod before, taken from her the provision she got before, and that thorny path she must tread again. Now to warn, exhort, dissuade from evil in such circumstances, if that be all we do, is little better than hypocrisy, and means little else than reproach. And we see ourselves reduced to this extremity, that either we must act in a way outrageous to humane feeling, or, by our silence, though accompanied with inexpressible pain, seem to countenance a course which we abhor.

It may be worth while to illustrate this point by way of analogy. Those who suffer injuries in following occupations and trades are humanely cared for, and treated at public expense or by private bounty. When the endeavour fails to restore a useful member of society to his place and functions, a debt is paid to the unfortunate, and compassionate feeling is satisfied. If the result be more fortunate, a benefit is conferred in the restoration of a useful member to society. Suppose, however, a society of mistaken philanthropists followed an army to cure the wounded of the enemy, and restore them to their friends again, to fight against the country of their benefactors, this conduct would be absurd, and the humanity of it would be lost sight of, in the contempt and scorn, or direct opposition which would be turned against so unwise and unpatriotic a procedure. Or again, imagine a state of civil disorganization where thieves and burglars should often meet in conflict a feeble police, and where wounds and severe injuries were frequent. Imagine, further, that a benevolent society were constituted to shelter, provide for, and cure these lawless combatants, and when cured to dismiss them to pursue their disorderly life, would not the act of humanity be forgotten in the indignation felt against those who evaded the law, harboured, aided, and encouraged the disturbers of the peace, the enemies of the public safety? But these fictitious cases are similar in principle to the institution which should simply take charge of the prostitute when unable to follow her unlawful occupation, feed, clothe, shelter, cure her, and then, as soon as fit to resume them, dismiss her to fall again upon her evil practices. Hence the conclusion seems just and reasonable, let there be simply a dispensary or hospital opened, provided with necessaries and the requisite attendants for the reception and cure of women who live by prostitution, and become diseased by following this mode of life, where shelter, care, and cure are all gratuitous, and the condition of obtaining the advantage of them is the attendance or residence of the applicant; let the plan be as remote from the continental system of Europe, registration, domiciliary visits, compulsory inspection, and medication, as possible, and as consistent with the liberty of the subject and the protection afforded by law as can be desired; still there attaches to the modified scheme a character, the vices of which exclude it from the category of legal institutions, and bid away from it the cold approval the moralist and philanthropist would feel disposed at first sight to bestow upon it.

But it is not alone by an appeal to fictitious analogies, or by the assertion of undeniable principles, that we reach this conclusion. Tried by practical application, the institution and the associations it provokes challenges only reprobation. This point was put forward in reference to the establishment set on foot at this place, and I desire it should be pointedly mentioned, that nothing has appeared in public to tend to the belief that, though the establishment at Kurrachee was abolished, yet similar establishments do not exist at Poona and Belgaum to this hour. The remarks to be repeated here, therefore, have a living interest at this moment. Were it otherwise, yet their repetition

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is desirable, for it seems as if most minds never contemplated any other means of abating the evils of the venereal disease amongst troops except the establishment of lock hospitals, and the proposal is continually coming to view, put forward, it is believed, by men who not only know nothing better, but have never heard of any other plan or possibility of dealing with an admitted evil, a detriment, and reproach. Speaking in regard to the establishment of a venereal dispensary at this place, it was said, these things are done, not in accordance with any known law, but in opposition to it. Women of disreputable character the law enjoins should be expelled from cantonments; but this is not done. They are countenanced and permitted to remain. When sick, they are lodged, fed, and receive care and medicine at the public expense, as if they were valuable members of the community, or servants of the State. And what a contrast do the industrious and decent inhabitants, as respects their treatment or the neglect of their necessities, afford! It was proposed to take their school from them for the accommodation of their vicious neighbours. When sick, what care do they receive? A few applicants and an occasional inmate, of the female sex, are seen at the general hospital; but let returns of all the hospitals in Sinde be called for, excepting at the same time the patients in jail, and perhaps not half-a-dozen will be found. Again, I have attended, in the dwellings of the native poor, women in child-birth, some of whom I am certain, as one can be in such matters, but for help must have died, and some of whom earlier relief would have saved from death; but who ever heard in the provinces, and only lately at the presidency, of a maternity hospital, an institution than which few could be more desirable, and none bear a higher stamp of Christian philanthropy? In plain terms, and this statement in its general extent cannot be denied, the vicious, whom law, religion, and morality condemn, receive indulgence, protection, and support in their necessities from the public money, while the honest, industrious, respectable, however necessitous, are not thought of, or viewed with unconcern, apathy, or contempt.

If we inquire what effects such a practice is likely to have on the minds of others, we shall find it far from salutary. The woman is encouraged and confirmed in her evil courses. The soldiers are countenanced in crime; and if they contract disease will be apt enough to reproach the Government which has held out a false hope of immunity. Decent inhabitants cannot but be perplexed, when they think that a Government, which in principle approves of honesty and industry, should yet make its especial favourites the impure, the corrupt, the disorderly; and in their bewilderment they will probably lose what little hold on their confidence and affection, as nature and duty teach them, the rulers of the country are entitled to and enjoy. Nor is it impossible that the parents of Christian youth in the cantonments look with dread on an establishment where the modesty of tender years may be endangered and vicious habits contracted under sanction of authority.

But as respects the soldier, who rejoices not in his improved condition of late years? Who is there who sympathizes not with every regulation directed to his elevation and well-being as a man and as a Christian? And not a little has been done, and with no little effect in late years. The schools in regiments, the Ten Years' Enlistment Bill, good-conduct badges and pay, all indicate the same purport, and tend to realize the same desirable result. All address themselves to his capabilities of improvement and moral elevation, and all are intended, by bettering the condition of the soldier, to raise the character of the service, facilitate the supply of men to constitute an armed force, and to make that force when constituted more valuable and efficient. Now the institution under review is not in harmony with these regulations and usages. It does not facilitate their action, but is opposed to them and detrimental. The dissolute soldier, the man under the tyranny of lust, is the discontented, needy, dishonest, drunken, untruthful, quarrelsome, disobedient, and negligent soldier; and this institution is designed for men like these, or will make men like these. The good can have no benefit by it. Their concern with it is to deplore its existence, and regard it with alarm and abborrence. It is therefore the antagonist of the school, the church, the reading room, the playground, and every thing which is brought into use or may be brought into use to make the soldier an instructed, a contented, and a happier man. I can conceive the incredulity with which those who best love the soldier, and most earnestly, consistently, and successfully seek his amelioration, would hear of an institution like this being organized in these times (May 1858), and at this time of day; but I cannot conceive the horror with which many would receive the evidences of its existence.

If it should be asked, how then deal with the offenders in the bazaars of this class? The answer is, as the law directs. Expulsion is that law. If it be objected that this is cruel, that evils will follow it, as well might it in any case be said that justice is cruel, or the law tyranny. Execution of the law occasions distress, gives rise to evils; but execution is not a daily office, and it is enforced that greater distress and greater evils may be anticipated. And as for evils to come, the fallacy is easily exposed. We must not do evil that good may come is an admitted truth; as we must not do good lest evil may arise is an oft-enacted fallacy. The good in the latter case is positive, the evil only contingent, and if the evil comes, for every wrong and for every evil there is a remedy. The course therefore is plainly marked, and if we believe in a moral governor of this world who delights in goodness, we cannot refuse to acknowledge that in this very faith he has given us ample encouragement to prosecute what is good, and just reason to think that he will favour the good and set his face against all that is evil.

It has been already shown how repugnant this establishment is to law, religion, and morals, and it is not meant to recur to that view of the subject. But to cut off all objections, if there must be an institution for the care of prostitutes, it is desirable to indicate the principles on which it might be legally founded and honourably conducted. Examples of institutions of this kind are seen in Great Britain and Ireland, and the great Scott, the commentator, was chaplain of the London Lock Hospital. These institutions are signalized by the aspect of reform of character as much as by that of punishment. The law does not forego its claim to deal with prostitutes as criminals, but religion steps in and deals with them, and tries to make them penitents. By the various names of Magdalene asylums, lock hospitals, penitentiaries, and such like, these houses of correction are known, and the objects common to all are by sobriety, cleanliness, and medical assistance, by a regular series of labour, by solitary confinement during the intervals of work, and by religious instruction, to preserve and amend the health of the offenders, to inure them to habits of industry, to guard them from pernicious company, to accustom them to reflection, and to teach them the principles and practice of moral and social duty. Institutions like these are within the bounds of law, are approved by reason, and sanctioned by religion. Institutions with attributes like these are schools or churches, as well as jails. But to aggregate prostitutes in a public building and give them public support where no such attributes hallow the scene, is to constitute neither a church nor a school nor a jail, but a brothel.

Another letter by way of supplement was afterwards forwarded. In this I took occasion to quote the recorded opinions, or, in one instance, oral testimony, of Lord F. Fitzclarence, Sir Bartle Frere, General Jacob, Colonel Edwardes, and Sir John Lawrence on the subject in question, and this weight of authority was thrown into the scale which bore the condemnation of the lock hospital system. Lord F. Fitzclarence, through the Adjutant-General, announces his views thus:—"I am directed to intimate that after "giving the whole subject his best attention, his Excellency "concurs with his predecessors in command of the army, "that police measures for preventing the infection of the "soldiers with the venereal disease cannot be carried further "than therein ordered (this alludes to orders for expulsion) "without involving the certain degradation and oppression "of many women of respectable character, and occasioning "other evils which in his Lordship's opinion would be "much greater than that which it is the object to remedy." General Jacob, amongst other remarks, makes the following:—"I would not interfere with these women in any way, "and although it might be good policy to provide dispen-"saries or hospitals, to which such persons might resort if "they chose, there should be none specially set apart for "them. The proper and only wise method of reducing "this disease is to improve the condition, the state of moral "being of those who resort to these women. Coercion of "every kind always increases these evils. Moral forces "alone are of any value." He adds, speaking of the Sinde horsemen, the elder, graver, and better part of the soldiers, seven-eighths of the whole number probably have their families here, and do not resort to public women, except when they employ them at nauches, &c. &c. Colonel Edwardes and Sir John Lawrence both concur in the propriety of expulsion of prostitutes, and signalize the restriction on marriage amongst the English troops as a great evil and hardship, and assert that married men are the better soldiers, and women and children no impediment in time of service, as they are left in cantonments.

To this weight of authority, it was said, I would add one or two facts. The 4th company of reserve artillery at present stationed here (1858) I have had charge of for 14 months, and the strength, inclusive of men attached from other companies at Hydrabad and Shikarpoor, has been the

average of 107 men per mensem. Of primary cases of venereal affection there have been treated 13, which by calculation gives for 1,000 men per mensem for one year 111 cases. I have had charge also of the depôt 1st Fusiliers for nearly 19 months. Of these months I omit the first, as it represents the whole regiment not the depôt. The strength for these months is 95, as in that time about 150 recruits passed through. The primary venereal affections in these 18 months are 20, which by calculation would give per 1,000 per mensem in the year, cases, 140. The mean of the Artillery and Fusiliers is 125, which divided by 12 for 12 months gives an average of admissions per mensem in a European regiment 1,000 strong of 10½ nearly. I served for five years with a native regiment, the 1st Grenadiers, an abstract of the return of which I have now before me. The strength was 781 per annum, the number of primary venereal affections amongst the privates (there was not one amongst the native regimental officers) was 77, the annual average was therefore 15. This by calculation for 1,000 gives admissions 19 per annum, and per mensem $1\frac{7}{12}$. When we compare, therefore, the condition of a European regiment and of a native regiment in this matter of venereal infection, the native regiment appears to a greater advantage, by five times over, than the European. And it will be extremely difficult to find any satisfactory explanation of this deplorable fact, other than that in the European regiment marriage is restricted and widows unkindly used; whereas in the native regiment marriage is free, and the native soldier's family generously treated.

It was already stated that these representations were followed by the destruction of the ill-featured institution which was set up here. But whether its congeners at Poona and Belgaum shared the same fate has never, I believe, been made public. If these exist the reasons urged are as applicable to them as they were in the instance which gave rise to them. But the subject would be imperfect indeed if we stopped here. The system is called for, it is not said wisely called for, because of the deep pervading power of the sexual passion, and the evils which arise from its promiscuous indulgence. Now the wisest law that ever was promulgated on this subject, the only one which deals a deadly blow at the heart of the vicious and debasing crime in question, is the simple one, "Let every man have his "own wife, and every woman her own husband." How complex, how difficult, how unavailing all other legislation on the subject except this, and this how plain, how obvious, how admirable! This law, however, has been set aside; there has been wailing in families, and immorality in public places, because this law has been set aside. The British public though late, has recognized the fact, and sympathises with those who are sufferers by it. The Government will not overstep public feeling, but concentrate its action, and gain merited applause if it lends ear to a law which should never have been violated. But the marriage of the soldier will entail additional expense on the public. If it be so, and this may on a comprehensive view be doubted, let the public know why, and it will not complain. Besides, does any one think that the pay of the soldier is ever to continue at the venerable 13 pence a day? Sir Archibald Alison has publicly stated his opinion that the soldier's pay ought to be 20 pence a day. With changed times, is everything to change but the soldier, his pay, his prospects, his happiness? I conclude then that these two principles of the repression not recognition of prostitution, and of the permission not restriction of marriage amongst the European soldiers in India, indicate clearly what is needed in the way of Christian and public duty, and what is best for the elevation of the soldier, as respects morality, health, happiness, and efficiency for the public service. And I add my conviction that this, the true remedy, bounty to soldier, not the prostitute, will, whenever applied, declare itself in its simplicity, perfect propriety, efficiency for the end desired, and the many priceless advantages it will bring in its train.

Accommodation.

In the year 1851 it occurred to me to be engaged in conjunction with others, one of them the Superintending Engineer of the province, in devising the plan of a lunatic asylum for Kurrachee. It then appeared how vague were existing opinions on the subject of space in buildings, and how little information was available from any source to satisfy the inquirer. The subject occupied attention. Sir Charles Napier had wisely insisted on having hospitals and barracks greatly larger than those heretofore in use; but the principle, or rate, to guide to the determination of what the actual space should be, was not to be found. Sir Charles particularly desired height, and had no better reason to assign for the preference than that the doctors would no longer be able to stuff their patients into the corners of the hospitals. This was sometimes jocularly, or perhaps seriously, met by the statement, that we had a tall column of air in dead wells, yet the air sometimes was fatal to those who descended into them. Dr. D. B. Reid had recommended 1,500 cubic feet per man, but this, almost by common consent, was declared an extravagance. In April 1852 it became my duty to make a special report on the jail at this place. The space allowed for patients was very small, and seemed to have been really productive of very bad effects. It was remarked,—"It has not been "hitherto sufficiently considered that a man in 24 hours "must breathe 300 cubic feet of fresh air or sicken. "Were he confined in a space of this extent, without the "access of new air, the process of vitiation must commence "with the first respiration, and the man could not live "in health and vigour for 24 hours. Hence the necessity "of spacious accommodation, and of free ventilation, with-"out due observance of which health cannot be maintained, "disease will be aggravated, and life itself destroyed. In "Europe, a space from three to five times exceeding that "mentioned, or from 1,000 to 1,500 cubic feet, together "with good ventilation, is judged suitable as an allowance "for each individual in any establishment permanently "occupied and the air of which is liable to constant vitia-"tion. And it might be easily shown that the conditions "obtaining in hot climates render desirable an increase and "not a diminution of this allowance." This, however, did not escape without what was meant, perhaps as correction, but looked like animadversion. It was observed, "In re-"ference to Dr. Grierson's special report on the Kurrachee "jail the Board direct me to remark that though the "number of cubic feet of air necessary to be respired in "24 hours by a single individual be stated at a moderate "amount, they are of opinion that that officer rather "exceeds when he talks of 1,000 or 1,500 cubic feet, "together with good ventilation, being considered suitable "as an allowance for each individual in any establishment "permanently occupied, and the air of which is liable to "constant vitiation," at least in practice it is not so, "for "even in the metropolitan hospitals of London, Dublin, "and Edinburgh, in the provincial hospitals of all England, "and in the general hospitals, naval and military, of the "British Government, the allowance is under 1,000 feet; "while to British soldiers in barracks at home and in tem-"perate climates, the allowance is 450 to 500 cubic feet, "increased in tropical countries, in hospitals, to 650 or 700 "feet, 1,000 feet in barracks, and 1,500 in hospitals is as "much as could be desired for each European even in the "tropics." The force of the concluding sentence here, it is presumed, depends on the assumption that the want of the native in respect of air is less than that of the European. Natives generally want less, as pay, for instance, and possibly they may want less atmospheric air; but the fact, I think, has not yet been determined by experiment. This recusancy on the part of the Medical Board is not to be wondered at. Opinions grew very slowly on this subject, and perhaps have not yet reached their maturity. Lavoisier, whose merits are so well known, in the end of last century, pronounced the air required in respiration for one man in 24 hours to be 120 cubic feet. Sir G. Blane, in the beginning of the present century, named 600 cubic feet in hospitals as a minimum, and thought 1,000 not too much. Dr. Bostock, in 1826, quotes with approbation this conclusion, the former had embraced. In the year 1833, Begin in the *Dictionnaire de Medecine et de Chirurgie Pratiques*, under the Article *Hôpital*, assigns 20 cubic *mètres* as the volume of air calculated for fever cases in hospital, and the equivalent of this in English cubic feet is a space of 700 cubic feet; but when he gives the dimensions which should characterize the hospital he approves of, he seems to raise to 1,000 cubic feet this amount of space. About 1844 Dr. D. B. Reid recommended 1,500 cubic feet, and there opinion in England seems at present to halt. However, the authorities of King's College, London, did not adopt that standard, but allow for each patient a minimum of 1,800 cubic feet, and a maximum of 2,400 cubic feet. Besides this diversity and gradual development of views, confusion of thought was occasioned by the connexion subsisting between space and ventilation. In the progress of knowledge events lag behind. Principles always precede their practical application, and even when more enlarged notions of the necessity of increased space began to prevail, there were very strong objections entertained to pulling down small, and then erecting new and suitable buildings. The intention of this increase, it was allowed, was to give fresh air, and this intention it was sought to accomplish, not by increase of space within, but by means of better ventilation from without. Yet no attempt was made to determine in what relation space and ventilation stood to each other. Again, in India, it was often said, rules like these apply in Europe, where buildings are shut up on account of climate, but with us buildings are almost always

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open, are thus ventilated at all times, and the increase of space demanded in Europe is not requisite. To this argument no effectual answer was forthcoming.

It was in the same year, 1852, that I was under the necessity of considering the question again. The occasion was this, I was called on by the Medical Board to report my experience and opinion of the station of Colaba as affecting health, and especially the health of European troops. The subject of space in barracks and accommodation fell thus to be specially adverted to, and it was sought to attain some definite notion, which should assign a just limit to precepts hitherto apparently arbitrary.

In my reply, therefore, in October 1852, I wrote thus:—

" Accommodation is highly important for troops. Besides " protection from the various changes of the weather, space " and ventilation demand more attention than they have " hitherto usually received. The amount of space allowed " to troops on Colaba is not known; but, though recently " enlarged, it may be presumed, if one judges by the views " very prevalent, to be defective still. It cannot be in- " opportune, at any rate, to say a few words on the subject. " Pneumatic chemistry seems to have been long cultivated " before chemists saw the relation it bore to space in dwell- " ings and ventilation, and the mode of estimating these " which is perhaps the best, is of very late introduction. " Dr. Bostock, who criticises with great care the experi- " ments on respiration made before he published, was aware " of the relation alluded to, but contented himself too " easily by giving an approval of Sir G. Blane's estimate " of 600 cubic feet of space for every man. This allowance " is about twice the amount of air a man respires in 24 " hours. Dr. Reid, when he published about eight years " ago, recommended from three to five times the amount in " cubic feet of the air respired, that is from 1,000 to 1,500 " cubic feet; and it has been very lately announced that " the Hospital of King's College, London, is to have wards " to contain 14 beds, with a minimum of space of 1,800 " and a maximum of 2,400 cubic feet for each patient. " These numbers represent nine times and twelve times re- " spectively the amount of air respired in 24 hours. It will " give, perhaps, a clearer conception of these differences to " state, that a space $8\frac{1}{2}$ feet in length, breadth, and height, " contains a little more than 600 cubic feet. Ten feet in " the dimensions mentioned contain 1,000 cubic feet. " Twelve and one-sixth, in the same way, give 1,800 cubic " feet. For 2,400 cubic feet the space must measure, in " the three dimensions, nearly $13\frac{1}{2}$ feet, and for 3,000, " almost $14\frac{1}{2}$ feet. Two modes have been adopted for " estimating the space required for each individual. Find- " ing the amount of air respired, it has been multiplied a " given number of times, and the product according to the " multiplier assumed as the space required. Thus a late " writer states (*Tomlinson on Warming and Ventilation, Lon- " don*, 1850,) as follows:—' In the process of respiration a " ' full grown man draws into his chest about 20 cubic " ' inches of air, only one-fifth of this is oxygen, and nearly " ' one-half of this oxygen is converted into carbonic acid. " ' Now, allowing fifteen inspirations per minute for a man, " ' he will vitiate about 300 cubic inches, or nearly one-sixth " ' of a cubic foot of atmospheric air, and this by mingling " ' as it escapes with several times as much, renders at least " ' two cubic feet of air unfit for respiration.' This esti- " mate gives air respired in 24 hours 250 cubic feet, and this " multiplied by 12, the number stated, viz., $\frac{1}{6} \times \frac{12}{1} = 2$, is " 3,000 cubic feet. The other mode is to find the amount of " carbon expired in 24 hours, to calculate the oxygen this " requires to convert it into carbonic acid, and to determine " from this the quantity of pure air necessary to be respired " in order to supply the requisite amount. Thus the same " writer says,—' From a comparison made by Professor " ' Miller, of King's College, of the result of numerous " ' experiments, it appears that a man of ordinary stature " ' consumes in the course of 24 hours 9 oz. troy of carbon; " ' that the heat generated is sufficient to boil away 8 lbs. of " ' water; that the consumption of oxygen on this process " ' is equal to 24 oz., or 19·4 cubic feet, that the quantity " ' of air vitiated amounts to 97·2 cubic feet, and the pro- " ' duct in carbonic acid to 33 oz.' By the quantity of air " vitiated here is meant the amount from which the oxygen " is wholly withdrawn, which is just five times the oxygen " consumed. But the quantity of air respired is twice as " much; for only one-half the oxygen inspired is consumed " during each respiration. The air respired, therefore, by " this mode of calculation is nearly 200 cubic feet in 24 " hours. Now, nine times this amount is 1,800 cubic feet, " and twelve times the same amount is 2,400 cubic feet; and " these are precisely the results, as they were most probably " the data, used in determining the construction of the " new hospital of King's College, and they approximate " pretty closely to those found by the other method before " explained."

" These are the rules for guidance on a subject scarcely " yet fixed on settled principles, and which, when better " understood, will create a demand for yet greater space in " buildings. It remains, however, to inquire how far they " are consistent with propriety and suitable to the end in " view. The carbonic acid being the most abundant of the " noxious products thrown off in respiration, and most " easily measured, is taken as the basis of the calculations " regarding space and ventilation. The mean amount of " carbonic acid in ordinary atmospheric air is about $\frac{1}{2000}$, or " ·0005. The amount in air expired is about $\frac{1}{12}$, or ·083; " and in air vitiated to this degree combustion ceases, and " plants and animals cannot live long. Practically, then, it " may be assumed, that respired air contains $\frac{1}{10}$, or ·1, of " carbonic acid, and this must be diluted 10 times to make " the air safe. Thus $\frac{1}{10} \div \frac{10}{1} = \frac{1}{100}$, or ·01, and this again " divided by 10, or $\frac{1}{100} \div \frac{10}{1} = \frac{1}{1000}$, or ·001, gives the " amount of ventilation needed to reduce the air to that state " of purity that only $\frac{1}{1000}$ more of carbonic acid should be " added to the air, when it would be represented by ·0015 " instead of ·0005. Observing this rule, and taking 300 " cubic feet to represent the quantity of air respired in 24 " hours, to dilute it 10 times it must be mixed with 10 times " the same bulk, or converted into 3,000 cubic feet, the space " to be allowed for one individual. But if it is wished to keep " up a pure air, it must be mixed with 10 times this bulk " again, or 30,000 cubic feet, which shows the ventilation " needed to maintain an atmosphere nearly pure. In other " words, there must be admitted into the space of 3,000 cubic " feet nearly 21 cubic feet per minute of fresh air by ventila- " tion, if the individual confined in it is to breathe an atmos- " phere which shall contain only three times more of carbonic " acid than the air he breathes originally contained. Or " again, 300 cubic feet, 3,000 cubic feet, and 30,000 cubic " feet, mark the requirements of one individual in 24 " hours for respiration, space, and ventilation respectively."

" These are the conditions necessary to maintain a pure " air according to the data made use of. There are, how- " ever, other facts to be adverted to which, wherever they " exist, and some of them always exist, render still more " imperative the claims put forth for space and ventilation. " These it is not needful to illustrate at length; the enu- " meration of them will suffice. They are a humid air, " high temperature, the privation of oxygen in respired air " as well as and nearly equivalent to the vitiation by car- " bonic acid gas, and lastly, the watery vapour, laden with " offensive animal matter, exhaled from the skin and lungs " during respiration. The last of these is especially impor- " tant. It has been stated that ' the odour of the air at " ' the top of the ventilator of a crowded room is of so " ' noxious a character that it is dangerous to be exposed " ' to it, even for a short time. If the air be passed through " ' pure water, the water soon exhibits all the phenomena " ' of putrefactive fermentation.' To the same cause, also, " is due much of the effect described in the following " quotation:—' In the houses of the poorer classes in " ' Russia, where the windows are single, and a number of " ' persons occupy a small stove-heated room, a thick icy " ' crust forms on the inside of the windows during frosty " ' weather, arising from the condensation of the breath, " ' perspiration, and the aqueous fumes of candles and " ' of the stove, &c. When a thaw comes on, the icy crust " ' is converted into water, and a deleterious principle is " ' disengaged which produces effects similar to those " ' arising from fumes of charcoal. Persons so affected " ' are immediately carried into the open air and placed in " ' the snow, with very little clothing; the temples and the " ' region of the stomach are well rubbed with snow, and " ' cold water is poured down their throats, and the friction " ' is continued until the livid hue of the skin disappears, " ' and the natural colour is restored.' With these effects " we may contrast those of a purer air. For instance, a " manufacturer puts a ventilating fan in his factory to " remedy the evils of a highly vitiated air. The result is, " the people apply for higher wages, because their appetites " are keener, and they require more food. The veterinary " surgeons recommend ventilation for stables, and the " annual saving to the British Government is 10,000*l.* per " annum. The effects of condensed air are very similar, and " perhaps for the same reason, that more oxygen is breathed, " under circumstances favourable in other respects to the " healthy functions of the body. There is felt a pleasant " sensation in the chest; there is increased vigour of body " and of mind, with improved condition of some diseased " states, and more effective performance of some healthy " actions."

" These considerations, with others which need not be " adduced, occasion reasonable apprehension that many " evils in barracks and hospitals accrue to the men from " want of space and ventilation; and in any place, as in " Colaba, where other injurious influences are also at work,

" the respective effects of each separate cause are aggravated " by reciprocal reaction."

Passing on now in the progress of events and the history of opinion, I extract from a public document, namely, *Budget of Public Works of the Presidency of Bombay*, 1857–58, dated April 15, 1857, the following:—" The desirable- " ness of establishing some general rule for fixing the " amount of space to be set apart for each man in the " hospitals of European troops of this presidency was in " the beginning of 1853 brought under the consideration " of Government by the late Lord F. Fitzclarence. His " Lordship considered it of great importance that a fixed " rule on this subject should be adopted and enforced, in " order to prevent overcrowding in hospitals, and also to " enable the medical authorities to know at all times with " correctness the amount of suitable accommodation avail- " able for troops."

" After consulting the Medical Board on the subject, " this Government, in accordance with the Board's recom- " mendation, decided that 1,800 cubic feet per man should " be made the standard in the hospitals of the Bombay " presidency.

" Subsequent to the adoption of the above standard, the " Commander-in-Chief pointed out that nearly every Euro- " pean and military hospital in this presidency was deficient " in accommodation, and required to be considerably " enlarged. In this opinion, which was supported by the " Medical Board, the local Government fully concurred."

With the affirmation of this rule, if it may so be called, which indicates a slight advance in the opinion of the Medical Board upon that before alluded to, the matter rests. Lord F. Fitzclarence died in 1854, and in 1857 the public works were suspended; and in this breathing time it is important to inquire whether the decision come to by Government be adequate to the necessity of the case. In the first place, no mention is made of barracks, and it is presumed the space of 1,800 cubic feet was not meant to be allowed in barracks. If, then, this amount of space be barely sufficient for hospitals, and less be allowed in barracks, then, to say nothing of ordinary occasions, whenever the weather or other cause constrains men to occupy the barracks more than usual, or a greater number of men than usual is put into barracks, the space is too little, and health must suffer. But for hospitals even the space is insufficient. Did this opinion rest simply on my own decision of the question, however firmly and in good faith I might hold it, still I might hesitate to give it prominence; but it happens that I can adduce authority which will command respect. It was shown before that space and ventilation are inseparably connected, and it would not be possible to give dimensions to a building, as a habitation for living beings, which should obviate the necessity of ventilation; in other words, renewal of the air of the interior which supplies the inmates with air for respiration. It is evident also, that for health in buildings, just in proportion as space is small, so is the need of ventilation greater. Now, when 1,800 cubic feet is decided on as the space in hospitals, there is no provision for ventilation, and no one is in condition to say that ventilation is duly performed. It is left to the operation of doors, windows, and some few apertures in the roof or elsewhere, and to the action of the outer air, which of course daily, perhaps hourly, varies, as the temperature, force, and direction of the winds vary. It cannot be denied, then, that where ventilation is so uncertain, and may altogether fail, as in calm weather it must, the greatest limits of space are very necessary; and it will appear yet more evident when the matter is put in another light. In the *British and Foreign Medico-Chirurgical Review* for April 1860, in the article on the site and construction of hospitals, when the reviewer treats of ventilation, he says, "The French hospitals " contracted for a supply of 2,220 cubic feet of air per bed " per hour." But "to give," says Dr. Sutherland, "the " air of a ward the highest degree of freshness, the amount " of air passing through it should be at least double the " amount required by the French hospital contracts, or " about 4,000 cubic feet per bed per hour."

We shall suppose, then, as we have reason to do, that the wards here spoken of allow 1,000 cubic feet per man. Let us next convert the hourly supply into that of 24 hours, which conversion gives for the French hospitals 53,280 cubic feet per diem, and for the proper amount, nearly double as Dr. Sutherland says, 96,000 cubic feet per diem. These sums bear to 1,000, the cubic space per man, the proportion of 1 to 53 and of 1 to 96, that is, in the former case the air must be renewed 53 times, and in the latter 96 times per diem. But what it is important to observe is this, that were the space in the French hospitals doubled, or made 2,000 cubic feet instead of 1,000 cubic feet, then, though the renewal of the air be half the number of times only, yet the purity of the air in either case would be the same. And the reason is not obscure, for the air of the smaller hospital is contaminated twice as much, and requires twice as much ventilation, that is renewal, to maintain the same degree of purity. Observe, again, for confirmation of this fact, that it is the same amount of air in either case which is needed for ventilation. The difference consists only in the rapidity or number of times with which air equal in amount to the contained air is transmitted through the hospitals. Now, if the hospital with the space of 1,000 cubic feet per man requires 96,000 cubic feet of new air per diem per man, or necessitates the renewal or change of the air 96 times, the hospital with space per man of 1,800 cubic feet requires only 53,333; for as 1,000 : 96,000 :: 1 : 96, and as 1,800 : 96,000 :: 1 : 53,333; and what immediately concerns the result of this investigation, as 3,000 : 96,000 :: 1 : 32. It follows, therefore, that the hospital with space of 1,000 cubic feet per man must have new air 96 times a day; that whose space is 1,800 cubic feet 53 times a day; and that whose space is 3,000 cubic feet, only 32 times a day. The first is possible only by the aid of strong mechanical means; the second would require, probably, less expenditure of force, and would not be independent of it; and the third only approaches the conditions which would probably make natural spontaneous ventilation effective to maintain the purity of the interior air. The conclusion is, that for Indian barracks and hospitals, if they must be built, and the latter, it is presumed, must be built, 1,800 cubic feet, unless in conjunction with artificial ventilation, is greatly too little; and that two alternatives offer themselves to remedy the defect—either to enlarge the space or to employ artificial ventilation.

It has been, perhaps, noticed, but may with propriety be pointedly referred to, that provided, as is probable, Dr. Sutherland's calculation proceeds on the *datum* of a space of 1,000 cubic feet per man, the conclusion he comes to agrees well with that which was stated in the foregoing part of this paper, for 1,000 × 96,000 = 96,000,000 differs but little in such a calculation from 3,000 × 30,000 = 90,000,000. Add but 2,000 cubic feet to the ventilation in the latter case, that is, make the 30,000 32,000, and the result is precisely the same. This is the more satisfactory, as the aim of both calculations was identical. This design he announced to be " to give the air of a ward the highest degree of " freshness," and in the foregoing pages it was said, "There " must be admitted into the space of 3,000 cubic feet nearly " 21 cubic feet per minute of fresh air by ventilation, if the " individual confined in it is to breathe an atmosphere " which shall contain only three times more of carbonic " acid than the air he breathes originally contained." The only sound principle in this question is the maintenance of a pure air. Data may differ. Calculations may reach the same result by different ways, but if the ultimate end be not a pure air, nothing is right, nothing thoroughly effective. And it is to be borne in mind, when the means to accomplish this end are considered, that space and ventilation bear an inverse ratio to each other, that as space increases ventilation becomes less, and that they may reciprocally bear that relation to each other, when ventilation shall become easy, or, perhaps, natural and spontaneous.

One who reflects carefully on these things, who sees the direction they point to, and would wish to realize the facts of speculations like these, would be wholly destitute of foresight, if he did not anticipate an objection, which will be immediately raised. It will be said, the increase of space you require is enormous, the expense would double that of the erection of the present hospitals and barracks. This view of the question may be admitted. Probably, indeed, the truth of it cannot be disputed. But it may be urged that this view presents but one side of the account. There is another, which it is the duty of professional men to try to exhibit. Against the expenditure in money we have to show the removal of lessened vigour and vital energy, of languor, lassitude, and discontent, of impaired health, vitiated moral tone, of disease often, and deaths not seldom, the results not obvious to sense, undeniable in reason, of the contaminated air of barracks and hospitals. But who shall estimate in money value the difference between an army moral and effective at all points, and one debased in character, and deteriorated and inefficient in physical condition? There is yet another side of this question, which appeals to the sensibilities of men. We demand for men every where, we judge imperative for those whom we would maintain in health, good and pure water, good and clean food, and we are sympathized with, and it is considered a great evil when matters are otherwise, and would be regarded a monstrous, an intolerable grievance to insist that impure and bad water, bad and impure food, should be made use of: here where matters are more patent to observation and better understood, the state of feeling corresponds at least in some degree to the necessity, and it provides against or exposes where they exist, and removes evils of

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this description. But air is more necessary to man than even food and water; and pure and good air is as imperatively wanted as pure and good food, or pure and good water, nor is it in reason in any degree less unseemly that men should content themselves with, or be constrained to submit to, impurities of the one kind any more than to those of the other. If besides the injury be taken into account, it is, perhaps, just as great or greater in the instance of impurities of the air than in those of food and water. The harmony of the being and constitution of man with the physical conditions of the world which surrounds him is so perfect that nature cannot be violated by ignorance or artificial arrangements, without injury, loss, and embarrassment; and we may safely repose that confidence in that harmony which shall enable us to observe it as a rule of duty; and if, in following it out in this instance, the soldier receives the benefit of what best promotes his well-being as a man and as a moral and religious being, and amongst other things of the purest air, the result it cannot be affirmed will be inexpensive. The expenditure, however, will be the most profitable, the only suitable, well laid out in performance of a solemn duty, and in maintenance of the efficiency of that force which gives security to the common interest, upholds the throne, maintains the administration of justice in mercy, and repels, if that evil day should come, foreign invasion.

MEDICAL POLICE.

In the year 1843 I served in a committee at this station, the object of which was to report on the conditions prejudicial to health existing in cantonments, and to point out remedies. The analogy of this climate to that of the Persian coast was pointed out, the existence of fever inferred as probable, the peculiarity of this place in the limited quantity of rain was dwelt on, and the necessity of peculiar care and assiduity in sanitary matters enforced from this consideration. The reason of appointing this committee was the prevalence of sickness at the time. A year of very great sickness and mortality followed elsewhere in Sinde, and the sickness which existed here was, perhaps, on that account less observed, and little or nothing was effected for cleansing the cantonment. When first occupied, Kurrachee was esteemed and reported by Dr. Cahill, an intelligent observer, as peculiarly healthy. My own note of the place, when I first landed here, in November 1839, was, "Kurrachee has now been occupied for upwards of 12 "months, and has acquired, though I think hardly with "justice in so short a time, a reputation of peculiar "salubrity." It was occupied in the year 1838. It lost this character, as is evident from the formation of the committee before alluded to; but it was not till 1846 that it was signalized by an outbreak of cholera, sudden and terrible, which gave it a bad eminence, never to be forgotten. Out of a force of 6,626 men bearing arms, almost in equal numbers Europeans and natives, including women, children, and native followers, the deaths in different hospitals were 915 out of 1,841 attacked by the disease between June the 14th, when it made its appearance, and July the 11th, when it ceased. In four days, from 15th to 18th inclusive, there were admitted on an average 203, of whom on an average 110 died daily. Two regiments suffered in an especial manner. In Her Majesty's 86th regiment, out of 434 seized, of whom were 18 women, five children, and one native follower, 258 died, of whom 15 were women, four children, and one native follower. In the 1st European regiment Fusiliers, there were 252 admissions, of whom six were women, six children, 19 native followers, and of these died 103, being men 83, women five, children three, and native followers 12. Cholera had prevailed sporadically for about 12 months previous, but before that time also had prevailed, but never with such dread severity. Now, passing all other circumstances without notice, and some of them are not unimportant, such as the dearth and scarcity of provisions at the time, it is very desirable that it should be distinctly known, as Dr. Arnott informs us, that the state of camp and neighbourhood at that time was most obnoxious, and as much neglected as if medical police had never been heard of. In No. II. New Series of *Transactions of the Medical and Physical Society of Bombay*, page 182, published in 1853, Dr. Arnott mentions sources of disease common to all regiments then at the station, and then he says:—"But "there were others peculiar to the position of the camp of "Her Majesty's 86th regiment and the Bombay Fusileers. "They lay still further to the eastward or leeward of the "other lines, and of the suddur bazaar. Between the "latter and these camps . . . was a large piece of "bare waste ground, where all dead animals, the cleanings "of necessaries, the sweepings of streets, and where in fact "most of the filth and offal of the camp was deposited. "The accumulation of putrid animal and vegetable matters "was enormous." He states that the Fusileers had been too long encamped on the same ground, that the tents were crowded, and the ventilation little attended to, and then adds,—"Under these circumstances there was "certainly enough, if not to engender disease, at least "to encourage its propagation and extension. And "I have always viewed them as accounting for the "intensity of the attack in these two regiments." Had this fact been known to Dr. Carpenter, *Human Physiology, Ed.* IV., 1853, pp. 519-50, he would have found in it, it is presumed, a more efficient cause of this disaster than even previous fatigue and overcrowding, which, no doubt, the latter especially, were very prejudicial. His analysis of the features of the case omits this scandalous impropriety, and is somewhat inaccurate in other particulars; but his conclusion that corrupted air gave intensity to the malignant scourge is only more confirmed by the fact, judiciously recorded by Dr. Arnott. Kurrachee, in 1839, was healthy. In 1843 fever prevailed severely. A peculiarity, elsewhere observed by others in situations where corrupted air infested the locality or the antecedents which generate it, abounded, was very frequent in Kurrachee in 1843. It was experienced amongst others by myself. At meals principally, or immediately after, without much warning, uncontrollable nausea and vomiting suddenly appeared and quickly subsided, without other obvious derangement of health, previous or subsequent. In 1846 the unhealthiness of the place culminated as has been related; but frequent sickness and cholera in milder forms prevailed afterwards, especially in the years 1851 and 1852. In the former year, in April, by the foresight and energy of Sir Bartle Frere, then Commissioner in Sinde, a committee of conservancy was formed, and of this committee, in November of the same year, I became secretary. The appointment of this committee was the first step to sanitary improvements in Kurrachee. In less than one month from its formation, the resolution for the erection of furnaces was passed, at first only experimentally; but the existence of many of these erections now gives a feature peculiar to itself to Kurrachee as respects the outskirts both of the town and cantonment. In 1852 the practice of the inhumation of the waste and filth of the jail was carried out by the committee, a practice which to this day beneficially continues. The operations of the committee were limited and embarrassed by want of funds; for available resources were yet small, and all the suggestions of the committee could not be immediately embodied in the material accomplishment of their designs. It was therefore reserved to Sir John Hall, on his visit to this place as Deputy Inspector-General in the early part of the year 1853, to point out, as he did most forcibly, the unreformed nuisance which had existed since 1846 and shed its baneful influence ever since, though not with such awful virulence as marked the calamitous cholera of that year. By his report the interest of Lord F. Fitzclarence was roused, and thus a new and happy impulse was given to sanitary improvements at Kurrachee. By additional furnaces, by increased establishment of those employed in the cleaning department, and by better supervision, the most prominent evils were completely removed and a system set agoing which rendered the recurrence of them impossible. It cannot be said that all is even now as it ought to be; but there is a readiness to recognize defects,—a great contrast to former times,—which consist principally in the yet too limited establishment, and which there is reason to hope will be removed.

But little interest, it may be thought, attaches to a narrative like this. Perhaps even it may be judged by a severer censor that, through partiality and an overruling estimate of local concerns, it is sought to give undue prominence to what does not merit deliberate consideration. Let us then revert to the facts already noticed: at first Kurrachee was healthy; gradually the health of the place deteriorated, and the year 1846 makes it memorable as the theatre of one of the most calamitous epidemics recorded in the annals of medicine or of history. Nor was it till after the year 1852 that the place enjoyed an immunity from yearly attacks of fever and often of cholera. But this is exactly the era of the sanitary reforms, and the removal of obnoxious practices and nuisances is precisely simultaneous with the cessation of epidemic disease. No one can consider the history and connexion of these facts with due care and avoid the inferences that neglect of sanitary police and the presence of disease, and, on the other hand, attention to police and the cessation of disease, which they fully establish, stand in this case in the relation of cause and effect, that it is not hopeless to set limits to the most virulent diseases, and that were due precautions, such as science indicates and experience confirms, had recourse to, life would be saved, much misery averted, and climates, without changing character, would lose the terrors and the dangers which environ them, which impair the enjoyment of life, often curtail it, and add incalculably to the expense of the government of the country. It must be

admitted that this year, contrary to expectation, cholera visited the place. It advanced from the eastward, invaded several villages, appeared at the harbour, at Keeamaree, in the town and jail, and, lastly, in the cantonment. The incursion, however, was brief, the numbers attacked limited, and the deaths few absolutely, and even more so relatively to the actual amount of the developed disease. There have been then seven years of exemption from the disease with diminished sickness in other respects, and, in the eighth year, an attack which one cannot but characterize as mild, and this, though it qualifies yet cannot set aside, and scarcely, when we make allowances for other circumstances, invalidates the general result.

This result certainly merits attention as an instance of the effect of sanitary measures, and the good which ensues when they are pursued on an adequate scale; and, as before hinted, this result, confirmed by experience, is indicated also by science. The geologists in some of their sketches picture to us the naked crust of the earth, then the disintegrated mountains, next the decomposition of the fragments thus freely exposed by the agencies which operate on them. Plants spring up after this, and the mixture of organized products with the inorganic transforms the sandy soil into fertile mould, increase of vegetation goes on, and, lastly, animals appear upon the scene. Now in the earlier stages of this process, and in all that we recognize then in the inorganic constituents of the earth and air, there is found nothing noxious to the life and health of animals. Organization afterwards gives rise to new compounds and new products, and when these, as waste refuse material, are accumulated in neglected masses, in the process of reduction to simpler combinations, the result of ordinary chemical affinities when the cessation of vitality has left the organized structures an easy prey to them, gaseous compounds are formed prejudicial to health, and which are capable, some of them, of a power passively or more actively to extinguish life. Connected with this subject, in the report on Colaba, I had occasion to observe "earth, air, " and water, though viewed very differently in ancient and " modern times, are still the great elements which influence " man's condition and development, and the health he " enjoys. They are simple, harmless, beneficial in them- " selves. The necessities of vegetable and animal life, the " action of living properties, and the affinities of organized " products resolve them into new combinations, and some " of these are highly injurious. It is the object of science " to disclose and unveil all evils of this kind, and of " science, practically applied, to obviate and remove them, " and a generous confidence in the harmony of man's con- " dition with his duties and enjoyments ought to make us " slow to believe that any natural evil is beyond the control " of science rightly directed or without a remedy of which " only lack of industry or of sagacity may obstruct the dis- " covery and the application. Nor when we pass from the " more tangible objects comprised under these divisions " to the consideration of the imponderables,—heat, light, " and electricity,—is there found any fact which renders " the judgment of nature and of science which has been " announced visionary or untrue." Man received commandment to increase, multiply, and fill the earth and subdue it, and more especially in regard to that portion where his lot was cast to dress and keep it, and it is evident that his success in compliance with the former part of his obligation is dependent on his diligence in the execution of the latter part of his office. Nor is this true simply as respects subsistence, but as respects health and well-being also. He dresses the earth for food, but if he neglects to keep it, to return to it what he takes from it, the accumulated waste materials will accuse him and punish him for neglect, and the earth itself will fail to yield its increase. Thus uncultivated marshes generate ague, torment and kill men, but, drained and cultivated, they are beautiful, healthful, and produce food for man and beast. The waste of animal matters, recrementitious products of the arts, or decaying products of organization left to diffuse the noxious gases that arise from them into the air, contaminate it, and affect the health, longevity, and productiveness of man, teach him, if he will hear, how he has neglected his duty to the earth and himself, and warn him to dress the earth and keep it. Towns and camps, where medical police has failed to remove noxious matter, have often afforded proofs and illustrations of this hurtful ignorance and prejudicial neglect of duty. Kurrachee was an instance of this kind, and though at this place the condition of agriculture and the prejudices of the people in great measure rendered it impossible to return immediately to the earth for fertilizing purposes the waste products of busy industry and civilization, yet the partial compliance with the great primitive commandment carried out by the inhumation of noxious substances and their assimilation with the soil and the dissipation of their elements by incremation and their transmission through the air to feed the vegetation they should come in contact with. Even these imperfect modes of freeing the station from impurities have been attended with results most evident, efficient, and satisfactory.

The chemist takes a small piece of rock, submits it to his refined analysis, and ascertains with precision the ultimate components of it, and their respective proportions. He knows then, without further research, that he can affirm correctly what are the ingredients of the mountain from which the fragment was taken, of the chain of mountains to which the first belongs, of other chains, possibly, which stretch into other countries, or even of those, perhaps, which exist in countries divided by the ocean from that which afforded the specimen subjected to his analysis. And, however this may be, he is at least certainly in condition to declare, whenever a substance which possesses the same sensible and physical properties as that examined by him offers itself to his notice, that the components of it are identical with those of the portion of rock the constituents of which he had determined. Universally in nature the same results are yielded by homogeneous substances when chemically analysed. The same universality belongs to experiments in physical science. When Pascal found that the column of mercury varied in height, when measured at the bottom, middle, and top of the Puy de Dome, he felt quite sure that the same result would be found on any other mountain by any other philosopher who should make the experiment. Uniformity of antecedents produces uniformity of consequences also. In medical and in sanitary matters the same principle eminently applies. How many thousands of important decisions are made daily by the application of analysis, and how fruitful is this procedure in good results. But how few comparatively are guided by the results of actual and immediate experiments. The few labour, and the many enter into their labours. Experimental philosophers and discoverers are rare, but innumerable are those who, by the knowledge of their discoveries and the use of analogy, reap the fruits of their sublime achievements, and confer untold benefits on the world. This principle, though constantly operative, is no doubt obscurely recognized; and the reason of this is, that it is often prejudiced by misapplication. Were it possible, by due discrimination, to secure identity of circumstances in the matter dealt with, compared with that to which by analogy we liken it, there would be no disappointment in results. The event would answer expectation, and the principle would be as familiar and well known as its effects would be evident and beneficial. In inquiries in science this precision is attainable, and the progress in knowledge corresponds; but in the vast multitude of the world's mixed affairs discrimination is often at fault, perfect adaptation and similitude neither can be effected nor offers itself, the conclusions we desire and anticipate come not into view, or come denuded of their splendour or mutilated in their fair proportions, and then doubt, mistrust, and suspicion attach to the principle and procedure, which ought rather to be attributed to him who has made a wrong application of them. In applied science, therefore, the obstructions are formidable, the world is incredulous, and progress is slow; yet sure it is, though slow. And just in proportion as care and discrimination are used in the application of principles in practical science, established by experiment or example, to cases in actual life, just in the degree there is attained a conformity of conditions or circumstances between these original examples or experiments and the analogous cases which present themselves, just in that same degree and proportion shall results conform to expectation, effects to principles, and then shall the application of them, by analogy, stand vindicated to all the world. Practical ability consists in the perception of these analogous conditions, and he only profits by experience who learns readily to apprehend and rightly to use them. The sanitary measures resorted to at Kurrachee may be regarded as bearing a double relation. When it is considered that examples innumerable have established the principle, just as if it had been ascertained by so many experiments, that impurities caused by waste and excrementitious vegetable and animal matter contaminate the air, which, being respired in this state, originates disease in the human frame, that the removal of these impurities where they exist, or the prevention of them, removes or prevents disease, and when by analogy use is made of this principle, and the cleanliness it demands is realized in Kurrachee, and the exemption from disease which was expected is experienced, the measures adopted here are in that case neither an original experiment nor a deduction from numerous observations, but the application of a precept or principle by analogy; there is no novelty and no uncertainty in the matter; on the contrary, the precept receives additional illustration and confirmation from the new example. Again, if we look at the measures put in use here, not in reference to the principle that guides

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them or the end proposed, but in respect to the means by which this is effected, there, it is seen, are peculiar, and perhaps merit some separate consideration. It might almost seem, indeed, that in this view what has been done here may claim the rank of an original experiment; original only, however, it is in the means employed and in urging the necessity of the strictest sanitary police for the health of troops in camps or cantonments; and in holding up Kurrachee as an example pregnant with instruction, it is to be observed that what is demonstrated and enforced by it is cleanliness. If it be thought and said that the means used here, the burning in furnaces and the burying in trenches of the waste matter of the town and cantonment, are simple, easily worked, and admirable in their effects, and therefore worthy of imitation elsewhere, this is quite a secondary affair. What is really insisted on is an absolutely perfect system of sanitary police. The means by which it is carried out may vary indefinitely, but that method only is the best which, without damage done to any other private or public interest, combines cheapness in cost, ease in working, and efficiency in result. It is the object, then, of these remarks strongly to insist on the benefits of sanitary police at Kurrachee, to urge the adoption of similar measures in every standing camp or cantonment or town in India, and if no better means suggest themselves, to recommend the use of those which have been employed at Kurrachee.

It remains to present in brief form the conclusions established and measures recommended. Drunkenness, the parent of crime, disease and death, is an obtrusive, obnoxious habit in the army. All endeavours yet made to eradicate the evil have failed. The great step to be made in order to extirpate drunkenness, that without which other means will prove abortive, is the abolition of the canteen. Prostitution, which produces five times a greater amount of venereal disease in European regiments than what exists in native regiments, ought not in any way to be sanctioned, nor ought any regulations except those which are repressive to exist on the subject of prostitution. Marriage, on the other hand, the only effective remedy for immorality and for venereal disease amongst the troops, ought not to be restricted, but free, and the additional cost which might follow, if any follow, should be asked for from the nation, which must have troops, and would choose rather to have moral, healthy, effective troops, and would willingly pay for them. As respects accommodation, that hitherto supplied to troops has been extremely defective, nor has the nature of the structures in barracks and hospitals remedied the defect. Two alternatives exist if a remedy be sought. These are enlarged structures or ventilation. Space in buildings and ventilation bear an inverse ratio to each other, and as in India artificial ventilation does not exist, ample space is all the more requisite. This space must always be required in hospitals, but if the expense for barracks be too great, another course, not before indicated, may be adopted in lieu of barracks. Following the example of native troops, let the men marry and live in cottages. These aggregated and constituting villages, would resemble the lines of a native regiment. Perfect cleanliness in every town, station, camp, cantonment in India should be observed. Waste matter of every kind should be with the greatest care and promptitude reduced to innoxious forms, and if not applied to agriculture or other useful purposes, disposed of as at Kurrachee, by incremation or inhumation. If we suppose the troops have good water, good food, good clothing, and good medical attendance, the measures enumerated above seem to be those which make the complement of what is needed to constitute a perfect sanitary system for the army. They are not less important, though less obvious and appreciable, than those advantages which we assume the troops to enjoy. Their importance is such that no greater benefits, when we except divine grace, which no act of man can convey, can be conferred on the troops. The want of them vitiates much good. The attainment of them therefore is a double benefit. In the removal of evil, in imparting good, in the emancipation from pernicious influences, and restrictions, and in bestowing those privileges and advantages on the troops, the ravages of immorality, disease, and death will be checked, many valuable qualities will be brought into being, the soldier will rise in new splendour and dignity, become an example to the nations, and adorn the religious character of his country, to which he has too long and too often been a blot and a reproach.

It remains to make one remark. It has been said by a high authority, European soldiers cannot maintain health or vigour in the plains. Without disputing the statement, the fact, it is averred, has not been proved. The statement it may be said, rests on experience. But the experiment has never been made, nor experience gained in circumstances which command respect. If the foregoing remarks prove anything, they show that the conditions of the experiment have never yet been pure and simple, that the accessory conditions have produced disturbing effects, and vitiated the results. What is called experience, therefore, in this case is fallacious. We may not affirm that the assertion is wrong. We affirm that the conclusion is premature. This point is to be decided only when the conditions of the experiment have been purged. Then only shall we attain a conclusion, as derived from the unmixed conditions of the case, on which reliance may be placed. This remark applies to the plains generally, as also specially to many stations, pronounced unhealthy, when the experience which decided the question was both far too limited and obtained under circumstances which, as they vitiated it, should have robbed it of the confidence hastily reposed in it. Again it is repeated, purge the conditions of the experiment of all accessories that complicate and vitiate it, then begin anew, note what happens, and adopt it as conclusive, for then only are we following the rules of philosophy, then only reaping facts which as the fruit of genuine experience are entitled to confidence and respect.

I have the honour to be,
Sir,
Your most obedient servant,
D. GRIERSON, M.D.,
Surgeon Major, Staff Surgeon.

Kurrachee, 31st December 1860.

NEEMUCH.

Accommodation	Queen's Troops	Artillery	148
		Cavalry	119
		Infantry	665
	Native Troops	Cavalry	316
		Infantry	783

References to Subjects and Queries.	REPLIES.
1. TOPOGRAPHY.	1. The country within five miles of this station is flat, undulating, rocky, and dry. There is no wood or jungle in the vicinity, and no water of any considerable extent. 2. The station is elevated about 1,476 feet above the sea; but is on the same level as the adjacent country. It is from 10 to 12 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest mountains are at a distance of about 70 miles from the station. 4. There are two nullahs within camp limits, which contain running water for about nine months in the year. There are several nullahs and small rivers within five miles of the station. The vicinity is not liable to inundations. The ground is slightly broken and irregular along the banks of the nullahs, which almost encircle the station, and is doubtless a source of malaria during and after the rains. 5. The western side of the camp is well exposed to the prevailing winds, and is not encumbered with trees, &c., nor sheltered by higher ground. The eastern portion is shut out from the prevailing winds by the bazaar. The temperature of the station is not raised by exposure to reflected sun heat. For four months of the year cold north and north-east winds prevail, and for the remainder of the year west and south-west winds. The station is

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	too far inland to derive any benefit from the sea breeze. The dry north-east wind appears to predispose to hepatic affections and rheumatism. 6. The country surrounding the station is cultivated; but there are no works of irrigation near it. There is no cultivation of rice or indigo, neither is the preparation of hemp or flax carried on near it. 7. The town of Neemuch is within half a mile of the station. The population varies from 8,000 to 10,000. 8. The ground on which most of the buildings in camp stand is a red soil with a substratum of trap, and indenting and encircling the camp is a belt of black soil. The ground has not been occupied previous to the erection of the station. 9. On the lower ground water is to be obtained at a depth of 19 feet during the dry season; whereas on the higher ground the wells run dry. During the rainy season water is to be found at a depth of from three to five feet below the surface. 10. The natural drainage of the station is good, and there is no lodgment of water even after a heavy fall of rain. The subsoil being impervious, the drainage is entirely on the surface, the water finding its way to, and being carried off by the nullahs. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from wells; but is not stored in tanks. There is a tank within a short distance of camp, containing water for about 10 months in the year; but it is not used for the purpose of supplying the station with water. It does not contain either plants or animals. The wells which contain drinking water are not liable to pollution from leaves or other impurities falling into them. No surface impurities can drain into them. No nuisance or malaria proceeds from either the tank or wells. 12. There are 39 wells in camp, which give a sufficient supply of water. The water is hard, but good, and there are no marked peculiarities in its colour, taste, or smell. The water is raised and distributed by water-carriers specially employed for that purpose. Any further supply can be obtained, when desirable, by sinking other wells. 13. There are no other topographical points on which to remark. 14. All stations are selected by a military committee composed as follows:—One officer of the quartermaster-general's department, one medical officer of superior rank, and an officer of rank and standing, together with a civil officer in charge of the district. No improvements can be suggested.
II. CLIMATE.	1. The only instrument available at the station for conducting and registering meteorological observations, is a common thermometer. 2. Table of meteorological observations from 1st January 1860 to 31st December 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Winds, Storms, &c.
		°	°	°	°			°					
January -	—	55	18	62	49	—	—	75	0·00	N.E.	Moderate.	—	Cloudy. A light shower of rain fell on the 22nd.
February -	—	60	21	71	50	—	—	84	0·34	Variable.	Calm.	—	Cloudy on the 20th.
March -	—	70	23	80	60	—	—	97	0·00	W. & S.W.	Moderate.	—	
April -	—	81	22	92	70	—	—	97	0·00	W. & S.W.	High Winds.	—	
May -	—	84	20	94	75	—	—	94	0·31	W. & S.W.	High Winds.	—	Cloudy on the 16th.
June -	—	80	17	82	78	—	—	82	1·65	W. & S.W.	Monsoon from about the 20th, occasional storms.	—	Cloudy on the 12th, 13th, and 30th.
July -	—	74	11	76	73	—	—	—	11·79	W. & S.W.	Monsoon.	—	Cloudy and thundering from the 1st to 6th, and again from 11th to 22nd, and from 26th to 30th.
August -	—	74	9	75	73	—	—	—	15·68	W. & S.W.	Moderate.	—	Clouds and thunder from 1st to 20th.
September	—	75	12	79	71	—	—	82	3·83	W. & S.W.	Calm.	—	
October -	—	71	19	77	66	—	—	—	0·23	N.E. & W.	Calm.	—	Cloudy. Light showers of rain fell on the 3rd and 16th.
November	—	67	22	78	56	—	—	89	0·00	N.E. & W.	Moderate.	—	
December	—	65	21	76	55	—	—	87	0·33	E. & N.E.	Moderate.	—	Light showers fell on the 19th and 20th.

3. The climate varies with the season of the year. From the 15th November to the 15th February it is cold, dry, and bracing, and from the middle of February to the middle of June the heat gradually increases, the maximum being attained during the month of May, when fierce hot winds prevail. During the monsoon the climate is mild and pleasant. In October the heat again increases, decreasing at the latter end of the month. The diurnal variation of the temperature is great, the nights being generally cool and pleasant, owing to the elevation. The atmosphere contains but little moisture, even during the monsoon, and the air is free from dust and other impurities. The surrounding country is but thinly covered with trees of any size. With proper precautions the climate would not be very prejudicial to the health of the troops. The diet should embrace a liberal supply of vegetables, and beer in moderation. The barracks should be spacious, well raised from the ground, and sheltered from the sun's influence by broad verandahs. The clothing at present in use appears to be well adapted to the climate, as it is sufficiently loose and allows the free movements of the body and unimpeded circulation. The khakee clothing is admirably suited for the hot weather, as is also the serge tunic during

NEEMUCH.
BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	the damp and variable weather of the monsoon. The wicker helmet is an insufficient protection and requires a thicker covering of cotton to protect the head from the powerful influence of the sun's rays during the hot season. A moderate amount of exercise is required for the preservation of health in India, and therefore drill, if carried out with a due regard to the season of the year, cannot but prove beneficial. In the hot months soldiers should not be exposed on parade later than half an hour after sunrise, or before sunset. Soldiers on duty should have sufficient accommodation to shelter them from the sun and weather, and sentries should always mount guard under cover. December, January, and February are the most healthy months, and May, June, October, and November the most unhealthy at this station. Fevers are the prevailing diseases at all seasons. 4. There is no district near the station with a climate more conducive to health than that of Neemuch. 5. The experience of the Committee has been extended over nearly the whole of the Bombay Presidency. It is of opinion that the stations in the South Mahratta country and the Deccan possess climates the most conducive to the health of the troops.
III. SANITARY CONDITION OF THE STATION.	1, 2, 3. Plans of the station, district, and barracks are transmitted. 4. Table of barrack accommodation :— Date of construction, 1858. Total number of rooms, 9. Total regulation number of non-commissioned officers and men, 100.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				ft. in.		ft.	ft.
1 Main Room - -	100	200 0	24 0	21 0* Mean.	100,800	1,008	48	1 9	28	5	4
4 Non-commissioned Officers' Rooms.	1	18 0	10 0	11 9	2,115	2,115	180	1 9	2	5	4
4 Ditto - - -	1	10 0	10 0	9 10½	987·5	987·5	100	1 9	2	5	4
Guard Room - -	1 Serjeant 12 Privates	35 0	17 0	9 6	5,652·5	434·8	45·77	1 9	2 2 Doors	4½ 6½	3 3½
Prison Cells - -	1 or 3	19 3	11 6	14 0	3,099·18 1,033·06	3,099·18 1,033·06	221·87 73·79	1 9	1 Door	6	2

* Mean, including Roof.

The solitary cells are only 8 in number, and therefore, should occasion require it, as many as 3 men may be put into one cell. Each cell has a door, 6 × 2 feet, and 2 ventilators in the roof, which is flat.

5. The windows of the main room are on opposite sides; of the small non-commissioned officers' rooms, on adjacent sides; and of the larger non-commissioned officers' rooms, on the same side. They are French windows, and open inside. There is a verandah on both sides extending the whole length of the building, the end portions forming the non-commissioned officers' rooms. The extent of the verandah is 161 ft. 6 in. by 10 ft. wide, measuring from the wall to verandah pillars. Neither the men nor anyone else are allowed to sleep in the verandah at night. There are no jalousies or jhilmils, but there are weather screens called "jhamps," which keep out both sun and rain.

6. The bedsteads consist of 2 planks supported by trestles, and the bedding is as follows:—1 pillow, 2 pillow covers, 2 sheets, 2 camolines, and 1 carpet.

7. The tents used at this station are of the usual square form, 14 ft. square, 5½ ft. to the tops of the "kanats" or sides, and 14½ ft. high at the apex (interior dimensions), which gives a cubic content of 1,666 ft. The number of men in a cavalry or artillery tent is 8, and they have therefore 208¼ cubic feet, and 24½ superficial feet per man. In an infantry tent there are 10 men, which gives 166·6 cubic, and 19·6 superficial feet per man.

8. The barracks are ventilated by means of ventilators in the side walls, just under the wall plate. The guard rooms have flat slab stone roofs, through which are open ventilators protected by a slab on the top. The tents have doorways on opposite sides, which afford ventilation. In the barrack rooms, when all the doors and windows are kept shut, the ventilation is insufficient. The ventilators at the top allow the foul air to escape, but do not admit the fresh. No ventilation for tents is required in addition to that derived from the doorways. The air is cooled by means of tatties made of "kuskus." The kuskus is placed on a wooden frame made to fit the doorways. Water is constantly thrown on the tatty from the outside by a man kept for that purpose, and the hot wind playing through this apparatus is rendered cool and pleasant inside the room. The tatties cost 3 annas 6 pice per square foot. A tattie for a barrack doorway of the usual dimensions, 7½ × 4½ ft., costs 7 rupees 4 annas and 2 pice, or 14*s.* 6¼*d.*

9. The present infantry barracks at this station were run up in a short space of time, when cover was urgently required for the European troops after the mutiny of 1857. These, therefore, are not permanent. The plinth and foundation are of stone and lime work, but the superstructure of the main building is of sun-dried brick and mud, the verandah pillars (which are exposed to the rain) being of kiln-burnt bricks and mud. The tents are constructed of three thicknesses of canvass, with a lining of red or blue serge inside. There are no huts.

10. The floors of the barracks are filled up to the level of the plinth (an average height of 1 foot at this station), with earth well watered and rammed, upon which is placed a layer of stone flagging. There is no passage of air beneath the floor.

11. The materials used in the construction of the barracks are good, but the barracks themselves are merely semi-temporary ones. There are no huts for Europeans. The materials used in tents are also good. No improvements are suggested. The repairs are executed quickly by the executive engineer. The senior medical officer is responsible for the general sanitary state of the camp, but his suggestions can only be carried out through the military authorities. The walls and ceilings of the barracks are cleansed and limewashed once in six months.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	12. The lavatories, as shown in the sketch transmitted, are small flat-roofed buildings, one being attached to each barrack. There are two baths, one for the artillery, and the other for the infantry. The bath is built entirely of brick and lime masonry, with a single tiled roof. The depth of water therein is five feet at the deepest, and four and a half feet at the shallowest part. The water is supplied by a duct leading from a well outside the building, and is carried off by a pipe passing from the bottom of the lower end of the bath through the outer wall, and thence through an open watercourse, the ground having a natural slope towards a nullah.
	13. A sketch of the barrack cook-house is attached. The means of cooking are the usual Indian fire-places, and the vessels are of copper tinned monthly. The water is supplied as usual by water carriers. The drainage is insufficient, and is about to be improved. The washing of the linen is performed in the usual manner by native washermen.
	14. Sketch of the privies is transmitted. The privies are built of stone, with flat slab stone roof. The night soil and urine is carried away daily by sweepers appointed for that purpose.
	15. The privies have open ventilators on opposite sides; but they are not lighted at night. The barracks are lighted by means of brass lamps, suspended from the tie-beams, which burn oil. There are also oil lights placed on small niches along the walls.
	16. The drainage is quite insufficient, and of the very worst description. The drainage of the privies and urinals is only on the surface, which is not suitable for buildings of this description. Closed drains and cesspools are required. In the lavatories there are "percolating cesspools;" but the soil does not admit of free percolation. In the cook-houses there is only surface drainage. The barracks and hospital are dry. The fluid refuse of the barracks is daily carried away by sweepers, a regular staff of these men being kept up for the purpose. The water of the lavatories only is received into cesspits. These cesspits are within 16 yards of the barracks; but only in one instance is there a well near to a cesspit; and this is not at all affected by its proximity. The lavatory cesspits are within 15 yards of the men's quarters, from which the hospital stands at a distance of upwards of one mile. There are no foul ditches near the station.
	17. The surface of the cantonment is kept properly cleansed. The refuse, and manure, &c., are carted away to a distance, that it may be burnt.
	18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station, bazaar, &c.
	19. The sanitary condition of the bazaar is tolerably good; but the ventilation and drainage are imperfect. The water, supplied from four wells, is good and sufficient. The latrines are too close to the houses, and are not used at present for lack of a proper establishment to keep them clean. The people are obliged to resort to the surrounding country for the purposes of nature. The inhabitants of the bazaar pay sweepers to keep their premises clean. The superintendent of bazaars maintains a strict supervision, and punishes the inhabitants by fines or otherwise, if they do not attend to this matter. It would be advisable to have the latrines moved to a distance, to keep up a proper establishment for keeping them clean, and sufficient force of sanitary police to enforce the latrines being used. The native houses near the station are more or less dirty, as is usually the case. There are dung-heaps close to them; but they are not sufficiently near the station to produce any ill effects from malaria, &c. The barracks, at the eastern end of the camp, are exposed to the disagreeable emanations from the bazaar at certain seasons. This nuisance could be prevented by the removal of the bazaar, or by building new barracks at the western extremity of the camp.
	20. The slaughter-house is well situated with regard to the station, being at a sufficient distance from the barracks, hospital, and bungalows. No nuisance is experienced therefrom.
	21. There is a regulation in force against picketing horses in the bazaar. They are removed to a village at a distance of half a mile from the station. There are no particular regulations in force with regard to these picketing grounds, as they are sufficiently removed from the station to obviate any nuisance being experienced therein. The manure is removed for the purposes of cultivation by the people round about.
	22. There are no stables for artillery or cavalry horses. The manure is carried away to a distance and burned. The picketing ground for the European artillery is within 100 yards of the nearest artillery barrack, and that of the native cavalry is within 15 yards of the nearest huts occupied by the men. The native hospital is within 400 yards of the picketing grounds; but the European hospital is fully half a mile distant.
	23. The quarters for married non-commissioned officers and men are sufficient for the present requirements of the station. Married people do not occupy barrack-rooms with the men.
Officers' Quarters.	1. The officers at this station occupy private houses. These quarters are good, and I have no improvements to suggest in regard to them.
IV. Health of the Troops.	1. The station, surrounding district, and adjoining native population, are generally healthy.
	2. Fevers prevail to a considerable extent; but the mortality is not great.
	3. The healthiness of the population is to be attributed to the district, being on high tableland, without swamps or marshes, and to the absence of rank vegetation.
	4. All the troops at present in this station were on field service in Central India before coming here—the greater part of them for a period of nearly two years. A portion of the infantry barracks on the right of the line is less healthy than the remaining portion. The ground is rather low, the floors are not sufficiently raised, and the prevailing winds are partly excluded by higher ground to the south-west.
	5. The troops at this station are not camped out.
	6 to 13. No experience in hill stations.
	14. Frequent change of station on the plains is not desirable for the troops. A residence of at least three or four years at a healthy station is requisite to restore the tone of a sickly regiment.
	15, 16. No experience of hill stations.
	17. There is no higher ground near the station which could be advantageously occupied as a hill station.
	18. A red ferruginous soil resting on a subsoil of slate or trap, or a dry sandy soil provided there be sufficient slope for thorough natural drainage, is best suited for military stations.
	19. The best age for a soldier to proceed to India is at about 20 years, and the period of the year for him to land there, in November and December, in order to reach his station before the hot weather sets in. The troops on landing are sent to their regiments if near at hand, if at a distance they are sent to Khandalla on their first arrival, where they remain until a

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	sufficient number of them be collected to be sent off to the regiment. They then go through their usual course of drill, and take their share of duty with the remainder of the regiment. I would recommend, for preserving the health of recruits on first landing in India, moderate exercise without undue exposure to the sun, and a careful avoidance of liquor in excess, unripe fruit, &c. The diet should embrace a sufficient supply of vegetables with a moderate amount of animal food. 20. Troops should be sent direct from the home depôts to India. With due precautions a regiment's earlier years of service in the plains would not be attended with greater danger than after a more protracted residence in the country. 21. Troops are conveyed from the port to the interior in the following manners: by water when they are transported in steamers (if available) or country crafts; by land they proceed by railroad or by bullock train, when available; otherwise they proceed by ordinary marches. The regulations in force on the subject of transport are sufficient for the due preservation of the health of the troops. 22. from my experience I consider that the number of years a British soldier should serve in India ought not to exceed 12. 23. The present system of conducting medical boards, with respect to invaliding, works satisfactorily. 24. Invalids leaving India for home should embark in January or February so as to arrive at the beginning of the English summer.
Diseases.	1. There are regular inspection parades, for the discovery of incipient diseases, once a week at this station. 2. There has been scorbutic disease among the men of the 95th regiment, but as the head quarters of the regiment has left the station, there are no records to refer to by which means the proportion could be ascertained. The disease is attributable to the bad state of the health of the regiment at the time of its arrival here, and not to any peculiarity of the climate of Neemuch. 3. There are no records of the cases of hepatic disease available for Europeans, as the European regiment has lately left the station. Among the native troops hepatitis is a rare disease, only one case having occurred during the year 1860. 4. Dracunculus is not a common disease amongst the troops at this station. Amongst the native troops the admissions during the year 1860 has amounted to 1·4 per cent. 5. The proportion of venereal disease amongst the native troops is 3·3 per cent.; but the establishment of lock hospitals is a doubtful measure. 6. The troops at this station suffer from the following diseases, viz.:— *Fevers*, intermittent, remittent, and continued. *Dysentery*, acute and chronic. *Cholera*, Asiatic. *Small-pox*, and *Rheumatism*, acute and chronic. The following return shows the proportion which admissions and deaths from the above diseases bear to total admissions and deaths amongst the native troops, from January 1860 to December 1860:—

Total Admissions - - 1,194 Total Deaths - - - 5	Admissions.	Deaths.	Proportion of Admissions.	Proportion of Deaths.
Fever - - - - - - -	626	1	52·4	20·0
Dysentery - - - - - -	6	—	0·5	—
Cholera - - - - - -	—	—	—	—
Small-pox - - - - - -	6	1	0·5	20·0
Rheumatism - - - - - -	78	—	6·5	—

There are no records on this head available for European troops.

7. Intermittent and remittent fevers are the most frequent zymotic diseases, and are most prevalent during the hot weather and rains. No unusual atmospheric conditions have been observed to precede or accompany these diseases. These diseases are not limited to any particular spot in the bazaar. The sanitary condition is pretty equal over the whole extent of the bazaar. The personal habits and conditions of the European troops are not such as to predispose to these diseases; but the natives, being more or less dirty in their habits, are more liable to them.
8. The duties and amusements of the troops at this station are conducive to their general state of health, provided that long exposure to the sun be avoided. They are consequently not such as to predispose to these diseases.
9. The medical officer of Her Majesty's 95th regiment has tried small doses of quinine as a prophylactic against malarious disease with advantage.
10. The removal of the troops to the high and open ground to the left of the present line is to be recommended. A more ample provision for the occupation and amusement of the men would also be advisable.

V. INTEMPERANCE.	1. The soldiers at this station are on an average temperate. There are very few confirmed drunkards amongst them, and no records exist from which the proportion of these could be obtained. 2. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteen, but are not permitted in the bazaar. The spirit, which is arrack, is of good quality. Each man is allowed one dram per diem. Spirit does not form part of the ration, either at the station, on the march, or in the field. The men are not allowed to get a dram from the canteen before parade. Spirit is never given as a ration to convalescents. No drinks, other than intoxicating drinks, injurious to health, are sold at the canteen or in the bazaar. 4. The consumption of spirits is injurious to the health of the troops, and is not conducive to the efficiency and internal discipline of the corps.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	5. Spirituous liquors are not supplied as part of the ration, but each man is allowed to purchase one dram from the canteen. The abolition of the sale in the canteen might prove injurious to habitual dram-drinkers, but it would be advisable to induce all the men, if possible, to take some substitute for the spirit, either beer or porter. 6. Both wines and malt liquors would prove beneficial to health as compared with spirits, but preference is given to malt liquors. 7. Coffee, tea, lemonade, soda water, and similar drinks are used at this station. Their influence on the health is beneficial, but a certain amount of stimulant is required in a tropical climate. 8, 9. It would be beneficial to prohibit the sale of spirits in the canteen, and permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. 10. A reading room with a coffee shop attached is to be recommended; the coffee shop to be distinct from the canteen. 11. The bazaar regulations are such as are laid down in Jameson's Code, which apply equally to all stations. They are effectually carried out. European soldiers cannot purchase liquor in the bazaar on any consideration; natives may do so, provided it be drunk on the spot, but he may not remove it from the bazaar.
VI. Diet.	1. The ration for all European troops in the Presidency is as follows:—1 lb. of beef or mutton, 1 lb. bread, 1 lb. mixed vegetables, 4 oz. rice, 1 oz. of salt, 2½ oz. sugar, ¾ oz. of black and green tea mixed, in proportions of ⅔ to ⅓ respectively, and 3 lbs. of firewood. The rations are inspected daily by the officer on duty, and the quarter-master, and sometimes by the commanding officer and surgeon. 2. The ration is in general complete, but fruit is not included in it. The vegetables are not always in due proportion. The stoppage is 3 annas and 4 pies (*5d.*) daily. The soldier has three meals per diem. Breakfast at 8 a.m. of bread and tea; dinner at 1 p.m. of meat, vegetables, and rice, made into various messes and stews; and supper at 4.30 or 4 p.m. (according to the season) consisting of bread and tea. The proportion of vegetables in this ration is 1 lb. for about seven months in the year, and ½ lb. for the remaining five months, which include the hot season. 3. A liberal supply of potatoes at all seasons would be conducive to health, as many of the country vegetables at present supplied are not relished by the men. At present only ½ lb. potatoes is supplied from about November until June. The rations are under the supervision of a non-commissioned officer, who superintends the cooks. There is no opportunity for the men to dispose of their rations. 4. Cooking houses, with the usual Indian fire places, are provided at this station, and are furnished with copper vessels, tinned monthly, large boilers, frying pans, dishes for baking, and tea kettles. The kitchens are clean, light, and well ventilated, and sufficiently supplied with water. The food is boiled, stewed, and baked; the cooking is properly done, and sufficiently varied. The tea is prepared in the large boiler as at home, and is not first rate. The men do not have tea, coffee, or other refreshment before a march. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near this station, under regulations to be decided by a local committee.
VII. Dress, Accoutrements, and Duties.	1. In addition to the usual clothing worn in England, the troops at this station have for the warm weather a suit of "khakee," and serge for the monsoon. Wicker helmets, with covers, and "pugrees," are worn at all seasons. In the hot weather a waist belt and small pouch are worn, and in the cold weather an additional pouch and shoulder belt, with 20 rounds of ammunition at all times. The clothing as issued at present to the troops is suitable for the different seasons in all respects, with the exception of the head dress, which does not afford sufficient protection from the sun. A lighter and stronger description of helmet of felt instead of wicker might be substituted with advantage. The upper leather of the boots should be properly blocked, so as to fit the feet more naturally. The men on guard wear "khakee" clothing during the day, and cloth clothing from sunset to sunrise, according to the season of the year. The sentries are generally planted under cover.
Duties.	1. It would be advisable to drill the men at home and not in India, as here they have but an hour's drill in the morning and evening. 2. The men drill for an hour morning and evening four days in the week, weather permitting. They are on guard one day in seven, excepting during the period of musketry instruction. The musketry drill necessitates the men being kept out during the day exposed to the sun. The time occupied in firing 90 rounds is too great, and the number might in India be reduced to 60 rounds with advantage, as the climate does not permit of an equal amount of drill or an equal number of days as at home. From ordinary drills the men do not suffer in health. The best time for drills and parades in the hot weather is early in the morning; and we do not recommend drill in the evening at all at that season. Troops on the march should arrive at their camping ground by sunrise. The men at this station have on an average six nights in bed during the week. 3. The furthest guard is mounted at a distance of one mile from the barracks. The guards last 24 hours. There are roll calls at meals and at tattoo beatings, and on the days when there are no parades there are roll calls morning and evening. There is no doubt that night duties are trying to the men, but they are necessary to be performed. No additional precaution for preserving the health of the troops can be suggested.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction at this station,—skittle grounds, schools with good schoolmasters, a library and reading-room, the former well lighted at night, a day-room and soldiers' gardens under the management of the men. There are neither workshops, ball courts, theatre, or gymnasia, but the first will be shortly erected. These means are sufficient to keep the men occupied in the wet season and during the heat of the day, but a theatre and gymnasia would be a great addition, and conduce much to the pleasure and health of the men. During the hot months the men are not allowed to leave the barracks, except for necessary purposes, from 8 a.m. to 4 p.m. The result is beneficial to health. 2. Suitable buildings should be erected for workshops, theatre, and gymnasium. Should the regiment here at present be raised to its full strength, an additional building would be required as a library. 3. Soldiers' savings' banks are in existence here, and are found to be most advantageous. 4. There is no shade from trees, sheds, or verandahs, &c., to enable the men to take exercise during the day, without injury to health.

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References to Subjects and Queries.	REPLIES.
IX. MILITARY PRISONS.	1. The cells at this station are objectionable in every respect. They are old gun-sheds inside the fortified square; and from their situation, immediately in contact with the outer wall, it is impossible to keep them cool or well ventilated. It is most desirable that large well-ventilated cells should be erected in a healthy situation, as a protracted residence in the present cells cannot but prove prejudicial to the health of the prisoners.
X. FIELD SERVICE.	1. There are no special local regulations for field medical service, not included in the general presidency regulations. 2. The medical officer can make any suggestions as regards the conduct of a line of march, bivouacking, camping, billeting, &c., and they are generally attended to. 3. Camping grounds are selected by the quartermaster-general's department; the main object being a supply of good water and high open ground. Should there be any objections in a sanitary point of view, the medical officer can make suggestions, which are invariably attended to whenever it is possible to do so. The regulations now in force appear to have worked satisfactorily throughout the Central Indian campaign, and no improvements can be suggested. 4. No reply to this query.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1. Plan of the hospital is transmitted. 2. The hospital is 1,100 yards distant from the nearest barrack, 850 yards from the nearest stable, and 450 yards from the bazaar. The hospital has an open site, and stands on high ground, which slopes away from it on all sides. There are no buildings, &c. which interfere with the ventilation. The site is generally healthy with reference to elevation, drainage, absence of malaria, &c. 3. The water supply is sufficient and wholesome. 4. The refuse water and other impurities are collected in cesspools and carried away at night. The night soil is removed in the usual way by sweepers. 5. The average height of the plinth is 3 feet above the ground. The floors are solid, and there is no perflation of air underneath; in fact, a passage of air beneath floors (in other stations) has been found not to succeed. The roof water is carried off by small channels projecting over the walls of the building. It does not sink into the subsoil, but is carried off by the natural slope of the ground. No guttering is required round the hospital for the rain-fall, as it runs off rapidly. The hospital is built principally of stone and lime masonry, the pillars and partition walls of brick. The walls and roofs are single, but the former are of a good thickness and keeps the hospital tolerably cool. There are no verandahs. The hospital consists of two flats. It was originally built as a residency, and has only been used as a hospital since the year 1857. The rooms are of various dimensions. Those on the upper story are seldom required for use as wards, as there is more than sufficient accommodation for the ordinary number of sick in the lower story. In the following table the dimensions of one room (the largest on the ground floor) are given, as that is always used.

TABLE of Accommodation.
Date of construction, 1821.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Heigth.	Breadth.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft. In.				Ft. In.			
No. 1	30, or if occasion require it 35	79	27½	25 10	56,115·67	1,870·52 1,603·3	72·4 62	1 9	11 Doors*	9½	5

* There are no windows on the lower story. The doors are double, the outer ones being Venetians, the inner glazed from top to bottom.

The hospital is so placed as to receive the full benefit of prevailing winds. The windows are French, and open inwards; they are of ample dimensions, and cannot be improved in any way.

6. None of the lower wards, with one exception, have any ventilation except by the doors and windows. The smaller of the two large rooms has 8 ventilators at the top of the room. The upper wards have ventilators in the slab stone roof. There are Venetian shutters, painted green, attached to all the doors and windows.
7. The wards are cooled during the hot months, when the hot winds prevail, by "tatties" made of "kuskus," the same being constantly watered by men employed for that purpose.
8. There are no means for warming the wards. The walls and ceilings of the wards are cleansed and limewashed once every 3 months, or as often as is required.
9. There is a privy and urinal to the N.N.E. of the hospital. Its construction is much the same as that of the barracks. It is properly drained into a cesspool, which is emptied out daily by the sweepers. The cesspool is at a little distance from the privy, and is not offensive.
10. There are two wash-houses for the hospital close to the building. They are similar to the barrack wash-houses, and are sufficient for the sick.
11. There are no bath rooms, but there are ten flat baths, which are used when required, and are sufficient.
12. The native dhobies do the washing of the hospital linen in the usual manner.
13. The storage is sufficient, and dry.
14. The bedsteads in use are the common country wooden bedsteads, laced with tape, and the bedding a mattress and pillow stuffed with straw, two sheets, a blanket, and a coverlid. Iron bedsteads should be substituted as cleaner, and less likely to be infested with vermin.
15. There is one kitchen on the north side of the hospital, and another larger one on the opposite side. They are both too close to the building, and are not large enough. There is no

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	apparatus beside the usual Indian fire-places, and copper pots tinned. The cooking is properly done, and sufficiently varied. 16. The diet tables, rolls, &c., are in strict accordance with the medical regulations of the Presidency. 17. Ten ward coolies are allowed to a regiment for attendance on the sick. They are generally very attentive, and make good nurses. Besides these, every severe case is allowed a comrade to wait upon him. Such attendance is considered sufficient. 18. The sanitary condition of the hospital and the present accommodation are as good as can be expected in a private house; but should any great increase of sickness take place, the accommodation would not be sufficient. 19. Suitable buildings for cells, for insane patients, and for hot and shower baths, are required. It is also recommended that proper quarters for warrant medical officers and for the 2nd class hospital servants be erected. The room occupied as a female hospital is too small, and not sufficiently ventilated, being low in the roof and otherwise unsuitable. 20. There are sick carts drawn by bullocks and elephants, which carry about the convalescents. There is no provision for shaded walks, &c. 21. A small detached house to the south of the building is used as a hospital for the women and children, but only a temporary measure. No improvements can be made. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. With regard to change of diet and medical comforts, the medical officer has power to order whatever may be requisite under the supervision of the Deputy Inspector-General of Hospitals. The repairs to buildings are carried out by the Public Works Department. The sanitary arrangements are partly under the supervision of the medical officer and partly under the Conservancy Department. 24. There are no wards or hospital for convalescents. Such accommodation would, of course, be advantageous, but it would be attended with enormous expense.
XIII. Burial of the Dead.	1. The burial ground used for British troops is fully quarter of a mile from the nearest building. It is to leeward of the station, with reference to the prevailing wind. 2. Its area is 9,157 square yards. Its soil is the black cotton soil, and the subsoil trap rock. Surface drainage. The ground has a good slope towards the nullah. Decomposition takes place very rapidly, and the ground is carefully kept. 3. The space allowed for each grave is 7 ft. × 3 ft. wide, with an interval of 3 ft. between each. They are dug 6 ft. deep, and are never re-opened, only one body being interred in each grave. Interment takes place about 12 hours after death. There is no burial ground set apart for Native troops; they are buried in the same place as other natives. 4. The grave-yard is never offensive. The British troops are buried in the usual manner with military honours. 5. The Mussulmans dead are buried in a burial ground at a distance of 900 yards in rear of the bazaar. The Hindoo dead are burned at about the same distance. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements suggested in the modes of disposal of the dead.

(Signed) Charles Lucas, Brigadier, Commanding at Neemuch.
E. Mahaffy, Staff Surgeon.
E. P. Gambier, Lieutenant, Assistant Ex. Engineer, N. & N.

1st November 1860.

AHMEDNUGGUR.

Accommodation	Queen's Troops or European Troops of the Indian Army.	Artillery	337
		Cavalry	122
		Infantry	451
	Native Troops	Artillery	135
		Infantry	747

References to Subjects and Queries.	Replies.
I. Topography.	1. The station of Ahmednuggur, distant about a mile from the town, is situated near the head of the Seena valley, about six miles from the source, and is surrounded on three sides by hills, having slight elevation above the plain, on which the station is built. The features of the ground hence admit of the water draining off freely, and little opportunity is offered for its being retained in pools and swamps. There is no wood or jungle, and little water, beyond that contained in a few pools in the bed of the Seena river, to be found in the vicinity of the station. 2. The station is about 1,900 feet above the sea level, and, being at the head of the valley, and partially surrounded by hills, it has in different places a greater or less elevation above the adjacent country. The nearest water is 52 feet distant. The station occupies the highest ground available in the neighbourhood for a cantonment.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	3. At a distance of six miles from camp is an isolated hill, on which a capacious building was constructed about 400 years ago. This place having been found to be well adapted for a sanitarium, has been occupied recently for that purpose. Its elevation above the station is 617 feet. 4. The only water in the vicinity of the station is in the bed of the Seena river, three miles from camp. The bed is usually dry for eight months in the year, and the water only appears at the surface at a few spots where pools have been formed. There is also a large nullah, a tributary to the above, which passes through camp, at some distance from the public buildings, but the quantity of water retained in the bed is very small. In heavy floods during the rainy season the water is liable to overflow the banks of both streams, but quickly subsides, and has no tendency to settle or soak into the adjacent land. There are no large pits or excavations in which the water accumulates. It is readily drained off by the natural watercourses. 5. The station, generally speaking, has an open aspect, and is well exposed to the prevailing winds. There is garden ground within the cantonment, but care is taken to prevent excessive vegetation, and hedges and trees are constantly cut and kept in order. The close proximity of the suburb or native town of Bhingar is liable to have a prejudicial effect on the health of the troops. The place contains about 3,000 inhabitants, and is kept generally in a dirty state. The streets and lanes are narrow, and badly ventilated, and the sanitary arrangements generally defective. It is desirable to extend to it the regulations in force in the cantonment, or to institute the same measures which have effected such great improvement in the state of the town of Ahmednuggur. The buildings of the station occupy a commanding position, and are not in the slightest degree liable to be affected by reflected sun-heat. The station is singularly exempt from variable winds, which have a prejudicial effect on health. It is freely exposed to the sea breeze, which diminishes the temperature, and renders the place more congenial for Europeans. 6. Generally speaking, the surrounding country is uncultivated. Towards the bank of the Seena crops are grown, but at a distance from camp. Works of irrigation are restricted to a few patches of land, watered by the surplus water from the aqueduct which supplies the camp, and by wells sunk along the river bank. It is, however, little adopted. No injurious effect has ever been known to arise from irrigation. Its extent is too limited to allow of an opinion being formed on the subject. The cultivation of rice is not prohibited, but there is not, I believe, a rice field within ten miles of Nuggur, and very few fields in the Talooka. No indigo is grown, to my knowledge, in the Nuggur Talooka, neither are hemp nor flax grown within many miles of the cantonment. A solitary and detached plot of ground may be cultivated occasionally with either of these crops, but the quantity grown is so small as not to affect health in the slightest degree. 7. The town of Ahmednuggur, containing a population of 36,000, is situated on the outskirts of camp. The suburb of Bhingar, occupied by 3,000 people, is built in continuation of the cantonment on the north-east side, and in immediate proximity to the European lines. 8. The geological structure of the district around the station comprises a trap formation, which is extensively met with in the long spurs jutting out in an easterly direction from the western range of the Ghauts. This rock is covered by a layer of black soil, which increases in thickness as the hills gradually submerge into the vallies, at the lowest points of which, and towards the banks of the principal watercourses, its depth becomes considerable, and in numerous localities the understratum of trap is found to have given place to a layer of limestone (commonly termed kunkur), which is largely employed to produce mortar for building purposes. The site on which the station stands was not in former days occupied for the purposes of habitation. 9. During the dry season water stands at a level of 18 feet below the surface. During the wet season it is only 8 feet below the surface. 10. The porous nature of the subsoil, where it consists of trap rock, which in great measure is of a soft and friable nature, affords ample means for complete under drainage of the country. The black soil, being a retentive stratum, the water which falls thereon lies on the surface till it evaporates, but the nature of the ground in the vicinity of camp does not admit of such taking place to any great extent. The rapid fall of the high ground adjacent to the station, and the defined character of the natural watercourses, preclude, in great measure, the accumulation of moisture in the subsoil of the station, beyond what is advantageous to an efficient supply of water in the wells. 11. Water is obtained from aqueducts, which have their source in large wells or reservoirs near the foot of the hills, the supply of which is further increased by percolation through the stratum, along which the excavation for the galleries or channels extend. There are numerous aqueducts and branches for the use of the town, but only one in use leads to the European lines. There is no storage of water in open tanks. The wells at the source are in many instances covered in with masonry domes. The head reservoir contains always a sufficient supply of water. These reservoirs contain no animals nor plants, and they are never used for bathing. There can be no impurities from foul drainage, &c., and no malaria can arise from any tank. 12. There are four distinct aqueducts, with numerous branches which supply the town and station. It would be difficult to arrive at an estimate of the total amount of the supply. The quality is good and wholesome, and the amount sufficient. No means of ascertaining the chemical composition. The water is discharged into distribution wells and reservoirs, and raised thence by Bheesties, who distribute the water for watering cattle and horses. Troughs are built in convenient localities in which water is maintained at a constant level. The system of supply by aqueducts has been in use for many years, and generally with satisfactory results.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	There are faults in the details of the system which demand attention, and regarding which references have often been made, but, as a whole, the arrangement is good, and adequate for the requirements of the station.
	14. The authorities appointed to determine upon and select sites for stations usually comprise members of the medical, quartermaster-general, and engineer departments, together with officers of any other service who may be considered to have a local knowledge of the subject. The system scarcely admits of improvement.
II. Climate.	The meteorological instruments at this station consist of barometer, thermometers, and rain gauge, kept at the artillery hospital, Ahmednuggur.

Observations for 1859.

Months and Years.	Barometer, Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature at 4 P.M.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks on Clouds, Dew, Wind, &c.
	In.	°	°	°	°	°	°	°	°				
January	27·882	71·4	22·3	82·0	59·7	71·4	60·7	115·1	0·04	S. & S.E.	Moderate in general	30	Seasonable, cloudy on 3rd, little rain and lightning.
February	27·879	76·7	23·1	87·8	64·7	76·7	62·6	116·8	—	S., S.E., W., N.W.	Moderate	27	Warm for season. At times cloudy.
March	27·781	80·0	23·5	91·9	68·4	80·0	64·8	115·4	0·34	N.N.E., N.W., S., S.W.	Moderate and strong	28	Temperate, cloudy, rain 2 days.
April	27·781	85·5	20·0	95·1	75·1	85·5	69·5	115·5	0·44	S. & S.E., N. & N.E.	Strong winds.	25	Close and sultry, stormy on 27th, with rain.
May	27·745	87·4	23·8	99·8	76·0	87·4	72·4	119·6	1·05	N.W. & W.	Strong	23	Close and sultry, storm on 28th, with rain, lightning, and thunder.
June	27·632	80·4	13·2	87·7	74·5	80·4	73·2	95·0	6·71	W. & S.W.	Do.	9	Cloudy, with heavy rain.
July	27·600	79·1	10·1	84·3	74·2	79·1	73·5	91·2	3·74	S. & S.W.	Do.	9	Close and sultry, cloudy, high winds, with rain.
August	27·675	76·3	10·6	82·0	71·4	76·3	70·2	88·0	7·83	W. & S.W.	Strong winds.	6	Cloudy, heavy rain and showers.
September	27·738	75·7	10·1	80·9	70·8	75·7	70·7	89·4	7·69	S.W. & S.	Strong	4	Cool, cloudy, heavy rain.
October	27·820	77·3	17·9	86·0	68·1	77·3	68·4	111·4	1·38	N. & N.E. to S.E.	Moderate	27	Nights cold; days warm; rain on one day.
November	27·858	77·4	19·2	85·3	66·1	77·4	64·8	109·6	0·50	E., N.E. & S.E.	Do.	25	Cool and pleasant, 3 days cloudy and close, with rain.
December	27·877	70·2	21·9	80·9	59·0	70·2	60·1	106·1	0·17	N.E., & N. to E., & S.E.	Do.	28	Nights cold, weather cool, some rain on one day.

3. The climate of Ahmednuggur is healthy and dry like that of the Deccan generally, which is attributable to the elevation, 1,900 feet above the sea level. Except in the immediate neighbourhood of the cantonments, there are few trees. No canal, and but little irrigation. Occasional dust storms during the hot months, March, April, and early part of May. During the monsoon and cold months warm woollen clothing is necessary for the troops, lighter clothing during the hot months, March, April, and May. Morning and evening are the best hours for drills, parades, and exercises. The most unhealthy period is the hot months and immediately after the rains. In the former fevers and affections of the head and liver prevail. It is also the time when cholera and small pox have in general appeared. After the rains diarrhœa and dysentery are most prevalent.

4. There is no district near the station, that I am aware of, more conducive to health than the station itself.

5. I have served at Bombay, Cutch, Kurrachee, Poona, Deesa, Rajcote, and Ahmednuggur.

I regard the climate of Bombay as the worst for Europeans I have seen. I have known the health and efficiency of more than one regiment suffer to a very great extent from it. I may instance Her Majesty's 17th Foot and Her Majesty's 57th regiment, which contracted fever there, and from which the latter still suffers. The climate of Cutch is not considered good for Europeans. The 2d European Bombay light infantry suffered so severely there some years since that they had to be removed in a lamentable state. There was no European regiment there when I was there, but the European officers of native regiments, as well as the regiments themselves quartered at Bhooj, enjoyed good health. The climate of Kurrachee, now that good barracks have been built, is, I imagine, as good as any on the Bombay side of India. Kurrachee is subject to epidemics, such as cholera, dreadfully severe; but at the time of cholera, there were a great many more troops than there was proper accommodation for, as the barracks were low and small. They have been since replaced by the finest and best constructed barracks I have seen in India.

Near Kurrachee is the sanitarium of Gizree on the seaside, the pure air of which and the sea bathing are of great use to weakly men.

The climate of Deesa is exceedingly hot during some months, with hot winds like the blast of a furnace. They are not unhealthy, if Europeans avoid exposure to them. The outdoor heat is so great that healthy men have been struck down dead as if shot. The cold months are very pleasant, being bracing, with occasional frost. Within 50 miles there is a beautiful and salubrious station, Mount Aboo, now a regular sanitarium, but the climate is exceedingly damp and the rains very heavy. During the rainy months Mount Aboo is, on account of damp, unfit for many diseases, especially these of the chest and bowels. Fevers also are prevalent at that period. At other seasons the climate is delightful, almost European, sharp hoar frost and clear bright weather having a most exhilarating effect on the system. A somewhat lengthened experience leads me to consider the climate of Deesa, although hot, decidedly good, and one suitable to Europeans with certain precautions.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	The climate of Poona and Ahmednuggur are very similar, except that the latter is further from the sea, and has little sea breeze. The climate is very good, the hot months few, with cool nights, and during the rains, delightful, somewhat like that of Italy. Cold weather agreeable. During hot months, March, April, and first part of May, a hot dry wind prevails, particularly felt by those liable to liver derangement, and interfering with the action of the skin. Refreshing showers fall at the end of May, and the monsoon begins in June. October is sometimes a hot and disagreeable month. At Rajcote European officers and their families enjoyed good health. The seaside is within easy reach from it. The great want on this side of India are good sanitaria along the coast. There are no fine hills like those in the other presidencies on which to locate troops, but there are places on our coasts where sanitaria could be built, and which for certain diseases would be preferable to hill stations, such as Porebunder, Dhin, and other places on the Kattiwai coast. Dapoolie and Naree, in the neighbourhood of Vingola, on the southern coast might be named, from which one or more sites for sanitaria might be selected, the use of which might obviate the necessity for sending a great many men to England, while the quickness and facility with which men might be sent to them, would save many valuable lives, besides economizing public money.
III. SANITARY CONDITION OF STATION.	1, 2, 3. (Maps and plans.) 4. The following are the details of barrack accommodation at the station.

Date of Construction.	Permanent Barracks 1831.	Temporary Barracks 1859.
Total number of rooms or huts.	Ditto 12.	Ditto 12.
Total regulation number of non-commissioned officers and men	Ditto 600.	Ditto 600.

Barrack Rooms or Huts.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Feet.			
Permanent Barracks:											
Artillery 12 -	50	107·5	24	22	56,760	1135·2	51·60	1·5	22	4	3
Temporary Barracks:											
Infantry 12 -	50	131	22	14	40,348	806·96	57·64	1·5	12	4	3
Guard-rooms:											
Artillery - -	9	24	18	14	6,048	672	48	1·5	2	5	3·5
Infantry - -	8	22	22	14	6,776	844·5	60·5	1·5	2	4	3
Eight Prison Cells -	1	10	10	15·5	1,550	1,550	100	1·5	Ventilating apertures instead of windows.	—	—

5. The majority of the buildings are provided with windows on opposite sides of the rooms. The windows are usually fixed in folding frames opening from the inside. Verandahs are invariably provided, in some instances enclosed at the extreme ends to form quarters for non-commissioned officers and other similar purposes. The average width is 10 to 13 feet.
In the broader verandahs the space is enclosed to add to the interior capacity of the buildings, and to furnish an additional apartment for the men to take their meals in.
6. The beds consist of iron trestles with boards. The bedding supplied by Government, good and sufficient, no improvements to suggest.
7. The tent accommodation is as follows:—European double poled for 22 men consists of fly, shell and six feet walls of three thicknesses of cloth. Interior dimensions 22 feet by 15 feet. Cubical contents 2,826 feet. Superficial area per man, $15\frac{2}{3}$ feet. European, single pole for 13 men, as above, 14 feet square, cubic contents 1,601 feet. Superficial area per man 15 feet. European hospital tent for 20 men consists of fly shell and double walls, six feet and five feet, forming a verandah. Interior dimensions 24 feet by 14 feet, cubic contents 2,821 feet, superficial area per man $16\frac{4}{5}$ feet. Tent, native double poled, for 30 men consists of single fly of two thicknesses of cotton cloth. Interior dimensions 22 feet by 14 feet. Cubic contents 903 feet. Superficial area per man $8\frac{6}{15}$ feet.
8. Ventilation in permanent barracks is effected by giving the rooms a sufficient height with clerestory windows in the height of the walls. There are metal and wooden ventilators in the ridges of the more temporary buildings. Where the walls are low, ridge ventilation is generally employed.
The arrangements suffice to ventilate the buildings equally well by night and day.
No artificial means of cooling the air are required in this climate.
9. The permanent barracks are built of brick. The temporary barracks of wood framing and wattle and dab walls.
10. Floors generally are made of moorum well beaten down and consolidated with water. Their surface is raised from one to two feet above the level of the ground, but there is no arrangement for a current of air passing under the buildings.
11. The materials used for building are generally well adapted to the climate, but in temporary buildings it would be desirable to substitute kutcha brick for wattle and dab.
Repairs are executed by the executive engineer and (by recent arrangements) partly by the barrack master, immediately on representations being made by the officers in charge of the buildings.
The brigadier, or chief military authority here, is responsible for the sanitary state of the station.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	Barrack walls are whitewashed at intervals usually of six months, but oftener if the medical officer considers the work essential.
	12. There is a separate lavatory to each barrack, and the water after flowing off the washing bench is made to pass through a urinal, which it cleans in its passage, and thence into a cesspool.
	13. The cooking apparatus is simply a raised masonry bench with projections on which the cooking utensils are supported. The water is supplied by bheesties, and the refuse liquid is collected in cesspools which are cleansed daily. No linen is washed at the barracks; it is taken away by washermen and brought back when ready.
	14. The privies are built in the immediate vicinity of the barrack buildings. Their contents are removed daily by sweepers, and the refuse liquid of privies and urinals is collected in cesspots and removed daily.
	15. The ventilation of the privy buildings is given by a large cubic space and numerous openings.
	16. There is no drainage by sewers. Night soil is daily removed from the cesspits of privies and urinals. The ground in the vicinity of the barracks slopes sufficiently to admit of all surface and other drainage being readily carried off. No part of the buildings is damp. All the fluid refuse, as already stated, is collected in cesspits and removed daily. These cesspits are three feet by three. They are at the end of each barrack, built at the surface of the ground, distant from the wells, which cannot be injured by them. The spot of ground adjacent to the station behind Bhingor is made very offensive by the native population of the latter using it as a receptacle for dirt and refuse.
	17. Surface cleansing is done daily by the conservancy carts, and is as efficiently done as the limited establishment will admit. An increase is required and strongly recommended. Refuse and manure are removed to a considerable distance; that from stables, &c., is disposed of and carried away by purchasers.
	18. The cantonment is kept free of vegetation, except the officers' compounds. There are no old walls, hedges, &c., interfering with the general ventilation.
	19. With regard to the bazaar the surface drainage is good, and water is rapidly carried off. The water supply is abundant, and cleanliness strictly enforced. There are no latrines. No crowding permitted. Two carts and two pairs of bullocks carry away the refuse daily. Every one is obliged to collect it in a basket, and throw it into the cart as it passes the house, and constant supervision of the premises, with fine, if found offensive and dirty. The system works well and the bazaar is clean. No improvements suggest themselves. The inhabitants of Ahmednuggur and Bhingar are permitted to answer the calls of nature on the very boundary of camp. The effluvia from this cause, while objectionable, is unavoidable. When the wind blows from the north, over the native dwellings to the cantonment, the smell of ordure is very perceptible, This arises from the fact that the residents of places not under military control are allowed to have their privies near their houses, and the removal of the filth not being duly attended to, the atmosphere must become tainted. This as regards Bhinghar is repeatedly felt. The remedy is simply that the places, if permitted to remain, be daily cleansed.
	20. Animals are slaughtered on the limits of camp. No regulation relative to slaughter places, save as regards time and cleanliness. Cattle are killed morning and evening. Birds of prey and dogs devour the offal. No nuisance experienced from slaughtering places.
	21. The bazaar horses, where there are no stables, are picketed on a piece of ground behind the bazaar. The place is swept every morning, and the dung either removed or made into fuel.
	22. There are no stables belonging to the station. Artillery and cavalry horses are picketed in an open space in front of the artillery barracks, at a distance of 200 yards. Dung is removed daily, and disposed of to brick manufacturers as fuel.
	23. There are 80 separate permanent quarters for married artillery soldiers; enough for the barracks. There are none for the infantry in the temporary barracks, and it is not yet decided if any will be required.
	Officers' Quarters.—1. Officers live in bungalows, the property of private individuals. They are advantageously arranged as regards position and other sanitary respects.
IV. Health of the Troops.	1. The station of Ahmednuggur, the district, and the native population are healthy.
	2. The disease most prevalent among the native population at certain seasons is fever of the intermittent type. They have had occasional invasions of epidemic cholera and small-pox: the latter is, however, becoming more rare as the benefits of vaccination are becoming better known and more permitted among the native population, who here, as elsewhere in India, have been exceedingly averse to it. Affections of the spleen are not common.
	3. I consider the absence of jungle and rank vegetation as the great cause of healthiness in the surrounding district; also that there are no swamps or other sources of malaria.
	4. The artillery who form my medical charge are principally recruits fresh from England. No. 18, light field battery, arrived here from active service in Central India on the 16th of September 1859; generally speaking the men were in good health on arrival, and have continued so since; some have had rheumatism and some fever, but not to any great extent. Three of the barrack rooms are not so good as the others, on account of some mistake in the estimates for improvements.

AHMEDNUGGUR. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	5. The troops are not, as a general rule, camped out. A portion of Her Majesty's 57th Regiment have been lately camped out for rifle practice in the cold season; their health was very good. 6. I have not been in charge of troops at hill stations. 7. So far as my limited experience goes, I cannot say that troops who have been at hill stations have suffered more on returning to the plains than their comrades who had not gone. 8. My experience of hill stations has been very limited, but under certain conditions I should think that hill stations would be beneficial to the health of European troops. 9, 10. No experience. 11, 12. The best months for residence at hill stations would be March, April, May, and October, the hot months. There should be 12 months' residence. 13. Troops on leaving hill stations for plains require no special precautions beyond being kept from unnecessary exposure. 14. With regard to change of stations; I do not think troops should be moved too frequently on the plains, except the station be a decidedly unhealthy one, in which case it ought not to be occupied by European troops at all. I think a move every three years often enough. More frequent moves are distasteful to married men, besides being unnecessary. 15, 16. No experience. 17. About 5 miles from the cantonment there is a hill on which accommodation for about 100 men has lately been provided. It is 617 feet higher than the station; it is cooler and the nights delightful. It is useful where a short change is required, but being on the top of a lonely and barren hill, there would be a total want of occupation, and men would suffer from ennui. Water has to be brought from a considerable distance, and baths would be very expensive. Supplies have to be brought from the cantonment. The place is only fit for a few men at a time. 18. From my experience, I should say that dry and sandy soils are most healthy for stations. 19. I do not think that soldiers should be sent to India before 18, between which age and 24 is, I think, the best age for soldiers proceeding to India. They should land in the cold season. The barrack accommodation at Bombay, where troops are landed, is very bad. It is, I believe, in contemplation to send troops when landed at once by rail to Khundala, on the line of the Ghauts, separating the Deccan from the Concan. This, for various reasons, would be attended with many advantages. Artillery recruits are sent off without delay to Poona and Ahmednuggur. 20, 21. I do not think it would be found convenient, nor would any benefit be derived from locating troops, intended for India, at any intermediate station, and therefore that they should be sent direct from the depôts. I would strongly advise that troops on landing should not, if possible, be delayed at Bombay, but marched direct to the railway. Those whose regiments were at a distance, to be located for a time at Khundala. Those for Poona and Ahmednuggur to proceed there at once; those for Sinde or the North-west Provinces could be sent to Kurrachee without landing at Bombay. Troops proceed direct to the interior by rail or macadamized roads. 22. With regard to the length of a man's service in India, my own opinion inclines to 12 or 15 years, or even more, provided he takes rational care to avoid unnecessary exposure and intemperance. A man who has served some years in India, and whose constitution is good, as will generally be the case if it is allowed fair play, has become acclimatized, and therefore is worth half a dozen raw unacclimatized lads, especially where the duty entails fatigue and exposure. Were short services adopted the State would lose the services of hardy, acclimatized, and useful men, to be replaced by raw lads, useless in India until they had served three or four years, which is nearly as long as the advocates of short service think a man should serve within the tropics. 23. As regards medical boards, it would be unbecoming in me to pass strictures on my seniors; I may, however, observe that I think the medical officer, under whose charge proposed invalids have been, is the person best qualified to judge as to what should be done with them, and that in all cases his opinion should have great weight, and not be set aside unless in certain rare instances, in which he was clearly in error. I have seen an instance of lamentable results attending the disregard of the regimental medical officer's opinion, and men returned to their regiments who had been recommended to be sent to Europe. 24. Invalids should leave India so as to arrive in England towards the end of spring or beginning of summer.
Diseases.	1. Health parades are discontinued in the artillery, on account of being exceedingly obnoxious to the men's feelings. Men are warned in all cases to present themselves in hospital at once. Nearly 20 years' experience has proved to me that health parades are needless. They should be abolished throughout the army. Failing immediate application, the men should have "with delay" marked against their names in the report book, and they should be obliged to make good all guards and other duties missed while in hospital. This or similar punishment would be found quite sufficient to prevent delay in application. 2. Only three cases of scorbutus have occurred among the European artillery at this station in ten years, and they were recruits from England. 3. The admissions from hepatic disease in the same arm here have been 2·3 per cent. of the total admissions from all diseases, or 1 in 44. The deaths, 8 per cent. of the total deaths from all diseases, or 1 in 13. This disease has decreased of late years. 4. Only 11 cases of dracunculus have occurred in 16 years in the artillery, among men who had arrived from stations where the disease prevailed. 5. The admissions from venereal diseases have been 12·5 per cent. of the total admissions from all diseases, or 1 in 8. Next to fevers and diarrhœa, this has been the most prevalent disease at the station. It is difficult to suggest any means of diminishing this liability

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	The only method would be inspection of the women. I think it would be highly advantageous to establish lock hospitals, but to be of use they must have suitable establishments attached to them. 6. *Fever* has been the most prevalent disease in the European artillery. The proportion of fever admissions to admissions from all diseases has been as 1 to 4, and the deaths from fever as 1 to 22 of the total deaths. Ephemeral, remittent, and continued fevers prevail in the hot months, and intermittents after the termination of the monsoon. The admissions from ephemeral fever 9·2 per cent., and from intermittents 14·5 per cent., of the total admissions. During the last 10 years, 29 cases of remittent, and 20 cases of continued fevers have been admitted. There were no deaths from ephemeral fever and intermittents. Four deaths took place from remittent, 4·6 per cent. of all deaths from disease. No deaths occurred from continued fever. *Dysentery.*—The admissions from dysentery have been 2·1 per cent. of the total admissions from disease. The deaths 21·8 per cent. of the deaths from disease. In some years it has prevailed very much, as, for instance, in 1854 and 1859, at the termination of cholera, when the greatest number of casualties occurred from it. *Cholera.*—The cholera admissions have been 1 to 132 of the total admissions, and the deaths from cholera 1 in 3 of the total deaths from disease. In 1854-1859, nearly two-thirds of those attacked died *Small-pox.*—Only 5 cases, and 1 death among the artillery in 10 years. *Rheumatism* has supplied 1 in 16 of the total admissions from disease. 7. The above, with diarrhœa, are the more common diseases at the station. Catarrh and throat affections are also common. Fevers are most prevalent in the hot months and after the rains. Hepatic affections during the hot months. Catarrh and throat affections at the conclusion of the cold and commencement of the hot months. As influencing disease at the station, the proximity of the village of Bhingar, already mentioned, is to be regretted. It is a refuge for bad characters from the camp; liquor is sold in it to the soldier. It is not under camp regulations, and is crowded, ill-ventilated, and dirty. The stations of the cantonment show that almost every epidemic has its origin in Bhingar. I believe that more than one ineffectual attempt has been made by the local military authorities to have the village removed, which would be an immense advantage if it could be carried out. 8. As regards the effect of habits and duties in predisposing to disease, the great bane of the soldier's life in India is want of occupation. It is that which leads him to drink, and so lays the seeds of disease. On entering a barrack room, for one man employed six will be found doing nothing. I have the most profound opinion that too great exertions cannot be used to furnish legitimate amusement and occupation for the men. Much has been done of late years, but a great deal remains to be done. The men, as a class, are not given to literary pursuits, although this is daily mending. For one man in the ranks who could read and write in former times, ten can do so now. It is well known that in the field in India, even during the hot weather, while there is excitement among the men, there is little sickness and epidemic disease. But if the exposure is kept up without excitement, the men are almost certain to be attacked by an epidemic. Hence Europeans should only be moved during the cold months, unless on unforeseen emergency. 9, 10. Quinine is not needed as a prophylactic. No recommendations to make as to precautions to prevent epidemic disease other than those in use.
V. INTEMPERANCE.	1, 2. The soldiers on the station are temperate. No confirmed drunkards. No record kept as to diseases occasioned by intemperance. Drunkenness, *per se*, is punished as an offence. 3. There is an exclusive privilege of sale of spirits in the bazaar, which fetched by auction 19,560 rupees for the current year. It is for natives. Mowra is chiefly sold. Spirits are not a component part of the soldier's ration at the station, it being optional to purchase liquor or not. The quality is $\frac{12}{25}$ spirits, and $\frac{6}{25}$ water; not more than two drams a day allowed to each man under any circumstances. It is not a habit among the men to take a dram before parade. On march spirits are a part of the ration, and invariably so in the field. Spirits are not given as rations to convalescents. No liquors injurious to health are sold by authority in the bazaars. 4. I do not consider the cousumption of spirits by troops and convalescents conducive to health; on the contrary, I consider ardent spirits injurious to health. The quantity allowed (1 dram in quarters and 2 in the field) cannot be detrimental to efficiency and discipline. 5. I would abolish the use of spirituous liquors as part of the soldier's rations. The old soldier might feel the loss, but the young soldier would derive benefit from not acquiring the taste for ardent spirits, which, were it not part of the ration, he might never taste. 6. Beyond all comparison, I am of opinion that the use of malt liquor is preferable to that of spirits or wines. I consider the introduction of malt liquor for the use of the soldier as the greatest benefit that could have been conferred on him. And I am of opinion that the more the use of malt liquor is brought into play, and the less that of ardent spirits, the better it will be for the men. 7. I do not think that tea, coffee, lemonade, and soda water, and similar drinks, are much used at this station. I am in favour of abstinence altogether from spirits, but think that malt liquor in moderation is far preferable to the slops (ginger beer, lemonade, sherbets) which men are apt to drink when thirsty, and which are apt to induce diseases of the stomach and bowels. 8. I am of opinion that it would be beneficial to suppress altogether the spirit ration, and to substitute beer in its place. 9, 10. I would permit spirituous liquors to be sold in canteens only on particular occasions, and under the special and express sanction of the commanding officer. On such occasions, the spirit should be *the best of its kind* without regard to price. 11. The bazaar regulations for the sale of liquor are as follow. They are generally speaking obeyed.

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	"No licensed liquor seller residing in the cantonment shall on any pretence whatever give or sell liquor to any European soldiers, their wives or children. All cooks, cleaning boys, madrassis, and that class of natives who act as soldiers' servants, shall drink their liquor at the shops, and on no account shall they be permitted to take any away. For the observance of this rule the kilals shall be held responsible. The liquor sellers shall purchase their supplies from the liquor contractor, and from no other person. "All liquor shops shall be closed at 9 o'clock P.M., and not opened before gun-fire in the morning." (True extract.) W. V. JONES, Captain, Superintendent of Bazaar.
VI. DIET.	The canteen regulations in Jameson's code are strictly acted up to. 1. The composition of the ration in both European services is as follows:— 1 lb. bread - - - ⅝ oz. of tea 1 lb. meat - - - 2½ oz. sugar 4 oz. rice - - - 3 lbs. wood 1 oz. salt - - - 1 lb. vegetables } per man. No changes are made in this. Fresh vegetables are always given when in season. The constituents of the rations are inspected, first, by the European supervisors of the commissariat department, and then, previous to issue, by the regimental authorities. 2. A complete ration, including vegetables (no fruit) is allowed to every soldier. Non-commissioned officers and married men can each draw compensation in lieu, at the rate of three annas four pice a day, in which case they make their own arrangements for rations. Soldiers living in barracks take three meals a day; breakfast at 7 A.M.; dinner at 1 P.M., and tea at 4½ P.M. 3. I think that the ration both as regards quantity and quality is good. There ought, however, to be a greater variety in cooking it. At present the vegetables and meat are served in the men's jamboos, and form a greasy indigestible soup-like mess. It would be better if the several messes had their meat roasted or boiled together in joints, and that the meat and vegetables should be separately served, when in cantonment. The rations cannot be sold by the men. 4. Food is cooked without any apparatus, by means of large copper cooking pots and pans. The kitchens are clean. The meat is boiled or baked, according to the wish of the men. 5. There are soldiers' gardens at this station. They are under regimental arrangement.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. In cold weather and rains the dress is cloth clothing. In hot seasons and on fatigue duties khakee and white clothing. The usual accoutrements. The serge tunic and trousers with great coat are sufficient for cold weather; the khakee, everything that could be desired for the hot. The dress on guard is according to season, and there are good guard rooms and sentry boxes. No improvement can be suggested. The late alterations in dress,—the helmet—doing away with the stiff stock, and making the clothing loose, the trousers narrower below than above, are great improvements as regards health and comfort. Every man should wear a flannel belt next the skin. To prevent foot sore is a most important object. To this end the boot should *fit well;* too great stress cannot be laid on this. The present practice of serving out boots of similar shape to men with differently shaped feet cannot be too much reprehended. Big ill-shaped boots chafe the feet after a march of a couple of miles. Small boots, if the man can march at all, will cover his feet with sores and corns, and the man's efficiency is compromised. It would require more trouble and somewhat more cost to introduce a better system, but both would be amply repaid by increased efficiency. The uppers and soles, both separate, but otherwise made, should be sent out to India, all of the largest size, and fitted and made up for each man on the spot. European shoemakers should be attached to each company for the purpose. The stocking should fit well, otherwise foot-sore will be occasioned. For a march soft woollen is best; for other duties cotton. When both boot and sock fit, the soldier should be taught to rub a little common brown soap on each heel and instep each morning before march, and with this trifling precaution (and taking off boots and socks before crossing streams) a soldier may march from the Himalayas to Cape Comorin without getting a sore foot. At present, the wonder is that every man who marches a dozen miles is not laid up with foot-sore.
Duties.	1. I do not think, as far as health is concerned, that any object would be gained by having the men thoroughly drilled before coming out to India. But I am of opinion that it would be highly advisable that the first year of a recruit's life in India should be passed in as good a climate as possible. 2. I do not think men suffer from drills or parades, provided they are not of too long duration and are at proper hours. 3. Morning is the proper time for drills and parades. They should be concluded before the sun has any power, especially in the mounted branches of the service, the men having stables afterwards. In marches the men should arrive at their camping ground as soon after sunrise as possible. This is the usual custom. The reliefs are as follows:—*European:* cavalry, 15; artillery, 10; infantry, 8. *Native:* cavalry, none; artillery, 3½; infantry, 9. 3. Guards mount from private parade grounds and are relieved daily. Night roll calls are only resorted to when circumstances require them. Night guards are not detrimental to health, and no additional precautions are required than those usually adopted under existing regulations.
VIII. INSTRUCTION AND RECREATION.	1. The station is supplied with ball courts, skittle ground, schools, library and reading room. There are also regimental soldiers gardens, besides workshops and a theatre. There are no day rooms, and no gymnasium. There are soldiers' savings' banks. The recreations are sufficient, but should be more extensive for the station. There are restrictions on exposure during the heat of the day in hot seasons, but not during the rains or in cold weather. 3, 4. There is sufficient shade to enable the men to take exercise, without injury to health.

References to Subjects and Questions.	REPLIES.
IX. MILITARY PRISONS.	1. The cells are 10 feet by 10 feet. I would suggest their being considerably increased in size.
X. FIELD SERVICE.	1. There are no local regulations for field service. 2. The recommendations of the medical officer on a march are invariably weighed and considered. 3. The medical officer can remonstrate, which I consider sufficient. 4. Arrangements as to field hospitals, &c., are conducted under the superintendence of the Principal Inspector General, Medical Department.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following are the statistics of the station:—

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857-58	Detachment H.M. 33rd Regiment	19	—	—	1	—	—	—	—	—	—	—	2	—	—	—	19	—	22	—	121·0	—
1858-59	Detachment H.M. 3rd Dragoon Guards. Detachment H.M. 18th Royal Irish Detachment H.M. 33rd Regiment Detachment H.M. 57th Regiment	334	175	—	1	1	46	—	12	—	80	1	18	—	—	—	393	1	725	3	217·0	0·8
1859-60	Wing H.M. 3rd Dragoon Guards Detachment H.M. 28th Regiment Detachment H.M. 56th ditto H. M. 57th ditto	709	1,550	7	4	1	96	2	18	1	204	15	9	1	—	—	383	3	2,354	30	332·0	4·2
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	1st Battalion Artillery	881	352	—	—	—	29	—	18	—	220	4	51	—	1	1	369	1	1,040	6	272·9	1·5
1851-52		505	311	—	1	—	40	1	12	1	178	1	49	—	2	1	445	1	1,038	5	205·5	0·9
1852-53		463	235	—	—	—	48	1	17	—	145	4	34	—	—	—	388	—	867	5	187·2	1·0
1853-54		435	115	—	—	—	46	1	18	3	90	2	20	—	2	2	382	—	673	8	154·7	1·8
1854-55		311	117	—	1	—	25	—	18	1	195	10	24	—	30	19	284	—	694	30	223·1	9·6
1855-56		268	156	1	2	1	22	1	21	—	76	—	18	—	—	—	221	2	516	5	192·5	1·8
1856-57		196	81	—	1	—	24	—	—	—	57	—	11	—	1	—	192	—	377	—	192·3	—
1857-58		155	26	—	1	—	20	—	10	—	40	—	9	—	—	—	154	—	260	—	167·7	—
1858-59	1st Battalion Artillery Depôt 3rd European Regiment	276	113	1	2	—	99	2	3	—	109	1	44	—	—	—	472	—	854	4	309·4	1·4
1859-60	1st Battalion Artillery Depôt 3rd European Regiment	344	251	2	10	—	86	2	22	2	231	8	60	2	14	9	375	1	1,040	26	302·3	7·5

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	1st Battalion Gun Lascars 3rd Battalion Artillery 7th Regiment N.I. 26th do. do 5th Company 4th Battalion Artillery	1,267	561	1	5	—	14	—	4	1	134	2	12	2	3	—	511	4	1,244	10	98·1	0·7
1851-52	1st Battalion Gun Lascars 3rd Battalion Artillery 26th Regiment Native Infantry	1,116	309	1	6	—	11	1	2	1	92	—	9	1	—	—	319	2	748	6	67·0	0·5
1852-53	1st Battalion Gun Lascars 4th Battalion Artillery 4th Company 4th Battalion do. 3rd Battalion Artillery 26th Regiment Native Infantry	1,085	361	2	5	—	13	—	2	—	108	2	7	—	—	—	361	2	857	6	78·9	0·5
1853-54	1st Battalion Gun Lascars 4th Battalion Artillery 6th Company 3rd Battalion Artillery 4th Company 4th do. do. 26th Regiment Native Infantry	1,061	295	—	4	—	28	2	3	—	84	1	11	—	—	—	380	3	805	6	75·8	0·5
1854-55	1st Battalion Gun Lascars 4th Battalion Artillery 24th Regiment Native Infantry	963	268	3	6	—	9	—	3	—	97	1	14	2	8	2	268	1	673	9	69·8	0·9
1855-56	1st Battalion Gun Lascars 4th Battalion Artillery 4th Company 4th Battalion do. 24th Regiment Native Infantry	1,101	459	1	3	—	31	2	5	—	206	1	13	—	—	—	366	1	1,083	5	98·3	0·4
1856-57	1st Battalion Gun Lascars 4th Battalion Artillery 24th Regiment Native Infantry	971	288	1	3	—	22	5	3	1	78	—	17	1	—	—	297	3	708	11	73·9	1·1
1857-58	1st Battalion Gun Lascars 4th Battalion Artillery 5th Regiment Native Infantry	988	598	6	48	—	20	2	2	—	158	2	4	—	5	2	737	1	1,572	13	159·1	1·3
1858-59	1st Battalion Gun Lascars 4th Battalion Artillery 5th Regiment Native Infantry 22nd do. do.	1,079	365	1	24	1	15	1	7	—	87	—	11	2	—	—	615	2	1,124	7	104·1	0·6
1859-60	1st Battalion Gun Lascars 4th Battalion Artillery 22nd Regiment Native Infantry Depôt 24th Regiment do.	1,189	1,132	2	6	—	21	1	3	2	161	5	8	1	5	1	485	1	1,821	13	153·1	1·0

AHMEDNUGGUR.
BOMBAY.

EUROPEAN WOMEN AND CHILDREN.

Years.	Station.	CORPS.	WOMEN. Strength. Europeans.	Strength. Indo-Europeans and Natives.	Strength. Total.	Treated. Europeans.	Treated. Indo-Europeans and Natives.	Died. Europeans.	Died. Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	Strength. Indo-Europeans.	Strength. Total.	Treated. Europeans.	Treated. Indo-Europeans.	Died. Europeans.	Died. Indo-Europeans.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1852-53	Ahmednuggur.	1st Battalion Artillery	36	28	64	56	28	1	1	131·2	3·1	38	29	67	67	49	6	1	173·1	10·4
1853-54		Ditto - - -	38	30	68	25	22	—	—	69·1	—	40	35	75	66	42	6	2	144·0	10·6
1854-55		Ditto - - -	29	26	55	46	29	1	2	118·1	5·4	34	31	65	62	41	6	6	158·4	18·4
1855-56		Ditto - - -	33	24	57	48	19	—	—	117·5	—	54	34	88	79	12	—	4	103·4	4·5
1856-57		Ditto - - -	36	22	58	54	29	1	—	143·1	1·7	67	31	98	108	40	9	5	151·0	14·2
1857-58		Ditto - - -	44	26	70	38	23	—	—	87·1	—	71	31	102	133	44	16	10	173·5	25·4
1858-59		Ditto - - -	36	22	58	51	12	—	1	108·6	1·7	49	28	77	59	10	1	—	89·6	1·3
1859-60		Ditto - - - Depôt 3rd European Regiment - -	71	27	98	87	18	3	1	107·1	4·0	93	35	128	85	23	13	1	84·3	10·9

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 1860.

W. C. COLES, Assistant-Surgeon,
Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. The hospital is situated to the south-west of the barracks and is adjacent to them. The horse lines are in front or west side of the hospital, and distant about 200 yards. The hospital is at a considerable distance from the bazaar, and the only houses near it are those of the officers at the rear of the building. The site is open and freely ventilated. There are no houses, walls, &c., to interfere with this. It is healthy as to elevation, drainage, absence of malaria from river banks, nullahs, ditches, or any other nuisance. 3. The water supply is abundant and wholesome. 4. The refuse water is carried away by means of drains which lead to cesspools outside the hospital, from which it is removed and taken to a distance from camp. 5. All the ward floors are raised four feet above the surface of the ground. They are of stone. There is no perflation of air below the floors. There is no provision made for conveying away the roof water which sinks into the subsoil. There are superficial gutters for carrying away surface water. The hospital is built of brick with a tiled roof; both walls and roof are single, but sufficiently thick to keep the hospital cool. There is a verandah, eight feet wide, on both sides, which with *chicks* afford sufficient shelter from the sun's rays. The verandahs have on occasions of emergency been used as accommodation for sick, for which they are not well adapted. Parts of the verandahs are used as places (they cannot be designated as rooms) for eating meals in, there being no rooms for that purpose. There are three wards, all on the ground floor, and 60 beds. The following are the particulars of the accommodation :— Date of construction, 1831; raised and otherwise improved, 1856; wards, 3; beds, 60.

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards. Length.	Breadth.	Height, Mean.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area per Bed in Feet.	Height of Bed above the Floor.	Windows. Number.	Height. Ft. In.	Width. Ft. In.
1	20	70	24	24	40,320	2,016	84	1½	Top - 18 Bottom 10	4 0 6 7	3 0 3 0
2	20	64	24	24	36,864	1,843	76·9	1½	Top - 19 Bottom 11	4 0 6 7	3 0 3 0
3	20	64	24	24	36,864	1,843	76·9	1½	Top - 19 Bottom 11	4 0 6 7	3 0 3 0

The hospital is so placed as to receive the full benefit of prevailing winds. There are two sets of windows in each ward, one below and the second six feet higher up. The lower windows open in the centre, having a fan above, which can be opened or shut independently of the rest of the window. The upper windows are on a pivot in the centre, and are opened and shut by means of a rope. This double set of windows is most conducive to ventilation and coolness.

6. The windows are used for ventilation and are sufficient to keep the wards free from odour or closeness. The upper windows have jalousies, opened and shut by a rope. The lower windows have none.
7. There are no means of cooling the air. Shutting the wards up by day in the hot weather being sufficient, while the nights are always cool and pleasant.
8. No means of warming are necessary.

The walls of the wards, &c., are whitewashed every three months or oftener if necessary.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	9. Privies and urinals are at a short distance from the hospital, and connected by covered passages. The drainage is good, leading to cesspools outside, from whence the contents are removed by hospital sweepers, and taken to a distance by night carts. Water is freely used in the urinals, by which, and the use of deodorizing agents, both privies and urinals are kept quite free from noxious or offensive exhalation. 10. The bathing apparatus in India is in general very simple; copper handbasins and wooden tubs with slipper baths for those requiring hot baths near their bed side. The artillery hospital has also shower baths, and the lavatories are being enlarged. 11. The bathing rooms, when enlarged, will be sufficient for sick. 12. Hospital clothing is washed at a distance by native washermen and returned fit for use. 13. The storage is sufficient and dry. 14. The hospital cots are of iron painted, some having iron, some tape bottoming. The mattress is made of straw, bed-clothes according to season. Sheets, blanket, and counter-pane in cold weather. No blanket in the warm season. Iron cots all that could be desired. 15. The cook room is convenient, and contains everything necessary for cooking diets. 17. The hospital attendance consists of the hospital serjeant and ward boys, in numbers proportioned to the sick. Patients who wish it may have a comrade as orderly to attend on him. The attendance is sufficient. 18. The sanitary condition of the artillery hospital at this station is very good. No gangrene or pyæmia. Cholera has appeared in it as elsewhere. 19. The only deficiency in the hospital is a convalescent's dining room. They dine in the verandah at present, but anything is better than dining in the wards; among other reasons, because flies, which are a pest of the first magnitude in India, are attracted by it. Such dining rooms are required for all hospitals. 20. There are grounds but no shaded walks where convalescents can take exercise. 21. There is a female hospital, with matron and assistant matron, for the wives and children of the artillery. The accommodation is not sufficient. Alterations have been recommended, but deferred. 22. There are no special hospital regulations for this station. 23. The hospital is under the direct control of the medical officer. He can suggest and make requisitions for repairs, change the diets and prescribe comforts, subject to the supervision of the superintending surgeon of the division. 24. There is no convalescent ward.
XIII. Burial of the Dead	1, 2. The burial ground is within camp limits, but at the outskirts. Its position as regards prevailing winds is favourable. Area, 300 feet by 200 feet. Soil, morum (schist); subsoil, white clay. Decomposition takes place very readily; the grounds are carefully kept. 3. Grave space 7 feet by 2 feet. Two feet between the graves. Depth of graves, 5 feet. Not re-opened except vaults, which are hermetically closed over each coffin. Interment takes place within 12 hours, always within 24 hours after death; in cases of cholera or epidemics, as soon as possible. 4. The grave yard is never offensive. 5. The dead of camp followers and bazaar people are either burnt or buried according to the customs of their caste. The burial ground and place of cremation are on the outskirts of camp. 6. No injury to health accrues from the present practice of burial, and 7. No improvement in the regulations can be suggested.

21st June 1860.

J. Hobson, Brigadier.
W. L. Cameron, Surgeon, 1st Batt. H.M.B. Artillery.
A. U. H. Finch, Capt. Engineers.

ADEN.

Accommodation	Queen's Troops	Artillery	140.	This is to be doubled—sanction obtained.
		Infantry	350.	To be increased to 500—sanction obtained.
	Native Troops	Artillery	100.	
		Infantry	1,100.	

References to Subjects and Queries.	Replies.
I. Topography.	1. Aden is a peninsula connected by a narrow neck of land with the sandy plains of the interior of Arabia. The country is nearly flat for miles, but there are high and lofty hills in the distance. There is no wood or jungle in the vicinity. 2. The cantonment at the upper end of the crater is 123 feet above the level of the sea at high tide, but the adjacent country is almost on the level of the sea for miles. The only high and healthy ground adjoining the station is Mur Shag hill, about 300 feet above high tide, which juts out into the sea a considerable distance in an easterly direction, and is therefore under the influence of both monsoons, the prevailing winds thus passing freely over it fresh from the sea without being raised in temperature by coming over any land. The difficulty of access and transport for water and provisions throw great obstacles in the way of its being used for military purposes. 3. There is no mountain or table land at all available as a military site. 4. The nearest water is at Shaik Othman, about five miles in the interior. The vicinity is not generally liable to an overflow of water; but when the violent thunder storms occur, which is usually about once every three years, the crater of Aden, on which the camp and town are situated, is overflowed for a few hours; the water, however, is soon carried off into the sea, or sinks into the subsoil, which is of a very absorbent nature. There are no water pits, but two or three ravines exist, formed by the Shum Shum range of hills. They are not prejudicial to health.

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References to Subjects and Queries.	REPLIES.

I. Topography—*cont.*

5. The station is free and open to the winds in an easterly direction, and although surrounded towards the west by very high hills, the winds when blowing from that quartor are too high to be much impeded by them. There are no trees, hedges, walls, or houses that can interfere with free ventilation. In the part of the cantonment occupied by the native troops the temperature is raised several degrees by reflected heat. The station is exposed to no cold winds. The wind varies but little in its direction, blowing, when the periodical monsoons set in, from the S.W. for five months, viz., from May to September, and from the E. and N.E. for the remaining period of the year; the force of it, however, varies considerably. When the S.W. monsoon sets in, the camp itself becomes exceedingly hot, from the temperature of the air being greatly raised by the wind blowing over the high hills surrounding the cantonment. At the other season a fresh cool sea breeze blows constantly into camp.
6. The surrounding country is not cultivated, there being no works of irrigation or any water in the vicinity of the station.
7. The town of Aden is situated close to military limits, and contains 25,000 inhabitants.
8. The district is of volcanic formation, the soil and subsoil of the station being formed of the disintegration and washing down of the surrounding rocks, combined with that thrown up by the sea. The town, &c. is built upon the *débris* of former buildings.
9. The average depth at which water is found in the dry season is 140 feet below the surface. There is no rainy season.
10. The rain-fall sinks into the subsoil, which is of a very absorbent nature, or is soon carried off into the sea. There are no surface springs. The drainage from the Shum Shum range of hills and Munsoorie heights passes into the subsoil of the station.
11. The water supply of the station is derived from wells. Tanks to contain about 10 or 12 million gallons, collected from the drainage of the Shum Shum hills, are in progress, called "Taweela Valley Tanks;" and one condenser at the Isthmus, and two at Steamer Point, are nearly ready for use, and they will yield, it is believed, between them 500 gallons the hour. The tanks contain, at a rough estimate, 30,000 feet square, but are at present empty. There are three reservoirs at the Isthmus, covered in, which are full, and contain one million gallons between them; they were filled by hand, but they will in future be made use of to store condensed water in as soon as the engine is working. No tanks for drinking purposes are also used for bathing. The wells are not liable to pollution from any source.
12. The amount of drinking water is limited, but will, it is expected, be much increased shortly, when the Taweela tanks are completed and the condensers in full working order. The composition of the water of wells, which form the chief source of supply to the inhabitants for drinking purposes, is—

Specific Gravity, at 60° F.	Banian, 1007·2.	Parsee, 1006·2.	Turkish Well, 1005·1.	Taweela.
Chloride of sodium - - -	32·93	29·80	30·88	19·63
" magnesium - - -	10·11	11·50	10·97	6·35
" calcium - - -	14·75	13·29	11·05	15·96
Sulphate of soda - - - -	13·69	7·62	8·40	5·63
Nitrate of lime - - - -	14·09	5·23	4·50	—
Carbonate of magnesia - - -	·35	·31	·45	—

The water supplied to the troops for drinking purposes, first sort, is on the whole good, but the supply is very limited. The water is raised by bullock power, and distributed through camp on donkeys and camels. In the event of eur present prospects of obtaining a good supply of water failing, it can always be obtained in any quantity at Shaik Othman, and brought in on camels; or, as formerly, an aqueduct might be constructed, the ancient one not being repairable.
13. There are no other topographical points bearing on the health of the station, not included in these queries.
14. All stations are selected by a committee of experienced officers, two of whom are the medical officer and engineer. There is no improvement in this to be suggested.

II. CLIMATE.

1. There are no instruments for meteorological observations at this station, except the thermometer supplied to the hospital.
2. TABLE of Meteorological Observation prepared on the only available data, being One Year's Observation from January 1859 to December 1859.

Month.	Mean Temperature.	Month.	Mean Temperature.
January - - -	76	July - - -	93
February - -	78	August - - -	93
March - - -	83	September - -	89
April - - -	87	October - - -	81
May - - -	90	November - -	82
June - - -	94	December - -	76

3. The climate is equable throughout the year from its vicinity to the sea; and for the same reason there is in general a good deal of moisture in the atmosphere. The temperature is pretty high, and the effects of the sun's rays are always powerful. There is no cultivation. At times, especially in the hot months, clouds of dust envelop the camp, but beyond the temporary annoyance, there are no bad effects to the health of the troops, excepting some slight cases of ophthalmia at times. The troops are generally pretty healthy; the diet and clothing require to be light, and the shelter the best procurable from the sun's rays. Every precaution is taken as to the amount, nature, and times for drills, duties, and exercise. In general the most

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	healthy months at the station are those of the cold season, from November to March. May and September may be considered as the most unhealthy months. The most prevalent diseases then are fevers, diarrhœa, and scurvy. 4. Beyond a removal from the camp to Steamer Point, a distance of about six miles, or to Mur Shag hill, about a mile off, there are no other places where an invalid can be sent without taking a long sea voyage, either to Bombay or by the homeward route. 5. Captain Fuller has served at Poona, in the Poona districts, and Concan. He prefers the Concan to the Deccan, although most people prefer the latter. The climate of the former is moist, that of the latter dry; but, in his opinion, the climate of Aden is generally more salubrious and healthy than either of the above. Major Lynch has served at almost every station in the Bombay Presidency, and has found but little, if any, difference as regards salubrity. Belgaum and Poona are generally considered the most healthy stations. Dr. Davidson has served chiefly in Sinde and Guzerat, Rajpootana, and Aden. His stay at other places was too short to form an opinion. Sinde was decidedly the most unhealthy. The others, for India, were comparatively salubrious.
III. Sanitary Condition of Station.	1, 2, 3. A map of the adjacent country and plans of the station and barracks are transmitted. 4. Table of Barrack Accommodation. Date of construction:— Isthmus barracks, 1853–58. Infantry barracks, front bay, 1857–60. Old artillery barracks, unknown. Native infantry regiment barracks, 1857–58. Sappers and Miners barracks, 1858. Total number of rooms or huts, 106. Total regulation number of non-commissioned officers and men, 1,980.

—	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
For two companies of infantry in Front Bay. Men's quarters -	4	46	120	24	$\frac{25+18}{2}=21\frac{1}{2}$	61,920	1346·08	62·608	$1\frac{1}{2}$	16	6	4
Serjeants' do. -	8	2	$33\frac{3}{4}$	10	$\frac{18+12}{2}=15$	5062·5	2531·25	168·75	$1\frac{1}{2}$	4	6	
1 patchery for married men of one company.	12	2	16	14	$\frac{13+19}{2}=16$	3,584	1792·	112	—	3	4	3
2 ditto under construction, each for 12 married men.	12	2	14	9	$\frac{7+13}{2}=10$	1,260	630·	63	—	Three doors (6 × 4) to these rooms.		
Isthmus barracks. Men's quarters -	2	46	116	24	$\frac{20+28}{2}=24$	66,816	1452·5	60·5	—	16	$8\frac{1}{2}$	5
Serjeants' do. -	2	2	14	10	24	3,360	1680·	—	—	1	$8\frac{1}{2}$	5
Old artillery barracks will be pulled down on new ones being built. No. 1 barrack	1	32	88	$20\frac{1}{2}$	$\frac{12+21}{2}=16·5$	29,766	931·8	56·3	—	23	5	3
No. 2 do.	1	32	110	12	$\frac{7·5+16·5}{2}=12$	15,840	495·	41·2	—	No windows. The walls have several trelliswork openings to answer the purpose of windows.		
Native infantry regiments -	56	24	80	20	$\frac{6+10}{2}=8$	12,800	533·	66·6				
Sappers and Miners - -	8	16	80	20	8	12,800	800·	100·				
Guard-room, under one roof -	—	4	30	20	$\frac{13+18}{2}=15\frac{1}{2}$	9,300	2325·	150·	—	6	4	3
1 cell do. do. - -	—	1	10	$9\frac{1}{2}$	$15\frac{1}{2}$	1472·5	1472·5	9·5	—	2	4	3
1 do. do. - -	—	1	10	$9\frac{1}{2}$	$15\frac{1}{2}$	1472·5	1472·5	9·5	—	2	4	3
Prison cells under one roof, with clear space between each of 10 feet - - 4 each.	}	1	10	5	$\frac{18+13}{2}=15·5$	775	775	50	—	4	$1\frac{1}{2}$	$1\frac{1}{2}$

N.B.—Barracks with subsidiary buildings for one company of artillery in camp at Front Bay, and ditto ditto for one company of artillery on Ras Tarshyne, and ditto ditto for two companies of infantry on Ras Tarshyne have been sanctioned, and will be built in due course.

5. The windows are on opposite sides in barrack rooms, and open towards the outside in the Front Bay barracks, and towards the inside in the Isthmus barracks. There is a verandah on both sides. In the infantry barracks at Front Bay the verandahs are double, the interior verandah being 10 ft. in width, and the exterior one being $7\frac{1}{2}$ ft. wide. The Isthmus barracks have single verandahs on both sides, $12\frac{1}{2}$ ft. in width. The verandahs are used as sleeping quarters at present, on account of the limited

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	accommodation, a wing being accommodated in the barracks for three companies. There are no properly constructed jalousies or jhilmils. 6. Planks on iron trestles are used for bedsteads in barracks, and the bedding is of carpets. No improvements are suggested. 7. The tents are made of good Dungaree, of three folds of cloth, white outside and blue inside. The following Table shows their dimensions, cubic space, &c. :—

Description of Tents.	Dimensions of Tents.			Europeans.												
	Length.	Breadth.	Height.	Cubic Contents.	Artillery, with Harness.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Cavalry with Saddles.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Foot Artillery and Infantry.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Staff Serjeants.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.
European soldiers, two poled - -	22½	14	$\frac{6+12}{2}=9$	2,835	14	202½	22½	16	177⅜	19 11/16	22	128 19/22	14 7/22	2	1,417½	157½
European soldiers, single poled - -	14	14	9	1,764	8	220½	24½	10	176⅖	19⅗	13	135 9/13	15 1/13	1	1,764	196
European soldiers' hospital, single poled - - -	14	4	9	1,764	12	147	16⅓	15	117⅗	13 1/15	20	88⅕	9⅘	2	882	98
Staff serjeants, single poled - - -	14	14	9	1,764	4	441	49	5	352⅘	39⅕	6	294	32⅔	1	1,764	196
Native cavalry, single poled - -	11	10	$\frac{6+11}{2}=8\frac{1}{2}$	935	8	116⅞	13¾	10	93½	11	13	71 12/13	8 6/13	1	935	110
Native infantry, single poled - -	11	10	8½	935	7	133⅔	15⅚	9	103⅔	12⅓	12	79 7/12	9⅙	1	935	110
Hospital, single poled	11	10	8½	935	12	77 11/12	9⅙	15	62⅓	7⅓	20	46¾	5½	2	462½	55

Description of Tents.	Natives.									For Hospital.					
	Cavalry, with Saddles.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Golundauze Infantry Sappers.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Native Officers.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Europeans.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Native.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.
European soldiers, two poled - -	—	—	—	—	—	—	—	—	—	12	236¼	26¼	15	189	21
European soldiers, single poled - -	—	—	—	—	—	—	—	—	—	8	220½	24½	10	176⅖	19⅗
European soldiers' hospital, single poled - - -	—	—	—	—	—	—	—	—	—	12	147	16⅓	15	117⅗	13 1/15
Staff serjeants, single poled - - -	—	—	—	—	—	—	—	—	—	4	441	49	5	352⅘	39⅕
Native cavalry, single poled - -	25	37 19/25	4⅖	30	31⅛	3¾	4	233¾	27½	8	116⅞	13¾	10	93½	11
Native infantry, single poled - -	18	51 17/18	6⅛	22	42½	5	4	233¾	27½	7	133⅔	15⅚	9	103⅔	12⅓
Hospital, single poled	—	—	—	—	—	—	—	—	—	12	77 11/12	9⅙	15	62⅓	7⅓

8. The barracks are ventilated by teak wood trellis work in the walls over each door and window 2 ft. high, and the same breadth as the door and window, and are within about 2 ft. of the top of the room. There are also openings in the roof formed by decreasing the slope in places. The ventilation is sufficient to keep the air pure night and day. No cooling apparatus is necessary in the barrack rooms, as the barracks are well open to the breeze at all seasons. Punkahs have been recently erected on account of the excessive sickness among the 4th King's, recently arrived from unhealthy Indian stations.

9. The Isthmus barrack walls are built of rubble and chunam. The roof is a framing of teak with a covering of jawlies. The doors and windows are of teak. The Front Bay barrack walls are of wattle and daub nine inches thick (that is, timber framing covered and plastered with mud). The roof is of jawlies, and the doors and windows of teak. The sepoys' huts are a framing of Zanzibars, with Aden rafters, the walls and roof being covered with mats and jowlies.

10. The floors are paved, and in the Isthmus barracks are over an arched ground floor. In the Front Bay barracks the space between the plinth walls under the stone paving is filled in with dry rubble. The height of the floors above the ground is 2 ft. 9 in.; there is no passage of air beneath them.

11. The materials and construction of the barracks, huts, and tents are suitable for the climate; but the Front Bay barracks would have been more durable if the walls had

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	been built of rubble and chunam, instead of wattle and daub. In future all barracks and public buildings will be built of rubble and chunam, as approved by Government. The slope of the jowlie roofs in the above barracks is too little to let the rain run off freely, being only 30°. This slope ought to be 45°; and all roofs will be hereafter built to that angle, which will heighten the walls, and make the barracks cooler. The walls of Isthmus barracks are of rubble masonry, and similar to the above in other respects. The barracks and cantonment are kept in repair by the executive engineer and barrack-master; the latter has charge of all military buildings, and he is responsible for their sanitary state. Repairs are executed immediately their necessity is brought to notice. There are no ceilings to barracks. The walls are generally coloured and whitewashed once every two years. 12. There are no baths; the men bathe in the sea. 13. The barrack cook-houses are supplied with water by bheesties or water-carriers. The refuse water is allowed to soak into the subsoil. There are plenty of native washermen for washing and drying the linen. 14. The privies are cleaned by sweepers night and morning, and the contents burnt in furnaces built for the purpose. The urinals are flushed by the drainage of the wash-houses, and the contents flow into cesspools. 15. These buildings are ventilated by an open trellis work of Aden bamboos. The barracks are lighted by common lanterns, in which oil is burnt. 16. All drainage from barracks is allowed to sink into the subsoil, which is of a very absorbent character. The contents of urinals and wash-houses are received into cesspits. These cesspits are not in the vicinity of any wells. The cesspits at Isthmus barracks are 72 feet from the urinals in the barracks; they are 10 feet in diameter, and 6 feet deep. Those at Front Bay barracks are 20 feet from the urinals, are 10 feet in diameter, and 7 feet deep, and 40 feet from the nearest barracks. No cesspools are near the hospital. The subsoil absorbs the contents of the cesspools. There are no foul ditches. 17. Refuse and manure are conveyed away daily in carts, under the direction of the barrack-master, and burnt in furnaces in Halkut Bay. The cantonment is kept clean. 18. The surface of the cantonment is naturally free from vegetation. There are no old walls, thick hedges, &c. interfering with the ventilation. 19. The Sudder bazaar is situated at the north-west end of the cantonment, and is in close proximity to the lines of the 29th native infantry, and sappers and miners. A few officers' houses are also in the vicinity. With respect to drainage, there are no regular drains near to the Sudder bazaar, but they are not required, the ground on which the shops are built being elevated and dry. The ventilation is good, and water is supplied from the Government wells in the Khusaf valley. In regard to cleanliness, care is taken that no nuisances are committed in or near the bazaar; in the rear of the shops a privy has been constructed, resorted to by the residents, and the men and followers of the native regiments. The houses are in no way crowded, and to preserve cleanliness the bazaar peons are stationed in different parts of the camp to see that nuisances are not committed in unauthorized places. We do not think that any improvement can be effected in the sanitary condition of the bazaar. The general condition of the native houses is good, and there are no dungheaps or cesspits within them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The distance from the place where animals are slaughtered to the station is about a mile. It is situated in the civil limits, and the entrails of the animals are buried in a spot set apart for the purpose. No inconvenience is experienced, and we can suggest no improvement in the present arrangements. 21, 22. The bazaar followers do not possess horses; all animals are stabled in the civil limits. There are no cavalry or artillery stables, nor any picketing grounds. 23. At present there are quarters for 12 married men of the infantry in Front Bay; eventually there will be quarters for 24 more, equal to the full allowance of married men to three companies located in Front Bay and the Isthmus. No barrack rooms are occupied by married men. Quarters for 12 married men of a company of artillery are sanctioned in Front Bay, and for 12 for a company of artillery at Ras Tarshyne, and for 24 married men for two companies of infantry at the same place.
Officers' Quarters.	1. There are no public quarters for officers.
IV. Health of the Troops.	1. The station may be regarded as healthy both for the troops and inhabitants. 2. Among the native population ulcers, small-pox, and fever seem to be the general diseases; spleen disease is not of common occurrence. 3. The native population may be considered generally as healthy, from there being little malarious influence and the attention paid to the general cleanliness of the place. 4. A wing of Her Majesty's 4th, or Queen's Own, arrived about six months ago from Ahmedabad, where they had been stationed for 18 months, and where they enjoyed good health on the whole, fever being the chief complaint. About 100 men of the 13th brigade, royal artillery, arrived in October 1858 from Surat, where they had been stationed about five months, and suffered a good deal from fever and dysentery. They did not enjoy good health on their arrival, but are now healthy. During their stay here the chief diseases have been fever and bowel complaints. Their accommodation is very good, and all equally healthy. 5. The troops cannot be camped out unless on emergencies. 6 to 16. No experience of hill stations. Frequent change of station in the plains is beneficial to the troops. 17. There is no higher ground near the station which could be advantageously occupied as a hill station.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	18. A dry, sandy, or gravelly soil is to be preferred for stations.
	19. Soldiers proceeding to India should be from 17 to 25 years of age, and they should land there from November to April. Troops on landing are at once marched to barracks. Recruits on first landing in India, if in Bombay, should be sent to Poona immediately, to remain there until acclimatized.
	20. Troops should be sent direct from the home depôts to India.
	21. At Aden troops land at Steamer Point, and march up to the camp, the luggage being conveyed on carts. No additional precaution is required for the preservation of the health of the troops on the route.
	22. The period of a British soldier's service in India should be from 14 to 20 years, dependent on the station they are likely to serve at.
	23. The manner of conducting medical boards at out-stations, as existing in the Bombay army, seems to prove satisfactory as to invaliding.
	24. Invalids should leave India for home at any time, so as not to arrive either in the early spring or in the winter. Their time of departure must be regulated by the route chosen.
Diseases.	1. A medical inspection of the European troops takes place weekly. Such is not required, nor would it prove serviceable for native troops.
	2. The European troops for the last two years may be said to have been exempt from scorbutic complaints, but scurvy has been rather frequent among the native troops, the proportion being 10·6 of other diseases. It is attributable to the limited supply of good fresh drinking water; the better sort of vegetables are also dear and scarce. Tanks on a large scale are now being constructed to retain the little rain water that falls, and Government condensing apparatus are now also being erected.
	3. The following Table shows the proportion of hepatic diseases and scorbutus under treatment, to the total admissions and deaths from all diseases for the years ending 31st March 1858 and 1859:—

—	1858.		1859.		Total.	
	Admissions.	Deaths.	Admissions	Deaths.	Admissions.	Deaths.
Total admissions and deaths from all diseases in the European troops -	186	3	645	15	831	18
Total admissions and deaths from all diseases in the Native troops - -	589	8	779	90	1,368	98
Total of scurvy cases admitted in the European troops - - -	1	—	—	—	1	—
Total admissions of scurvy cases in the Native troops - - - -	25	2	70	2	95	4
Total admissions from hepatitis in the European troops - - -	—	—	10	1	10	1
Total admissions from hepatitis in the Native troops - - - -	2	—	—	—	2	—

4. No well authenticated case of dracunculus, having its origin in Aden, is known.

5. The proportion of sick from venereal diseases to that of others bears no constant ratio. At times the hospitals will be completely free from any venereal complaints, whilst at others numerous admissions will take place. The most obvious precaution is increased encouragement to marriage; and it is certainly advisable that some sort of surveillance should be kept over the public women.

TABLE of Admissions from these Diseases for the Years 1858 and 1859, showing the Per-centage upon the Total of Admissions from all other Diseases:—

EUROPEAN TROOPS.

Diseases.	1858.		1859.		Per-centage	
	Total Admissions.	Total Deaths.	Total Admissions.	Deaths.	Admissions on Total Admissions.	Deaths on Total Deaths.
Syphilis primitiva -	13	—	12	—	3·00	—
„ consecutiva -	2	—	3	—	0·60	—
Ulcus Penis non Syphilitica	1	—	2	—	0·36	—
Bubo simplex - -	13	—	12	—	3·00	—
Gonorrhœa - -	7	—	10	—	2·05	—
Orchitis - - -	—	—	1	—	0·12	—
Phymosis - - -	—	—	1	—	0·12	—

References to Subjects and Queries.

REPLIES.

IV. Health of the Troops —*Diseases—cont.*

NATIVE TROOPS.

Diseases.	1858. Total Admissions.	1858. Total Deaths.	1859. Total Admissions.	1859. Total Deaths.	Per-centage. Admissions on Total Admissions.	Per-centage. Deaths on Total Deaths.
Syphilis primitiva -	19	—	—	—	1·38	—
„ consecutiva -	16	—	10	—	1·82	—
Ulcus Penis non Syphilitica	2	—	—	—	·14	—
Bubo simplex - -	9	—	2	—	·80	—
Gonorrhœa - -	5	—	1	—	·43	—
Orchitis - - -	1	—	3	—	·29	—
Phymosis - - -	—	—	—	—	—	—

6. The troops, both European and native, suffer but little from epidemic or endemic disease. A very severe outbreak of cholera amongst the native troops took place in October 1858; it had been unknown at the station for 10 years previous. This complaint at that particular time, and for some months afterwards, committed graet ravages amongst the population on both sides of the Red Sea; it lasted among the troops only for a week.

The following Tables show the total admissions and deaths among the European and native troops for the years ending 31st March 1858 and 1859:—

EUROPEAN TROOPS.

Diseases.	Admissions for Two Years to Total of Admissions.	Deaths to Total Deaths.	1858. Strength, 297. Total Admissions.	1858. Total Deaths.	1858. Per-centage of Deaths.	1859. Strength, 356. Total Admissions.	1859. Total Deaths.	1859. Per-centage of Deaths.
Fevers - -	—	—	51	1	1·9	339	3	0·8
Dysentery - -	3·24	33·33	1	—	—	26	6	23·
Cholera - -	·12	—	—	—	—	2	—	—
Small-pox - -	—	—	—	—	—	—	—	—
Rheumatism -	1·91	—	8	—	—	8	—	—

NATIVE TROOPS.

Diseases.	Admissions for Two Years to Total of Admissions.	Deaths to Total Deaths.	1858. Strength, 1,094. Total Admissions.	1858. Total Deaths.	1858. Per-centage of Deaths.	1859. Strength, 1,175. Total Admissions.	1859. Total Deaths.	1859. Per-centage of Deaths.
Fevers - -	—	—	191	3	1·5	194	3	
Dysentery - -	4·60	1·02	20	—	—	43	1	2·3
Cholera - -	9·97	77·55	1	—	—	123	96	61·7
Small-pox - -	·07	—	1	—	—	—	—	—
Rheumatism -	·07	—	61	—	—	—	—	—
Scorbutus - -	6·72	4·07	22	2	9·0	70	2	2·8

TABLES of Admissions and Deaths from Fevers for the past Two Years, with the Percentage of Admissions and Deaths on Total Admissions and Deaths for the same Period.

EUROPEAN TROOPS.

Diseases.	1858. Strength, 297. Total Admissions.	1858. Total Deaths.	1859. Strength, 356. Total Admissions.	1859. Total Deaths.	Admissions on Total Admissions.	Deaths on Total Deaths.
Febris ephemera - -	—	—	13	—	1·56	—
„ intermittens -	10	1	77	—	10·48	5·55
„ remittens - -	—	—	5	—	·60	—
„ continua co. -	40	—	242	3	33·91	16·66

ADEN.
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References to Subjects and Queries.

REPLIES.

IV. Health of the Troops —*Diseases—cont.*

NATIVE TROOPS.

Diseases.	1858. Strength, 1,094. Total Admissions.	1858. Strength, 1,094. Total Deaths.	1859. Strength, 1,175. Total Admissions.	1859. Strength, 1,175. Total Deaths.	1859. Strength, 1,175. Admissions on Total Admissions.	1859. Strength, 1,175. Deaths on Total Deaths.
Febris ephemera - -	91	—	82	—	12·65	—
„ intermittens -	93	2	109	2	14·76	4·08
„ remittens - -	—	—	—	—	—	—
„ continua co. -	4	1	—	1	·36	2·04

7. None of the diseases enumerated in the four orders of the zymotic class show any marked change in their nosological character from what is exhibited in other places. Fevers, diarrhœa, and dysentery are most prevalent in September, and rheumatism in the cold weather. Small-pox prevails at all seasons. No particular climatic or atmospheric conditions precede or accompany their appearance. In the bazaars disease is most prevalent, but great attention is paid to the cleanliness, ventilation, and, as far as possible, the overcrowding of the dwellings is prevented. The personal habits of the troops do not predispose to these diseases, but the predisposition to them among the native population cannot be entirely removed.
8. A soldier's duties and occupations in barracks do not influence the prevalence of disease.
9. In a station such as Aden, prophylactic doses of quinine are not required.
10. For the prevention of epidemic diseases in Aden great attention is paid to cleanliness, as well as the establishment of a native village outside the fortifications, and certain quarantine regulations; but in a migratory population like this, it is impossible to prevent the ingress of persons affected with small-pox and such like diseases.

V. INTEMPERANCE.

1. The soldiers at the station are temperate; there are no confirmed drunkards.
2. There have been no admissions into hospital from diseases directly or indirectly caused by intemperance. In the royal artillery, during the half year ending 31st March 1860, the following entries have been made in the defaulters' book:—

Regimental entry - - - -	1
Battery „ - - -	12

Of these, the regimental entry and five of the battery ones were for acts of simple drunkenness, the remainder were for very slight offences. There has been one court-martial at the station since the battery first arrived at Aden in October 1858, and that was for being drunk and fighting; the man had just joined the battery. There is no record kept of abstainers, and men are often prevented joining such a thing on account of its getting known. The men who have been invalided from or died at this station have mostly arrived here with weakened constitutions. Drunkenness is always punished as an offence.
3. Arrack is sold at the canteen and bazaar, and in the latter place other descriptions of spirits also. Twenty-four parts of water are mixed with 76 of arrack. Each man consumes about three-quarters of a dram daily. Spirit, although issued by the commissariat, is paid for by the men; it forms no part of the ration at the station, on march, or in the field. The men do not take a dram before morning parade. Spirit is never given as a ration to convalescents. No drinks injurious to health, other than intoxicating drinks, are sold at the canteens; but most probably they are in the bazaar.
4. Spirits may be taken in moderation without obvious mischief; convalescents never require any, but are given beer and wine by prescription. The limited amount of spirit allowed at the canteens cannot affect the efficiency or the internal discipline of the regiment.
5. The quality of arrack allowed from the canteen cannot be injurious to health, but that sold in the bazaar is very indifferent and decidedly injurious; to abolish the sale of spirits in the bazaar would be, consequently, advantageous.
6. Malt liquor in moderation is conducive to health in this country, and it is not often the soldiers suffer from its abuse.
7. Tea is drunk at the morning and evening meals. Good lemonade and soda water are very expensive; but ginger beer is cheap, and consequently a good deal drunk. Their influence on health, efficiency, and discipline is beneficial, and far better than intoxicating drink.
8. It would not be beneficial to suppress the spirit ration, and to substitute for it beer, tea, &c., because then the soldier would purchase an inferior article in the bazaar.
9, 10. It would not be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, tea, coffee, &c., to be sold to the troops. No recommendations to suggest on these points.
11. The canteen and bazaar rules are those laid down in Jameson's code, and they are properly obeyed. The canteen is under the management of a committee, and is provided with all necessaries. No spirits, wine, or beer are allowed to be sold to a native, nor are any of those articles allowed to be taken away from the canteen, except under special authority. The canteen is accessible to the men from daybreak to tattoo beating, but is open for the issue of liquors only during such periods of the day as may be ordered by the Commander-in-Chief. The men must drink their arrack on all occasions at the place of issue, but they may take away the mid-day issue of malt for consumption with their dinner. No spirits are issued on any occasion before the usual dinner hour. Not more than one dram of arrack or one quart of malt liquor is issued at one time. Men on guard and recruits who have not finished their drill are not

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	allowed spirits. No intoxicated person or man under punishment is allowed to enter the canteen. In the bazaars no spirit is allowed to be made or vended without special permission, under a penalty of 50 rupees for the first offence, or one month's imprisonment, and for each subsequent offence the punishment of 24 lashes, or a fine of 100 rupees. No spirituous liquors are allowed to be sold to any European soldier or woman belonging to the detachment, or to any one for their use, within the limits of the cantonment.
VI. Diet.	1. The composition of a soldier's ration is as follows:—1 lb. beef or mutton, or both, in the proportion of five to two; bread, 1 lb.; vegetables, 1 lb. (but no potatoes), composed of onions, sweet potatoes, brinjalls, and bheudy; rice, 4 oz.; salt, 1 oz.; black or green tea, $\frac{5}{8}$ oz., in the proportion of two to one; sugar, 2 oz.; sweet water, 3 gallons; and brackish water, 2 gallons. No change in the diet, except that of providing potatoes. A responsible inspection of the ration is made daily by the orderly officer and quarter master. 2. A complete ration, including vegetables, is provided; but the vegetables are not good, and the beef is inferior. A soldier takes three meals a day, viz., breakfast at 8 a.m., dinner at 1 p.m., and supper at half-past 4 p.m. The proportion of vegetables entering into the constitution of the ration is $\frac{1}{5}$th dry onions, $\frac{1}{5}$th green onions, $\frac{1}{5}$th white radishes, $\frac{1}{10}$th bheudies, $\frac{1}{5}$th pumpkin, and $\frac{1}{10}$th sweet potatoes. 3. We would strongly recommend that potatoes be imported from Bombay, and issued to the European troops, the same as is now done to native troops. The Europeans do not dispose of their rations. 4. The means and apparatus available for cooking at the station are one set of copper utensils, which are tinned once a month, to every 10 men. They consist of one cooking kettle and cover, which answers as a frying-pan, and a large meat dish. The kitchens are kept clean. The water supply is from the men's allowance of three gallons sweet and two gallons brackish water per man. About three-quarters of the meat is boiled, and one quarter fried. There are no means for roasting. The cooking is generally properly done. Sometimes the meat is cooked up with the vegetables into a soup; at others, stewed; and occasionally made into pies. Tea is properly prepared morning and evening. The great want is the potato. On the march, one pint of coffee per man is issued at the half-way halting place, one cook per company being sent on overnight to prepare it. 5. Soldiers' gardens could not be established at Aden, or near it.
VII. Dress, Accoutrements, and Duties.	1. A soldier's dress and accoutrements consist of cloth tunic, cloth trousers, helmets, regulation accoutrements, serge tunics, trousers, and helmet, khakee tunics, khakee trousers, helmet, or forage cap, a forage cap with white covers according to the season. The dress and accoutrements are suitable to the climate; the Khakee clothing especially, both by day and night in the hot weather, and serge tunics and cloth trousers by night only in the cold season. There are no improvements to suggest in the dress worn at this station. In the hot weather the guard dress is Khakee; in the cold, serge tunics and cloth trousers. The men on guard are protected from sun and wet by means of sheds or verandahs.
Duties.	1. It would decidedly be advisable that all men should be drilled at home before being sent to India. 2. At Aden there are very few parades in the hot weather. Duration of drill varies according to taste of commanding officers; but half an hour is quite sufficient. The men do not suffer in health from drill. The best time for drills, parades, or marches is either early in the morning, or late in the evening. With regard to the number of nights the men have in bed during the week, the 4th Queen's have 11 nights in bed in camp, and 3½ nights at Isthmus. The royal artillery have 4 nights in bed. 3. Guards are mounted in the immediate vicinity of the barracks, and last 12 hours by day and 12 hours by night. There are roll calls morning, noon, and evening, when there are no parades. No ill effects arise from night guards, and no additional precautions are required.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at the station are as follow:—There is one ball court, two skittle grounds, two schools, with good schoolmasters, one for European and one for native regiments, and a library and reading-room sufficiently lighted at night. There are no day-rooms or soldiers' clubs, or soldiers' gardens, neither are there any workshops, theatre, or gymnasia. The means are sufficient to keep the soldiers occupied during the wet season and the heat of the day; but the men will be better off in this respect when the whole of the barracks and buildings which have been sanctioned are completed. Europeans are not allowed out during the heat of the day. 2. To improve the existing means of recreation more skittle grounds, with sheds, should be provided; also workshops, supplied with tools, and a theatre. 3. Soldiers' savings' banks have been already instituted; many men, however, remit their money to their friends. 4. There are no trees to shelter the men during the day; the men, however, can take exercise in the hot weather in the verandah of their barracks, but the addition of a gymnasium, under cover, would prove beneficial.
IX. Military Prisons.	1. There are four cells under one roof, in an open situation on the spur of a hill. There are also two cells attached to the quarter guard of the infantry regiment, Front Bay; their ventilation and sanitary state is good. Other cells are sanctioned, and will be built in due course.
X. Field Service.	1. There are no local regulations for field medical service, not included in the general presidency regulations. 2. Medical officers are always consulted as regards the conduct of the line of march of troops, bivouacking, camping, &c., and with the greatest benefit. 3, 4. Troops are never encamped out except on an emergency. Rules and regulations for field hospitals, &c. are sent. *See* Appendix.

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References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following Table gives the statistics of sickness and mortality at the station:—

EUROPEAN TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	Wing H.M.'s 78th Highlanders.	501	184	4	—	—	7	3	81	4	67	1	7	3	—	—	263	1	609	16	121·5	3·1
1851-52	Ditto ditto.	483	89	1	—	—	14	2	22	—	147	1	10	—	—	—	193	2	475	6	98·3	1·2
1852-53	Ditto ditto.	400	87	2	—	—	43	—	29	1	123	1	6	—	—	—	229	3	517	7	129·2	1·7
1855-56	Ditto 86th Regiment.	458	174	1	—	—	53	2	32	1	157	—	13	1	—	—	270	1	699	6	152·6	1·3
1856-57	Ditto ditto.	436	58	1	—	—	106	—	25	—	101	—	13	—	—	—	244	—	547	1	119·9	0·2
1857-58	Ditto 57th ditto. Ditto 86th ditto.	286	53	—	—	—	14	1	3	—	35	—	2	—	—	—	91	—	198	1	69·2	0·3
1858-59	2/11 Royal Artillery - Wing H.M.'s 57th Regiment.	311	261	2	—	—	19	2	10	1	53	2	3	1	—	—	141	1	487	9	156·6	2·9
1859-60	5/13 Royal Artillery - Wing H.M.'s 4th O. Regt. Ditto 57th ditto.	322	67	1	—	—	12	—	10	—	54	—	9	—	—	—	203	—	35	1	110·2	0·3
	European Troops in the Indian Army.																					
1852-53	Head Quarters 1st Bombay European Regt. Fusiliers.	132	46	—	—	—	10	—	9	—	23	—	19	—	—	—	177	—	284	—	215·1	—
1853-54	Ditto ditto.	513	218	1	—	—	34	—	47	1	131	3	75	3	—	—	450	—	955	8	186·1	·5
1854-55	2nd Company 1st Battalion Artillery. Head Quarters 1st Bombay European Regt. Fusiliers.	516	133	2	—	—	38	3	49	2	122	—	72	2	—	—	527	4	941	13	182·3	2·3
1855-56	2nd Company 1st Battalion Artillery. Head Quarters 1st Bombay European Regt. Fusiliers.	178	64	1	—	—	12	—	7	2	65	3	17	1	—	—	127	1	292	8	164·0	4·5
1856-57	2nd Company 1st Battalion Artillery.	102	23	—	—	—	30	—	1	—	44	—	5	—	—	—	63	1	166	1	162·7	0·9
1857-58	Ditto ditto.	94	10	1	—	—	2	—	—	—	11	—	5	—	—	—	46	2	74	3	78·7	3·2
1858-59	Ditto ditto.	42	3	—	—	—	—	—	1	—	5	—	4	—	—	—	31	—	44	—	104·7	—

NATIVE TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated	Died.	Treated.	Died.	Treated.	Died.
1853-54	Detachment Sappers and Miners.	108	15	—	—	—	6	—	—	—	11	—	1	—	—	—	59	2	92	2	85·1	1·8
1854-55	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	308	42	2	—	—	7	2	1	—	20	1	2	—	—	—	140	3	212	8	68·	2·5
1855-56	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	1,195	308	4	1	—	54	1	6	—	227	3	17	—	—	—	774	10	1,387	18	116·0	1·5
1856-57	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	1,017	330	2	1	—	45	3	5	1	103	1	14	—	—	—	603	4	1,101	11	108·2	1·0
1857-58	5th Company 3rd Battalion Artillery. 6th Company 3rd Battalion Artillery. Sappers and Miners - 29th Regiment Native Infantry.	1,094	191	3	5	—	81	—	3	1	63	1	7	—	—	—	308	3	607	8	55·4	0·7
1858-59	6th Company 3rd Battalion Artillery. 2nd Company Sappers and Miners. 29th Regiment Native Infantry.	1,175	233	3	2	—	45	3	—	—	156	4	24	—	123	76	562	4	1,145	90	97·4	7·6
1859-60	6th Company 3rd Battalion Artillery. 2nd Company Sappers and Miners. 29th Regiment Native Infantry.	1,114	229	2	1	—	23	1	3	1	118	1	18	—	1	—	229	5	622	10	55·8	0·9

By order of the Acting Principal Inspector-General, Medical Department,

W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 9th November 1860.

WOMEN AND CHILDREN.

Years.	Corps.	WOMEN. Strength. Europeans.	Strength. Indo-Europeans and Natives.	Strength. Total.	Treated. Europeans.	Treated. Indo-Europeans and Natives.	Died. Europeans.	Died. Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	Strength. Indo-Europeans and Natives.	Strength. Total.	Treated. Europeans.	Treated. Indo-Europeans and Natives.	Died. Europeans.	Died. Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1855-56	Her Majesty's Right Wing 86th Regiment.	28	—	28	52	—	1	2	185·7	3·5	46	—	46	60	—	3	—	130·4	6·5
1856-57	Do. do. do. -	27	—	27	34	—	—	—	125·9	—	41	—	41	65	—	5	—	160·9	12·2
1859-60	Her Majesty's 4th K. O. Regiment	6	—	6	—	—	—	—	—	—	12	—	12	—	—	—	—	—	—
1852-53	Head Quarters, 1st Bombay European Regiment.	28	22	50	49	40	1	—	178·0	6·0	41	20	61	44	16	6	—	98·3	9·8
1853-54	Do. do. do. -	13	16	29	10	9	1	—	65·5	3·4	20	16	36	6	2	1	—	22·2	2·8
1854-55	2nd Company 1st Battalion Artillery	9	3	12	1	1	—	—	16·6	—	12	1	13	1	—	—	—	7·7	—
" "	Head Quarters, 1st Bombay European Regiment.	15	14	29	18	13	—	—	106·9	—	26	16	42	20	13	3	3	100·0	14·3
1855-56	2nd Company 1st Battalion Artillery	8	3	11	8	—	—	—	72·7	—	12	—	12	2	—	—	—	16·6	—
1856-57	Do. do. do. -	6	3	9	14	2	—	—	177·7	—	11	2	13	31	3	2	—	261·5	15·4
1857-58	Do. do. do. -	4	3	7	5	4	—	—	128·5	—	11	3	14	11	4	2	1	107·1	21·4

By order of the Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

W. C. COLES, Assistant Surgeon,
Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Ground plans of the hospital are transmitted. 2. The hospital of the infantry in Front Bay is separated from the barracks by a wide watercourse. The position of buildings for an hospital for artillery is quite away from the barracks and on the sea shore, in a slightly elevated position; it is also quite away from the bazaar and town. Nothing interferes with the free ventilation of these buildings, and the site in every respect is quite healthy. 3. The water supply of the hospital, which is from wells, is principally brackish, and there are but few sweet wells in Aden. Tanks in the Taweela Valley, now under construction, will be finished in about 18 months, and will contain between 10 and 12 million gallons of rain water. A condenser is erected at the Isthmus, capable of supplying 5,000 gallons a day, and two small ones, at Steamer Point, capable of supplying between them 3,000 gallons per diem at present. Extra boilers and condensers are, however, to be added. 4. There is no drainage. The refuse water from the hospital is absorbed by the soil. 5. The wards in the hospital for infantry are on the ground floor, and three feet above the surrounding ground. In the artillery hospital the wards are four feet above the ground. The floors are filled in with dry rubble, and paved with cut stone. There is no perflation of air under the floor. The roof water sinks into the subsoil. There is no drainage or guttering round the hospital, it not being necessary, as the rain-fall is exceedingly limited. The foundation plinth of the hospital for infantry is constructed of rubble and chunam masonry. The walls are of wattle and daub, and the roof is covered with jawlies. The doors, windows, and ventilators are of teak. The foundation and plinth of the walls of the artillery hospital are of rubble and chunam masonry; the roof covering is of jawlies; and doors, windows, and ventilators are of teak. The walls and roof are single, but sufficiently thick to keep the hospital cool. The hospitals are supplied with verandahs on both sides, which are used for the accommodation of the sick when the hospital becomes crowded. The buildings consist of one flat. Table of Hospital Accommodation. Date of construction:—Infantry hospital, Front Bay, 1857–8; Artillery ditto, 1860. Total number of wards, 4; European General Hospital at Point unknown. Total regulation number of beds, 54.

Wards.		Regulation No. of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
	No.								Ft. in.			
Royal Artillery Hospital - -	1	12	36	24	$\frac{20+32}{2}=26$	22,464	1872·	72·	1 6	6	6	4
European Infantry in Front Bay -	1	12	36	24	$\frac{17+26}{2}=21\frac{1}{2}$	18,576	1548·	72·	1 6	7	6	4
The European General Hospital at Steamer Point - -	1	20	50	22	$\frac{13+22}{2}=17\frac{1}{2}$	19,250	962·5	55·	1 6	10	$4\frac{1}{2}$	3
	1	10	40	15	$\frac{12+18}{2}=15$	9,000	900·	90·	1 6	11	$4\frac{1}{2}$	3
Temporary Hospital. Native Infantry Sappers and Miners, and Golundauze Hospital - -	1	6	21	11	$\frac{7+15}{2}=11$	2,541	423·5	38·5	1 6	1	4′ 6″	2′ 6″ and one door $6\frac{1}{2}\times4$.
	1	20	49	21	11	11,319	565·95	51·45	1 6	3	4′ 6″	2′ 6″ and one door $6\frac{1}{2}\times4$.

ADEN.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open outwards, and their arrangement and construction is conducive to ventilation. 6. The means of ventilation are teak wood trellis work in the walls over each door and window, and an open ventilator in the roof. The means are sufficient to keep the wards at all times free from odour and closeness. There are no jalousies or jhilmils. 7. The air of the wards is cooled by punkahs. 8. No means of warming are necessary. The walls of the wards are cleansed and lime-washed about once every quarter. 9. The privies and urinals are about 40 or 50 feet off from the hospital. They are drained by hand, and are not offensive. There are no cesspits. 10, 11. There is a bath-room attached to the hospital for lavatory purposes, and for bathing the sick. It is sufficient for the purpose, and convenient. 12. The hospital linen is washed and dried by washermen. The means are amply sufficient for the purpose. 13. The storage is sufficient and dry. 14. The bedsteads used in hospital are planks on iron trestles, the same as used in barracks. 15. The kitchen is about 30 or 40 feet from the hospital. The cooking apparatus is the same as that used in barracks already described. The means are sufficient, and the cooking of diets is properly done and varied as much as possible. Potatoes are recommended. 16. As one system of diet tables and diet rolls exists under the Bombay presidency, and the returns required for working the internal economy of the hospital, and the present forms in use for keeping statistics of mortality and invaliding are the same in all corps, varying only regarding natives and Europeans, this question will have been fully answered in the report from the presidency. 17. With regard to attendance on the sick, there is an European hospital serjeant, but no nurses. Native ward coolies to attend on the sick are in constant attendance. 18. The sanitary state of the European hospitals is good. No epidemic disease has prevailed for the last two years, neither has gangrene nor pyœmia appeared. 19. There are no deficiencies or sanitary defects to notice, nor any improvements to suggest. 20. There is no special provision made for convalescents taking exercise. 21. Soldiers' sick wives and children are treated by the medical officers of the regiment. There is at present no hospital in camp especially set apart for them; but a sanitarium for females exists at Steamer Point. A female hospital is required in camp. 22. There are no special local hospital regulations which are not included in the general presidency medical regulations. 23. The medical officer's opinion is generally attended to in all matters relating to the hospitals. He has full control as to medical comforts. 24. There is no convalescent hospital at the station, nor is one required.
XIII. BURIAL OF THE DEAD.	1. The burial ground of British troops is in a direct line to the sea breeze at all seasons. 2. Its soil is gravelly. Drainage is not necessary. Cannot say whether decomposition takes place readily. The ground is carefully kept. The camp burial ground contains 74,240 square feet, the old cemetery at Steamer Point 27,000 square feet, and the new one, at the same place, 28,350 square feet. 3. The graves are seven feet long and four feet wide, with a three feet interval between each grave. The depth for an adult is six feet, and for a child five feet. Graves are only re-opened to admit the remains of relations; two or three of the same family may be interred in one grave, but seldom more. Interment is compulsory at ordinary times within 12 hours after death, and during epidemics as early as possible. The Europeans, Jews, and Mahomedans are the only nations who bury their dead, and they bury them in fresh graves about five feet deep. 4. The grave yards are never offensive. British troops are buried in the early morning or cool of the evening, according to the hour of death. 5. Camp followers or bazaar people are buried according to caste. Mussulmen and Jews bury their dead. Hindoos and Maharattas dispose of them by cremation. 6, 7. No injury to the public health accrues from the present practice. No improvements are suggested.

(Signed) E. P. LYNCH, Major, Commanding at Aden.
ROBERT H. DAVIDSON, Surgeon Superintendent Medical Department, Aden.
JOHN A. FULLER, Captain Executive Engineer.

17th July 1860.

APPENDIX TO REPORT ON ADEN.

FIELD GENERAL HOSPITAL REGULATIONS.

1. Whenever it may become necessary, in consequence of the increased number of sick and wounded men, during war or distant campaigns, to have recourse to field general hospitals in fixed situations, one or more such hospitals are to be established accordingly upon the general principles in regard to supplies of medicines, diet, and necessaries prescribed for regimental hospitals.

2. As soon as the officer commanding the troops shall have determined, in communication with the superintending surgeon, on the place at which a field hospital is to be established, and the number of patients to be transferred to it from the regimental hospitals in camp, or for whom it might be advisable to prepare hospital accommodation and necessaries, instructions are to be forthwith issued to the commissariat for the immediate preparation and supply of all articles, including cots for the sick and wounded, with the requisite establishment of hospital servants furnished by that department, according to statements to be prepared by the superintending surgeon, and sanctioned by the officer commanding the troops.

3. As the hospital establishments of European regi-

ments, of which the sick and wounded are sent to field hospitals, may admit of being for a time diminished, as many servants and as much clothing and bedding shall accompany sick and wounded men sent from these hospitals as can, in the judgment of the superintending surgeon, be spared, with reference to the present exigencies or prospective wants of such regimental hospitals.

4. The commander-in-chief, when with the army, will, in the same orders which direct the formation of one or more field hospitals, authorize the provision by the proper departments of all articles necessary for the purpose, and the entertaining of the requisite establishments. When the commander-in-chief is not present with the army, or a division of it, the officer commanding will issue orders to the above effect under discretional authority to be previously consigned to him.

5. Medicine indents are to be prepared by the surgeon or medical staff officer, who may be selected for the charge of a field hospital, under the instructions of the superintending surgeon, by whom they are to be countersigned, for such supplies of those articles as may be deemed necessary and can be spared from stores in camp in the first instance; further supplies can be drawn from the stationary depôts; or the indents shall be made on the stationary depôts, in the event of its being practicable, in consequence of previous arrangement, for the first demands, to be thence supplied in proper time.

6. Whenever the probable time and place at which it may become necessary to establish one or more general hospitals, for the reception of the sick and wounded during war, can be anticipated by the commander-in-chief, or the officer commanding the troops, the earliest intimation will be given to the commissariat and the nearest medical depôt, in order that the attention of officers in charge of those departments may be directed to the probable demands that will be made upon them, or according to the nature and probable duration of the service in prospect. Adequate supplies for one or more general hospitals will accompany the army in the first instance, or be intermediately brought forward to such advanced situation as may be found convenient.

7. The expense that may be incurred in furnishing petty stores, necessaries, &c. by the hospital storekeeper is to be charged in a contingent bill monthly, liable to be attested upon oath when required. These bills are to be countersigned by the surgeon or senior medical staff officer in charge of the hospitals in which the articles charged for shall have been expended (or for which they may have been provided in the case of any remaining on hand at the end of each month), and also by the superintending surgeon of the division, in testimony of their correctness, to the best of the knowledge and belief of these officers; statements in the form of indents, which are to be signed by the surgeon of the hospital, setting forth the several articles which have been required from time to time, for the use of the sick and wounded (?).

An advance of cash will be made on this account in the first instance, on the application of the surgeon or medical staff officer who may be appointed to the charge of the hospital, to be made through the superintending surgeon; and a sum equal to the amount required for the monthly disbursements is to be advanced by the paymaster or the collector, where there may be no pay-office at hand, upon timely application being made by the hospital storekeeper through the surgeon in charge of the hospital. The amount to be adjusted as usual in other cases of money being advanced by collectors on account of military disbursements.

9. A medical staff, consisting of a surgeon for the general charge and superintendence of the field general hospital, with a salary of Bombay rupees 600 per month, exclusive of the usual pay, batta, and tent allowance of his rank, with as many surgeons or assistant-surgeons for the duties thereof as may be necessary and can be spared, together with an assistant-surgeon for the appointment of hospital storekeeper to the general hospital, will be appointed by the commander-in-chief, to whom a list of those most available shall be submitted by the medical board or by the superintending surgeon, if those appointments be made immediately in the field, care being taken in all such cases not to remove from the charge or duties of regimental hospitals either the surgeon or assistants, to the prejudice of the management and requisite duties of those hospitals respectively; and to provide for this eventual arrangement and other calls for medical aid during war a sufficient medical staff will always be appointed in the first instance, when practicable, to do duty with every considerable division of the army that may be ordered to take the field.

10. The assistant surgeon who may be appointed to act as hospital storekeeper to general hospitals shall invariably, in addition to that charge, afford such personal medical attendance to the sick as may be required of him by the surgeon in charge of the hospital.

11. An officer or other agent of the commissariat department will attend every field general hospital that may be thus established during war, as well for the purpose of furnishing and maintaining the requisite hospital equipments and diet for the sick, as for supplying provisions to the men who may be discharged from the hospital fit for duty until they shall rejoin their corps.

12. An apothecary and steward, with such other first-class servants as may be necessary, are to be appointed, on the recommendation of the superintending surgeon, to each field general hospital that may be established during war, and such a number of second-class servants as he may deem proper shall be drawn from the commissariat for the same purpose.

13. The establishments that may be allowed for field general hospitals, as well as the establishments fixed for medical depôts in the field, are to be mustered on the 1st of each month by superintending surgeons, or the commanding officer on the spot, or officers properly authorized, as the case may be; and regular muster rolls are to be prepared for all those establishments, and to be attested in the usual manner by the mustering officer whoever he may be.

14. The pay of hospital servants employed in field general hospitals is to be drawn from the commissariat, and paid according to the rules prescribed on this subject for regimental hospitals.

15. An officer from each corps is always to be sent in charge of the sick, when they amount to 20 men, who may be sent from regiments or corps of Europeans, to field general hospitals, and a sufficient number shall remain on that duty until it may be necessary to accompany the men when ordered to rejoin their corps.

16. Whenever men may be discharged from field general hospitals as no longer requiring medical attendance, yet in the opinion of the surgeon requiring some modification of their ordinary diet, rations of provisions, if Europeans, will be supplied to them by the commissariat, or a provision roll framed on this principle, to be presented daily by the commissioned or non-commissioned officers under whose charge they may be placed, and the provisions to be thus supplied may be made to vary from articles usually issued to troops in health, according to the state of convalescence of men thus circumstanced, and for whom certificates are to be furnished by the medical staff who may have attended them in the field general hospital, describing the diet, &c., most proper for the men whilst in progress to their corps, according to which the provision rolls are to be countersigned by the officer in charge of the men, and delivered as vouchers to the commissariat department, stoppages being made from the men on this account, agreeably to the regulations on this subject, when rations or messes are furnished for men not in hospital or under such further regulations as circumstances may render expedient.

17. The regulations respecting hospital stoppages from Europeans, as detailed in Section V., are applicable to and are to be particularly attended to by medical officers in charge of field general hospitals; and when they are discharged from them, they are, as in regimental hospitals, to be furnished by them with the regular certificates.

Arrangements in the Field before and after Action.

18. When the force to which a medical officer is attached is placed under circumstances rendering it likely that in the course of service it may be engaged with an enemy, the medical officer will arrange with the adjutant or staff officer of his charge for the attendance at the hospital or his own quarters of the bandmen, to the end that they may be by him instructed in the application of field tourniquets.

19. He will explain to them their use, mode of application, &c., and will satisfy himself that they are in so much fitted for the duties they may soon be employed in.

20. While the troops are moving on, medical officers will follow their respective corps with all the empty sick carriage, &c.; but as soon as they deploy, or form for action, all, excepting one medical officer for each brigade or body of equal strength, will move to a short

distance in the rear, out of the range of musketry, and will there make their preparations for succouring the wounded and performing any operations that may then be necessary. Cordials, &c., should be at hand, and all instruments and dressings, &c., ready to be used.

21. In the rear of each brigade, and within range of musketry, one medical officer (in general, an assistant surgeon, and the junior present) will, as above stated, be stationed for the purpose of checking any alarming hemorrhage, and expediting the removal of wounded men to the stations in the rear.

22. For this purpose the doolies and other sick carriage will be placed under his orders, and the bandmen and others will assist the wounded from the ranks to the place where the medical officer is stationed, and from thence into the doolies.

23. To all of the bandmen and others employed in this duty field tourniquets should, previous to the action, have been issued. No men are to be allowed to go into doolies who can possibly walk to the rear.

24. The surgeons or medical officers of regiments are, as has been stated, to be stationed at a short distance in the rear, but out of the range of musketry, and there the wounded will be dressed, and all cases requiring immediate operation be attended to; at these posts bheesties with water will be placed, and from thence all men sent to field general hospitals will be despatched.

25. These posts are to be in as sheltered situations as possible, and if not very easily seen, to be distinguished by some flag or other conspicuous object.

26. If any town or village be situated in the rear, not far from the scene of action, in which there are houses or buildings calculated to receive wounded men, straw, &c., for bedding and abundance of water, &c., should be provided and kept in readiness for them, and to this at least all those severely wounded ought to be removed.

Removing Sick or Wounded to the rear or to Field General Hospitals.

27. The quantity of carriage rendered disposable by the consumption of stores of every kind is invariably to be notified to the superintending surgeon or medical officer performing his duty with the force, or in their absence, to the medical officers with corps, to the end that it may be taken advantage of in the transport of sick or weakly men; and in the same manner, when carriage so rendered disposable is sent to the rear, it ought to be employed in the conveyance of men to field general hospital.

28. By taking advantage of these opportunities the force can be easily disencumbered of its chronic cases.

29. To enable superintending surgeons and medical officers to perform this part of their duty without inconvenience, the place of destination, with notice of the exact day and hour when such carriage is to proceed to the rear, ought to be intimated to medical officers.

30. In addition to those means of moving sick to the rear, or at times when these do not exist, advantage must be taken, first, of the doolies and sick carriage belonging to their charge; second, of transport belonging to the country.

31. When it can possibly be avoided, the first ought never to be detached, unless for short distances, or excepting when stores of some description, such as medicines, instruments, &c., are to be brought up from the rear; and in both these cases the most positive directions should be given for its immediate return.

32. The transport of the country should be divided into classes, as doolies, cots, &c., for those unable to ride or go in carts, &c.; and carts, bullocks, tattoos, &c., for the slighter cases.

33. Medical officers must always, in person, class off their sick, and apportion the different modes of conveyance for individuals.

34. When water carriage is to be had, it is incumbent on medical officers to ascertain whether the boats are decked, open, or capable of being protected by awnings, and the cases should be allotted to them according to their condition.

35. Regimental surgeons should be directed to take advantage of every opportunity which offers for sending to the rear their chronic cases; acute cases should be kept as long as possible with their regiments, or at least so long as there remain any symptoms to subdue.

36. No case should be sent to the rear for reception into field general hospitals which can be conveniently treated in the regimental hospital with the probability of the soldier soon being made effective.

37. All convoys of sick sent to the rear should, according to their magnitude and the importance of the cases sent, be accompanied either by a medical officer or subordinate medical servant.

38. They ought to move at proper hours and by such routes as may have been laid down for them.

39. Care should be taken that every sick soldier sent to the rear have his blanket, watch cloak, warm clothing, and knapsack with him.

40. In case a subordinate medical servant only be attached to the convoy, he is to report himself to any medical officer that may pass him on the march, and, in any case of difficulty, is to request the assistance and advice of any medical officer who may be within reach.

41. The medical officer into whose charge the subordinate medical servant will deliver the men is to report the state in which they were received, with any casualties that may have occurred on the way.

42. During any halt of the convoy, the clothes and bandages, &c. of the men ought to be well washed and aired, &c., and the persons of the men themselves should be made as clean as circumstances will permit.

JACOBABAD.

Accommodation. Native Troops { Cavalry, 2,400. Infantry, 1,600.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is a desert, and is flat, sandy, and dry; there is no wood, jungle or water in the vicinity. 2. The elevation of the station is about 220 feet above the level of the sea, but it is on the same level as the adjacent country. There is no higher or healthier ground adjoining the station. 3. The nearest mountain is 60 miles distant and about 3,500 feet above the plain. 4. There are several small canals, bringing Indus water from a distance of 52 miles, which pass through or near the station; the vicinity is not, however, liable to overflow. There are artificial tanks made on purpose to retain the Indus water; but these have no prejudicial effect on health. 5. The station is perfectly open and freely ventilated; the temperature, however, is raised by the buildings being exposed to reflected sun heat. It is exposed to fresh dry cold winds in the winter months, and in the summer to fiery hot winds. 6. The surrounding country is cultivated in some parts during the autumn. All the cultivation is by irrigation, and is all round the station. Artificial irrigation has no effect on the health of the station. Fever prevails more or less in the end of autumn, when the Indus waters are drying up in the province generally. The prevailing winds then being S.S.E. or S.E., they pass over nearly 400 miles of swampy lands, and must necessarily come charged with malaria. Directly the northerly winds set in, in November, the fever disappears. There is no cultivation of rice. A little indigo was cultivated last year 2½ miles off; but no injury to public health occurred from it. 7. A large town, containing 10,000 inhabitants, immediately adjoins the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	8. The general nature of the soil of the district is alluvial deposit, brought down by the canals from the Indus, occasionally covered with a layer of drift sand from the desert, which lies along the north. The station occupies new ground.
	9. Water is found at a depth of 37 feet below the surface. In 1847 it was 45 feet; but from the larger quantity of Indus water brought down, and its freely percolating into the surrounding soil by means of the tanks, there has been a permanent rise of 8 feet. The wells are kept filled with Indus water during the time of its presence, which sweetens the soil by adding to the soaking supply. Wells, previously as salt as brine, have been made perfectly sweet this way.
	10. The rain-fall, which is very trifling, 8½ inches being the largest annual fall, rapidly evaporates or soaks into the ground. No drainage from higher ground passes into the subsoil of the station.
	11. The water-supply is derived from the Indus during the inundation months, and from wells at other times. There are two open tanks, one having a surface 62,600 square feet and a depth of 20 feet, the surface of the other being about 69,750 square feet and 7 feet deep. They are full from April to September. The shallow one is dry by December, the other holds a little water, when the Indus supply returns in April. The plants and animals they contain are the same as in all Indian tanks. No tank used for drinking purposes is also used for bathing, neither are the tanks or wells liable to pollution from any cause. No nuisance or malaria proceeds from any tanks within or without the station.
	12. There are the two tanks already mentioned and some 20 wells for the water-supply of the station. The Indus water, as it first comes up, is yellow and muddy from the silt in suspension, but on this being precipitated the water becomes clear, and is most delicious to drink. There are no means of giving its chemical composition; but it will be well known to chemists. The quality of the water is very good, and not injurious to health, and the amount is sufficient. It is raised either by hand in leather buckets, or by the Persian wheel. No better supply could be obtained.
	13. The climate is totally unfitted for Europeans.
	14. Hitherto stations have generally been selected more with an eye to their military importance than for their sanitary advantages. I am decidedly of opinion that all Europeans should be located as much as possible on hill stations, or at such healthy ones on the plains as can be selected to mass troops at. It is a waste of men's lives, scattering them over the country in bad climates, and where there are no means of giving them wholesome employment for mind or body during the summer months.
II. Climate.	1. The only instruments for conducting meteorological observations are the ordinary hospital thermometers.
	2. A meteorological table is prepared, but the information is very meagre, there being no instruments. The observations on rain are obtained from the political superintendent's register.

Table of Meteorological Observations, from 1st January 1848 to 31st December 1859, the year 1857 being omitted, the regiment having gone on service to Persia:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January -	—	60	—	77	43½	Have only an Annual Record from 1851 upwards. The lowest fall of rain in one year was 2½ inches, the highest 8 inches.	N.E. & N.W.W.	Moderate commonly.	—	Cloudy, often light rain and showers. An earthquake in 1855 and thunderstorms. Wind variable, occasionally high.
February -	—	65	—	82	56		N.N.E., E., & S.	Variable, light, and moderate.	—	Showers and light rains for a few days, and an occasional dust storm.
March -	—	74	—	92½	48		E.N.E. to S.W.S.	Often high, with dust.	—	Dust storms; one or two very heavy. Light showers once or twice.
April -	—	85	—	100	70		N.W. to S.E.	Variable hot and dry winds.	—	Dust storms regularly, 7 in one month, 1851. Rain very little.
May -	—	95	—	107½	83		S. & S.E. most, occasionally N.W. to S.	—	—	Dust storms six days in 1851.
June -	—	99	—	108½	89½		S.E., variable and calms.	Simoon at times.	—	Calms and variable.
July -	—	97½	—	108	87		S.E.	—	—	Showers, occasionally heavy rain. Dust storms. 4 inches and upwards of rain fell in July 1855, 16 days.
August -	—	92½	—	102½	82½		S.W. & S.E.	Very light	—	Rain hardly noticeable generally; in 1856, 14 days' rain.
September	—	91	—	101½	80½		S.E. to E. & N.E.	Light -	—	Dews at night.
October -	—	80	—	93½	69		E. to N., S.E. to W.	Light -	—	35° of change of thermometer between morning and noon observed in 1849.
November	—	70	—	87½	52½		S.E. to E.N.E.	Variable	—	Cloudy often; dry weather as a general rule throughout the year.
December	—	62½	—	79	46		N.	Moderate	—	Ditto.

JACOBABAD.
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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate, during the greater part of the year, is the driest in the world, the heat in summer being excessive, rendering the station totally unfit for European soldiers. The variation of temperature is sometimes very great. The cold winter months are most agreeable to Europeans, when ice and frost at night are common: this, however, lasts only for about three months, and during this period the natives of Hindoostan and the Deccan suffer much from chest complaints. Many thousands of trees have been planted in and around the station, and they sensibly diminish the heat in summer; but they have not had much effect in producing more or regular rain. On the canals drying up in the autumn, malaria is produced, and intermittent fevers prevail sometimes prostrating the majority of the troops and the inhabitants of the country. The wind at that time is generally from the S.S.E., and passes over some 350 miles of drying swamp; but the moment the northerly winds set in here, in November, the fever decreases rapidly. September and October are the most unhealthy months. The best precautions are wholesome generous diet, avoiding exposure to the sudden changes from heat to cold during the night, turning the troops out properly clad in the mornings. Drills and exercises should be much the same as at any other time during the year, guided by common sense, that is sufficient to keep the men's interest and attention alive, but not so much as to disgust or weary them; the latter will predispose to disease at any time. 4. There is no district more conducive to health nearer to the station than Kurrachee, the seaport of Scinde, which will be fully described by the authorities there. It is one of the best localities for European soldiers in India. 5. I have served for 18 years in Sinde, at the stations of Hyderabad and Jacobabad principally, 13 of which have been at the latter. Hyderabad is almost as cool as Kurrachee, being within the influence of the S.W. monsoon; but is often most unhealthy in the autumn and winter. I have served one year in the Punjab, at Peshawur, which was very unhealthy, as it is now. This might, I believe, be remedied by extensive planting of trees, the valley being almost surrounded by hills, and after rains noxious gases are evolved, which can neither escape nor be absorbed, the trees being very scarce.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, adjacent country, and barracks are forwarded. The large canals are on an average 10 feet deep and 20 feet broad; the smaller ones are 4 feet deep and 8 feet broad. There are no drains, sewers, dung-heaps, or cesspits. 4. Table of barrack accomodation. Date of construction of lines of - - { 1st Regiment, 1859. 2nd „ 1847. 3rd „ 1844. Total number of pendalls and non-commissioned officers' quarters, 21 double and 6 single pendalls; 87 N. O. quarters. Total regulation number of non-commissioned officers and men - 2,421.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
Pendalls -	100 men in each double pendall.	450	2 × 8	Average. 8′ 5″	61,200	612	72	1½		None.	
	50 in each single.	450	8	8′ 5″	30,600	612	72	1½		None.	
N. O. Quarters	One centre room.	18	11	10′ 0″	3,171	3,171	324	1½	6	2	Semi-circular.
	Two verandahs	18	7	9′ 5″							
Guard Room: Three quarter guards, each containing	- -	2 rooms 30′	15	16½	—	—	—	—	7	2	—
		1 room 15′	16								

There are no windows, but doors to each man in front. There are no verandahs to pendalls; the soldiers sleep outside altogether in hot weather and within in the cold; there are no jalousies or jhilmils.

6. The men generally use the common charpoy of the country for sleeping on, which is an oblong framework with four legs, having coarse string stretched across it; they answer very well.
7. The men provide their own tents, which vary in form from the very humblest kind of rowtee for the sowar to a small single-poled tent for a native officer.
8. No particular means exist for the ventilation of the pendalls; no means are in use for cooling the air of barrack rooms.
9. The troops at this station live in what are termed pendalls, the foundation and plinth of which are built of burnt brick and mud, the walls of sun-dried brick and mud, and the roof of beams tatties, two mats, and rafters plastered with mud. On the rifle lines now in construction the roof is supported on light burnt brick arches.
10. Floors are usually constructed of earth, well rammed, raised one foot above the general level of the ground. In the hospitals the floor is paved with burnt brick. There is no passage of air beneath.
11. The materials and construction are suitable to the climate; and we are not aware that any improvement would increase the salubrity of the pendalls, &c. &c. Barracks and cantonments are kept in repair by the engineers' department; the commanding officer of the station being responsible for the general sanitary state. All buildings except the hospital are unwhitewashed.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12. There are no lavatories for the men; they are not required for natives, as they perform their ablutions in the open air, with the aid of bheesties or water-carriers. 13. There are no cook-houses; each man making his own cooking arrangements. The dhobies or washermen wash and dry the clothes outside of camp, either at wells or water-courses. 14, 15. There are no privies or urinals. 16. No means of sewering or draining are required in the barracks, any water thrown about quickly disappearing by absorption or evaporation. There is no fluid refuse. No part of any building used as a barrack or hospital is damp. There are no foul ditches near the station. 17. Sweepers are employed to clear up all dirt or filth in the camp, which is then conveyed to one spot on the leeward side of the cantonment, and there burnt. This is done daily, and efficiently performed. The refuse from the horse lines is spread out over the road in camp. 18. Gardens are encouraged as much as possible in the cantonment. There are no old walls, thick hedges, &c., to interfere with the ventilation of the station or bazaar. 19. Drainage is unnecessary in the bazaar. The roads are broad, and a canal, full of water for seven or eight months, runs by it; wells are also close by. It is kept scrupulously clean, is planted with trees, and well lighted with oil lamps. Bazaar sweepers are employed to keep it clean, and offenders against regulations for preserving cleanliness are severely punished. The ordinary houses of the country are made of mud, or sun-dried or kiln-burnt bricks. No dunghills or cesspits are allowed within them for a moment. No nuisance is experienced in barracks from wind blowing over the native houses. 20. The slaughter places are at one side of the town, to leeward, about a mile from the barracks, and they are only allowed in one place. The offal is buried. No nuisance is experienced from them; if there were, those causing it would be punished under the local rules. 21. The owners of bazaar horses are allowed to keep them in their own places where they like, and are held responsible that no dirt collects or nuisances are created. 22. The cavalry stables are between the lines of pendalls, each man living immediately behind his horse. They are simply sheds, or a long connected roof covering 50 horses in each row. The stalls are open, so that there is a free passage of air. The line refuse is removed daily, and spread out on the camp roads. 23. The married men all live with their families, in houses built by themselves, well in rear of the lines. None are allowed to remain in the lines.
Officers' Quarters.	1. The officers' houses are surrounded with nice well-kept gardens and trees. No particular measures for drainage are required. The trees are kept well cropped, to ensure ventilation. No improvements are suggested.
IV. Health of the Troops.	1. The seasons at Jacobabad vary extremely, and there is a corresponding amount of sickness or otherwise. From May to September the weather is intensely trying; the daily amount of sick is then from 1½ to 2 or 3 per cent. The annual number of deaths is low in the regimental hospital. It is highest in the civil hospital, numbering 12 last year, which is about an average. The district consists of a desert, here and there cultivated, and but scantily populated. With the exception of the usual fever of the country, and from which few escape, the native inhabitants appear generally speaking healthy; but for an unlimited period of residence the same cannot be said of the European inhabitants of the station, the climate being so extraordinarily trying. 2. Intermittent, quotidian, and tertian fevers are most frequent among the natives, particularly in the autumn; which diseases are in the winter and spring complicated with chest diseases, and not unfrequently with diarrhœa and dysentery. These are the most frequent causes of death. Eye disease, which has mostly assumed the chronic form at the time of application for relief, also occurs. Spleen disease is common, but less so than might be expected, and chronic rheumatism is also frequent. 3. I cannot say how miasma is generated, but all azotized matter serves as a nidus of infection. As Faraday found with what facility organic matter clings to an earthy pulverulent substance, and showed that sand was rich in ammonia, the habitat of this noxious agent is co-existent and as extensive as the desert we inhabit. Add to this the terrific heat and the deadly simoom, and an idea can be formed of the climate of Upper Sinde. In December, January, and February the cold is greatly felt, particularly by the poorer classes, the thermometer having been as low as 29° outside at 6 a.m., with occasional heavy falls of rain, and a bleak north and north-east wind. As a natural consequence the natives suffer from chest disease, rheumatism, and disease of the bowels. To those who are able to provide suitable clothing and comforts this cold season proves restorative after the debilitating effects of the hot weather. 4, 5. The troops now at Jacobabad are all natives, and have been there for the last 13 years. No portion of the men's present accommodation is more unhealthy than the rest. The troops are always moved about in the cold weather, and kept in camp as much as possible with advantage to health. 6, 7. No experience of hill stations. 8, 9. I am of opinion that for preserving health well-selected hill stations are most suitable for troops. The European troops should be massed as much as possible at such stations, and moved about in camp in the plains in the cold weather for military exercise. To restore health hill stations are almost useless. European soldiers should be sent to England for change, as it would be cheaper in the end. 10 to 13. No experience of hill stations. 14. I should say that the course most conducive to the health of troops serving in India would be to locate them as much as possible in well-selected hill or other healthy stations, such as Kurrachee, Poona, and Belgaum in the Bombay Presidency, and only send them to the plains when absolutely necessary or for exercise in the cold weather. Fixed head-quarters, with comfortable quarters for married people, having garden plots, &c., good work-shops for men, baths, ball courts, &c., would make residence in one spot preferable to change. Marching exercise in the cold country should always be practised. 15, 16. No experience of hill stations. 17. There is no higher ground near the station, that I am aware of, which could be advantageously occupied as a hill station. 18. No experience.

JACOBABAD.
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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	19. Soldiers proceeding to India should be 20 years of age, and should land there in November. It would be highly advantageous if recruits could always be marched by easy marches in in the cold season, under good commissioned and non-commissioned officers, from the place of disembarkation to their future station, as it would greatly aid their training, physically and morally. 20. If not sent till 20 years of age troops might be sent direct from home to India, and on landing should be sent, if possible, at once to their regiments. 21. The mode of transport through Sinde has hitherto been by the Indus by steamers. Arriving early in November, they might be marched to any part of the Punjab or North-western provinces; and this would, I think, be preferable. The confinement on board the steamers is particularly irksome and bad. 22. If barrack accommodation were better, if means of employment for the soldier were more supplied, and the Indian life made more endurable to them, I believe all soldiers of the local army would gladly enlist after their first term has expired. Regiments of the line should be relieved every 10 years, those men who liked being allowed to exchange and remain. 23. I have no suggestions to make as to the mode of conducting medical boards in regard to invaliding. 24. Invalids should leave India in the cold weather, so as to arrive in England in the spring.
Diseases.	1. There are no regular inspections for the discovery of incipient diseases at the station. 2. Scorbutus has only appeared once or twice in the regiment in six years, one case being at an outpost, when probably vegetables were scarce. In the jail, however, there are always a few cases, but seldom more than six. An extra is then allowed for vegetables, with lime juice, &c. The preventive measures are, the use of anti-scorbutics and other general means. 3. Few, if any, cases of hepatic disease, uncomplicated with other diseases, are met with, but I have seen two or three cases of abscess of the liver. In one case there was original disease of the lung, in another there was no clear history; a dispensary case. Jaundice is occasionally treated, and congestion of the liver, and other derangements, both functional and organic, are not rare. 4. Dracunculus is rarely met with in Upper Sinde, but a case now and then presents itself, once or twice perhaps in a year, among the dispensary patients. In the regiment also three or four cases may be treated, but in one or two of the latter instances the patients had lately arrived from the Deccan. 5. The proportion of constantly sick from venereal disease to the total sick admitted in the hospital was,—

			Total all other Diseases.
In 1856, syphilis, primary - - -	6		
„ secondary - - -	6		
	—	12 - -	1,155
In 1857, syphilis, primary - - -	13		
„ secondary - - -	8		
	—	21 - -	717
In 1858, syphilis, primary - - -	8		
„ secondary - - -	5		
	—	13 - -	993

6. The troops suffer from—

Fever of the endemic intermittent form.

Dysentery.—Not very frequent in the regimental hospital, the men usually applying before the complaint has got so far, and consequently a diarrhœa is cured which might be called dysenteric; but at the dispensary, from neglect, cold, and other adverse circumstances, the case is different, and there are often cases under treatment, and these serious and long continued.

Cholera is unknown, I believe; at least I have not seen or heard of a case beyond one resembling a sporadic case six years ago.

Small-pox.—One case in an adult and two or three among children in the course of seven years. These occurred in 1854 or 1855. I heard of one case in a child this spring.

Rheumatism.—Chronic rheumatism and neuralgia is extremely common, and unfortunately often slow in recovery. Acute rheumatism with heart disease is seldom met with; indeed I do not recollect a case occurring here.

The proportion of admissions and deaths from rheumatism to the total admissions and deaths from all diseases is—

	Diseases.	Admissions.	Deaths.	Total Admissions from all Diseases.	Total Deaths.
1856.	Rheumatism, acute - -	25	1	1,128	3
	„ chronic - -	14			
1857.	„ acute - -	15	1	700	10
	„ chronic - -	23			
1858.	„ acute - -	2	None	971	7
	„ chronic - -	33			

7, 8. I do not remember any instance of zymotic disease. The bazaar has a good supply of water from wells, two large tanks, and numerous nullahs. Cleanliness has been particularly attended to, and the lines have been recently built and improved, and extremely good and capacious, allowing of free ventilation. There are no habits among the troops which predispose them to zymotic diseases.

9, 10. Men attacked with malarial disease go into hospital and undergo a regular course of treatment. Officers and men, however, when they find that fever is about them, take quinine, which wards off or cures an incipient attack in a day or two. This occurs once or twice a month, on the changes of the moon.

References to Subjects and Queries.	Replies.
V. Intemperance.	1, 2. The questions under this head evidently refer to European regiments only. The troops at Jacobabad are all natives: two-thirds Mussulmans to one-third Hindoos. All, more or less, drink ardent spirits, but instances of drunkenness among them are rarely seen. Drunkenness is punished as an offence when it causes either neglect of duty or interference with the comfort or convenience of others. 3. Distilled spirits are sold in the bazaar by a contractor who has the sole licence to open shops for the sale of liquor, but I cannot say what is the probable amount consumed by each man per diem. Spirit is only given to convalescents in very rare cases of excessive weakness. No other drinks injurious to health, besides intoxicating drinks, are sold in the bazaar. 4. It depends entirely on the soldier and his habits whether spirit is conducive or injurious to health; but the excessive consumption of it must be detrimental to efficiency and discipline. 5. With regard to the question as to whether it would be beneficial or otherwise to restrict or abolish the use of spirituous liquors in the canteen or bazaar, if the men had better means of recreation when not on duty, they would not feel so wearied by an Indian life and would not seek forgetfulness, or in some cases necessary support, in stimulants. 6. I should say malt liquors are decidedly preferable to spirits. Lord Dalhousie ordered the experiment to be tried largely. Officers with European corps can say how it succeeded. 7 to 10. These queries do not apply to this station. 11. No bazaar regulations exist. People buy as they like from the shops opened by the liquor contractor.
VI. Diet.	Not applicable to native troops.
VII. Dress, Accoutrements, and Duties.	1. The cavalry wear a dark green alkaley and pantaloons, and in cold weather a sheepskin jacket over-all, the wool inside. The infantry wear a brown double cloth tunic, with pantaloons to match. In summer all wear cotton clothing, that of the cavalry being white and that of the infantry dyed brown. The clothing is very suitable to the climate and for the soldiers' duties at all times. The head-dress lately introduced in the Bombay army—a light wicker-work helmet, with cover and puggree—is a very good one.
Duties.	1. Recruits should be drilled at home before being sent to India; his bodily strength would thus improve, and his first impressions of the country would not be mixed up with the wearying task of the drill ground. 2. All the year round there is brigade parade once a week, and each regiment parades over separately; besides awkward men are sent to the drill squads. Parade and drills last about an hour and a half. The best time for drills, parades, and marches is early morning, except in the cold weather, when none should be attempted, unless otherwise necessary, before the sun has well risen. The men have six nights in bed during the week. 3. No guards are mounted at a greater distance than a mile from barracks; guards last 24 hours. There are roll calls every evening at sunset, Sundays excepted. Night guards have no ill effect on health.
VIII. Instruction and Recreation.	1. There is a good fives court, which has the best effect of maintaining the health of the European officers. No other means of recreation exist. 2, 4. Do not apply at this station.
IX. Military Prisons.	1. There are no cells or military prison at the station.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency medical regulations. 2. The commanding officer is responsible for the conduct of the line of march, bivouacking, &c., and when he is in doubt would take advantage of any information the medical officer could supply him with. 3. Strict cleanliness is always enforced in camp; and any suggestions by the medical officer always receive prompt and full consideration. 4. The arrangements for field hospitals, ambulances, transport of the sick, &c. are the same throughout the presidency.
XI. Statistics of Sickness and Mortality.	The following table gives the required information under this head.

Native Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fever.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1852–53	1st Regiment Sinde I. Horse 2nd do. do.	1,473	2,136	19	—	—	13	1	7	—	89	7	6	—	—	—	795	—	3,046	27	206·6	1·8
1853–54	1st Regiment Sinde I. Horse 2nd do. do.	1,464	688	9	—	—	26	2	3	—	43	—	9	—	—	—	846	2	1,615	13	110·3	0·8
1854–55	1st Regiment Sinde I. Horse 2nd do. do.	1,462	769	6	1	—	29	2	4	—	61	—	13	—	—	—	963	3	1,840	11	125·8	0·7
1855–56	1st Regiment Sinde I. Horse 2nd do. do.	1,498	1,010	5	—	—	11	—	1	—	35	—	6	1	—	—	669	1	1,732	7	115·6	0·4
1856–57	1st Regiment Sinde I. Horse 2nd do. do.	1,231	1,658	8	—	—	28	3	3	1	97	2	6	1	—	—	780	4	2,572	19	208·9	1·5
1857–58	2nd Regiment Sinde I. Horse 3rd do. do.	1,262	865	6	—	—	19	2	1	—	26	—	2	—	—	—	569	—	1,482	8	117·4	0·6
1858–59	1st Regiment Sinde I. Horse 2nd do. do. 3rd do. do. 1st Jacob's Rifles - - 2nd do.	2,924	1,774	10	3	—	37	2	6	1	112	4	8	1	—	—	2,121	4	4,061	22	138·8	0·7
1859–60	1st Regiment Sinde I. Horse 2nd do. do. 3rd do. do. 1st Jacob's Rifles - - 2nd do.	3,576	2,695	15	2	—	78	8	11	2	183	5	18	2	—	—	2,151	5	5,138	37	143·6	1·0

By order of the Acting Principal Inspector-General, Medical Department,

W. C. Coles, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

JACOBABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan. 2. The hospital is in rear of the centre of the lines of each regiment. 3. The water-supply is abundant and wholesome. 4. Refuse water and other impurities are removed from the hospital by sweepers, there being no sewage to the building. 5. The hospital has only one floor, raised 2½ feet above the surface of the ground. Whenever rain falls, which is not often, it soon soaks into the soil or runs off into the trenches cut to water the trees. The foundation and plinth of the hospital is constructed of burnt brick and mud, the walls of sun-dried bricks and mud, and the roof of beams, tatties, mats, and rafters plastered with mud, and supported on light brick arches. The walls are single, but sufficiently thick to keep it cool for natives. There is a ten feet verandah all round, which affords good shelter. The hospital is used more as a dispensary; only the worst cases, requiring constant attendance, being kept in it; these are placed wherever it is coolest. The building consists of one flat, and is so placed as to receive the full benefit of the prevailing winds. The windows can be opened completely so as freely to admit the air. 6. The ventilation of the wards is good. There are no jalousies or jhilmils. 7, 8. There are no means of cooling or warming the wards. The hospital is cleansed and whitewashed about once a year, or whenever necessary. 9 to 13. There are no privies. The men make their own arrangements for cooking, washing, &c. 14. The men supply their own bedsteads and bedding. The bedsteads are made of common wood, with string stretched across. 15. There is no hospital kitchen. 16. There are no diet tables or diet rolls, &c. 17. When there are very bad cases in the hospital the patient is allowed to have a comrade to attend on him. 18. The sanitary condition of the hospital is good; and no pyæmia, epidemic disease, or gangrene have appeared in the wards. 19. There are no sanitary defects to remark upon or improvements to suggest. 20. This query does not apply to this station. 21. Soldiers' sick wives and children are treated by the medical attendants at their own houses. The present arrangements are satisfactory. 22. There are no special local hospital regulations not included in the general presidency medical regulations. 23. The hospital arrangements are left to the medical officer; and any requisition or suggestion of his is promptly listened to and complied with if expedient. 24. There are no wards or hospital for convalescents at this station.
XIII. BURIAL OF THE DEAD.	1. The Mussulman burial ground is about half a mile to the west of the station, and on the opposite side from that from which the prevailing wind blows. 2. Its area is about 1,200 square yards, the soil is alluvial and sandy, and decomposition rapidly takes place. The ground is carefully kept. 3. There are no regulations with regard to graves; but they are never less than 8 feet in depth. They are never reopened. Interment generally takes place within 24 hours, but in hot weather bodies sometimes interred within 12 hours. 4. The grave yard is never allowed to be offensive. These remarks apply to the Mussulmen, only two Europeans (officers) have ever been buried at the station. 5, 6, 7. The dead of bazaar people are disposed of according to caste—the Mussulmen are buried in burial ground, and Hindoos are burnt at a spot south-west of the station. No injury to the public health accrues from the present practice; no improvements in the manner of disposing of the dead are necessary.

(Signed) W. L. MEREWETHER, Major,
Commandant-in-Chief, Sinde Horse,
F. F. Force.

11th August 1860.

DHARWAR.

Accommodation. Native Troops.—Infantry - - - 900.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. There are undulating and somewhat barren hills in the country surrounding the station, on the north, south, and west sides. On the east a black cotton plain, not perfectly flat, but in gentle swells and valleys. The general aspect of the country is hilly and dry. There is no wood or jungle in the vicinity, and no large sheet of water; but a few small tanks in the environs. 2. The elevation of the station above the sea is 2,482 feet. It cannot well be said to be above the adjacent country, which is all much of the same character; but the ground occupied is thoroughly well drained. A very small nullah runs through the station which dries up almost immediately after the rain has ceased falling. There is no marsh nor anything of the sort; and the nearest tank is 2 miles off, and is not larger than the Serpentine. The best ground appears to be that on which the station is built, and there is none higher or healthier in its vicinity. 3. There is no mountain or table land near the station. Dharwar is situated on a number of little hills, and similar features of ground are met with to the west until the Ghauts are reached. Dharwar is on the spot where the water shed divides, and consequently on the highest ground generally; though some isolated hills 30 to 40 miles away from the station, between it and the Ghauts are higher by about 500 feet. Dharwar is generally higher than the crest of the Ghaut; but 2 similar isolated hills are about 4 or 500 feet higher than Dharwar; all such hills are from 30 to 40 miles distant. To the east the ground falls away to the Madras coast many hundred miles distant. 4. With the exception of wells and drinking water reservoirs, there is no water near the station; and there is no overflow of water in the vicinity. There is a little broken ground towards the north between the jail and the fort, but well to leeward, and has no effect on the health of the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	5. The roads through the station have trees planted along their sides, and there are gardens and hedges, but the ventilation (owing to the high situation and size of the enclosures, which, with the exception of the hedges, are generally quite clear of vegetation) is perfect. The temperature of the station is not raised by exposure to reflected sun heat. The station is exposed to the sea breeze, which in the hot weather begins to blow late in the day, and to prevent a chill, very thin clothing should not be worn in the evening, otherwise its effect is refreshing and healthy. The land or east wind also blows particularly in December, January, and February, and is apt to cause rheumatism, &c. 6. The surrounding country is cultivated where the land is good, but owing to its barren hilly nature on the south, west, and north, there is a good deal of open land bearing a poor crop of grass, and which is used for grazing cattle only. The land in the valleys on the outskirts of the station in places is formed into terraces for the cultivation of rice; but beyond these terraces, which collect the rain water a little, there are no works of irrigation. This has not been observed to have any ill effect on the health of the station. There is no prohibition to the cultivation of rice, which is but trifling at the bottom of the neighbouring valleys. Neither the cultivation of indigo, nor the preparation of hemp or flax is carried on near the station. 7. To the east of the station and joining it there is a large native town with suburbs. 8. The geological structure of the station is metamorphic clays, and mica schists, &c. The fort has been occupied by the natives for many years, but the surrounding hillocks on which the station is built, were probably not occupied by dwellings before. 9. The depth of water below the surface, owing to the undulating character of the ground, necessarily varies; in some cases, the wells are but 20 feet deep, in others from 90 to 100 feet. The rise in the wells in the rainy season is but a few feet, and many become perfectly dry in the summer. As a rule no water is injuriously near the surface at any part of the station. 10. The rain fall flows readily away from the surface, and no drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from wells and tanks. There are no tanks in the station; but immediately contiguous to it there are one or two which supply the inhabitants of the town, the extent of the surface of which is in all about 30 acres; there are also two tanks within the fort. The former of these tanks are generally dry in the hot weather; but those in the fort have a good supply of water all the year round. They contain neither plants nor animals. No bathing is allowed in a tank used for drinking purposes, and in no case is there pollution from leaves or other matter falling into them. No nuisance or malaria is experienced from the tanks. 12. The water is very good and wholesome, and there is always plenty for drinking; but for washing, &c. the supply is rather scanty in hot weather. The means are not available to give its chemical composition or microscopic characters. The water is good and not injurious to health, with the exception of its being supposed to give rise to Guinea worm among the natives. The amount is generally sufficient for drinking and cooking purposes. It is of a tolerably soft quality, and is raised from the wells by a simple bucket and string. No better supply is necessary. 13. No other topographical points occur. The station is one of the healthiest in the Bombay Presidency. 14. I am unable to say what amount or kind of enquiry is gone through as to topography, climate, sanitary condition, &c. before a new station is selected, as during my experience a new one has not been chosen.
II. Climate.	1. There are no instruments available at this station for conducting and registering meteorological observation, with the exception of a common thermometer and rain gauge. 2. Table of Meteorological Observations from 1st January 1859 to 30th April 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
	°	°	°	°	°	°	°	°	°				
January -	—	72	22	83	61	—	—	—	—	E. & N.E.	Usually high, mod. occasionally	31	Sky clear, occasionally cirri.
February -	—	80	18	89	71	—	—	—	—	E.N.E.&S.W.	Do. do.	28	Do. do. do.
March -	—	83	18	92	74	—	—	—	0·30	Do.	Do. do.	31	Do., occasionally heavy dews in the mornings.
April - -	—	82	18	91	73	—	—	—	2·02	N.E. & S.W.	Moderate and calm.	20	Latter part clouds and sunshine, cumuli, with occasional thunder and lightning.
May - -	—	84	14	91	77	—	—	—	5·36	S.W. & E.	Do. do.	—	Sunshine and clouds — cumuli — occasional thunder and lightning.
June - -	—	79	8	83	75	—	—	—	1·61	S.W.	Monsoon.	—	Cloudy and occasional sunshine—nimbi.
July - -	—	76	7	80	73	—	—	—	11·77	Do.	Do.	—	Do. nimbi.
August -	—	73	7	77	70	—	—	—	5·68	Do.	Do.	—	Do. do.
September -	—	73	7	77	70	—	—	—	2·84	Do.	Do.	—	Do. do.
October -	—	76	11	82	71	—	—	—	1·46	S.W. & E.	Do.	—	Sunshine, and occasionally cloudy.
November -	—	77	16	85	69	—	—	—	0·65	E.	Moderate	30	Cloudless.
December -	—	72	16	80	64	—	—	—	—	Do.	Do. occasionally high	31	Do.

DHARWAR. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate is very good. November, December, January, and February, especially the first three months, are dry and cool. There is a good deal of moisture in the air in March, April, and May up to June, when the rains commence. From February to June the climate is hot in the day time, but generally cool at nights. The climate is never very cold, but occasionally foggy in the hot weather in the mornings; the temperature, also, is pretty equable. The effects of tree planting in the station are beneficial. There is no irrigation in camp, nor any impurity of air. The health of the troops (natives) is very good. No particular kind of diet, shelter, or clothing is necessary, neither is any particular precaution required (beyond what is usually adopted in all cases) as to the amount of duties, &c. I may state that the Europeans, when stationed here for a short time (two years), enjoyed very good health. During the stay of the regiment here (about 16 months) July, August, September, and October have been the most healthy, and November, December, and January, when fevers and rheumatism were the most prevalent diseases, the most unhealthy months. 4. There is no district near the station, the climate of which is more conducive to health than that of the station. 5. The following is a list of stations at which I have served, with my observations on their comparative salubrity, viz.,—Upper Sinde, unhealthy; Mhow, healthy; Deesa, healthy; Bombay, unhealthy; Asseerghur, healthy; Sholapore, healthy; Belgaum, healthy; and Dharwar, healthy. The last two-named stations are the most healthy for Europeans, but I can scarcely say which is the most healthy for natives.
III. SANITARY CONDITION OF STATION.	1 to 15. No answers to these queries, there being no barracks at Dharwar. 16. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is performed by sweepers, and the rubbish is buried at a distance or burnt; the cleaning is efficiently done. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar, &c. 19. The bazaar is crowded and narrow, and the ventilation very imperfect. There is no supply of water, but the drainage is good, and cleanliness is ensured by frequent inspections. The filth is carted away. There are no regulations for preserving cleanliness in the bazaar further than that each householder is responsible that no filth is allowed to accumulate in front or rear of his house, and that all rubbish is cleared away by a certain hour morning and evening. The condition of the houses in the town is generally good, and there are no dungheaps or cesspits within them. No nuisance is experienced in the station from wind blowing over the native buildings. 20. The slaughter-houses are of a considerable distance from military limits. The offal is buried, and no nuisance is experienced. 21. No horses are allowed to be picketed in the bazaar, but they are kept always in the town, and no inconvenience is experienced. 22. There are no cavalry or artillery at Dharwar. 23. There are no quarters for married non-commissioned officers or men at this station.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is very good; the bungalows are well ventilated, and the grounds well drained. No improvements to suggest.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining population are healthy. 2. The diseases most prevalent among the natives are fevers, bowel complaints, rheumatism, and guinea worm; cholera every now and then makes its appearance epidemically, but there is scarcely any spleen disease. 3. I attribute the healthiness of the native population to the following facts;—the country is generally speaking, open, well cultivated, and free from malaria; in the town of Dharwar sanitary measures are tolerably well carried out for a native town; the heat is never very great, the nights generally cool, and the natives generally in this part of the country are well-to-do, and contented. 4. The troops at this station were at Belgaum about four and a half years, with the exception of about 13 months, when the greater part of the regiment was in Persia. They left Belgaum on the 22nd December 1848, and were then in a good state of health. The principal diseases there were fevers, bowel complaints, and rheumatism. They arrived here on the 25th December 1848 in a good state of health. Fevers, bowel complaints, rheumatism, an outbreak of epidemic cholera, and latterly, guinea worm, have been the principal diseases since coming here. No portion of the accommodation here, as regards the sepoy lines, is more unhealthy than the rest. 5. The troops at the station are not camped out. 6 to 13. I am unable to answer these queries from a want of experience of hill stations. 14. Frequent change of stations in the plains is beneficial to the health and spirits of troops, if the stations be healthy, and the men march in cold weather. 15. I have no knowledge regarding the barrack and hospital accommodation at hill stations. 16. I cannot say, from inexperience, what ranges of elevation above the sea, are most suitable as sites for hill stations. 17. There is a hill on the Ghauts at Kerowlee which has been recommended as a sanitarium. It has good water on the top and table land convenient for building and exercise. Its distance from the station is about 45 miles, and to reach it about 3 miles of road on the plain (to connect with an existing road) would have to be made, and a road up the hill itself. Its elevation is about 3,000 feet above the sea. 18. I have had no experience to enable me to say what classes of surface and sub-soil are the most healthy or unhealthy. 19. I should say that from 20 to 25 years of age is the best age for a British soldier to proceed to India, and he should land here in the cold weather. In my opinion, strict enjoinment of temperance in eating and drinking, clothing suitable to the climate and season (especially as regards head-dress), exercise short of fatigue, as little exposure to the heat of the sun as possible, together with an approved system of barrack accommodation with all its appliances, moral and physical, would be the best means to resort to, to preserve the health of the recruit.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	20. My experience with European troops has not been great; but I am much inclined to think that sending them out to India direct would, on the whole, be the best plan. European troops on landing should always, if possible, be sent to cool and elevated stations, such as those on the table lands in this Presidency, Poona, Kirkee, Belgaum, &c. 21. There is no water transport from the port to the interior in this Presidency for troops, but they must either march, or are conveyed by bullock dawk, or railway carriages. I have never seen either of these modes of transport in operation, and am unable to give any opinion as to their fitness for preserving the health of the soldier en route. 22. As far as my experience goes, I think that from 12 to 15 years should be the extreme period of service in India for an European soldier. I mean for the soldiers generally in a Queen's regiment (line). 23. In my experience the manner of conducting medical boards, as regards invaliding, has always been such as to avoid conflict of opinion. 24. Invalids proceeding from India home should leave so as to arrive about the beginning of summer.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases at this station. 2. There has been no scorbutic disease at this station. I have never seen this disease affecting any of the troops in this country, except during the Persian campaign, when it made its appearance to some extent amongst the natives, arising from bad water, and a deficiency of vegetables. When the causes were removed the disease soon disappeared. 3. Hepatic disease has been very rare in the regiment since its arrival here. There has been only one case, and that a slight one. 4. The proportion of cases of dracunculus usually under treatment, since the arrival of the regiment here, has been about eight per cent. The disease is supposed to arise from the use of water, but whether it is the external or internal use of it, or from its being used in both ways, that gives rise to the disease, is a point not yet cleared up. I know of no preventive, though perhaps boiling the water before use might act as such. 5. The proportion of venereal diseases, since the arrival of the regiment here, has been about eight per cent. I have not had very much experience with Europeans; but from all I have seen and heard, I certainly think it would be advantageous to establish lock hospitals. 6. The troops at this station have suffered from the following diseases :— *Fevers.*—Intermittent fever is the most prevalent disease here amongst the sepoys, but they do not suffer much from it, as it is generally of a mild uncomplicated nature. A few cases of remittents have also occurred, but most of them of a mild description. *Dysentery.*—Only four cases of this disease have been admitted at this station, and, with one exception, were of a very mild and simple kind. *Cholera.*—An outbreak of this disease in the epidemic form occurred in the months of last May, June, and July. The great proportion of cases taking place in May. It appeared in the most virulent form. *Rheumatism.*—This disease generally occurs in the chronic form, and is often very long and tedious in its cure. The following table shows the proportion which admissions and deaths from the above diseases bear to the total admissions and deaths :—

Diseases.	Admissions to Total Admissions.	Deaths to Total Deaths.
Intermittent Fever	23 per Cent.	No deaths.
Remittent ditto	1·5 „	Ditto.
Dysentery	0·6 „	4·5 per Cent.
Cholera	4·7 „	77·2 „
Rheumatism	8·0 „	No deaths.

7. The more frequent zymotic diseases belong to the miasmatic class; but the enthetic and parasitic orders also comprise a considerable number of the prevailing diseases. These diseases are mostly prevalent in the hot and cold weather. The means are not available at this station to test and record any atmospheric or climatic conditions and changes that might precede or accompany such diseases; but no such conditions or changes have been observed. In the station itself, these diseases have been most prevalent in the sepoys' lines. Their sanitary condition, with the exception that they adjoin the town of Dharwar, at their eastern extremity, is very fair. I am not aware that any particular part of the town of Dharwar is more liable to the above diseases than another. For a native town, sanitary measures are tolerably carried out in Dharwar, I believe. The personal habits and conditions of the natives, such as regard their general want of cleanliness, not only with respect to themselves personally, but in and around their houses; their close and badly-ventilated dwellings; their often poor and scanty food and clothing, with many other causes, will always predispose them (the natives) to zymotic diseases.
8. This question refers to European troops.
9. Small doses of quinine have not been tried as a prophylactic against malarial disease at this station.
10. Beyond a strict enforcement of all sanitary measures I have no recommendations to make on any of the preceding points, except it be, that when epidemic disease, such as cholera, makes its appearance amongst the troops of a station, they ought, if possible, to be marched out of camp some little distance, and there located for a time.

X. Field Service.	1. There are no local regulations for field medical service not included in the general Presidency regulations. 2. As far as my experience goes, medical officers are rarely if ever consulted as to the conduct of a line of march, billeting, &c.; but at the same time I am of opinion that good practical suggestions from medical officers, would generally be attended to. 3. As far as my experience goes, which has been limited as regards field service, camp regulations for the preservation of health were good, camping grounds well selected, and general sanitary regulations well carried out. The water supply generally abundant; but the water not always to be had of the best quality; in fact, often bad. I am of opinion that tents on field service are generally too much crowded, and field hospitals also. I cannot say what

DHARWAR.
BOMBAY.

References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	powers other medical officers may have had in these matters, but any suggestions I have ever thought it advisable to make regarding those under my own care, were always to the best of my recollection followed. 4. The arrangements for field hospitals, ambulances, &c., &c., are detailed in the medical code of regulations of the Presidency.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following table gives the statistics of sickness and mortality :—

DHARWAR.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Dead.	Diseases of the lungs. Treated.	Diseases of the lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1858-59	8-14 Royal Artillery - - Detachment H.M. 56th Regiment	144	50	1	—	—	16	1	7	1	46	1	4	—	1	—	156	1	280	5	194·4	3·4
	European Troops in the Indian Army.																					
1857-58	Detachment 2nd European Regiment - - - - -	82	77	—	—	—	4	—	1	—	11	—	5	—	—	—	82	—	180	—	219·5	—
1858-59	Ditto ditto ditto -	20	5	—	—	—	—	—	—	—	1	1	—	—	—	—	5	—	11	1	55·0	5·0
	NATIVE TROOPS.																					
1852-53	5th Regiment Native Light Infantry -	727	278	1	3	—	1	—	1	—	39	2	4	—	—	—	218	2	544	5	74·7	0·6
1853-54	5th ditto ditto -	700	402	—	4	—	6	—	2	—	32	—	5	—	1	1	325	1	777	2	110·9	0·2
1854-55	5th ditto ditto -	665	263	5	10	—	3	—	—	—	45	—	9	1	2	—	298	—	630	6	94·7	0·9
1855-56	5th ditto ditto 28th ditto N. ditto Detachment 29th ditto ditto	741	173	—	8	—	9	—	2	—	60	1	4	—	—	—	318	—	575	1	77·4	0·1
1856-57	28th Regiment Native Infantry -	669	90	2	15	—	3	—	2	—	35	1	3	—	—	—	159	—	307	3	45·8	0·4
1857-58	28th ditto ditto -	866	135	—	11	—	8	—	1	—	55	—	3	1	17	3	313	1	543	5	62·7	0·5
1858-59	20th ditto ditto - 28th ditto ditto -	654	144	2	1	—	10	1	2	1	75	4	6	—	—	—	318	1	556	9	85·0	1·3

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General Medical Department,
Bombay, 17th August 1860.

W. C. COLES,
Assistant Surgeon, Secretary.

XII. HOSPITALS.

1, 2. There is a permanent hospital at this station for natives, but it was used by the European troops whilst they were located here. There is also a temporary hospital erected for the use of the native regiment. Both are well away from the bazaar. The permanent hospital is very much confined, being contiguous to out-buildings, &c., which obstruct the ventilation. The temporary hospital, on the contrary, is perfectly open, and thoroughly ventilated. Both sites appear to be perfectly healthy.

3. The water is brought to the hospital by bheesties, and is good.

4. There is no artificial drainage to either hospital, but refuse matter is carried away by sweepers.

5. These native hospitals are simple buildings on one floor. The floors are well raised off the ground by solid filling up, but there is no perflation of air beneath them. In the permanent hospital the roof water is received in open masonry drains laid in the ground below the eaves, and conducted away to a distance; in the temporary hospital it simply falls on the ground, which is on a slope, and is carried away immediately. The permanent hospital has brick and lime walls, with a double tiled roof, and is moderately cool. The walls of the temporary hospital are of lath and mud plaster, very thin, but still quite sufficient to keep the building cool. Each building has a verandah on each of its long sides 10 feet wide, which affords excellent shelter from the sun; they are not used for the accommodation of sick or convalescents. The temporary hospital is placed so as to receive the full benefit of the prevailing winds, but the permanent one faces too much to the south. The windows open perpendicularly in the centre, and are fitted in the permanent hospital with glass, and with venetians outside, and are perfectly well arranged for coolness and ventilation. The temporary one is simply fitted with plank shutters.

6. The ventilation of the permanent hospital is not good; it depends entirely on the doors and windows, and what little foul air can escape through the tiles. The temporary hospital has the roof at the ridge raised all along above the main roof, and overlapping it. The part of the main roof lying below it not being tiled, any foul air that collects must pass out at once. This arrangement has answered admirably. Neither jalousies nor jhilmils are required or used in the hospital.

7, 8. There is no apparatus either for cooling or warming the air admitted into the hospital wards. The walls and ceilings of the wards are limewashed four times a year.

9. The privies and urinals are simple sheds, with a passage for the sweeper at the back, who removes everything daily; no cesspits are consequently required. They are not supplied with water, but they are never offensive.

10 to 17. These queries refer to European hospitals alone.

18. The general sanitary state of my hospital (a temporary one) is very good. The only drawback to it in this respect is that were much sickness to prevail in the regiment, the accommodation would be too limited, but as yet it has not been found so. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards.

19. The hospitals with which I am acquainted are generally deficient in ventilation; their sites often not well chosen, and a bad arrangement as regards their wards. There is generally, if not always, a great deficiency of accommodation for the medical subordinates, and hospital servants.

20, 21, 22. No replies to these queries.

23. The powers of the medical officer are ample, I imagine, as regards repairs, changes of diet, medical comforts, and general arrangements of the hospital; but in any matter involving

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	much expense his suggestions to improve its sanitary state would probably, if carried out at all, only be so after considerable delay and trouble. 24. No reply to this question.
XIII. Burial of the Dead.	1. The European burial ground is about half a mile from the nearest occupied bungalow and is well to leeward. 2. It is about an acre in area, and its soil is a species of gravel formed by the decomposition of primary rocks, trap, or granite. It is kept moderately clean, and in pretty good order. 3. Being a burial ground for a small station, where interments do not often take place, there is plenty of room between the graves, none of which are ever reopened. Interment takes place within 24 hours after death, with natives within 12 hours. The native troops are buried or burned about three-quarters of a mile from camp. 4. The graveyard is never offensive in the slightest degree. British troops are buried as soon after death as convenient. 5. The dead of camp followers and bazaar people are disposed of in the same way and place as those of the native troops and townsmen. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements to be suggested.

(Signed) Edward Baynes, Major,
Commanding at Dharwar.
W. Neilson, Surgeon,
H.M. 20th Regiment, Native Infantry.

12th July 1860.

RAJCOTE.

Accommodation.—Native troops.

Detachment 3/3 Artillery - - -	38
1 Squadron 2d regiment Light Cavalry -	139
H. M. 17th Regiment Native Infantry -	846

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is that of a vast, undulating, flat, and stony plain, with cultivation in the vicinity of the town and cantonment. There is not much wood or jungle near the station, but a river which runs past the town of Rajcote is only half a mile distant from the station. 2. The station is 450 feet above the level of the sea, 100 feet above the adjacent country, and 100 feet above the river. There is no higher or healthier ground in the vicinity of the station. 3. The nearest mountain is the "Girnar," which is about 56 miles to the south-west of Rajcote, and is nearly 3,700 feet above the sea level; therefore, about 3,250 feet above the cantonments of Rajcote. 4. The nearest water is the river Ajee, which flows past the town of Rajcote at a distance of about half a mile from the cantonments. The vicinity of the station is not liable to overflow, as the water during the rains runs off into the river. There is no broken ground near the station, but a slight ravine, which runs through a portion of the camp, and which, during the rains, is usually full of water. It has not been observed to have a prejudicial effect on the health of the troops. 5. The station is thoroughly open to the sea-breeze, which blows steadily during eight months in the year. It is not encumbered with trees, hedges, or gardens, and there is nothing to obstruct its free ventilation. The temperature of the station is not raised to an appreciable degree by being exposed to reflected sun heat. During the months of November, December, January, and February the winds are northerly and north-easterly; but they have very little prejudice on health. The immediate surrounding country is cultivated. There are no works of irrigation near the station, and the cultivation of rice is prohibited within cantonment limits; none is grown in the surrounding country. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Rajcote is the largest in the vicinity of the station, and is about half a mile distant from it. Its population is 7,000 souls. 8. The geological structure of the station is as follows:—Sandstone and trap; surface, black soil and subsoil stony. The ground on which it stands was never before populated. 9. Water is usually found during the dry season at a depth of from 25 to 30 feet below the surface, and during the rainy season at from 12 to 15 feet. 10. The rain-fall flows on the hard and rocky ground into the river; but in some places, where there is black soil, it does not flow away so readily. There is no adjacent higher ground. 11. The water supply of the station is derived partly from the river, but chiefly from wells in the cantonment; there are no tanks within three miles of the station. The wells are not liable to pollution from leaves falling into them; but if not constantly used, they become very foul from the accumulation of pigeons' excrement and rubbish from their nests. 12, 13. The supply of water is abundant, both from the river and wells; it is colourless, inodorous, and well-tasted. It has not been analysed, nor its microscopic characters observed, but it is of moderate softness, and its quality appears to be good, and not in any way injurious to health. It is raised from the wells by means of a leathern bucket and rope, with which the watermen fill their water-bags, or "puckalls," and is distributed through the camp by means of bullocks. There are no other topographical points bearing on the health of the station to be remarked on. 14. No reply to this question.

RAJCOTE.
BOMBAY.

References to Subjects and Queries.	REPLIES.

II. CLIMATE.

1. The following are the meteorological instruments available at the station :—One wet bulb thermometer, two common ditto, one mountain barometer made by Newnham of Regent Street, and a rain gauge, which latter consists of a copper funnel leading into a bottle, whence the water is daily removed and measured in a glass cylindrical vessel graduated to $\frac{1}{100}$ of an inch.
2. The following meteorological table contains the mean of four daily observations, viz., sunrise, 10 a.m., 4 p.m., and 10 p.m. The mean sun temperature contains the mean of observations taken only at 4 o'clock p.m., daily.

Table of Meteorological Observations from 1st January 1857 to 31st May 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January -	29·75	69·2	19·7	77·7	58·7	69·0	55·0	103·3	None.	N. & N.E.	Calm and moderate.	29	
February -	29·71	75·0	20·7	82·5	61·8	74·4	57·2	111·0	"	"	Do.	28	
March -	29·71	82·0	21·3	89·2	70·7	81·2	62·1	116·8	"	N.W. & W.	Do.	30	
April -	29·68	86·3	19·3	96·5	77·2	87·2	67·5	118·8	"	Westerly.	Do.	28	
May -	29·58	90·2	16·6	99·1	82·5	90·8	73·8	117·0	"	"	High winds.	30	
June -	29·59	89·1	12·0	95·0	83·0	89·2	77·5	110·5	4·21	"	Monsoon.	17	
July -	29·45	85·0	6·9	88·3	81·4	85·0	76·7	Cloudy.	8·30	"	Do.	7	
August -	29·56	81·5	4·8	84·0	79·2	81·7	76·0	"	8·94	"	Do.	3	
September	29·50	81·1	6·6	84·6	78·0	82·2	73·1	"	5·22	"	Variable.	18	
October -	29·73	83·0	11·5	88·6	77·1	82·8	69·2	119·0	None.	W. & N.	Calm and moderate.	29	
November -	29·70	77·3	21·3	86·1	65·8	85·1	56·8	123·2	"	W.N. and N.E.	Do.	29	
December -	29·85	72·5	15·9	79·1	63·9	70·8	54·5	110·0	"	N., N.E., and E.	Do.	30	

3. The climate of the station, on the whole, appears to be healthy. Variable monsoon weather from June to September, but the remaining eight months are dry; fogs are not frequent, mostly occurring in November and December. The climate of the station does not appear to be influenced by irrigation or tree planting, and the purity of the air is not much affected by admixture with dust or other impurity. Only native troops are at the station, and on these the influence of the climate appears to be favourable. A more substantial diet than what they usually allow themselves, as well as more spacious and better ventilated huts, would be desirable. The only precautions as to exercise, &c., at all necessary are the avoidance of long parades in April, May, and October, and too early parades in December and January. All the months appear to be healthy, except, perhaps, May, September, and October, the month preceding and the months following the rains, when fever is prevalent.
4. There does not appear to be any more healthy district near the station.
5. I served in Sinde for a few months, at detached periods, in 1856 and 1857; but at that time had no opportunity of making observations on its salubrity. The remainder of my service was spent on field service in Persia, and in the Indian navy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Maps and tracings of the station, barracks, and surrounding country forwarded.

4. TABLE of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
				Feet.							
Native Infantry, 682	1	Variable.	Variable.	12	—	—	—	—	None.		
Native Artillery, 35	1	do.	do.	12	—	—	—	—	None.		
		Ft. in.	Ft. in.								Ft. in.
Guard Room - -	1	15 9	6 9	8	—	—	—	—	2	4	3 6
Prison Cells, 4 -	1	13 3	10 0	34(?)	—	—	—	—	1*	1	4

* Ventilating.

5, 6, 7. There are no windows, verandahs, jalousies, or jhilmils at this station, nor any bedsteads, cots being used.
8. In huts the door is the only ventilator; in guard-rooms the ventilation is effected by means of the doors and windows, and in the tents any one side can be thrown open. The ventilation in the native huts is utterly insufficient; there are no means for cooling the air admitted to the barrack-rooms.
9, 10. Huts for sepoys are constructed of unburnt bricks and mud, and roofed with tiles. The floors are made of earth, slightly raised, and cow-dunged over occasionally.
11. The materials and construction of huts and tents are no doubt suitable for the climate, but the huts in the native lines might be much better ventilated. The barracks and cantonments are kept in repair by the barrack serjeant, and the staff officer is responsible for the general sanitary state of the cantonment.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12, 13, 14, 15. Negative answers to all these queries. 16. All nuisances are removed daily by sweepers from the station; there are no cesspits or foul ditches. 17. An establishment of two sweepers is kept up for the removal of the refuse manure, &c. within the cantonment and its vicinity. 18. The surface of the cantonment is kept as free as possible from vegetation, and there are no old walls or thick hedges, &c. to interfere with the ventilation of the station or bazaar. 19. The bazaar is pretty well drained by one deep nullah, but there is no artificial drainage; the ventilation is indifferent, the water supply good, but there is a great want of cleanliness. There are no latrines, and the bazaar is overcrowded in parts. No rubbish is allowed to be burnt or to accumulate, nor are holes permitted to be dug for making bricks, &c. Each householder is held responsible for the cleanliness of his own house, and the adjoining street gutters, and no house is allowed to be built or repaired without the inspection and permission of the bazaar master. There are some dungheaps, &c. near the town, but beyond the limits of the cantonments. No nuisance is experienced by the troops from wind blowing over the native dwellings. 20. There are no slaughter places at this station. 21. There are very few horses in the bazaar, and these are kept in private stables, the rubbish from which is removed daily, and the manure carried off and sold at regulated times. 22. There are no stables for artillery or cavalry horses, but they are picketed in the open air in front of the men's lines, and at a considerable distance from the hospital. There are no dungheaps, the manure being carried away and sold daily. Cavalry horses are picketed by troops, front and rear ranks facing inwards, about 60 paces in front of the men's lines, but at a considerable distance from the hospital. 23. There are no quarters for married non-commissioned officers or men at this station.
Officers' Quarters.	1. The quarters for officers at this station appear generally to be clean and well ventilated; but the addition of upper stories would be very desirable.
IV. Health of the Troops.	1. The station and the district in which it is situated appear to be generally healthy, and the population of the neighbouring native town is perhaps more healthy than such populations usually are. 2. Intermittent fever appears to be the only epidemic at all extensively prevalent here, and spleen disease, although frequent in other parts of the province, is not so in Rajcote. Cutaneous affections, however, are not uncommon, but small-pox has not prevailed for some years. Cholera existed, though not extensively, in July 1851, and in May and June 1854, and some cases have occurred this season. 3. The healthiness of the neighbouring native population is attributable to the dryness and fineness of the climate; and sickness, when prevalent, to the filth of the houses and streets, and the entire absence of ventilation. The rapid evaporation also of the water from the surface covered with vegetation during the rains in September and October renders fevers then more prevalent. 4. The left wing of the troops at this station arrived at Rajcote in June 1858 from Deesa, where it had been one year. The right wing arrived in January 1857 from Bhoog, where it had been 15 months; the state of their health on arrival was pretty good. At Bhoog intermittent fevers, scorbutus, and rheumatism were prevalent, from which latter diseases the men never suffered, chiefly since arrival here. There is no difference as to the healthiness of one part of the men's present accommodation over another. 5. The troops at this station are never camped out. 6 to 13. No reply to these queries, having had no experience of hill stations. 14. I should think it would be more conducive to the health of troops serving in India to locate them on hill stations, with short periods of service in the plains; and I am also of opinion that troops should not remain longer than two years at any station. 15, 16. No experience of hill stations. 17, 18. There is no higher ground near this station which could be advantageously occupied as a hill station. My limited experience does not enable me to point out any particular class of surface and subsoil more healthy than another for stations. 19, 20. British soldiers should not leave home for India before the age of 21 years, and should land here at the end of November or beginning of December. Recruits on first landing in India should be kept within barracks during the day, when they might be provided with indoor amusement, allowed to engage in any trade or art they may have acquired, furnished with suitable books, kept from the bazaar at night, and not allowed to indulge in excess of any kind. If these precautions were adopted, it would be scarcely necessary to send troops to intermediate stations, nor would it be necessary to send them at once to hill stations, and the dangers of the earlier years would thus be best diminished. 21. I have had no opportunity of observing the mode of transport of troops from the port to the interior. 22. I am of opinion that 10 years ought to be the maximum length of continued service in India. 23. The manner of conducting medical boards here does not appear to tend to any conflict of opinion as regards invaliding of native soldiers. 24. I consider the best period of the year for invalids to leave India for home to be in January and the beginning of February.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*—*Diseases.*	1. There are weekly inspections of the troops at this station by a medical officer for the discovery of incipient diseases. 2. During two years, terminating March 31st, there were five cases of scorbutus in the regimental hospital, or 0·25 per cent. of all other diseases. I have not myself seen a case of it, and it is of such unfrequent occurrence at this station as to render preventive measures unnecessary. 3. No case of hepatic disease is recorded at this station for the last two years; but recently I found an abscess in the liver of a sepoy who died of intermittent fever of long continuance, hepatic symptoms having been developed in the course of the other disease. 4. Only six cases of dracunculus, or 0·3 per cent. of all diseases, have been treated in the regimental hospital during the last two years. The medical subordinate attached to the civil hospital, and who has been resident for more than 15 years, states that during that time he has not seen more than five or six cases. 5. Venereal diseases during the last two years only formed 2·9 per cent. of all admissions to hospital, and they do not appear to be prevalent in native regiments, of which only I have any experience, and when they occur are usually of a mild and tractable character. Lock hospitals in large European stations would doubtless be advantageous. 6. The following are the diseases from which troops at this station suffer:— *Fevers.*—Ephemeral and intermittent fevers, chiefly quotidian. *Dysentery.*—They scarcely ever suffer from this disease. *Cholera.*—Not at all from this disease. *Small-pox.*—This also is unknown at this station. *Rheumatism.*—They suffer to some extent from this complaint. The following are the proportions which admissions and deaths from these diseases bear to the total admissions and deaths:—

Ephemeral fevers	Admissions	291 or 24·4 per cent.
Intermittent fevers	"	868 or 43·2 per cent.
Ditto do.	Deaths	4 or 26·6 per cent. of total deaths.
Dysentery	Admissions	14 or 0·19 per cent.; no deaths.
Rheumatism	"	150 or 7·46 per cent.
Ditto do.	Deaths	1 or 6·6 of all deaths.

These are the admissions for 1858–9 and 1859–60. There was no case of cholera or of small-pox during that time.

7. Intermittent fever is the only zymotic disease at all frequent here, and it is remarkable only for its mild character and the facility with which it yields to treatment. It occurs throughout the year, but is especially prevalent in September and October. The transition from wet to dry weather, and the rapid evaporation from the surface, which during the rains is covered with vegetation, are the climatic conditions which accompany this fever. Disease does not appear to be confined to any particular portion of bazaar or native dwellings, which are defective as regards cleanliness, drainage, and ventilation, with a crowding of dwellings. The water supply is, however, abundant. There have not been observed any particular habits or conditions of the troops or among the native population to predispose to the diseases in question.

8. So far as I have observed epidemic disease does not appear to be influenced by the sepoy's duties or occupations.

9. Prophylactic doses of quinine against malarial diseases have not been tried at this station.

10. From my experience I think that epidemic disease among native troops might be much mitigated were rations to be issued to them by the Government, inasmuch as from the smallness of their pay, and their great passion of hoarding up money, they will not expend enough to procure sufficient food. An improvement too is required in the native huts, which are much too small and entirely without ventilation.

V. INTEMPERANCE.

1. The soldiers at this station are usually temperate, and there are no confirmed drunkards among them.

2. There are no admissions into hospital for diseases caused directly or indirectly by intemperance, and drunkenness does not occur.

3. Distilled spirits are sold at one shop in the bazaar. That consumed by the troops is arrack, distilled from the flowers of the maura tree, and is not unlike inferior whisky in taste; its strength is variable. Spirits form no part of the ration for troops at this station, neither is it given as a ration to convalescents; but in hospital, brandy is given in some cases at the discretion of the medical officer. No drinks injurious to health other than intoxicating drinks are sold in the bazaar.

4. We do not deem the consumption of spirit, except in very limited quantity, conducive to health or to the efficiency and discipline of the corps.

5. We think it would be beneficial to the health of European troops to restrict the use of spirituous liquors and to abolish the sale of them in canteens and bazaars.

6. We are of opinion that the use of malt liquor or wines would have a more beneficial influence on health than that of spirits.

7. Coffee, tea, lemonade, soda water, &c. are not much used at this station, being confined exclusively to officers.

8, 9. It would be better to substitute beer, tea, &c. for spirits for the use of the troops, and to permit only beer, coffee, tea, &c. to be sold to them in the bazaar.

10, 11. No recommendations in addition to the above to make. There are no bazaar regulations on the above subjects at this station.

VII. DRESS, ACCOUTREMENTS, AND DUTIES. *Duties.*

1. We think it advisable that European troops should be drilled at home before being sent to India.

2, 3. No answer to these questions.

References to Subjects and Queries.	REPLIES.
VIII. INSTRUCTION AND RECREATION.	Rajcote has never been a station for European troops. A station library and gymkhana are established here, supported by the European officers.
IX. MILITARY PRISONS.	1. There are four cells in one building at this station, and these appear to be in a very satisfactory state as regards structure, ventilation, and sanitary arrangements.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. So far as regards native troops, of which only we have experience, the practical working of the powers of the medical officer appears satisfactory. 3. In my experience of native troops, the practical operation of regulations, sanitary or otherwise, has not been attended with difficulty or inconvenience. 4. On field service native troops are allowed one dooly and six bearers to every 100 men, and coolies for the carriage of medical stores, &c. Any carriage in excess of these is supplied by the commissariat upon the requisition of the medical officer, and for which indents are subsequently furnished. Sick extra carriage usually consists of native carts drawn by bullocks.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following return gives the required information :—

RAJCOTE.—NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	2nd Regiment Light Cavalry - 8th Regiment Native Infantry - 18th do. do. -	978	883	5	—	—	11	1	7	1	88	1	15	—	3	1	568	3	1,580	12	161·5	1·2
1851-52	2nd Regiment Light Cavalry - 3rd Company 4th Battalion Artillery - - - - 18th Regiment Native Infantry -	1,169	852	—	3	—	48	2	8	—	63	2	14	—	6	1	515	4	1,509	9	129·0	0·7
1852-53	1st Company 3rd Battalion Artillery - - - - 3rd Company 4th do. do. - 2nd Regiment Light Cavalry - 18th Regiment Native Infantry -	1,276	595	—	1	—	28	1	9	2	85	2	17	—	—	—	508	5	1,243	10	97·3	0·7
1853-54	1st Company 3rd Battalion Artillery - - - - 2nd Regiment Light Cavalry - 18th Regiment Native Infantry -	1,201	428	—	1	—	20	—	—	—	88	2	7	—	—	—	386	2	930	4	77·4	0·3
1854-55	1st Company 3rd Battalion Artillery - - - - 2nd Regiment Light Cavalry - 3rd do. do. - - 18th Regiment Native Infantry - Right Wing 23rd do. do. -	1,231	570	1	2	—	14	1	8	1	146	—	14	1	4	3	527	4	1,285	11	104·3	0·8
1855-56	1st Company 3rd Battalion Artillery - - - - 3rd Regiment Light Cavalry - 23rd Regiment Native Infantry -	819	539	3	10	—	8	—	1	—	68	—	4	1	—	—	573	3	1,203	7	146·8	0·8
1856-57	1st Company 3rd Battalion Artillery - - - - 3rd Regiment Light Cavalry - Wing 17th Regiment Native Infantry - - - - 23rd Regiment Native Infantry -	843	491	—	6	—	18	—	5	1	68	1	7	—	3	2	351	1	949	5	112·5	0·5
1857-58	1st Company 3rd Battalion Artillery - - - - Wing 17th Regiment Native Infantry - - - -	420	110	—	1	—	17	1	—	—	21	—	1	—	—	—	166	—	316	1	75·2	0·3
1858-59	1st Company 3rd Battalion Artillery - - - - 17th Regiment Native Infantry -	787	389	—	17	—	13	—	—	—	42	2	9	—	—	—	282	—	752	2	95·5	0·2
1859-60	1st Company 3rd Battalion Artillery - - - - Squadron 2nd Regiment Light Cavalry - - - - Detachment 14th Regiment Native Infantry - - - 17th Regiment Native Infantry -	860	725	4	8	—	16	3	—	—	43	—	7	1	—	—	325	4	1,124	12	130·6	1·3

By order of the Acting Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay 29th September 1860.

XII. HOSPITALS.

1. There are two hospitals in camp, one used by the cavalry, and the other by the infantry; they are precisely similar, having been built on the same plan.

2. The two hospitals, which adjoin each other, are situated about 400 yards to the west of the lines, and to windward of them, and are about half a mile to the north-west of the bazaar. The site is open and nothing interferes with the ventilation, it is the healthiest site in every respect that the camp affords.

3, 4. The water supply is abundant and wholesome, but there are no means of drainage for the removal of refuse water and other impurities from the hospitals.

5. There is only one ward in each hospital, elevated about 18 inches above the ground; but there is no perflation of air beneath the floor. The roof water sinks into the subsoil, but there is an open drain by both hospitals, which carries away the rain-fall in wet weather with tolerable rapidity. The hospitals are built of sandstone and chunam, the roofs and walls are single, without ventilation between the roofs, they are not sufficiently thick to keep the hospitals cool. The hospitals are supplied with verandahs on both sides, 6 feet 5 inches

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	on one side, and 13½ feet on the other or west side. These verandahs are only used for the accommodation of the sick when the hospitals are overcrowded. The hospitals consist each of only one story.

TABLE of Hospital Accommodation.
Total number of wards in each hospital, 1.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1	No regulated number.	Ft. in. 98 3	Ft. in. 22 9	Ft. in. 12 6 to the slope of the roof.	Not ascertained.	Variable.	Variable.	Ft. in. 1 4	16	Ft. in 4 10	Ft. in. 3 4

The hospitals receive the full benefit of the prevailing winds. The windows open outwards and their arrangement is conducive to ventilation.

6. The windows and doors of the wards are on opposite sides, and are the only means of ventilation; they keep the hospitals free of odour and closeness when not overcrowded. There are no jalousies or jhilmils.

7, 8. There are no means either for cooling or warming the air admitted into the wards of the hospitals. The ceilings and walls of the wards are cleaned and lime-washed four times a year.

9. There is one privy, distant 17 yards from the hospital, but no cesspits. The filth is removed and the place cleaned morning and evening by sweepers. The privy is not offensive.

10, 11. There are no lavatory arrangements for the hospitals; but tepid baths are available when required for the sick.

12. There is a washerman attached to the hospital, whose services are usually sufficient for washing and drying the hospital linen, &c.

13. The storage is sufficient for a native hospital.

14. The cots used in the hospitals are made of squared wood, laced with cotton tape, 6 feet 4 inches long, 2 feet 10 inches broad, and 16 inches high; the natives bring their own bedding. The substitution of iron for wooden cots is very desirable.

15, 16. There are no kitchens attached to the hospitals, nor any diet tables in force for native troops.

17. There is one hospital orderly for attendance on the sick, and in addition to the regulated number of second-class servants, sepoys are allowed, on the recommendation of the medical officer, to watch such cases as require constant attendance.

18. Occasionally the hospital is found too small for the number of the sick; but it does not appear that epidemic disease, hospital gangrene, or pyœmia has ever originated in it.

19. No other deficiencies or sanitary defects to notice, nor any improvements to suggest besides those already remarked upon.

20. In wet weather convalescents can only take exercise in the verandahs, at other times in the vicinity of the hospitals. There are no fenced grounds, shaded walks, or seats set apart for their use.

21. There is no arrangement for the treatment of soldiers' sick wives, as native women could scarcely be induced to submit to any; but children are frequently brought to the hospital to be seen and prescribed for by the medical officer.

22. There are no special local hospital regulations which are not included in the General Presidency Medical Regulations.

23. The only control over the medical officer as regards the sanitary state of his hospital, &c., is that exercised by the deputy inspector general of hospitals, whose sanction is, in most cases, necessary.

24. There are no wards for convalescents here, and for native troops such accommodation is hardly necessary.

XIII. BURIAL OF THE DEAD.

1. The European burial ground is situated within the station, but to the leeward of the lines and officers' houses.

2. The burial ground measures 243 by 226 feet, and is carefully kept. The rate at which decomposition takes place is unknown.

3. There is no regulated space for graves, but their depth is usually about eight feet; it is never found necessary to re-open them. There is no fixed or compulsory time for interment, but it always takes place in from 12 to 24 hours after death. The native troops, with very few exceptions, are Hindoos, and burn their dead; on an average not more than one sepoy being buried yearly.

4. The grave-yard has never been found offensive.

5. The Mussulman burial ground in camp adjoins the European one, but is not much used; the dead of camp followers and bazaar people being mostly burned.

6, 7. No injury has been observed to accrue to the public health from the present practice, nor have any improvements hitherto been found necessary.

(Signed) T. TOLFREY CHRISTIE, Lieut.-Col., Commanding at Rajcote.
C. B. LA TOUCHE, Lieut. H.M. 17th Regiment, Staff Officer at Rajcote.
C. JOYNT, M.D., Assistant Surgeon, H.M. 17th Regiment N.I.

July 22, 1860

KULLADGHEE.

Accommodation.—Native troops.

- Cavalry, European officers, 6.
- Sabres, 673.
- Infantry E. officers, 5.
- Native commissioned, non-commissioned officers, rank and file, 438.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is level, intersected by low hills, covered with stunted brushwood. It is scantily wooded, and there is but little jungle. There is an abundance of water in the vicinity of the camp. 2. The station is elevated above the level of the sea 1,750 feet; but is almost on the same level as the surrounding country. The nearest water is the Gutpurbah, a river of importance, in which there is running water all the year round. It flows within a few hundred yards of camp. There is no higher or healthier ground adjoining the station. 3. The nearest mountain or table land is 50 or 60 miles distant from the station. 4. The vicinity of the station is not liable to overflow. There is broken ground, but no place wherein stagnant water accumulates. 5. The station is open, and freely exposed to winds, and there is no obstruction to free ventilation. The temperature of the buildings is not raised by exposure to reflected sun heat. The influence of the periodical winds (N.E. and S.W. monsoon) is regularly experienced, as also the sea breeze, which is undoubtedly beneficial to health. 6. The country surrounding the station is cultivated to a considerable extent; but there are no works of irrigation. Rice is not cultivated in the neighbourhood, nor is the cultivation of indigo, nor the preparation of hemp or flax carried on near the station. 7. The town of Kulladghee, having a population of about 2,000 souls, lies about 250 yards to the N.E. of camp, and immediately outside its limits. 8. The site of the camp is upon new ground, with a red gravelly subsoil, resting on quartz and primitive limestone. 9. Water is found in the dry season at a depth of about 70 feet below the surface; and in the rainy season at about 60 feet. 10. The rain fall or water from surface springs flows readily away, and is rapidly carried off by nullahs towards the river. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from the river and from wells. There are no tanks. 12. There is an abundant supply of water always available from the river and wells. Its quality is generally good, and by no means injurious to health. It is raised by the usual method of drawing from wells and rivers. 13. The natural drainage of the camp, and the consequent absence of those causes likely to generate malaria, combine to give the native troops a comparative immunity from diseases usually caused thereby. 14. The selection of sites for new stations is conducted by mixed committees detailed for the purpose.
II. Climate.	1. The only meteorological instruments available at this station are thermometers and pluviometers. 2. Table of meteorological observation from 1st January 1855 to 31st December 1859.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Winds. Direction.	Winds. Force.	Remarks.
	°	°	°				
January	76	89	60	0·05	Easterly.	Moderate	Days clear and cool, nights cold, no dew.
February	79	92	66	—	Ditto.	Ditto.	Ditto, ditto.
March	88	101	74	0·05	Ditto.	Ditto.	Day sensibly warm, nights cool.
April	89	104	74	1·45	Ditto.	Calm.	Ditto, ditto, evening sea breeze.
May	87	101	74	3·80	Variable.	Moderate	Days hot, nights cold, evening sea breeze.
June	84	96	72	1·62	Westerly.	High winds.	Weather cool, cloudy, and occasional showers.
July	82	91	73	2·94	S. Westerly	Ditto.	Monsoon weather.
August	83	93	73	2·53	Ditto.	Ditto.	Ditto, ditto.
September	82	91	73	4·1	Ditto.	Moderate	Monsoon subsiding, weather hot and unsettled.
October	79	91	68	6·67	Variable.	Ditto.	Cloudy days.
November	76	88	63	0·64	Easterly.	Calm.	Clear and cool, cold nights.
December	72	85	60	0·4	Ditto.	Ditto.	Ditto, ditto.

N.B. The above is an average condition of the season for the period under report.

3. The climate throughout the year may be considered tolerably good. It is dry, with the exception of the monsoon months, and is uninfluenced by artificial causes of any kind likely to be injurious to the health of the troops. No suggestions seem requisite with regard to dress, drill, and exercise. The most unhealthy months are those of May and June, when cholera, fever, and bowel affections prevail.
4. The only climate near more conducive to health than this is that of Belgaum, the head quarter station of the southern division of the army, and distant 75 miles.
5. The services of the members of the committee having been distributed over very many stations in the Bengal, as well as in the Bombay Presidency, little more than opinion approximating to their comparative healthiness or otherwise can be given. As a few of the healthiest, the following may be mentioned in Bombay, Ahmednuggur, Mulligaum, Asseerghur, Kurrachee, Belgaum. The following are generally considered unhealthy, Dhoolia, Baroda, Hyderabad (Sinde), and Aden, in all of which some of the members of the committee have had experience.

Sanitary Condition of Station.	1, 2, 3. Map of the station with plans of the station, lines, and pendalls, &c., are transmitted. 4. No permanent accommodation for European troops. 5 to 16. These questions having reference exclusively to European troops; the committee pass to the consideration of No. 17.

KULLADGHEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	17. The immediate neighbourhood of dwellings in cantonment is kept clean by the owners thereof, while all refuse matter in the vicinity of the bazaars and public roads is removed by scavenging carts, and deposited at a considerable distance to leeward of camp. 18. The surface of the cantonment is kept sufficiently free of vegetation, and there are no old walls, thick hedges, &c., interfering with its free ventilation. 19. The health of the permanent residents in the bazaar is generally good, and the site being high, water drains quickly off. Cleanliness is enforced by the bazaar authorities. The bazaar is under the immediate supervision of the staff officer, staff surgeon, and kotwall, who require the occupants of the various houses to keep them and their vicinity clean. The town of Kulladghee excepted, there are no native dwellings, dung heaps, or cesspits, in the neighbourhood of camp. 20. No answer to this question. 21. So few of the permanent residents of the bazaar or the camp followers living therein possess horses, that no defined limit for the purpose of picketing seems to be assigned, the beasts for the most part being allowed to forage for themselves, in the jungle by day, and at night are secured close to the dwellings of their owners. 22, 23. No European troops at this station.
Officers' Quarters.	1. The quarters occupied by officers are not public; they are invariably kept in a state of cleanliness.
IV. HEALTH OF THE TROOPS.	1. The average state of the public health in the station is good, as is also that of the adjoining native population. 2. Cholera, fever (for the most part of a mild type), and small-pox are the prevailing diseases; spleen disease occurs but rarely. 3. The neighbouring native population being almost entirely rural, in tolerably easy circumstances, and the necessaries of life being within the reach of all, and abundant, are the chief causes to which their average state of health may be attributed. 4. The troops at the station are local, with the exception of the 7th regiment native infantry, lately arrived from Bombay, where they suffered considerably from scurvy, and from which they are steadily improving. In point of accommodation sufficient difference does not exist likely to influence health to an appreciable extent. 5. Troops at this station are cantoned. 6. No member of the committee has ever held charge of troops at hill stations. 7 to 18. These questions having reference solely to hill stations, and there being no European troops here, the committee pass to the consideration of No. 19. 19. Soldiers should proceed to India from the age of 18 to 24 years, and land there from November to February. For preserving the health of recruits on first landing in India, I would recommend the following precautions:—Temperance, avoid undue exposure to the sun, wear flannel constantly next the skin, and let the duties as regard drill, &c., be as light as possible during the first four months. 20. It is the opinion of the committee that advantage would accrue in point of health by troops being sent to intermediate stations, whereby acclimation might become gradual. Troops on landing should be sent to hill districts if practicable, but in all instances they should be removed from the coast. 21. Troops are transported from the port to the interior usually for some distance by rail, then by bullock cart, and marching, and by steamers, from port to port. 22. A British soldier should not serve in India longer than 10 years consecutively. 23. It is the opinion that great benefit would arise were medical invaliding boards or committees (whose opinion would be final) appointed in each division. 24. Invalids leaving India for home by the Cape route should do so in November, December, or January.
Diseases.	1. The frequency of parade inspections for the discovery of incipient diseases is regulated by the appearance of scurvy and other ailments. 2. There has been no case of scorbutus at this station. 3. The proportion of hepatic disease usually under treatment among the native troops, is small, for the most part simply congestive and amenable to treatment, though cases do occasionally occur complicated with dysentery and other affections of the bowels. Beyond the means known to advance and preserve the standard of health, there is none which the committee is prepared to recommend for native troops. 4. As the occurrence of dracunculus is usually ascribed to the nature of the water consumed by the men, it would be difficult for the committee to suggest any prophylactic, the adoption of which would not necessarily entail what is beyond the men's reach, *i.e.*, change of water. 5. The proportion of the constantly sick from venereal diseases to the total sick is not more than two per cent. among the native troops. The establishment of lock hospitals would in the opinion of the committee be highly advantageous to the health of the European troops of the army. 6. The following are the diseases from which the troops at this station suffer:— Fevers—Of an intermittent type are prevalent at this station at certain seasons. Dysentery—But rare. Cholera—Is frequently sporadic in the camp. Small-pox—But rarely prevails to a serious extent, the benefits of vaccination being regularly promulgated. Rheumatism—Is not a prevalent disease. The following is the average proportion, taken for five years, which admissions and deaths from the above diseases bear to the total admissions and deaths.

From 1st January 1855 to 31st December 1859.

Diseases.	Total for five Years.		Average of five Years.		Remarks.
	Admitted.	Died.	Admitted.	Died.	
Dysentery - - -	38	—	7·6	—	These returns refer to the 1st Regiment Southern Mahratta Irregular Horse. Average strength at head quarters, 325.
Cholera - - - -	16	9	3·2	1·8	
Small-pox - - -	—	—	—	—	
Rheumatism - - -	59	1	11·8	0·2	

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. Great prostration of the vital powers is the nosological character of the more frequent zymotic diseases. These diseases are most prevalent in May and June, and are preceded by deranged electric condition of the atmosphere with frequent suspension of the usual winds. There is no particular prevalence of any of those diseases in certain parts of the bazaar. With regard to the habits of the troops, little can be said, but want of cleanliness and ill-constructed buildings predispose, to some extent, the native population to those diseases. 8. No answer to this question. 9. Small doses of quinine have not been given as a prophylactic against malarial disease at this station. 10. Epidemic diseases being rare here, the committee have nothing to recommend.
X. Field Service.	1. There are no local medical regulations not included in the general presidency regulations. 2. When any doubt exists as to healthiness of position as regards the line of march, bivouacking, camping, &c., the question is disposed of by consultation with the medical officer. 3. There do not exist any peculiar regulations for the preservation of the health of the troops, which are located in permanent and well-ventilated buildings with an abundant supply of water. All suggestions by the medical officer receive ready attention, and he is invariably consulted on the above subjects. 4. It is not in the power of the committee to afford information as to the arrangements adopted in the presidency for field hospitals, ambulances, transport for sick, and hospital supplies, &c.
XI. Statistics of Sickness and Mortality.	1. Kulladghee has been occupied by Madras as well as Bombay troops.

KULLADGHEE.—European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1858-59	Detachment 8-14 Royal Artillery - Detachment H.M. 56th Regiment -	135	27	1	—	—	19	—	3	—	30	1	6	—	—	—	153	—	238	2	176·2	1·4
	European Troops in the Indian Army.																					
1857-58	Detachment 3rd Company 1st Battalion Artillery - Detachment 2nd Regiment European Light Infantry -	29	19	—	—	—	—	—	1	—	14	—	1	—	—	—	23	—	58	—	200·0	—
1858-59	Detachment 2nd Regiment European Light Infantry.	15	7	—	—	—	—	—	—	—	3	—	3	—	—	—	14	—	27	—	180·0	—
	Native Troops.																					
1852-53	Detachment 5th Regiment Native Infantry - Detachment 19th ditto ditto -	99	25	1	—	—	6	—	—	—	6	—	—	—	—	—	27	—	64	1	64·6	1·0
1853-54	Detachment 5th ditto ditto -	48	5	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—	12	—	25·0	—
1857-58	Southern Mahratta Irregular Horse -	345	92	1	1	—	2	—	—	—	43	—	3	—	—	—	312	—	453	1	13·1	0·2
1858-59	5th Regiment Native Light Infantry - L. W. 15th Regiment Native Infantry Detachment 18th ditto ditto - 1st Regiment Southern Mahratta Irregular Horse - 2nd ditto ditto -	807	234	1	4	—	6	—	4	—	24	1	3	—	—	—	544	—	819	2	101·4	0·2

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department, Bombay, November 9, 1860.

W. C. Coles, Assistant Surgeon, Secretary.

XII. Hospitals.	There is no general hospital at Kulladghee.
XIII. Burial of the Dead.	1, 2. There is a small burial-ground situate about a quarter of a mile to the south-east of the station, and to the leeward of it, for the interment of the European dead. 3, 4. Refers solely to European troops. There is no native burial-ground within camp limits. 5. The dead of camp followers or bazaar people are disposed of by burning or interment beyond camp limits. 6, 7. No injury occurs to the public health from the present practice, nor are any improvements, in the way of regulation or otherwise in the burial or disposal of the dead, to be suggested.

(Signed) John T. Sanderson, M.D., Assistant-Surgeon, 2nd Regiment of Southern Mahratta Horse.

H. Wilson, M.D., M.R.I.A., Assistant-Surgeon, 1st Regiment Southern Mahratta Horse.

July 1, 1860.

TANNA.
BOMBAY.

TANNA.

Accommodation—Native Troops, Infantry, 315.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is hilly, but in the neighbourhood of the camp it is flat; two miles to the east and west there are ranges of hills. It is well wooded, the hills on the west being covered with jungle, and there is abundance of water. The sea separates the station from the main land. 2. The elevation of the station above the sea is about 10 feet, but is generally lower than the adjacent country. There is higher and healthier ground adjacent, but no plateau sufficiently large to be occupied by troops. 3. The nearest mountain or table-land is two miles distant. It is 700 or 800 feet above level of station. 4. The water nearest the station is a creek or arm of the sea which separates the station from main land. The vicinity is liable to overflow during the heavy falls of rain in the monsoon There is a nullah or ravine behind the civil lines, which contains putrid salt water and is detrimental to health in the hot season: During the monsoon the salt water is washed into the sea by rain water, the nullah being the bed of a mountain torrent. 5. The station is shut out entirely from westerly breezes by a range of hills on the west. It is surrounded immediately on north-west and south by the suburbs of Tannah, which interfere with free ventilation and the temperature is raised by the buildings being exposed to reflected sun heat. The station is almost shut out from all breezes. 6. The surrounding country is partially cultivated. Artificial irrigation is observed to have an effect on the health of the station, when evaporation is going on, which is injurious to health. Rice is cultivated close up to the station on all sides. Indigo is not cultivated, neither is the preparation of flax or hemp carried on near the station. 7. The town of Tannah immediately surrounds the station, and has a population of 12,000 souls. 8. The geological formation of the hills consists of trap with subsoil of gravel and decomposed trap. The station occupies old ground. 9. Water is usually found about 15 feet below the surface during the dry season, and during the rainy season almost on the surface. 10. The rain-fall or the water from surface springs in the immediate station flows readily away but in the vicinity, which is lower ground, it lies till evaporation takes place. There is higher ground adjacent, the drainage from which passes through the subsoil of the station into the sea. 11. The water supply of the station is derived from wells and tanks. The tanks are open, and contain in surface about 17,000 square yards, they are more or less full, but nearly dry up during the hot season. They contain rank grass and lotus, amphibious animals, and numerous insects. The tank used for drinking purposes is also used for bathing, although there are rules against the same existing, which are not carried out. The tank and wells are liable to pollution by vegetable matter falling into them, but they receive no foul drainage; nuisance and malaria decidedly proceeds from the tanks both within and without the station, the best means of preventing which is to deepen and clean them out of leaves and lotuses. 12. There is one tank and several wells for supplying the station with water. The well water is very good, but the tank water is bad, and altogether the supply is insufficient. If the rain does not fall by the 18th June, there is a great scarcity of water. The water is raised by lotas attached to ropes. A better supply could be obtained by deepening the wells and tanks. 12. There are no other topographical points bearing on the health of the station, except that we consider the station very badly situated, being surrounded with hills on every side, which shut out the sea breeze, and the native town and bazaar being in close proximity to the station. 14. New stations are selected generally by the Quartermaster-General in conjunction with Superintending Surgeon and an engineer: no improvements can be suggested.
II. CLIMATE.	1. The means and instruments available at the station for conducting and registering meteorological observations are a thermometer and rain gauge. 3. The character of the climate is excessively moist, but not variable, the temperature being generally high throughout the year. A moderate number of trees have been planted here and there about the station. There are no canals, the only irrigation influencing the climate are the numerous rice-fields which bound the station on all sides; the atmosphere is not impregnated with dust. The troops being well clothed and sheltered, and living well, the climate has not much influence on their health. The men are drilled for one hour at the time, morning and evening, during the cold weather, and once a day during the hot weather. January, February, and December are healthy months, and April, May, June, and September are unhealthy. The prevailing diseases are cholera, diarrhœa, and fever. 4. There is no district near the station, the climate of which is more conducive to health. 5. With regard to the comparative salubrity of stations at which we have served, Kolapore, Sattara, Poona, Bombay, Kurrachee, Sukkur, Shikarpore, Baroda, Ahmedabad, Deesa Aden, Hyderabad, Belgaum, and Dharwar are good, Kurrachee being the most healthy; Kolapore, Sattara, and Poona the climate is good, Kurrachee very good. Ahmedabad fair, Deesa very good, Aden healthy, Belgaum and Dharwar pleasant, but not healthy, while at Bombay, Sukkur, Shikarpore, Baroda, and Hyderabad the climate is positively injurious.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, surrounding country, &c. are transmitted. All drains are open unless where an obstacle intervenes, when they are passed under. There are no sewers. 4. The following is a table of particulars regarding barrack accommodation, &c. Date of construction of barrack, 3 erected in 1852–53, 1 in 1840–41, 3 in 1857–58. Total number of pendalls, 7. Total regulation number of non-commissioned officers and men, 315.

References to Subjects and Queries.

REPLIES.

III. Sanitary Condition of Station—*cont.*

Pendals.	Regulation Number of Men in each Pendal.	Dimensions of Pendal. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area of Feet per Man of Floor Space.
		Ft.	Ft.				
No. 1 - -	35	116	31¾	5 feet at sides, 12 feet in centre.			
2 - -	35	112	30¼				
3 - -	41	127	32				
4 - -	37	107½	30				
5 - -	54	174¼	32				
6 - -	31	92¼	30				
7 - -	82	237	31				
			Mean.				
Total - -	315	966	31	5 to 12	254,541	808	95
Guard Room -	—	32½	46½	9	—	—	—
Prison Cells -	None.	—	—	—	—	—	—

The men sleep on the ground. There are no windows.

5. There are no windows at all to the barracks. There is a verandah all round the buildings about 4 feet wide, but it is not occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils.
6. The men sleep on the ground.
7. The tents used in camp are double-poled rowties, 29$\frac{11}{18}$ superficial feet, and 117¼ cubic feet per man, and capable of containing 13 men in each tent.
8. The barracks require no ventilation, the door being nearly always open, and the partitions being nothing but wattle and daub. The ventilation is sufficient to keep the air pure by night as well as by day. There are no means used for cooling the air for barrack rooms.
9. The pendals are raised on wooden posts, between which are wattle and daub partitions. Tents are composed of three-fold dungaree.
10. The floors of the barracks are earthen, raised 1 to 1½ feet above the ground, and admitting of no passage of air beneath.
11. The materials used in the construction of barrcks, &c. are suitable to the climate, and require no improvement. The hospitals and pendals are kept in repair by the executive engineer, and all necessary repairs are generally executed immediately on the requisition being received by him. We suppose the collector is responsible for the general sanitary condition of the station.
12, 13. There are no lavatories, washing-places, or baths for the men, neither are there any cook-houses. The conveniences for washing and drying linen are simply a good tank, a good stone, and a hot sun, the sepoys and dhobies going to whatever tank they prefer.
14, 15. There are no privies or urinals.
16. The natural slope of the ground carries off the water, and there is no artificial drainage. The natural drainage is sufficient for all purposes. No part of the buildings is damp. There are no cesspits, but there is a foul nullah 20 yards behind the quarters occupied by the military.
17. The general state of the surface cleansing within the cantonment and its vicinity is very good; refuse is thrown into the creek, and carried away by the tide.
18. The surface of the cantonment is kept free of vegetation. The town and suburbs interfere with the ventilation of the station.
19. The native bazaar (which is the only one) is managed very well, and is under the regulation of the police, who enforce cleanliness, and perform their duty well. The condition of the native houses near the station is good, but there are dung-heaps within them. A nuisance is experienced in barracks from wind blowing over the native dwellings, which is caused by the close proximity of the town, but there is no method of preventing this.
20. There being no European soldiers at the station, there is no cause for slaughtering animals.
21, 22. There are no stables or picketing grounds at the station.
23. No quarters are provided at the station for married non-commissioned officers or men.

Officers' Quarters.

1. There are no officers' quarters at Tanna.

IV. HEALTH OF THE TROOPS.

1. The station, district, and adjoining native population are healthy.
2. The most prevalent diseases among the natives are fevers, chiefly of the quotidian intermittent type, splenic enlargement, and diarrhœa.
3. We attribute the healthiness of the natives to their living well, the town not being overcrowded, the streets broad, and the sanitary state of the station being well looked after by the police.
4. The troops at the station arrived from Bombay on the 14th November 1859. While there they suffered from scurvy, but with the exception of a few cases of scorbutus the men were healthy on their arrival. They have since suffered from quotidian intermittent fever. No one portion of the men's present accommodation is more unhealthy than another.
5. The troops are never camped out at this station.
6, 7. No experience of hill stations.
8. From the great benefit which European troops derive from a residence at hill stations we highly approve of their selection for Europeans.
9 to 16. No experience of hill stations.
17. There is no higher ground near the station which could be advantageously occupied as a hill station.
18. We cannot say wha class of soil is more healthy or unhealthy than others for stations.
19. Soldiers proceeding to India should be from 19 to 20 years of age. They should land there during the months of November, December, January, and February. Cannot say how troops are disposed of on first landing as regards barrack accommodation, clothing, &c., or what precautions are taken for preserving the health of recruits on their arrival in India.

TANNA. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	20. Troops proceeding to India should first be stationed at the Mediterranean or the Cape, and on first landing in this country they should be sent to the hill districts, and gradually accustomed to the climate. 21. The mode of transport of soldiers to the interior is chiefly by land. 22. The number of years a British soldier should serve in India is 20. 23. We have no experience as to the manner of conducting the business of medical boards. 24. Invalids should leave India in February or March so as to arrive home in June.
Diseases.	1. Occasional inspections are made for the discovery of incipient diseases at this station. 2. When the men of the detachment arrived at the station a number of them were suffering from scorbutus, but they have much improved in health since they came here, and are now free from this disease. 3. The sepoys at this station have not suffered from any hepatic affections. 4. Guinea worm is very prevalent amongst the native population, but only one case has been admitted into the military hospital. 5. There have been no cases of venereal diseases under treatment, and sepoys seldom suffer from this affection, so that there is no necessity for the establishment of a lock hospital at this station. 6. The troops at this station suffer from fever of the quotidian intermittent type, of a mild character, which is readily amenable to treatment. Some very severe cases of dysentery have occured amongst the native troops, but most of them yield to local depletion, ipecacuanha, and opium. Tanna and the whole of the surrounding country was visited by a very severe form of cholera in May and June 1860, and a large number of the inhabitants and prisoners in the gaol fell victims to the scourge, but there were no admissions into the detachment hospital, and there are no records in the hospital that would show that the sepoys had ever suffered much from the disease. Small-pox broke out amongst the camp followers in February 1855, but no casualty occurred; the disease has not made its appearance in the lines since. Both the acute and chronic forms of rheumatism came under our observation, and this disease principally occurred with men who had frequently been under treatment with fever. With regard to the proportion which the admissions and deaths from these diseases bear to the total admissions and deaths we can say that during the 7½ months, the present detachment has been stationed here no casualty has occurred, but we are unable to give further information for want of records. 7. There is no peculiar nosological characters of zymotic diseases to be noticed. During the months of April, May, and June cholera and diarrhœa prevail, and a large number of cases of fever are admitted in May, June, September, and October, and their appearance is always accompanied with excessive heat. The sanitary state of the whole town is well looked after by the police, the drainage, water-supply, and ventilation is good, and disease is not more prevalent in one part than another. If the natives would discontinue their filthy habits of bathing, washing clothes, and drinking the water out of the same tank, in my opinion they would suffer less from diseases of this kind. 8. The occupations and duties of the sepoys have but little influence on their health. 9. Quinine has not been tried at the station as a prophylactic against malarious diseases. 10. We have no recommendations to make towards the prevention or mitigation of epidemic disease at the station.
V. INTEMPERANCE.	1. The soldiers at the station are very temperate, and there are no confirmed drunkards. 2. There are no admissions into hospital from disease caused by intemperance. Drunkenness is punishable as an offence. 3 to 11. No answers given to these queries, there being no European soldiers at the station.
VI. DIET.	No information under this head.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The ordinary regulation dress and accoutrements of the Bombay army are worn by the soldiers at this station, and we consider it suitable to the climate here, and cannot suggest any improvements. The present guard dress is a red coat and black linen pantaloons. There are sentry boxes and great coats to protect the men from the rain or sun.
Duties.	1. We have no experience, to suggest as to whether the men should be thoroughly drilled at home, or at some intermediate station before being sent to India. 2. The usual routine of the soldiers' duty is to mount guard every third day, and be drilled about four days in the week, for one hour in the evening (weather permitting) during the monsoon, and if the drill be short a soldier does not suffer from it. The best hours for drills, parades, and marches are in the morning before sunrise, and there are general orders on the subject. The men have upwards of four nights in bed during the week. 3. The guards are mounted at about 250 yards distance from the barracks. There are roll calls morning and evening. Night guards are always injurious to health, and European soldiers ought to have at least four reliefs and native troops three.
VIII. INSTRUCTION AND RECREATION.	No information under this head, the queries applying to Europeans; it is suggested, however, that a talim khana should be provided for the sepoys.
IX. MILITARY PRISONS.	1. There are no military prisons at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. The practical working of the powers of the medical officers as regards the conduct of the line of march of troops, bivouacking, camping, billeting, &c., is very good. 3. The practical operations of the regulations, for encamping the men are very good; on this subject we beg to refer you to page 143, Dep. General Orders, under the head of "Encampment." The medical officer has always the power of suggesting for the information of the commanding officer, and we can recommend no improvements in this respect. 4. Every regiment has its hospital establishment and carriage, the latter consisting of doolies kajavas, and spring carts. The hospital supplies are transported according to the means of carriage the country affords.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1. A ground plan and a rough marginal sketch of the elevation of the hospital is forwarded with the report. 2. The position of the hospital is within 100 yards or so of the pendalls, and lies N.N.W. of the town and to the west of the civil population. Its site is rather open, and there are no buildings which particularly interfere with the ventilation. The site is generally very healthy there being an absence of malaria from river banks, marshes, nullahs, ditches, water pits, foul ground, or other nuisances. 3. The hospital is well and abundantly supplied with good water. 4. The hospital has no refuse or sewage water and the sweepers remove all impurities. 5. The hospital buildings are constructed 1½ feet above the ground with no passage for air underneath the floors. The roof water sinks into the subsoil, and gradually drains off to the outer drain (mentioned hereafter) the position being slightly elevated. There is no guttering round about the hospital, but it is railed in, and outside the railing enclosures there is a drain, which carries off the rain-fall. The hospital is built of stone and lime, with single roof and walls, which are sufficiently thick to keep it cool, as cool as any building in Tannah can be. There are verandahs on both sides which afford shelter from the sun, their breadth is 8 feet. They are used for the accommodation of the sick when the hospital is crowded. The hospital consists of one ground floor. The following is a table of hospital accommodation :— Date of construction, 14th October 1848. Total number of wards - - 1 Total regulation number of beds - 12

Wards.	Regulation No. of Sick in each Wardr.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
1 Ward - -	12	56	18½	15 in centre 21	18,648	1,554	86⅓	1½	8	4½	3½

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows (as shown on plan) open outwards, and the other arrangements are good. The windows are divided into an upper and lower portion, either of which can be open or shut at pleasure.

6. There is no means of ventilation in the wards whatever, except by keeping the doors and windows open, which is quite sufficient for the purpose. There are jalousies or jhilmils attached to the outer verandah weather boards, which can be pulled up or let down at pleasure.
7. There are no artificial means in use for cooling or warming the air admitted into the wards of the hospital.
8. The walls and ceilings of hospital wards are cleansed and lime-washed about once every three months.
9. The privy is to the south-east of the hospital and within 48 feet of it; it is built of stone and lime, with cesspool attached. The night soil is removed by sweepers three or four times a day, and no water is required, each man taking his own lotah.
10. There are no lavatory arrangements for the hospital.
11. The means of bathing for the sick is left for the native troops to arrange themselves.
12. There are no means provided for washing and drying hospital linen.
13. The dispensary is used as a store room, and found to be sufficient.
14. The bedsteads, cots, and bedding in use at the hospital is the common charpoy of the regulation pattern, with four wooden legs, and sides of square wood filled in with tape, but we suggest bedsteads ought to be made of iron, as the wooden ones harbour vermin.
15. The hospital kitchen is to the south of the sick wards. There is no system of dieting, and the natives make their own arrangements.
16. No reply to this query.
17. Each sick man is provided with an attendant when it is found necessary, and there is one orderly attached to the hospital, which we think is quite sufficient.
18. The hospital is a good substantial building, and is well raised from the ground. All the arrangements are good. Epidemic disease, such as hospital gangrene, or pyæmia, have never been known to occur at this hospital.
19. There are no deficiencies or sanitary defects at this hospital, which have come under our notice.
20. A strong fence surrounds the hospital, the enclosure within which is found sufficiently large for the sick and convalescent to take exercise; there are no shaded walks or seats set apart for their use, and they are not found necessary.
21. The wives and children of the sepoys who may be sick are treated in their lines, and no other arrangement could be recommended, neither is it necessary.
22. There are no local hospital regulations enforced at the station.
23. The medical officer has the whole power vested in him in matters appertaining to the sanitary state of the hospital, and when repairs are required he reports to the proper authorities.
24. There are no convalescent wards or hospitals for convalescents, nor would they be of any advantage at this station.

XIII. Burial of the Dead.

1. The burial-ground is in the churchyard, and is situated about the centre of the station, immediately to the north of the native infantry lines.
2. The area of the burial-ground is 1,000 square feet; the subsoil is moorum (gravelly, and of trap detritus); the drainage is efficient, and the ground is carefully kept.
3. The burials at this station are so few that the graves are dug according to convenience, or as the friends of deceased may desire. The depth of a grave is generally from 5 to 8 feet, and the graves are not reopened for second interments. Interments for both European and

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead.—*cont.*	native troops take place as soon as all the necessary arrangements can be made which is generally from 20 to 24 hours after death. 4. The graveyard is never offensive, neither can it be, as burials at this station are so few. There are no British troops at the station. 5. With respect to the disposal of the dead of the camp followers or bazaar people, if Hindoos, they are burned; and if Mahomedans, they are buried. 6. No injury to the public health accrues from the present practice. 7. We cannot suggest any improvements in the way of regulation or otherwise in the burial of the dead.

August 11, 1860. (Signatures) H. J. MUTER, Captain commanding at Tanna.
JOHN H. WHITE, Lieut., Acting Ex. Eng.
J. MENNIE, Acting Civil Surgeon.

DAPOOLEE.

Accommodation—Native Infantry - - - - - - 358.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The station of Dapoolee lies in one of the numerous valleys of the Concan, on the first succession of terraces from the coast to the Western Ghauts, and around it the country bristles with hills of varying height, of rounded outline, and intersected with river or nullah courses. The surrounding country is essentially hilly, always dry after the monsoon, but during the rains in the broader valleys it is swampy. There is but little wood, jungle, or water in the vicinity, but in the Bunn Valley, lying in a north-west direction, and distant about five miles, there is some jungle. 2. The elevation of the camp of Dapoolee is about 600 feet above the level of the sea, and the mean elevation of the Concan is said to be about 100 feet. The immediately adjacent country is of the same elevation as the camp itself. The "Jog" nullah and the "Peera" river or nullah are the nearest water to the station; but these, although called rivers, are only monsoon torrents, and are dry beds in the hot season. At a distance of about two miles west a stream exists all the year, becoming very thready as the monsoon approaches. There are no lakes or marshes in the vicinity. Many of the hills are higher than the site of this station, without having any possible advantage for permanent military purposes. 3. The nearest table land is that of the Deccan; the next is Mahableshwur (considering it as an isolated position). The distance of the Deccan by a circuitous made road, and the ghaut at Koombarlee, is about 38 miles, and its elevation 1,800 to 2,000 feet above the sea. Mahableshwur, a celebrated sanitary hot-weather station, is distant about 40 miles, and stands at an elevation of 3,400 feet above this station. 4. The sea is the nearest large water, being nine miles distant in a course almost due west. The vicinity is not liable to overflow. A deep ravine runs through the station from the south-east to the north-west, and is the bed of the so-called river Peera, dry in the hot season. It can only affect the health in so far that it is the common necessary of the inhabitants and sepoys; but in this respect it is not prejudicial from experience. 5. The station, though surrounded by hills, is open to the winds, which easily pass over them, the south-east end of the station being the most freely exposed. Trees, houses, or walls do not in any material way interfere with the ventilation. The temperature of the station is raised in consequence of the proximity of dry uncovered hills. The station is not exposed to cold or variable winds, nor freely to land winds, but fully to sea breezes. These latter make the climate bearable, but are likely in debilitated constitutions to cause or prolong rheumatism; they do not possess any tonic effect on the constitution. 6. The surrounding country is cultivated in the monsoon. There are no works of irrigation near the station. The cultivation of rice is carried on immediately outside the camp limits, but there is no cultivation of indigo, nor preparation of hemp or flax in the district. 7. There is no large city or town near the station, but a large village named Jalgaon lies close on the south boundary of the camp. Its population is stated at between 3,000 and 4,000. 8. The geological structure of the district is volcanic; trap, with laterite overlying, the laterite hills having generally a rounded outline. The surface is composed of the broken-down laterite or decomposed trap; but laterite enters into all the surface and subsoil. The station occupies new ground and takes its name from a village half a coss to the north. 9. The depth below the surface at which water is found varies according to the locality; in the dry season at from three to 60 feet, and during the rainy season from one foot to 30 or 40 feet. 10. All water, from rain-fall and other sources, flows readily off, and is likewise in the rainy season quickly absorbed by the porous laterite soil. Only in parts does it lie on the surface and evaporate, and this may be easily remedied by drainage. After absorption it does not ooze out at the level of the station. The drainage from the higher ground finds its way by the gradual slopes and furrows to small watercourses, from these to larger ones, and from these again into "karrees" or creeks, and from thence to the sea. 11. The water supply of the station is derived from wells; but there are no tanks within half a mile of the station. The wells are generally so situated as not to be liable to pollution, but the situation of a few of them is such that leaves from overhanging trees may fall in. No foul drainage or other impurities run into them. No nuisance is experienced from the wells. 12. The amount of the water supply of the station varies with the season of the year; it is plentiful to the month of March, up to which time supplies are obtainable from river beds. It is afterwards nearly confined to wells, and these as the hot season draws to a conclusion gradually fail; small springs then afford a meagre supply. The number of wells in use is 77, and the population, excluding the regiment, is estimated at 3,425.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	With respect to the chemical composition of the water, it is slightly ferruginous, but its microscopic characters have not been observed. Its quality is good and by no means injurious to health, and in amount it is sufficient for the wants of the present population. For domestic purposes it is raised simply by a rope and vessel in wells near the surface, and in those deeper by a rope and wheel; for garden purposes it is raised by the Persian wheel. Better water supply might be obtained, but only at great expense, and by the formation of large tanks.
	13. A portion of the camp is situated on the north-east side of the ravine (Peera river), and this place is freely used as a public necessary. There are parts of the station which from their position obtain less ventilation by wind than others, but I do not learn that the health of the people inhabiting them is thereby affected.
	14. New sites for buildings are selected by committees of commanding engineer, and medical officers. The present committee does not possess the requisite amount of information with regard to the formation of new stations to enable it to suggest improvements.
II. Climate.	1. The instruments in use here for conducting meteorological observations are marine barometer, max. and min. regn. thermometer, air thermometer, wet bulb do., dry do., for sun's rays, and rain gauge; but instruments for sunshine, force of wind, &c., are not available. The observations are made four times a day, viz., at sunrise, 10 a.m., 4 p.m., and 10 p.m. There is also a vane for direction of wind.

1859. Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January	29·0	75·62	26·25	87·54	61·29	74·83	71·59	97·83	—	N.W., N.E.	Variable.	General.	Dew at mid. month, nimbi and cumuli and cirri, no storms.
February	29·40	72·93	27·11	89·64	62·53	77·71	73·43	98·89	—	N.W., N.E., S.W.	Gen. char. high.	General.	Dew, but not constant, heavy massive cumuli, cirri, no storms.
March	29·38	81·23	23·94	91·06	68·12	79·89	76·34	102·51	—	N.W., N.E., and S.W., E.	Gen. char. moderate.	Clouded.	Dew not general, cumuli and nimbi form clouds, no storms.
April	29·32	85·67	19·80	93·63	73·83	84·44	80·61	104·86	In. Cts. 0·28	S.W. and N.W.	High and moderate.	Clouded and sunshine.	Dew about 15 days, heavy electric masses, clouds, on 29th, cents 28, rain.
May	29·32	85·69	16·81	92·03	75·22	84·16	81·57	100·45	0·18	S.W. and N.W.	Moderate	Clouded and sunshine.	Dew on 19 days, heavy clouds, and at end of the month elect. dist.
June	29·21	82·88	10·53	85·63	75·10	89·92	74·69	89·60	34 06	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
July	29·17	82·15	9·65	83·90	74·25	81·01	79·16	87·35	42·81	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
August	29·24	79·69	5·39	78·32	72·93	78·48	76·17	84·19	34·52	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
September	29·22	79·13	10·77	83·43	72·66	77·44	76·23	89·56	10·78	S.W., N.E.	Moderate and squally.	A few days sunny.	Dew occasionally, overcast, squally.
October	29·34	80·38	18·97	88·58	69·61	78·90	73·93	99·58	1·12	N.W., N.E.	Brisk.	Sunny.	Dew, morning fogs, generally sunny, light clouds, and overcast, no storms.
November	29·36	81 43	24·63	92·76	68·13	79·72	72·65	100·33	—	N.W., N.E., S.E.	Moderate	Sunny.	Dew on 12 mornings, few clouds, cum. strata; no storms.
December	29·41	75·51	Max. th.	broken.	61·20	73·73	65·93	94·29	—	N.E. and N.W.	Moderate and high.	Sunny.	Dew on 10 mornings, few clouds, cumuli, hazy, no storms.

DAPOOLEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate is divided into three seasons; 1st, the cold season, from December to end of February; 2nd, the hot season, from March till June, increasing in heat; and the 3rd or rainy season, from June till October. October and November are close hot months. The moisture and dryness vary with the season; even during the rains, there is great variation as to the hygrometric state of the atmosphere. After the rains, for several months morning mists are frequent. Irrigation does not influence the climate, and there is no amount of dust or other atmospheric admixture affecting the climate. The troops at this station are native invalids, and no kind of diet is prescribed for them. They dress always in the red jacket or tunic on duty, but use themselves light clothing in hot weather, and as warm clothing as they can obtain in the cold and rainy seasons. The cold season is the only one suited to exercise and drills, which should take place in the morning. The clothing should be light in the hot and exhausting season, with thin flannel chest and loin clothing. December, January, February, March, and April are the healthiest months. Part of April, May, October, and November, from their close heat, are enervating. June, July, August, and September are the rainy months, and predispose in the already relaxed constitution to rheumatism and chest affections, where the usual precautions are not taken. 4. There is no healthier district near the station. 5. I have served at the following stations; Poona, Deesa, Mount Aboo, Kaira, Broach, Bhooj, Surat, Kurrachee, Hyderabad, Sukkur, Shikapore, Frontier of Sinde, Jacobabad (Khangur), Larkhana, throughout Northern and Southern Concan, Sattara, Southern Deccan country, and Neemuch. As far as I have been enabled to observe (never having been in charge of British troops), the following have appeared to me healthy stations:—Poona, Deesa, Mount Aboo, Kurrachee, Sattara, and Neemuch. Sukkur and Upper Sinde, Broach, Kaira, and Lower Guzerat, were in general injurious.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Map of the adjacent country, with a plan of the station, &c. are transmitted. 4. Table of hut accommodation. Date of construction of huts, 1848, and some in 1859 and 1860. Total number of huts, 358. There are no troops at present at the station.

Huts.	Regulation Number of Men in each Hut.	Dimensions of Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Feet Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.						Feet.	Feet.
358 - - -	1	18	8	10 to ridge.	1,110	1,110	144	None.	1	1	1
Guard Room - -	24	63½	22	10	19,558	814	58	—	5	4½	3
Prison Cells - -	4	15	22	10	5,280	1,320	82½	—	1	4½	3

5. Each hut or small house used by the sepoys has one opening opposite the door; no verandahs exist.

6. No reply to this query.

7. There are no tents.

8, 9. No means of ventilation are used beyond doors and windows, which are however sufficient for natives. Huts are constructed of sun-dried bricks, covered with tiles.

10. The floors are constructed of beaten earth, raised about one foot from the ground; but there is no passage for air beneath.

11. For native troops the huts are very well adapted, but a little more room and less crowding of families would increase their salubrity. The cantonment public buildings are kept in repair. Native soldiers' huts are not limewashed.

12. There are no lavatories for the men.

13, 14, 15. No reply to these queries.

16. There are no sewers, the natural drainage with open ducts being sufficient. Dampness pervades every building during the monsoon. There are no foul ditches.

17. The general state of surface cleansing is tolerable within the cantonment. It is performed by hand labour, and requires more labour expended on it than is allowed. The refuse manure, &c. is as much as possible carried away to leeward of camp, and in the dry season is always burnt.

18. The surface of the cantonment is kept free of vegetation; there are no old walls, thick hedges, &c. to interfere with the general ventilation.

19. The drainage of the bazaar is like the rest of the station, only required during the rains, and then it is well effected by the sloping character of the place, and the various nullahs. The water supply is tolerably plentiful, and cleanliness attended to as far as possible, but there are few latrines. The crowding is, I am sorry to say, considerable, and unavoidable, but good natural ventilation exists. Five labourers are constantly employed in the cleansing of the streets and lanes, a number quite insufficient. An ample registration is required, and also the numbering and naming of streets, lanes, houses, &c. Vaccination is very imperfectly carried on in consequence of a want of registration. The native houses near the station are of the better class of huts. Dung or dirt heaps are common; and these accumulations are used at the approach of the monsoon for burning in the fields. There are no cesspits, and no nuisance is experienced in the lines from wind blowing over the native dwellings.

20. The only slaughtering that is carried on is that of one or two sheep, and one or two goats daily.

21, 22, 23. No reply to these queries.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.* *Officers' Quarters.*	1. The condition of the officers' houses is good, and there is sufficient accommodation. Natural drainage alone exists; ventilation is simple, and requires no details. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are generally healthy. 2. During the hot and cold seasons few diseases are observed, but in the rainy season diarrhœa, dysentery, and chest complaints are not uncommon. Spleen disease is not often observed; cholera, choleraic diarrhœa, measles, and occasionally small-pox, occur at intervals. 3. The sea breeze tempers the great heat, and to its healthy action is attributable the immunity from general disease among the native population. Such diseases as fever may be attributed to insufficient food, exposure, and hard labour; cholera, measles, and small-pox to unripe fruit, contagion, and unknown causes, chiefly atmospheric. 4. The native veterans of this station come from all the regiments of the line, and from every station in which Bombay troops have been quartered. No portion of the men's present accommodation is more unhealthy than the rest. 5. Troops are not camped out. 6, 7. No experience of hill stations. 8. Hill stations should, whenever available, be used for the location of European troops. 9. I am not aware that healthy troops sent to hill stations contract any disease, nor am I aware that in Indian hill stations there are diseases peculiar to them. 10. No experience of hill stations. 11. The hot season is best adapted for residence in hill stations. 12. No reply to this question. 13. The avoidance of the exposure allowed with impunity at hill stations; a careful attention to dress, bathing, diet, and canteen, are the precautions necessary to protect the health of troops on leaving hill stations for the plains. 14. Short services on the plains with location at hill stations would be most conducive to the health of troops serving in India; occasional change of station in the plains is very requisite for the health and spirits of troops. 15, 16. Cannot say what barrack or hospital accommodation is provided at hill stations, or what range of elevation is most suitable for hill stations. 17. There is no higher ground near this station that could be advantageously occupied as a hill station. 18. I have not observed what particular class of surface and sub-soil is more healthy than others for stations. 19. Soldiers proceeding to India should be about 19 years of age, and should land there in the cold season. Not having served regularly with European troops, the committee cannot say how they are disposed of on first landing; but the precaution of the greatest moment to the recruits on arriving, is the placing them at once at some depôt or spot where the minimum of temptation to dissipation exists, and by giving them, wherever they may be, inducements either of employment or pleasure to remain at their quarters. 20. Troops should be sent direct from the home depôts to India. If hill districts are available it would be as well to send troops to them at once. The constitutions of the men, somewhat deteriorated by the voyage, are soon affected, if occupying hot or vitiated atmospheres, *e.g.*, town barracks. If hill stations are not available they should be sent to stations of well reputed healthiness, especially those at a distance from presidency cities or large towns. 21. In the Bombay presidency troops are conveyed by sea on steamers, or on land by rail, marching, or bullock train. The committee cannot from experience say what additional precautions may be required *en route.* 22. From 15 to 20 years is the length of time a British soldier should serve in India. 23. At stations, conflict of opinion at medical boards as regards invaliding of native troops has not been noticed. 24. Invalids should leave India so as to arrive in England during the earlier summer months.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases at this station. 2. There has been no scorbutus among the troops at this station. 3. Hepatic diseases are not usually under treatment at this station. It is peculiarly free from them. 4. Dracunculus is not noticed much at this station. It occurs in the district, and is there universally attributed to the impure drinking water. No prophylactic is known. Asafœtida is looked upon by the natives and wainds, with favour in the treatment. 5. Syphilis is a disease not observed in the hospital at this station. At European stations, registers of the females of this class, with weekly examinations of their persons, and a lock hospital, seem precautions necessary for diminishing the growing evil of this disease among soldiers. 6. The troops suffer from quotidian intermittent fever and chronic rheumatism. Mortality does not take place from the above diseases. In 1858, the admissions from fever were 62, and from rheumatism 25. The proportion of admissions from the former disease to the total admissions was 28·18, and from the latter disease 11·36. 7. Intermittent fever consists of a paroxysm divided into three stages, the cold, hot, and sweating, following in regular succession, and terminating in a complete subsidence of symptoms, and, save a certain languor, return to health. After an interval in the quotidian form of about 24 hours, unless prevented, the fever returns, and runs the course of stages over again. It is generally here uncomplicated, and quickly amenable only to quinine. It occurs chiefly in the cold and hot seasons, strong sea winds acting on the enervated constitutions, especially when the person is profusely sweating. It is chiefly observed directly on the sea coast, not so much so inland. This disease does not frequently show itself in the bazaar or station. The sepoys generally contract fever on their outposts, and come to the station for treatment. The natives confine themselves much in their small close dwellings, which are generally

DAPOOLEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	insufficiently ventilated. Sleeping in the open air, thin clothing, hard toil, and insufficient food, are predisposing causes amongst the natives to the reception of malarious poison. Intermittent fever is very little observed among the European inhabitants. 8. The soldiers on the march, and in the field, when exposed to the action of malaria, must necessarily be liable to intermittent fever. 9. Quinine is decidedly prophylactic against malarial diseases, though not tried in that character at this station. 10. Ague does not appear to take its rise at this station, or at least, rarely. Bancote or Fort Victoria ought to be abandoned as a station, as hardly a civil native servant, policeman, or soldier ever escapes without ague, even after a short residence. It is about 15 miles from this station, situated on the sea, at the mouth of a creek, and is the station of a native magistrate and his court.
V. INTEMPERANCE.	1. The sepoys are temperate as a class, and no confirmed drunkards are known. 2. There have been no admissions into hospital from diseases caused either directly or indirectly by intemperance. Drunkenness is punished as an offence. 3. Distilled spirits are sold at the bazaar; but the quality, and amount consumed by each man per diem, cannot be ascertained. 4. The consumption of spirits by troops is injurious to health, except when rendered requisite as a stimulant after fatigue or during toilsome work. They are not conducive to efficiency or discipline. 5. It would be beneficial to restrict the use of spirituous liquors as part of the ration, and certainly some restrictive measures ought to be adopted concerning the sale of liquors in bazaars. 6. Good malt liquor used dietetically is shown by all experience to be superior in its action to wine and spirituous liquors. 7. The influence of coffee, tea, lemonade, soda water, and similar drinks, on health, efficiency, and discipline, as compared with the use of ardent and malt liquors, must be good. This answer is given on the supposition that a free use is implied. 8. As a general rule, restriction, instead of suppression of spirit, would appear to be sufficient. Were beer of a good quality supplied, the habit of spirit drinking would fall quickly into disuse. 9, 10. It would be very beneficial in prohibiting the sale of spirituous liquors in the canteens to permit only tea, coffee, beer, &c., to be sold to the troops. No recommendations to make on these points. 11. There are no bazaar regulations with respect to European troops at this station.
VI. DIET.	1 to 4. No reply to these queries. 5. At this station vegetable gardens could be easily established, and they would be healthful and advantageous.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress consists of red tunic, red shell, black cloth trousers, black drill trousers, Kilmarnock cap with white cover, highlow shoes, overcoat, and white trousers. The accoutrements are—musket bayonet, ammunition pouch, cross belt, waist belt, percussion pouch, knapsack, and sling belt. The dress used by the men at this station appears all that could be desired. We cannot suggest improvement in the present style and composition of dress used. Every necessary precaution seems to be taken to ward off the effects of sun heat, night air, and wet. At this station there are sentry boxes. The protection on guard consists of the overcoat, and the sentry ground is the verandah of the guard-house during the heat of the day and in heavy rain.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The old sepoys are not drilled. The routine of duties is, guard mounting, guards inspection parades weekly, muster parades monthly, occasional parades, anniversaries, to hear certain orders read, &c., occasional treasure guards, and the outposts supplied by the veteran battalion guarding the local treasuries. In this climate the mornings in the cold season are the best for drills, parades, and marches. The average number of nights the men had in bed during the week for the month of May 1860, was six. 3. Guards are mounted close to the lines, and last for 24 hours. Sentries perform their guard for two hours; there are three reliefs. There are roll call parades twice in the 24 hours. The night guards are not observed to be detrimental.
VIII. INSTRUCTION AND RECREATION.	1, 2, 3. There is a native regimental school, but there are no other means of instruction and recreation. 4. There is not sufficient shade from trees and other means to enable the men to take exercise without injury to health during the day.
IX. MILITARY PRISONS.	1. There are no military prisons or cells at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. The powers of medical officers on the line of march are, I believe, confined to suggesting to officers commanding what they may consider necessary as affecting or likely to affect the health of the soldiers, their comfort, &c. 3. Dapoolee being a small out of the way station, and never visited by troops, the regulations in force for preserving the health of troops, as to the selection of camping grounds, &c., are simply confined to attention to cleanliness, cutting down exuberant or rank vegetation, &c. Whenever the medical officer suggests any necessary change or work, as far as the means are at hand, such change or work is always carried out.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	4. The regulations for field hospitals, &c. in force, are those of the Medical Code and those in Jameson's Code. Sites for field hospitals are selected by the commanding officer and senior medical officer. Medicine, diet, and comforts are provided by the commissariat. Doolies, and sick carriages of other kinds, are used to convey the wounded. In action advantage is taken of the close vicinity of villages to form shelter for the wounded.
XI. Statistics of Sickness and Mortality.	DAPOOLEE. Native Troops.

Years.	Corps.	Strength.	Fever.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850–51	Native Veteran Battalion - -	315	22	—	—	—	4	1	—	—	16	4	2	—	1	—	59	1	104	6	33·1	1·9
1851–52	Ditto ditto - -	369	27	—	—	—	14	1	2	1	8	1	1	—	1	—	111	1	164	5	44·4	1·3
1852–53	Ditto ditto - -	358	26	—	1	—	13	1	3	1	11	—	2	1	—	—	80	2	136	5	37·9	1·3
1853–54	Ditto ditto - -	347	29	1	1	—	4	—	1	—	7	3	1	—	—	—	72	1	115	5	33·1	1·4
1854–55	Ditto ditto - -	333	38	—	1	—	15	—	—	—	17	1	4	—	—	—	115	1	190	2	57·0	0·6
1855–56	Ditto ditto - -	322	39	—	—	—	9	—	—	—	12	3	3	—	—	—	131	3	194	6	60·2	1·8
1856–57	Ditto ditto - -	383	48	3	—	—	13	2	1	—	21	2	2	1	—	—	154	5	239	13	62·4	3·4
1857–58	Ditto ditto - -	498	45	2	3	—	5	1	1	1	21	4	9	—	—	—	87	4	171	12	34·3	2·4
1858–59	Ditto ditto - -	645	78	5	1	—	17	3	—	—	32	—	13	—	—	—	149	4	290	12	44·9	1·8
1859–60	Ditto ditto - -	596	88	2	—	—	18	1	1	—	19	—	6	2	—	—	109	1	241	6	40·4	1·0

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 29th September 1860.

W. C. Coles,
Assistant Surgeon, Secretary.

XII. Hospitals.

1, 2. The hospital is situated with reference to the lines of the sepoys to the north, and a little west. The Jog river runs between them and is crossed by a large bridge now broken and dangerous. The building is to the north of the bazaar, which is divided into two sections by the Jog. To the north of the hospital is a small hill, which excludes winds from that quarter. There are high trees about, but not close; affording a grateful shade, and not impeding access of winds. The site might be better and more elevated, as the hospital lies almost at the base of one of the hills, just sufficiently however on its rise to allow free running off of water. There is no foul ground near, but there is a large water pit to the north-west, filled in the rainy season, but not productive of malaria. This water pit cannot be dignified by the name of a tank.

3. There are two wells in the compound or hospital enclosure, the water of which is good and plentiful, until the close of the hot season. There is a plentiful spring supply near the hospital; there are no present means for improving the same.

4. There is no artificial drainage for removing refuse water and impurities.

5. The hospital is raised from the adjacent ground; it has no upper story or wards. There is no perflation of air underneath the floor, which is composed of hard beaten earth, cow-dunged every week. The roof water runs off, the position of the hospital being on an incline, and some of the water sinks into the subsoil. The guttering is made annually just before the rains, and is sufficient for every purpose. The hospital is built of laterite stone, with lime plaster over it. The walls are thick and single; the roof is of tiles and double, and both are sufficiently thick to keep the hospital cool. The single ward, of which each building of the hospital consists, is surrounded by a verandah eight feet wide. It is closed by glass windows to the west, and by jhaps to the east, affording perfect shelter from the sun's rays. The northern end of each verandah is set apart for a dispensary. They are occasionally used for the accommodation of sick, convalescents, and others. The hospital consists of one flat only.

Date of construction not ascertained. One ward in each wing.

Total regulation number of beds, 5 per cent. to strength.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.					Feet.	Feet.
No. 1 - -	30	95	22	14 to beam.	37,620	1,250	68	—	15	6	3
„ 2 - -	30	95	22	14 to beam.	37,620	1,250	68	—	15	6	3

The hospital does not receive the full benefit of the prevailing wind, but by a valley between the two hills facing the north-west it is enabled to receive the wind from that quarter to a certain extent. To the south-west a portion of the bazaar interferes, but notwithstanding these defects of locality it is well ventilated. The windows are casements, and well adapted for ventilation, and with the doors, are the only means for that purpose. There are no jalousies.

7, 8. There are no means for cooling or warming the hospital. The wards are cleansed and lime-washed once a quarter.

DAPOOLEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*,	9. The privies are situated to the right rear or north-east of the hospital ward, and are 75 feet distant, but connected by a roofed passage, which is entirely open on both sides to admit a current of air. They consist of seats or openings on the usual native plan. The filth is received in an open trough or drain, which is constantly cleaned from the outside by sweepers. The sweepers obtain access to the drain by means of small doors or openings in the wall, under and corresponding to each seat. The privies are not drained or supplied with water; all cleansing is done by sweepers. There are no cesspits; the surface below the privies is level, and by care they are never allowed to be offensive.
	10. There are no lavatory arrangements. An apparatus is built for heating water, and a bath room is attached to each ward; they are never used by native sick.
	11. The native sick, when their diseases do not preclude their doing so, bathe by throwing the water, hot or cold, over their nude persons. Except in cases requiring it their custom is not interfered with.
	12. Hospital linen is washed, &c. by a dhobie or washerman, forming one of the hospital establishment. The means are quite sufficient.
	13. There is no storage, the clothing is kept in a clothing chest.
	14. The bedsteads consist of a wooden framework, laced with broad cotton tape, taken off and washed after each patient is discharged. It appears to me, as bugs infest these wooden cots, that iron-framed ones would be an improvement. Native sick use their own bedding.
	15. There are two cook-rooms for native sick (for castes) to each wing. They are simple, and have no apparatus. The native sick either cook for themselves or the Brahmin cook, one of the hospital establishment, cooks for them.
	16. There are no diet tables for native sick. Since writing the above the corps, "native veteran battalion," has been disbanded; no forms are consequently forwarded.
	17. An orderly selected from the corps is always in attendance at the hospital, and any sick sepoy, if extremely ill, is always permitted to have a comrade to be with him, and attend to all his minor wants.
	18. I consider the sanitary state of the hospital as good; no epidemic disease, hospital gangrene, or pyæmia have appeared in its wards.
	19. I would suggest the fixing in of windows or casements, glazed, throughout the hospital, and the building of a separate ward for serious cases. This latter appears to me to be a great want in all regimental hospitals.
	20. There is a large sized enclosure, or compound, which might easily be made comfortable for the exercise of convalescents. Native sick, however, seldom desire to be seen outside. The compound is well shaded.
	21. The sepoys' wives and families are attended to when they visit hospital, and are attended at their houses, if willing, which they seldom are. The present arrangements are satisfactory.
	22. There are no special hospital regulations not included in the General Presidency Medical Regulations.
	23. With reference to peculiar repairs of hospital, these are carried out under the sanction of the superintending surgeon, at his or the medical officer's suggestion. With regard to medical comforts within the hospital, stations, camps, and on the march, the medical officer directs the supply of whatever may be required, subject to the pre or past sanction of the superintending surgeon. General repairs are carried on annually by the officer in charge of public buildings.
	24. There are no convalescent wards or hospital, nor does there seem for native soldiers any necessity for such.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for European residents is within the station, and is situated on the northern side of the camp and to the west of the hospital. The prevailing winds do not blow fairly over it toward the station. It is well situated on a slope, enclosed by a high wall, and its area is 9,600. The soil and subsoil is decomposed laterite, and all water runs off quickly. It is not known, however, what effect the soil has on decomposition. The ground is not particularly attended to.
	3. At present space is not apparently an object, the interval between each grave being from 6 to 10 and 12 feet, and the depth from 6 to 7 feet and more. Graves are never reopened. Interment is compulsory at ordinary times from 12 to 16 hours after death. Native troops bury their dead or burn the bodies. The Mussulman burial ground is to the north of the European one; the Mahratta and other castes are situated to the east of the camp. Natives are buried in a more superficial manner, as a general rule, though many good tombs are erected by them.
	4. The graveyard is never offensive.
	5, 6, 7. The dead of camp followers or bazaar people are buried in the burial ground of their castes. No injury accrues to the public health from the present practice of disposal of the dead, and no improvements are suggested.

(Signed) ALBANY TROWARD, Lieut.-Col. Commanding at Dapoolee.
T. B. JOHNSTONE, M.D., Surgeon.
M. K. KENNEDY, Captain, Executive Engineer.

21st August 1860.

DHOOLIA.

Accommodation.—Native troops	Officers - - - - -	8
	Non-commissioned officers -	20
	Rank and file - - - -	344

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is partially cultivated. It is a valley 9 miles in width and 20 in length, divided by the Panjur river in two unequal portions. It is flat, with a low range of hills on the north and south-west. The river Panjur rises from west to east, skirting the northern side of the station. The land not under cultivation is covered with low jungle.
	2. The elevation of the station above the sea is about 1,000 feet, but is on a level with the adjacent country. It is about 30 feet above the nearest water. There is no higher or healthier ground adjoining the station.
	3. The nearest high land is the hill fort of Galna, which is 24 miles distant; its height above the station is about 700 feet. The table mountain of Torum Mal is situated 90 miles north of Dhoolia. Its height above the sea is 4,304 feet.
	The following is a copy of a report on this mountain :—
	" To Alexander Elphinstone, Esq., Collector and Magistrate, Khandeish.
	" Sir,
	" With reference to your endorsement, No. 334 of 1849, dated the 23d ultimo, forwarding the copy of a correspondence relating to a settlement of the feud between the Bheels of the Burwanee state, and Koshia, Naig of Sinde, in the Akraum Purgunnah, and desiring me, with reference to Lieutenant Evans' remarks on Torum Mal, contained in the above correspondence, to avail myself of every opportunity that may present itself of acquiring information of the climate and salubrity of that place, I have the honour to state that I have since visited Torum Mal, and that the result of my observations is as follows :—
	" 2. Torum Mal is situated in the heart of the Suthpoora mountains, and forms the most elevated plateau of the whole range. It is in the Akraum Purgunnah, about 40 miles north-east from Shada, the chief town in the Sultanpoor talooka, and the nearest place from which supplies are procurable. Its distance from Mhow, *viâ* Chikulder, is about 140 miles. As far as Chikulder, the road is very good; but from the latter place to Torum Mal, a distance of about 60 miles, it is a mere footpath, through dense jungle, and a very mountainous country. The distance from Baroda, *viâ* Sagbarra and Shada, is about 150 miles; from Surat, *viâ* Nowapoor, Nundoorbar, and Shada, about 160 miles; from Dhoolia, 90 miles; and from Mulligaum, *viâ* Dhoolia, 120 miles. All these roads are very good and practicable for wheeled carriages to within about 20 miles of the summit of Torum Mal.
	" 3. The table land of Torum Mal forms an irregular plateau, about 20 miles in circumference. Its surface, however, is much broken by deep wooded ravines, and by irregular-shaped hills, rising from 300 to 600 feet above the general level. Towards the north-east end of this table land are two lakes, the upper one of which is between 2 and 3 miles in circumference. Its water is perfectly clear, the bottom being composed of sand and loose stones. I ascertained the depth of the water in the centre to be 36 feet; on the east side, a few yards from the bank, 31 feet; and on the west side, 27 feet. It contains no alligators nor fish, and the inhabitants say that fish put into it invariably die; but it contains a great quantity of a small species of shrimp, of which the Bheels take considerable quantities for sale to the neighbouring towns in the west of Khandeish; its surface is covered with different species of wild fowl.
	" 4. This upper lake is partly artificial, the east side being formed by a vellard extending across the valley at its gorge. The natives, considering this vellard beyond the power of human beings, ascribe its construction to Goorucknath, the presiding deity of the place; and from its immense solidity and extent it would certainly be considered an extraordinary work in any age and country. I ascertained by measurement its length to be 440 yards, its breadth at the base 98 feet, ditto at the surface 28 feet, and height 18 feet. A passage has been left at the south end of this vellard for the discharge of the superfluous water of the lake, and a channel cut to conduct it to the lower one, which is much smaller than the upper, and is said to sometimes dry up in the hot season. From this lower lake a broad channel has been cut for a considerable distance, which conducts the water over a perpendicular fall between 500 and 600 feet high into the valley below.
	" 5. The sides of the vellard of the upper lake are thickly shaded by wide-spreading trees of the ficus Indica, ficus religiosa, calyptranthes jambolana, &c., which also shade a great part of its upper surface, which being, as before stated, 28 feet broad, affords ample space for tents or small bungalows, and as a westerly wind prevails almost without change during the hot months, tents on this vellard receiving the breeze directly across the lake are kept very cool the whole day.
	" 6. The surface of the lake is about 400 feet below the groups of hills which border it on the south and south-west sides. The hills and plains being thickly studded with groups of large spreading carunda bushes, the toorum (a tall shrub bearing a sweet berry, peculiar to these hills), the wild mango, the ficus religiosa, the calyptranthes jambolana, and many others, give the landscape, at the dryest season, a picturesque verdant appearance, although from the habit the Bheels have of setting fire to the grass every season, the green jungle is not so continuous as on the Mahableshwur hills.
	" 7. I regret that I was unprovided with a barometer to enable me to fix the altitude of this plateau correctly; the boiling point of water with thermometer immersed gives an altitude of 4,304 feet above the sea level to the lake, and 5,434 feet to the hills, about a mile and a half to the south-east of the lake, and this I think will be found to be nearly the correct altitude.
	" 8. I noted the variation of the thermometer eight times daily during my stay, and although this was during the hottest period of the year, and I was living in a small rowtee open to

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	the S.W. and N.E., its greatest range was 89° and least range 66°, the mean temperature being 77°, and the daily range of variation being about 16°. During this time the thermometer in a tent under shade, with wet kus tatties, in the plains ranged from 88° to 105° daily. "9. There are about 40 Bheel families dwelling on the hill. They are scattered about in hamlets of five or six huts each, and rear a great number of cattle in the rich pastures of the lower table land. They also cultivate small patches of wheat, Indian corn, grain, tor mor (a species of rice), bhurtee, &c. Each family only cultivates enough to suffice for its own wants, and therefore a great portion of the richest land is left uncultivated. The soil above the upper lake is a rich black alluvial deposit, and on the higher plateaux it is a rich ferruginous clay, which would doubtless produce good crops of potatoes and wheat. The huts of the Bheel inhabitants are strongly constructed of interlaced bamboos, thatched with a species of coarse grass, about 10 feet in height, which grows in profusion on the sides of the hills. They are in the habit of descending to the markets of Tulloda and Shada, situated in the Sultanpoor talooka, and they carry down gums, lac, honey, bees-wax, dye-woods, charolee (a species of sweet nut), &c., which they exchange for salt, spices, cloths, iron, &c. They are a very quiet, inoffensive, timid people, very different from the Bheels in the plains. Their head man is Goorkhia Naik, a fine old man, who has often rendered good service in assisting in the apprehension of desperate characters who have taken refuge in these remote fastnesses. "10. A juttra takes place annually at Torum Mal, in the month of January, in honour of Gooruknath; it had been discontinued until within the last few years, owing to the number of robbers who infested the jungles below; it is now attended by between 200 and 300 persons chiefly from the west of Khandeish. "11. Remains of stone and brick buildings are found scattered all over the hills, and a substantial stone wall varying from 10 to 15 feet in thickness has also been carried round the hills for many miles. It has been defended by round towers of most solid construction, and each of the three passes leading up to the table land has been fortified by extensive works. All these are ascribed by the natives to the period of the Gowlee Raj, or Shepherd kings, to whom are also ascribed all the works in the west of Khandeish considered beyond the powers of the present race of inhabitants. These walls and fortifications are composed of blocks of stone, piled up without any mortar or chunam being used. The outward front is perfectly smooth, and this peculiarity of construction will be found in all works attributed to the period of the Gowlee Raj, as it also distinguishes all Etruscan walls in the ancient cities of Italy. There is also a second or inner wall which appears to have been constructed at a later date, probably after the ruin of the original fortification, and was intended to prevent the ingress of wild beasts, and to keep cattle from straying. All these ruins tend to show that at some early period a very considerable population was located here. "12. There are three approaches to Torum Mal, one leading from Khandeish, one from Burwan, and the third from Sinde and the Nurbudda. There is also a difficult footpath to Dhergaum on the Khandesh side, The road is very good for the first 20 miles from Shada, but for the last 20, from the Bheel village of Chirlee, it consists of a succession of steep ascents and descents. Tattoos with light loads can ascend, and the Banians from Shada bring up their supplies on donkeys; the road might be made much easier at a small expense. The pass leading to Sinde and the Nurbudda, which would be the road for people coming from Mhow and Mundlassir, is also very steep and difficult for about three coss. The ascent by the Hiwassea gate from the direction of Burwan is the most easily surmounted by laden cattle. "13. The Bheels of Torum Mal appear very healthy. They state that there is no prevalent sickness during the rainy season, but that a large species of fly with which these hills abound is very troublesome to both men and cattle. Tigers are seldom heard of above the passes, although they are numerous in the plains below, and during my stay I did not observe a single noxious reptile or insect of any sort. "14. Game is plentiful in the hills, and peacocks, jungle fowl, the grey partridge, quails, wild ducks, hares, wild cats, jackals, foxes, and bears are pretty numerous. The latter appear to ascend the table land during the night to feed off the wild fruits and descend to the valley in the morning. The bison or Bos Ganem, which abounds in hills further west towards Dhergaum, is said by the Bheels to ascend to the table lands during the rains, but never remains during the dry season. Antelopes and the civet cat are also found in the hills, and the Meelgae and genus Cervus (the Sambee) in the valleys around. "15. The geological formation of the hills is composed of hard red sandstone, ironstone, and masses of trap rock. On the east side scarped masses of bare basaltic rocks of a red colour rise perpendicularly to a height varying from 400 to 600 feet. The deep valleys below are concealed with thick jungle, and abound in peacocks and jungle fowl. From the lofty scarped projections, which on this side jut far out into the ravines, most extensive and romantic views are obtained over a vast extent of mountainous country towards the Nurbudda. "16. A great many trees and shrubs unknown to the plains are found on these hills; several produce edible fruits and berries, which form a considerable part of the food of the Bheels inhabitants, and several produce red and yellow dyes, which they carry to the neighbouring markets for sale. A variety of creeping plants entwine the branches of the largest trees, whilst mosses and lichens, the parasitic orchis, and viscum apontiacies strongly resembling the misletoe of Europe, tend to show the temperate climate compared with that of the low country. "17. Most of the inhabitants of this part of the Suthpoora range are a peculiar class of people called 'Panria.' Although commonly supposed to be Bheels, and classed as such, they deny all affinity with the latter, and will neither eat nor associate with them. They worship 'Waghdeo,' or the tiger demon; they do not eat the flesh of swine or cows, and their manners and customs are quite different from those of the Bheels tribes; they speak a peculiar language, are very quiet and inoffensive, robbery and plunder being almost unheard of amongst them. Most of them have settled in these hills during the last few years, having immigrated from native states bordering the Nurbudda. In the Akranee Purgunna the number of these settlers now amounts to 11,268 souls; five years ago the number was 2,570 souls; they pay to Government for the land they cultivate a sum of about 2,769 rupees annually. "18. There can, I imagine, be no question as to the salubrity of Torum Mal during the hot season, and that its invigorating climate would be a most beneficial change from the depressing heats of the plains, although the thermometer during this season averages

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	about 20° lower than it does in the plains, yet the elasticity of the atmosphere at this height, and the vicinity of a fine sheet of water, cause the climate to be still more agreeable to the feelings than the degree of temperature would indicate; the only question therefore is, whether people would consider it worth the trouble to traverse the wild mountainous country by which Torum Mal is on every side surrounded, for the purpose of enjoying a temporary sojourn on its summit. (Signed) "C. P. RIGBY, Lieutenant Western Bheel Agent." "Camp at Shada, 28th April, 1849.

REGISTER of THERMOMETER at TORUM MAL noted in a small Rowtee open to the South-west and North-east.

Date.	At Sunrise.	At 9 A.M.	Mid-day.	3 P.M.	Sunset.	9 P.M.	Mid-night.	3 A.M.	Mean of 24 Hours.	Greatest Variation.	Remarks.
	°	°	°	°	°	°	°	°	°	°	
April 15 -	68	75	82	85	80	77	74	66	75	19	Steady cool breeze from the N.W. Cold westerly wind at night.
„ 16 -	69	77	83	86	84	79	76	66	77	20	Clear sky; very calm. At about 2 p.m. cool westerly breeze set in.
„ 17 -	69	83	89	89	86	81	78	67	80	22	Cloudy weather and calm, no wind all day.
„ 18 -	74	82	87	89	84	80	79	78	81	15	Cloudy weather, with light breeze at intervals. Heavy clouds at night, and slight rain.
„ 19 -	74	75	84	84	82	80	78	77	79	10	Clear sky, with fresh breeze from N.W. at intervals, at night cloudy.
„ 20 -	70	74	82	85	83	80	79	73	78	15	Cloudy; no wind; a slight shower of rain about 8 a.m.
„ 21 -	72	80	83	88	84	82	80	70	79	18	Still cloudy morning; occasional breezes from the west after midday.
„ 22 -	69	82	85	86	83	78	80	70	79	17	Cloudy sky, with cool breeze after midday from the west.
„ 23 -	72	80	84	86	80	78	70	74	78	16	Cool breeze blowing from the S.W. all day; cloudy sky.
„ 24 -	68	72	81	82	80	75	70	70	74	14	Cold westerly wind blowing day and night; clear sky.
„ 25 -	67	70	80	82	79	74	70	68	74	15	Cold westerly wind all day and night; clear sky.

(Signed) C. P. RIGBY, Lieut., W. B. Agent.

LIST of the principal TREES and PLANTS found in TORUM MAL and the neighbouring Hills.

Names of Trees and Plants.	Uses to which applied.
1. Ficus Indica - - - -	—
2. Ficus religiosa - - -	Produces gum and the coccus lacca.
3. Mimosa chanda - - -	Yields a resinous gum.
4. Butra frondosa (Sans. Pullus) -	Its flowers used as a yellow dye, and its fruit as a purgative; yields gum.
5. Zizyphus Albens (Sans. Tourn) -	Its fruit is greatly prized by the Bheels; it is peculiar to Torum Mal.
6. Carissa carondas - - -	Its fruit is used as a pickle.
7. Ficus glomerata - - -	Its fruit is used as food; its wood affords good timber.
8. Tamarindus Indica - - -	Ditto Ditto.
9. Bassia latifolia (Sans. Madbura) -	Liquor is distilled from its flowers, which are also eaten when dried.
10. Zyzyphus jujuba - - -	Its fruit eaten as food; good hard wood.
11. Dispyrs glutinosa - - -	Ditto Ditto.
12. Teroura Elephantum - - -	Yields a gum.
13. Butra superba - - -	A yellow dye and gum.
14. Teeton grandis - - -	—
15. Khakur (native name) - -	Its fruit used as a pickle.
16. Calyptranthes jambolana - -	Timber and fruit tree.
17. Terminalia tomentosa - -	Its fruits used medicinally.
18. Zizyphus napica - - -	An edible berry.
19. Cordia latifolia - - -	A fruit tree.
20. Mimosa catechu - - -	Yields a gum which is used in dyes, and in making cheenand.
21. Grislea tomentosa - - -	Used as a dye.
22. Chirongia sapida - - -	Its nuts are much prized; used in confectionery, emulsions, &c.
23. Mangifera Indica - - -	—
24. Spondeas mangifera - - -	—
25. Dalbergia oojernsis - - -	Bark used in tanning.
26. Phyllanthus emblica - - -	Medicinal; its fruit used as a pickle.
27. Erytherua fulgens - - -	—
28. Dhamun (native name) - -	Good timber; its fruit is eaten.
29. Koosum (ditto) - - -	Yields a red dye.
30. Sapindus emarginatus (Soap tree) -	Its fruit used as a substitute for a soap, &c.
31. Ginlandina moringa - - -	Its flower is used as a vegetable, its bark as a medicine.
32. Hibiscus canambus - - -	Ropes made from its fibrous integuments, and oil expressed from its seeds.
33. Mimosa Sirisha - - -	Timber tree.

DHOOLIA. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	"True copy.—Original sent to Government on the 9th May 1859." (Signed) R. R. Powell, Major, Commanding at Dhoolia.

"Note from Dr. Knapp to Mr. Elphinstone.

"I heard from Rigby the other day; he sent me the observations which he had made on the boiling point of water at Toorum Mal for me to work out the height from Colonel Sykes' table; from which it appears that the level of the lake is 4,304 feet above that of the sea, and that of the summit of a hill about 1½ mile to the southward of the lake, 5,434 feet. This is higher than any part of the Mahableshwur hills, the general level of which is said to be 4,500 feet, and the highest point 4,700. I very much regret not having visited Toorum Mal, particularly as I now find that I could have had even a month's leave from the Brigadier. However, I must look forward to another opportunity, which perhaps may occur, when I may have the pleasure of visiting it with you."

"True extract.
(Signed) "A. ELPHINSTONE,
"Collector and Magistrate."

"True copies.—(Signed) R. R. Powell, Major commanding at Dhoolia."

4. The river Panjar skirts the north of the station, running east and west, but the vicinity is not liable to overflow of water. There is no broken ground to any serious extent.
5. The station is open, and would be freely exposed to winds, if not so encumbered with trees, hedges, and gardens. The temperature of the station is not raised by reflected sun heat. It is exposed to north-west and occasionally to north and north-east winds in December, January, and February, veering to west in March and south-west with monsoon.
6. The surrounding country is partially cultivated. A small aqueduct passes through the station, running parallel to the river; irrigation, however, is too insignificant, and the fields too distant to have any effect on health. There is no restriction as to rice cultivation, but it is cultivated at a distance, and cannot affect the station. Neither indigo nor flax is cultivated near the station.
7. The town of Dhoolia adjoins the station.
8. The surface of the district is black soil, with a subsoil of moorum. The station occupies new ground.
9. Water is found during the dry season at about 30 feet below the surface, and during the wet season at a depth of 23 feet.
10. The rain-fall sinks through the surface into the moorum subsoil, and so speedily drains off. No drainage from higher ground passes into the subsoil of the station.
11. The water supply is obtained from rivers and wells: there are no tanks. The wells, if not in constant use, are liable to pollution.
12. The water supply is abundant at all times. Its colour is rather blue, but its taste is agreeable, and it has no smell. It is soft and of good quality, and its amount is sufficient. There are no special means for raising and distributing it in use. No better supply could be obtained.
13. Dhoolia is situated on a plain screened by ranges of surrounding hills, and is consequently exceedingly hot.
14. New stations are selected by the quartermaster-general's department, in consultation with the medical authorities. No improvement in the mode of selection is suggested.

II. CLIMATE.

1. The only instruments for registering meteorological observations are a thermometer and a pluviometer, which are in charge of the civil surgeon.
2. Table of observations from September 1853 to March 1858.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature at 4 P.M.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, &c.
January	No barometer at the station.	70·38	18·59	80·25	61·66	Not registered.	63·25	102·98	None.	N.N.W.	No data to go by.	No data.	No data.
February		75·55	20·6	85·74	65·14		64·71	105·91	·21	N.N.W.			
March		82·52	20·26	91·95	71·69		68·17	113·04	·64	N.W.			
April		87·88	19·6	98·11	78·51		73·56	114·98	·50	N.W.			
May		91·26	18·15	101·39	83·24		76·96	115·14	2·30	W.S.W.			
June		87·29	12·34	93·72	81·38		78·67	102·84	15·27	S.W.			
July		81·66	5·96	84·59	78·63		76·69	88·65	21·21	S.W.			
August		79·88	6·65	83·82	77·17		76·99	85·60	9·52	S.W.			
September		80·01	7·42	83·45	76·03		76·78	90·8	20·97	S.W.			
October		79·97	13·54	86·2	72·66		73·56	97·95	13·28	W.N.W.			
November		75·91	17·9	83·22	65·32		67·2	100·39	None.	N.W.			
December		71·8	19·82	80·52	60·7		63·44	95·88	·3	N.N.W.			

Total fall in 5½ years.

3. The climate is hot and muggy; it is not influenced by irrigation, and there are but few dust storms. It seems beneficial to the health of the troops (native). During the extremity of the hot weather the drills and exercises are of limited duration; the duties of course remaining the same. March, April, and May, and the early portion of June, are the most healthy months, and October and November the most unhealthy. Fevers, with liver and spleen complications, prevail during the latter months.
4. The Mulligaum districts, south of the Arnee range of hills, are more healthy than the present station. The station of Malligaum is 34 miles distant, is 300 feet more elevated than Dhoolia, is perfectly drained, amply supplied with water, quite open to the breeze, more free from fever during the months of October and November, and has a climate in every way more suitable to the European constitution. The only reason which can be urged against its adoption is that costly public buildings have already been erected at Dhoolia.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	5. The stations at which I have served, with their comparative salubrity, are given as follows:—

1. Poona.—Healthy.
2. Bombay.—Unhealthy.
3. Ahmedabad.—Unhealthy.
4. Kurrachee.—Healthy.
5. Hyderabad.—Variable.
6. Shikapore.—Variable.
7. Mhow.—Healthy.
8. Rajcote.—Healthy.
9. Mulligaum.—Healthy.
10. Aden.—Unhealthy.
11. Deesa.—Healthy.
12. Nusseerabad.—Unhealthy.
13. Neemuch.—Unhealthy.

III. Sanitary Condition of Station.

1, 2, 3. Plans of the country and station are forwarded.

4. Table of barrack accommodation.

Date of construction of barrack, 1858.

Total of rooms or huts - - - - 372
Total regulation number of non-commissioned officers and men - - - - - } 372 { Native infantry troops.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Feet.	Feet.	Feet.							
Of native officers:											
Subadars - - -	1	20	10	11	2,200	2,200	200		The pendalls are open sheds without doors or windows.		
Jemidars - - -	1	12	12	11	1,584	1,584	144				
Non-commissioned officers	1	15	10	7	1,050	1,050	150				
Rank and file - -	1	7½	10	7	525	525	75				
Quarter guard-room, composed of three rooms, one of which is used as a prison cell - -	15	15	12	11	1,980	237					
		12	12	11	1,584						
		12	12	11	1,584	1,584	144				

5. There are no windows, doors, verandahs, or jalousies or jhilmils to the barracks.
6. Native troops do not use bedsteads or cots, but always provide their own bedding, which they spread on the floor. No improvements are suggested.
7. The tents used are regulation double-poled rowties for native cavalry, the cubic contents of which are 1,200 feet, breadth 14 feet, height 10 feet, extreme length 25 feet, and length between the poles 9 feet. The area per man 11·7 feet, and the number of men in each 30.
8. No special means of ventilation are provided in barracks, huts, tents, or guard rooms. Sufficient ventilation is obtained by opening the tents, &c. In pendalls for native troops no means of cooling the air are provided.
9. The barracks or pendalls are constructed of fire-burnt brick pillars and walls, the roofs are double-tiled, and the posts are of cut teak-wood. The tents are of cotton wove cloth, and the huts are constructed of mud.
10. The floors are of moorum, rammed and watered, and are raised 1½ feet above the ground. There is no passage of air beneath.
11. The materials and construction of the pendalls are good. The huts are merely temporary buildings, and the tents are well adapted for the purpose. It would be an improvement if the pendalls were provided with ventilators in the roof. The barracks and cantonments are kept in repair by the executive engineer, and the repairs are quickly executed. The staff officer is responsible for the general sanitary state of the cantonment. There are no stated intervals for cleansing and limewashing pendalls, but it is done when required, as the commanding officer may direct.

12 to 15. There are no lavatories or cook-houses, neither is there any convenience for washing and drying linen. There are no privies or urinals. There are no means of lighting at night.

16. The natural drainage is sufficient for conveying away readily and efficiently all surface water. No part of any building used as barrack or hospital is damp. The drainage is sufficient for all purposes. There are no cesspits or foul ditches. There are no means of drainage or sewerage.
17. The cleanliness of the sepoy lines is maintained by sweepers; this cleansing is efficiently and duly performed, and the refuse is disposed of to the tile and brickmakers.
18. The surface of the station is kept free of vegetation. There are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar.
19. The bazaar is well drained and open to the breeze; it is amply supplied with water; maintained in a state of cleanliness; and not crowded. The inhabitants of it maintain a sweeper. No improvements are required. The native houses near the station are generally in a good condition; no dung-heaps or cesspits are permitted within them. No nuisance is experienced in barracks from wind blowing over the native dwellings.
20. There being no European troops, this query as to slaughtering places does not apply to the station.

21, 22, 23. There are no stables for horses or picketing grounds. No quarters for married men exist at the station.

Officers' Quarters.

1. The officers' quarters are decidedly bad. If Dhoolia is to be the permanent head-quarters of a regiment, additional accommodation for officers is absolutely requisite.

IV. Health of the Troops.

1. The station, district, and adjoining native population are healthy, but the climate is not adapted to European soldiers.
2. The most prevalent diseases are fevers and spleen disease.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	3. The healthiness of the native population is attributable to the air and water being good. 4. The head-quarters H.M.'s 26th were at Sattara from 3rd January 1855 to 26th December 1856. Their general health there was good, the prevailing diseases being fevers and rheumatism. They were in Persia from 1st February 1857 to 4th September 1857, and while there their general health was good. The prevailing diseases were fever and bowel complaints. They were at Dhoolia from 30th November 1857 to 22nd November 1858, and on field service and outpost duty at Khandeish from 22nd November 1858 to 15th June 1860. Their general health is very good. The prevailing diseases have been fevers. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops are not camped out. 6 to 13. No experience of troops at hill stations. 14. Frequent change of station is not beneficial to the health, and damps the spirits of the troops. 15, 16. No experience with troops at hill stations. 17. Galna might be advantageously used as a hill station for a small number of convalescents, not exceeding 100. The distance from the station is 24 miles, and access is obtained to it by means of a country cart road. Its elevation is 700 feet above the plains, and it possesses a temperate climate. 18. Moorum is the most healthy class of surface for stations. 19. Soldiers proceeding to India should be from 20 to 23 years of age, and they should land there in November. I cannot say how troops are disposed of on their arrival, but recruits, on first landing in India, should be kept from liquor, and given abundant occupation for mind and body. 20. Troops should be sent direct from the home depôts to India, and on landing should, if practicable, be sent to hill districts to gradually accustom them to the climate. 21. Troops march on foot to the interior, or are conveyed by bullock transport trains, if their route lies along any of the great trunk roads. I am not aware of any additional precautions that are required. 22. About 12 years is the length of time a British soldier should serve in India. 23. I have no suggestions to make as to the mode of conducting the business of medical boards in regard to invaliding. 24. Invalids should leave India for home in January.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at the station. 2. There has been no scorbutus among the troops. 3. The proportion of hepatic disease among the native troops at the station is very insignificant, and generally is in the form of functional derangement. 4. Dracunculus is not (as far as my experience leads me) endemic to Dhoolia or its neighbourhood. I suspect the animal, in an early stage of existence, is taken into the stomach with the water drank. The prophylactic measures are, to be careful of the water in places notorious for Guinea worm; and if obliged still to drink it, to have it boiled. 5. One in 40 has been the proportion during the past 12 months of the constantly sick from venereal disease to the total sick in H.M.'s 26th Regiment N.I. Lock hospitals would be advantageous to the health of the population generally, and of the army particularly. 6. The following diseases, of the endemic or epidemic form, are those from which the troops suffer:— *Fevers.*—Intermittent, especially of the quotidian type, are more or less prevalent throughout the year, but not to any serious extent, and generally severest in November and December. Fatal cases in natives are generally complicated with some internal inflammation or congestion. *Dysentery.*—Not particularly. *Cholera* is more or less prevalent every hot season. No cases occurred in the regiment during the past official year. *Small-pox* very rare indeed, vaccination being imperative. *Rheumatism* is not prevalent to any serious extent, and very rarely with acute symptoms. The following is the proportion of admissions and deaths from these diseases to total admissions and deaths:—

Diseases.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.
Fever	54·97	None.
Dysentery	·55	"
Cholera	—	—
Small-pox	·27	"
Rheumatism	6·96	"

7. I am unaware of any diseases of the zymotic class being endemic to Dhoolia or its neighbourhood. Cholera, in its epidemic form, is the most frequent and regular in its occurrence, cases occurring sporadically at any season. In the cold season measles and mumps generally appear and small-pox and epidemic cholera throughout the hot season. Before an outbreak of the latter the air is very commonly close, hot, and sultry. The sanitary condition of the station is very good, and that of the town very superior to native towns generally. Epidemic cholera appears to have very few caste prejudices, attacking alike the rich and poor, the strong and the more delicate of both sexes.

8. This query is applicable only to European troops.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	9. Small doses of quinine have not been tried at the station as a prophylactic against malarial diseases. 10. No suggestions to offer on any of the preceding points.
V. Intemperance.	1. The soldiers at the station are temperate; there are no confirmed drunkards. 2. This query does not apply to native troops. 3. Distilled spirits are sold in the bazaar of infamous quality; the amount consumed by each man is not known, but is thought to be small. Spirit is no part of the ration for native soldiers, either at the station, on march, or in the field. It is given to convalescents under medical treatment. Arrack, brandy, or wines are given medicinally. No drinks other than intoxicating drinks are sold in the bazaar. Drunkenness *per se* is not punished as an offence. 4. The consumption of spirits by troops is injurious to health, and not conducive to the efficiency or internal discipline of the corps. 5. It would be decidedly beneficial to abolish the issue of spirituous liquors altogether. 6. Malt liquors are far more beneficial to health than spirits or wine. 7. Coffee, tea, lemonade, and sherbets and water are much used here, more especially the latter, and are preferable to both spirits and malt liquors. 8. It would be beneficial to the health of troops to suppress altogether the spirit ration, and to substitute for it beer, tea, and coffee. 9. It would be beneficial to prohibit the sale of spirituous liquors in canteens, and to permit only beer, coffee, tea, &c., to be sold to the troops, provided the soldier could not purchase inferior spirits elsewhere. 10. I have no recommendations to make on these points, unless the introduction of light wines of France in wood be considered advisable. 11. There are no bazaar regulations.
VI. Diet.	No replies to queries under this head, the subject being only applicable to European troops.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress at the station consists of a scarlet tunic of cloth, black cloth pantaloons, and black and also white cotton pants. The accoutrements are a pouch and bayonet belt, with knapsack. They have also a Kilmarnock forage cap, with white cover, ancle boots, and grey great coats for native troops. The present dress is suitable, but a khakee tunic and dhotee might be added to the above kit for field service, on march, and on guard mounting during the hot weather, and the black and white cotton pantaloons abolished. I have no suggestions to offer, except that woollen clothing (tunic) should always be worn on night duty. The present guard dress in the hot weather is scarlet tunic and black cotton pantaloons, and in cold weather and rains scarlet tunic and cloth pantaloons. The men on guard are protected by a verandah from the sun and wet.
Duties.	1. The men should be drilled at home before being sent to India, as they would be better able to defend themselves if attacked on board ship, and would be more useful if their services were required at any place en route. 2. The usual routine of a soldier's duties at the station are: a parade in the morning commencing about half an hour after reveillee, lasting one hour to one hour and a half; also a parade in the evening during the drill season,—usually the cold weather, of about three-quarters of an hour in duration, three times a week. The men do not suffer in health, but on the contrary, drills are found conducive to health. The best hours for drills are those immediately after day-break, same for parades. Marches in the hot season should invariably be commenced about half an hour before sunset; in the cold season about 3 or 4 o'clock in the morning. There are general orders on the subject. The men have two and a half nights in bed during the week. 3. Guards are mounted about 21 yards from the barracks, they last for 24 hours. There are roll calls morning and evening. Night guards render men on them liable to fevers and rheumatism, but no additional precautions in performing this duty can be taken.
VIII. Instruction and Recreation.	1. The only means of instruction at the station is a regimental school with a good schoolmaster. No means of recreation are provided, as the natives amuse themselves in their own particular fashion, and are not interfered with during their hours of relaxation. They have both quoits and skittles. There is no restriction on the men as to exposure to the sun and rain out of barracks when off duty. 2. The native troops should be instructed in field-works and in road-making; they should be taught to be self-supporting, *i.e.*, to make their own clothes, boots, shoes, &c., to build their own huts, making bricks, tiles, doors, and windows. For recreation they should have lectures on the mechanical arts, and on electricity, galvanism, and chemistry, illustrated by experiments. 3. The institution of savings' banks would be advantageous. 4. Does not apply to native troops.
IX. Military Prisons.	1. There are neither prison nor cells at the station.
X. Field Service.	1. I am not aware of any local regulations for medical field service, not included in the General Presidency Regulations. 2. The medical officer on the march is bound to offer any suggestions which he may think conducive to the health of the troops, and this course is found to be attended with advantage. 3. The practical operation of the regulations for preserving the health of troops in the selection of camping grounds, &c., as laid down in the separate general orders of the Bombay army is admirable. The medical officer represents to the military authority his opinion on the subject whenever he may consider that the ground selected is unhealthy. 4. The arrangements for field hospitals, ambulances, &c. are laid down in the Medical Regulations, Section XI. p. 123 to 134, of 1849.

DHOOLIA. BOMBAY.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	DHOOLIA.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	QUEEN'S TROOPS.																					
	EUROPEAN TROOPS.																					
1858-59	Detachment H.M. 3rd Dragoon Guards - - - - Do. do. 18th Royal Irish - Do. do. 57th Regiment -	74	32	—	—	—	10	—	2	—	13	—	—	—	—	—	39	—	96	—	129·7	—
	NATIVE TROOPS.																					
1850-51	Detachment 11th Regiment Native Infantry - - Do. 16th do. do. Do. Poona Irregular Horse - Do. Bheel Corps - -	1,059	261	1	8	2	5	1	1	—	8	1	21	—	2	2	285	1	591	8	55·8	0·7
1851-52	Do. 16th Regiment Native Infantry - - - - - Do. Poona Irregular Horse - Do. Bheel Corps - - -	946	234	4	10	—	2	—	—	—	43	1	9	—	2	1	249	1	549	7	58·0	0·7
1852-53	Do. 11th Regiment Native Infantry - - - - - Do. 16th do. do. - Do. Poona Irregular Horse - Do. Bheel Corps - - -	1,019	111	1	1	—	2	—	—	—	32	—	8	1	—	—	521	—	675	2	66·2	0·2
1853-54	Do. 11th Regiment Native Infantry - - - - - Do. Poona Irregular Horse - Do. Bheel Corps - - -	945	88	1	2	—	—	—	2	—	32	2	—	—	—	—	461	—	585	3	61·9	0·3
1854-55	Do. 11th Regiment Native Infantry - - - - - Do. Poona Irregular Horse - Do. Bheel Corps - - -	920	179	—	1	—	2	—	3	—	36	1	3	—	4	1	290	—	518	2	56·3	0·2
1855-56	Do. 19th Regiment Native Infantry - - - - - Do. Poona Irregular Horse - Do. Bheel Corps - - -	891	76	—	—	—	—	—	—	—	16	—	3	—	—	—	244	—	339	—	38·0	—
1856-57	Do. 19th Regiment Native Infantry - - - - - Do. Poona Irregular Horse - Do. Bheel Corps - - -	910	230	2	1	—	9	2	1	—	21	2	5	—	—	—	290	1	557	7	61·2	0·7
1857-58	26th Regiment Native Infantry Detachment Poona Irregular Horse - - - -	762	258	6	9	—	23	3	14	—	108	2	11	1	—	—	251	2	674	14	88·4	1·8
1858-59	26th Regiment Native Infantry 30th do. do. - Detachment Poona Irregular Horse - - - -	805	346	2	10	—	9	1	3	1	29	—	8	—	—	—	334	—	739	4	91·8	0·4
1859-60	30th Regiment Native Infantry Detachment Poona Irregular Horse - - - - Do. Bheel Corps - - -	1,190	509	6	6	—	23	—	8	1	72	3	9	—	29	12	402	—	1,058	22	88·9	1·8

By order of the Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 22nd December 1860.

XII. HOSPITALS.

1, 2. The hospital is about a quarter of a mile from the barracks in a north-west direction, and about a quarter of a mile west of the bazaar and town of Dhoolia. The site is not open or freely ventilated, for the out-buildings are to windward of the hospital and interfere with the ventilation; it is however healthy, but might with advantage, be more elevated.

3. The water supply is abundant and wholesome.

4. There is no refuse water, and the other impurities of the hospital are removed by sweepers.

5. The wards are raised about 3 feet from the ground. There is perflation of air underneath the floors. The roof water sinks into the subsoil and speedily passes away. There is a ditch which runs round the exterior of the building and rapidly carries off the rain-fall. The hospital is built of brick and chunam; the roof and walls are not double, with ventilation between, but are sufficiently thick to keep the building cool. The hospital is surrounded by a verandah nine feet wide, which affords sufficient shelter from the sun's rays. The verandahs are interior. The building being too small for its present purpose, constituted as it was for a detachment of four companies only, the verandahs are necessarily used for the accommodation of the sick. The hospital consists of one room only on the ground floor.

TABLE of Hospital Accommodation.

Total number of wards—one.

Total regulation number of beds—12.

Wards or Hospital Huts. Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Dimensions of Wards. Breadth.	Dimensions of Wards. Height.	Dimensions of Wards. Cubic Contents.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows. Number.	Windows. Height.	Windows. Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Inches.		Feet.	Feet.
Centre room, 1 -	12	32	22	16	11,264	17½	18	4	5	4
Verandah - -	About 20	41	9	10	3,696					

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is not so placed as to receive the full benefit of the prevailing winds. The windows open inwards, and are conducive to ventilation and coolness. 6. No means of ventilation beyond doors and windows are adopted, but the ward can thus be kept free of odour or closeness. There are no jalousies or jhilmils. 7, 8. No artificial means of cooling or warming the air of wards are employed. The walls of wards are whitewashed and cleansed every three months. 9. The privy is on the south-east corner of the hospital enclosure; it is built of stone and chunam, and tiled. The contents are removed daily by sweepers; no cesspits or drains are therefore required. 10, 11. There are no lavatories or means of bathing the sick. 12. There are no means of washing the hospital linen beyond the native washermen employed. 13. The storage is sufficient and dry. 14. Common wooden bedsteads laced with tape are used in hospital. The sepoys bring their own bedding, each being required to bring two clean sheets. No improvements are suggested. 15. The sepoys' food is cooked in an open shed in the south-west corner of the hospital enclosure. 16. No reply to this query. 17. The hospital orderly is always in attendance, and the sick, as may be necessary, are nursed by a comrade. 18. The hospital is too small for the number of troops now at the station, but no epidemic disease is known to have appeared within it. 19. The compound of the hospital should be enlarged; the out-houses should be placed further off and to leeward. The walls of the hospital are not high enough; an additional ward is required, and the whole building should be properly ventilated and sheltered from the sun by external verandahs. 20. This question does not apply to native troops. 21. The sick wives and children of sepoys, equally with themselves, receive medical attendance. No improvement is suggested in the present arrangement. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has unlimited power with respect to the sanitary state of his hospital; change of diet and medical comforts rest entirely with himself. All requisite repairs are executed immediately. 24. There are no wards or hospital accommodation at this station for convalescents, nor are any thought requisite.
XIII. Burial of the Dead.	1, 2. There is a small burial ground for Europeans within the station to the leeward of the prevailing winds. Its area is 100 feet by 46 feet, and is surrounded by a six-feet wall. The soil is black, and the subsoil is moorum. A drain runs along the south side. 3, 4. These queries apply only to European troops, of whom there are none at the station. 5. The dead of camp followers and bazaar people are disposed of according to caste. The Mahomedans are buried, and the Hindoos burnt. 6, 7. No injury accrues to the public health from the present practice, and no improvement is suggested.

(Signed) R. R. Powell, Major,
H.M.'s 26th Regiment, Bombay N.I.
J. M. Greig, Captain Engineers.
Henry Pitman, Assistant Surgeon.

31st October 1860.

SEROOR.

Accommodation.—Native Troops. { Cavalry, irregular, 25 for native commissioned, 32 for non-commissioned officers, and for 400 rank and file.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station of Seroor is situated nearly midway between Poona and Ahmednuggur, on the trunk line of road which connects those two places. It occupies an elevated open position with regard to the country around, which has the character of being hilly, and for the most part uncultivated. On the north side of the Goar river there is a succession of hills rising in ranges one above another, and extending for a considerable distance along the bank; but on the south side, on which the station is situated, the features of the country are more regular, and the hills are only to be seen at intervals. There is no wood or jungle to be met with in the vicinity of the station, and only the small quantity of water which flows in the bed of the Goar river. 2. The elevation of the station above the sea is 1,752 feet, but has scarcely any elevation above the adjacent country, in some places being higher and in others lower than the surrounding ground. The nearest water is the Goar river, above which the station stands at a height of 45 feet. There is no ground adjoining the station which would afford a better or healthier site than that which it at present occupies. The position has been found advantageous both for European and native troops for a period of 50 years and upwards. 3. The nearest mountain or table land which presents opportunities for establishing a sanitarium is at the hill fort of Poorundhur, near Poona. There is no elevated ground adapted for the purpose in the vicinity of the station.

SEROOR. BOMBAY.

References to Subjects and Queries. | REPLIES.

I. Topography—*cont.*

4. The river Goar flows close by the station, but with this exception there is no other body of water in the neighbourhood. During the four months of the year which constitute the rainy season, the bed of the river is generally full, and in extraordinary freshes the water sometimes overflows the banks, but not to an extent sufficient to cause injury to the buildings in the town or station. The period during which such an overflow lasts is confined to a few hours. There are no pits or broken ground in which water lodges in or around the station.

5. The station generally is remarkably open and exposed to the prevailing winds. The hedge rows and gardens are kept in good order, and strict rules are enforced by the station authorities for the prevention of an undue growth of vegetation. The buildings are not exposed to the disadvantage of reflected sun heat. The sea breeze is the wind most commonly prevalent in the station; land winds also frequently blow, but no injurious effect is known to arise from their occurrence.

6. To the south of the station the country assumes a cultivated appearance, but in other directions it is singularly bleak and barren. Irrigation is not carried on in the vicinity of the station, except watering a patch of ground here and there from wells. It is not, therefore, possible to judge of the effect artificial irrigation exercises upon health. The cultivation of rice is prohibited within camp limits, but is carried on about half a mile outside. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station.

7. The town of Seroor, containing a population of 7,000 inhabitants, is contiguous to the cavalry lines, which occupy a position on the north of the station.

8. In its geological structure the district is chiefly composed of traprock, the general formation of the ranges of hills which traverse this part of the Deccan. In the valleys and the more level tracts of ground this stratum is covered with a surface layer of black soil, which, however, has no very considerable depth.

9. Water is usually found during the dry season at a depth of 30 feet from the surface, and during the rainy season at a depth of 20 feet.

10. The water from surface drainage is freely carried off, most of it by the rapid inclination the ground possesses, and partially by drainage in the porous subsoil; none of it is retained on the surface. The high ground adjoining the station is of limited extent, and has little influence in adding to the supply of drainage water which passes through the station.

11. The native portion of the community, both of the town and station, derive their supply of water from the stream which perpetually flows in the bed of the Goar. The Europeans, who are very limited in number, obtain their drinking water from wells, sunk within the compound enclosures. The system of storing water in tanks is not adopted in the station.

12. The water supply of the station is unlimited. The Goar river for four months in the year flows with a full rapid stream, and for the remainder of the season there is always copious and constant flow of water in the bed. The water contains a small portion of lime, is hard, of very good quality, not at all injurious to health, and abundant in quantity. It is obtained directly from the river, and no better supply can be had.

13. There are no other topographical points to remark on, as the station is very healthy.

14. The selection of sites for hill or plain stations is conducted by a committee appointed by Government, and constituted of officers of the engineers, medical, and quartermaster-general's departments, and a better arrangement cannot be suggested.

II. CLIMATE.

1. The only instruments available at the station for meteorological purposes are an ordinary thermometer, a minimum self-registering ditto, and a rain gauge or pluviometer. Up to two years back there were also a barometer and a wet bulb thermometer, but these instruments are no longer in existence here. The temperature both inside and outside is noted and registered four times a day, as is also the direction of the wind. The amount of rain, when any falls, is measured and noted every day. Besides these observations the maximum temperature in the sun's rays and the minimum temperature are also daily observed and noted.

2. Table of meteorological observations from the 1st January 1854 to the 31st October 1858:—

Months.	Barometer Mean.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Rain, Inches.	Winds. Direction.
		°	°	°	°	°		
January - -	27·444	72	94	50	73	54	5 cents.	E. & S.E.
February - -	27·437	71	94	51	72	58	27 „	N.W.
March - -	27·399	80	101	59	81	52	38 „	W. & N.W.
April - -	27·342	87	107	64	87	63	87 „	N.W.
May - -	27·306	83	98	69	84	69	2 inches 94 cents.	W. & N.W.
June - -	27·264	81	96	69	81	71	3 „ 70	W. & S.W.
July - -	27·251	76	91	68	76	71	3 „	W. & S.W.
August - -	27·298	76	88	68	76	70	1 „ 48 „	W. & N.W.
September - -	27·345	76	84	66	76	70	3 „ 92 „	W. & N.W.
October - -	27·401	77	96	68	77	66	3 „ 69 „	N.W. & S.E.
November - -	27·256	75	95	59	75	59	73 „	S.E.
December - -	27·528	72	99	50	72	52	None.	E. & S.E.

3. The character of the climate of Seroor resembles in its main points those of the Deccan generally. It is, on the whole, and with the exception of the monsoon months, dry, but not excessively so, being within the influence of the sea breeze, which generally blows pretty strongly towards the evening. The variations of cold and heat, dryness and moisture, are very moderate, and not generally sudden. There is no tree planting or irrigation carried on to such an extent as to influence the climate generally. The air is usually free from dust and other impurities, with the exception of the dust storms, which occasionally occur during the hot season, but which are not frequent. The climate of Seroor seems to exercise a very favourable influence on the health of the native troops now stationed here, amongst whom there is a very small amount of sickness, and its influence was, I believe, equally favourable

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	on that of the European troops that were formerly stationed here. I am not aware of any particular precautions being rendered necessary by the climate, other than those usually observed at all stations during the height of the hot season. There are no marked distinctions as to healthiness or unhealthiness during the different months of the year. The prevailing diseases vary only according to the different seasons; bowel complaints being frequent during the monsoon, and during the cold season rheumatism and affections of the air passages. 4. There is no district within many miles the climate of which is more conducive to health than that of the station. 5. The stations at which I have served are Ahmednuggur, Kirkee, Poona, Poorundhur, Kurrachee, and Seroor; but in all these stations my residence has been of short duration, and the present station is the only one in which I have resided throughout the year. I should say, as far as my limited experience enables me to form an opinion, that all these stations are more or less conducive to health; but I do not feel myself capable of giving a decided opinion on the comparative salubrity of these different stations; certainly not one of them can be considered as positively injurious to health.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, adjacent country, and barracks are forwarded. 4, 5, 6. These queries and table of barrack accommodation apply solely to European barracks, none of which of a permanent kind are at Seroor, the station being exclusively occupied by native irregular cavalry who reside in huts. 7. No tents are issued to the troops in the irregular service, they being expected to furnish themselves with these articles. 8. This question is applicable to Europeans only. 9. The materials employed in the construction of barrack buildings are generally of a permanent kind; viz., burnt brick and lime walls, and single-tiled roofs. 10. The floors are, on an average, one foot above the ground, and are constructed of moorum beaten down, and consolidated with water. 11. The buildings, both in the nature of the materials of which they are constructed, and the arrangement in which they are designed, are well suited for the shelter of the troops who occupy them. Repairs are executed, whenever considered necessary, on instructions issued by the officer commanding the station, who is also responsible for the general sanitary state of the cantonment. The walls are limewashed periodically at the discretion of the commanding officer, and usually when a change of occupants of the huts takes place. 12 to 16. These questions apply solely to European barracks. There are no pools or foul ditches within the limits of the station. 17. The surface cleansing of the cantonment is performed by sweepers, of whom an adequate number is entertained for the use of the regiment Poona horse; the refuse is burnt. 18. The surface of the cantonment is entirely kept free from vegetation. There are no old walls, thick hedges, &c., to interfere with the proper ventilation of the station, bazaar, &c. 19. Regulations are enforced to have the principal streets in the bazaar always kept clean, and the inhabitants have been compelled to make efficient arrangements for the proper drainage of the place, and to remove all water which may lodge opposite their dwellings. The water supply is derived from the stream of the Goar river, which flows close by the town. All regulations and arrangements for the sanitary state of the bazaars are under the civil authorities, and have always been found satisfactory. The native houses, like those in most native towns, are built of mud-walls, and covered with tiled roofs. Their condition generally exhibits carelessness and negligence on the part of their owners to keep them in proper repair; but cleanliness is as much as possible enforced by the authorities. No nuisance is experienced from wind blowing over the native houses. 20. All arrangements for the slaughter of animals are under the civil authorities, and the Mussulmen of the corps supply themselves, according to their wants, from the bazaar. No inconvenience from the present arrangement has been experienced. 21. The arrangements for stabling or picketing the bazaar horses, and those of the camp followers generally, are all under the civil authorities. 22. There are no cavalry stables; the manure is removed to the rear morning and evening, and periodically sold. The horses are picketed in front of their owners' houses, at a long distance from the hospital. 23. No reply to this query.
Officers' Quarters.	1. The officers' quarters are all very open, well ventilated, and drained, and remarkably healthy. No improvements are suggested.
IV. Health of the Troops.	1. The station, district surrounding it, and the native population adjoining, are, as far as I am aware, generally very healthy. 2. Fever usually prevails to some extent amongst the native population, after the termination of the monsoon, but the cases are generally of a mild type, and very amenable to treatment. I am not aware of cases of spleen disease being prevalent. The epidemics which most frequently prevail are cholera and small-pox. The former is usually present in greater or less extent during the hot season, previous to the setting in of the monsoon; but it occurs generally in a mild form, and its duration is not protracted. Small-pox occurs but very rarely, and then only in particular parts, when the sanitary condition is very defective. 3. I consider that the healthiness of the station of Seroor and the neighbouring native population is due to the open situation, its exposure to prevailing winds, the almost total absence of all causes likely to engender malaria or noxious exhalations, and the dry character of the soil generally. There is also a constant supply all the year round of good wholesome river water, which may be looked upon as an important element in conducing to the healthiness, generally speaking, of the inhabitants of the neighbourhood. 4. This station is the permanent head-quarters of the Poona irregular horse, who have been stationed here for many years, during the whole of which period they have enjoyed the most excellent health. I am not aware of any portion of the men's accommodation being more unhealthy than the rest. 5. No system of camping out is carried on, but a large portion of the regiment is always away from the station on outpost duty in the surrounding districts, and the result as to the health of the men varies according to the salubrity or otherwise of the different posts,

SEROOR. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	though not sufficiently so to make any appreciable difference in the general health of the regiment. 6. I was in medical charge for rather more than three months, during the monsoon of 1857, of the hill station Poorundhur, near Poona. This station is a sanitarium for the reception of convalescents from the different European regiments serving in the Deccan and other parts of the Bombay presidency; but is not used as a hill station for healthy troops. With regard to the purpose for which it is used, the result of my limited experience is that in well selected cases, and after taking into consideration the season of the year during which the convalescents from different diseases are to be stationed there, the patients derive very considerable benefit from a more or less prolonged residence at a hill station. During my short residence at Poorundhur, however, it was in two or three cases painfully evident that, in order to gain the full benefit of a hill climate for convalescents, the greatest care is required to be taken in selecting the cases to be sent to these stations. 7. My experience is too limited to give an opinion as to whether troops resident for some time in hill stations are more or less liable to attacks of febrile or other diseases on returning to the plains, the greater portion of my service having been passed in charge of native troops; but I am of opinion that from the generally improved state of health and increase of stamina engendered by residence in a hill climate, and absence for a time from the debilitating influence of the plains, the predisposition to attacks of those diseases would be decidedly lessened, and this opinion, I think, is borne out by the experience of those European officers and their families who are able to get away from the plains and reside at one of the hill stations during the hot season. 8. I am of opinion that well-selected hill stations would exert a most favourable influence on the health of the troops residing in them. 9. I am not aware of any diseases peculiar to hill stations with which healthy troops are liable to be attacked on going to them, provided the season chosen be a favourable one. For weakly soldiers who have a predisposition to particular diseases, such as cardiac disease, rheumatism, or lung affections, I am of opinion that the hill climate is anything but beneficial, unless the hill selected be of low altitude, and it would therefore be desirable that the selection of men to be sent to hill stations should be left to the discretion of medical officers instead of their being taken indiscriminately. 10. I would recommend that men be provided with liberal means of healthful recreation and amusement, and that, as far as practicable, they should be exempted from duties of all kinds, in fact that the period of their sojourn in the hill should be a kind of holiday, spent in such a manner as to invigorate them, and put them in such a state of health as would enable them to bear with comparative immunity the heat of the plains on their return to them. I would send the third or fourth part of a regiment every year, so that every man might have the benefit of a hill climate once in every three or four years. 11. My experience of hill stations is confined to the rainy months, and with reference only to convalescents. For healthy troops I should say that the season during which the hill climate is most required, and is of the greatest service, is the hot season embracing the months of February, March, April, May, and perhaps part of June. I do not think that a residence of shorter duration than that mentioned would enable troops to obtain the full benefit to their health of such residence; but I do not think that any longer residence would, as a general rule, be required. 12. I do not think there is any period of residence beyond which injury is likely to be inflicted on the health of troops on returning to service in the plains, provided the hill station be a well-selected and suitable one. 13. I am not aware of any special precautions being required for protecting the health of troops on leaving hill stations for the plains. 14. The experiment of locating healthy troops serving in this country on hill stations for a more or less prolonged period, has not, as far as I am aware, been carried out hitherto on anything like an extended scale. My own impression, however, is that short periods of change to hill stations during the very hot months, and service on the plains during the remaining portion of the year, would be equally if not more conducive to health than their location on hill stations, with short periods of service on the plains. Frequent change of station on the plains, except where the change is from a healthy to a notoriously unhealthy one, and provided the precaution is taken of effecting the change during the most favourable season, is, I believe, undoubtedly beneficial to the health and spirits of the troops and convalescents. 15. In all the hill stations with which I am acquainted the barrack and hospital accommodation is very limited, these stations having hitherto been intended solely for the reception of convalescents, and there is not, as far as my knowledge goes, accommodation on any of the hill stations in the Bombay presidency for any considerable number of troops. At Poorundhur there is barrack accommodation for 100 men, and a hospital adapted for about 40 sick. There is also a patcherry capable of accommodating ten families, and a small female hospital in course of erection, which must be by this time approaching completion. 16. Cannot say what elevation above the sea is most suitable for hill stations. 17. There is no higher ground in the neighbourhood of this station, nearer than Poorundhur, which could be advantageously occupied as a hill station. 18. The soils for stations both as regards surface and subsoil, should be light, tolerably dry, and porous so as to allow any excess of moisture to drain away freely. 19. I consider that the best age for soldiers to proceed to India ranges between 25 and 30, and they should land there at the commencement of the cold season, which begins in the middle of November. 20. No reply to this query. 21. The transport of troops from the port to the interior is effected, if by water, in Government or private steamers or native vessels; if on land, by the railway or bullock train where available, or else by easy marches to their destination. I have no experience to enable me to state, whether any additional precautions are required for preserving the health of troops during their transport to the interior. 22. Cannot say what number of years a British soldier should serve in India. 23. As far as I am aware, the manner of conducting medical boards in the Bombay presidency is not liable to cause any conflict of opinion as regards invaliding. No suggestion to offer on this subject.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	24. I am of opinion that the best time of the year for invalids to leave India for home is from the end of December to the end of February following, so as to reach England at the commencement of the spring, but after the time during which easterly or north-easterly winds prevail.
Diseases.	1. No regular inspection parades are carried out in this station, but the men have strict orders to visit the hospital on the first symptom of approaching illness.

2. During the year which I have been in charge of troops at this station, I have not met with a single case of scorbutus or scorbutic disease, and on referring to the regimental records I find but one case noted during many years, and that occurred whilst the regiment was on field service in Persia in 1857.

3. No case of hepatitis has occurred during the last year.

4. Cases of dracunculus are very frequently under treatment, but they do not usually originate here. It occurs in men who have joined head quarters from out-post duty. There is so much difference of opinion concerning the exact species of the troublesome worm and its mode of entering the body, that I cannot offer any satisfactory explanation as to the cause of the attack. I would suggest, as a prophylactic measure, the necessity of very carefully drying the body after bathing, especially in tanks or other still waters, as the balance of opinion seems to favour the view of the guinea worm entering the body from the external surface.

5. With respect to the proportion which the constantly sick from venereal diseases bear to the total sick in hospital from all other diseases, it is impossible to estimate it, as we have no constantly sick from this disease. The cases do not average more than six or eight during the year, which is to be accounted for by the fact of the majority of the men in irregular cavalry regiments being married.

6. The troops at the station suffer from the following diseases of the endemic and epidemic class :—

Fevers.—The fever most prevalent at the station is the intermittent quotidian type, which generally occurs during the months immediately succeeding the monsoon; and to some extent during the hot season. Other forms of fevers are rare.

Dysentery of a mild type generally prevails to a small extent during the monsoon, and isolated cases are met with occasionally throughout the year, but are generally very amenable to treatment.

Cholera occurs epidemically during the hot season, and in varying degrees of intensity in different years, but the troops rarely suffer to any great extent from this scourge.

Small-pox is very rare indeed amongst the troops. The prophylactic measure of vaccination is assiduously carried on both amongst the troops, their families, and followers.

Rheumatism of a chronic character is the chief cause of admission into hospitals during the cold months. It occurs, however, chiefly among the aged and debilitated men of the corps, and is not serious in its effects.

The proportions which admissions and deaths from these diseases bear to the total admissions and deaths are as follows :—

Diseases.	Proportion of Admissions to total Admissions.	Proportion of Deaths to total Deaths.
Fever - - -	27 per cent.	18 per cent.
Dysentery - - -	·65 " (6 cases only having been treated in 5 years.)	0 "
Cholera - - -	4 per cent. (4 cases admitted in the same period.)	20 "
Small-pox - - -	0 per cent.	0 "
Rheumatism - - -	6 "	2 "

An average deduced from the returns of a greater number of years would probably modify these figures in some measure.

7. Purely zymotic diseases are of rare occurrence at this station, and I am not aware of their having presented any special nosological character when they have occurred. They have not so far as I am aware prevailed more at one season than at another, and I cannot say what are the climatic or atmospheric conditions which precede or accompany their appearance. They have occurred almost without an exception among the native population residing in the lowest and most densely populated parts of the town, in which almost every element conducive to a defective sanitary condition is in force. These cases however, except when in great excess, do not come under my immediate observation. There is nothing in the personal habits or conditions of the troops likely to predispose to these diseases, but amongst the poorer native inhabitants causes predisposing to these, and in fact, to all kinds of disease, are rife. Amongst these cases I may enumerate exposure to weather at all seasons, insufficient clothing, uncleanly habits, and deficient and in many cases extremely unwholesome food.

8. I consider that the duties and occupations of soldiers in barrack, when not carried to excess, are conducive to health and adverse to the prevalence of epidemic disease. The same remark may be applied to their habits, when these are not of a hurtful or debilitating character.

9. Fever has never to my knowledge prevailed to such an extent as to lead to the experiment of trying small doses of quinine as a prophylactic.

10. Epidemic disease may be considered to be at a minimum at this station, and I have no recommendations to offer with regard to its prevention or mitigation.

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References to Subjects and Queries.	REPLIES.
V. INTEMPERANCE.	1. No body of men could be more temperate than the Poona horse, and there are no c firmed drunkards among them. 2. There are no admissions into hospital from diseases caused directly or indirectly by int perance. No case of drunkenness is on record among the troops. 3. Arrack or native liquor is sold in the bazaar, and the sale being chiefly confined to the ca followers and persons residing out of camp limits, no average can be given of the amo consumed. No drinks injurious to health other than intoxicating drinks are sold in bazaar. 4. The consumption of spirits by troops and convalescents is injurious to health, and not c ducive to efficiency or discipline. 5. No reply to this query. 6. Malt liquor in moderation is most conducive to the health of Europeans in the relax climate of the plain, but wine and spirits are not at all requisite except medicinally. 7. Coffee, tea, lemonade, soda water, &c., are a good deal used at the station. No compari as to their influence on health, efficiency, and discipline, in opposition to spirits, can be ma as the Poona horse do not drink the latter. 8, 9, 10. These queries are applicable only to European troops. 11. There are no canteen or bazaar regulations in force at this station.
VI. DIET.	The queries under this head refer solely to European troops, of whom there are n here.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station consist of a turban, waistband, c trousers, jack boots and spurs, carbine or pistol, sword, pouch, carbine, and sword belts. present dress is suitable to the climate and the soldiers' duties by day and night, but ligl clothing might more generally be adopted in the plains. The present guard dress in Poona horse varies according to the season of the year. All guards and sentries at the stat are under cover.
Duties.	1. No reply to this query. 2. The following is the routine of the soldiers' duties:—Parade twice or three times a we and drill five days a week for an hour in the morning and evening. These do not in any interfere with the men's health. The cool of the mornings and evenings are the best ho for drills, parades, and marches, and, if the march is a long one, during the entire nig Full instructions are published in Bombay Separate General Orders, page 80. The n have five nights in bed during the week. 3. Guards are mounted within a circle of 300 yards, and are relieved daily; sentries relieved every two hours. There are no roll calls in the Poona horse. No bad effect ever been caused by night guards at Seroor, which is a particularly healthy station.
VIII. INSTRUCTION AND RECREATION.	Queries under this head refer solely to Europeans, of whom there are none at Seroor
IX. MILITARY PRISONS.	1. The standard guard of the Poona horse is the only place used for military confineme It is open to the winds, well ventilated, and amply sufficient for the requirements of station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service, not included in the General Pr dency Regulations. 2. On the line of march the medical officer has the power of offering suggestions as to the ti of march, salubrity or otherwise of proposed sites for encamping ground, and other poi of a similar nature. 3. The practical operation of the rules laid down for the preservation of the health of tro in camp, in page 145 of the Bombay Separate General Orders, seems to be all that desirable. The power of the medical officer in this matter is described in the preced answer. 4. The arrangements adopted in the presidency with reference to field hospitals, ambulan &c., are detailed in the Medical Code of Regulations, and at page 161 of Bombay Separ General Orders.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following table gives the statistics of this station:—

SEROOR.—NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cen to Streng
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.
1850-51	Poona Irregular Horse	224	95	—	—	—	9	—	1	—	17	1	—	—	—	—	142	—	264	1	117·8
1851-52		231	71	—	—	—	5	—	2	—	16	1	2	—	9	3	123	—	228	4	98·7
1852-53		282	46	—	—	—	6	—	—	—	10	—	3	1	—	—	113	—	178	1	63·1
1853-54		334	51	—	—	—	7	—	1	—	17	—	4	—	—	—	143	1	223	1	66·7
1854-55		359	19	1	—	—	2	—	1	—	12	2	1	—	7	2	71	2	113	7	31·4
1855-56		350	35	1	—	—	7	1	—	—	11	1	3	—	—	—	55	—	109	3	31·1
1856-57		191	16	—	—	—	2	—	—	—	5	—	—	—	2	1	42	1	67	2	35·0
1857-58		337	58	1	—	—	7	1	2	1	9	1	—	—	—	—	131	5	207	9	61·4
1858-59		247	31	—	—	—	2	—	1	—	4	—	—	—	—	—	105	1	143	1	57·8
1859-60		358	45	—	1	—	10	—	—	—	11	—	1	—	1	1	120	—	189	1	52·7

By order of the Acting Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 1860.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. No building has been specially erected as an hospital. The building used for this purpose is a detached bungalow in the centre of the camp, about 400 yards from the horse lines, and about 600 yards from the bazaar and houses of the civil population. The site is open and freely ventilated. There are buildings near, but which are not so situated as to interfere with a free current of air to the hospital. The site is generally healthy as to elevation and drainage, and quite free from malaria from river banks, &c., or other nuisances. 3. There is an abundant supply of good and wholesome water from two wells situated in the enclosure. 4. All impurities from the hospital are removed by sweepers as often as necessary. 5. The hospital contains only one ward, which is raised about 18 inches above the ground. No special provision is made for carrying off the roof water, but the greater portion is carried away by the natural slope of the ground, which also admits of the surface drainage being carried away without obstruction. The building is constructed of kiln-burnt bricks, and has single walls and thatched roof, which is sufficient to keep the hospital cool under ordinary circumstances. A verandah six feet in breadth runs all round, which affords sufficient shelter from the sun's rays, and the enclosed portions of which are occasionally used for the accommodation of sick or convalescents. The hospital consists of one flat only. It receives the full benefit of the prevailing winds. The windows open inwards from the centre, and their arrangement and construction is quite conducive to ventilation and coolness. 6. The ventilation of the wards is effected by means of open doors, windows, and jhilmils, which keep them cool at all times and free of odour or closeness. The jhilmils are those commonly used in India. 7, 8. There is no apparatus for cooling or warming the wards. The walls and ceilings are cleansed and limewashed whenever necessary. 9. There is one privy, of the simplest construction, situated to the rear of and detached from the hospital. It is not supplied with water, but is never offensive, being cleaned by sweepers as often as used. 10, 11, 12. There are no lavatories or means of bathing the sick; neither are there any means for washing and drying the hospital linen. 13. The storage is sufficient and dry. 14. The bedsteads used in the hospital are common wooden charpoys, laced with broad tape. The bedding, &c. is supplied by the patients themselves. 15, 16, 17. No reply to these queries, as they refer to European hospitals only. 18. The sanitary condition of the hospital is good. No hospital gangrene or pyæmia have, so far as I am aware, ever occurred. 19. I am not aware of any deficiencies or sanitary defects which call for improvement. 20, 21. Apply to Europeans only. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has entire control over all matters connected with the hospital arrangements, subject to the approval of the superintending surgeon of the division. 24. There is no convalescent hospital nor any wards for that purpose into which a soldier can pass until he is fit for duty.
XIII. Burial of the Dead.	1. The burial ground is about 400 yards from the camp boundary, and to leeward of the station. 2. It is about an acre in extent, with a hard and rocky soil. There is a hedge and deep drain all round it, and the enclosure is carefully kept. 3. There are no regulations as to grave space, depth of graves, reopening them, and times of burial, no British troops being now quartered at the station. The native burial grounds are outside the camp limits, and are under the civil authorities. 4. The graveyard is never offensive. 5. The dead of camp followers and bazaar people are disposed of according to the customs of the country and under civil regulations. 6, 7. No injury accrues to the public health from the present practice, and no improvement could be suggested without interfering with the native prejudices.

(Signed) R. M. Westropp, Captain commanding at Seroor, and President.

Members. A. V. H. Finch, Captain Engineers.
William E. Cates, Assistant-Surgeon, Poona Irregular Horse.
R. Thorpe Tragett, Lieutenant, Acting Adjutant, Poona Irregular Horse.

30th June 1860.

VINGORLA.

Accommodation—Native Troops—Infantry—Sawunt-Warree Local Corps 180, of all ranks.

Reference to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is very picturesque from the Wharf. A chain of low hills range in a N.N.E. direction, and extend within 500 yards of the town, and outside of camp as far as "Ruree," a fortress about 9 miles in a W.S.W. direction. The country is hilly and dry, with lofty fruit trees indigenous to the country. such as jack, cashew, cocoa-nut, and mangoe. There is no jungle, but several springs in the vicinity of the station. 2. The elevation of the station above the sea is about 20 feet, about 5 feet above the adjacent

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	country. There is a chain of low hills running in a N.N.E. direction from the Wharf to within about 500 yards from the town and a mile of the cantonment; with the exception of these hills there is no ground higher or healthier adjoining the station. 3. The nearest table land is 5 miles off, but it possesses no advantages either in a military or sanitary point of view. 4. With regard to the nearest water, the river Sawkoo is about ½ a mile distant, and the sea about 2½ miles from the station. The water in the rainy season runs off very rapidly. There is no broken ground within some distance of the station. 5. The station is well exposed to the sea breeze, which is highly salubrious, and no impediment exists to its free circulation. The temperature of the station is not raised by reflected sun heat. The sea breeze which is diurnal and salubrious is the prevailing wind in the year. The land wind from the E.N.E. is usually of short duration and not prejudicial at the station. 6. The cultivation of rice is constantly in progress in the vicinity of the town, fresh water being always procurable; no other cultivation seems so desirable as this for the inhabitants. It does not seem to have any injurious effect upon the health of the station. There are no works of irrigation. Rice is cultivated within 500 yards of camp during the monsoon, but at no other period of the year so close. Indigo is not cultivated. Hemp is prepared in the native town, but not to any great extent. No injury to health appears to arise therefrom. 7. The town of Vingorla is situated about 1½ miles from the station. 8. The geological structure of the hilly range, which commences from the wharf, is of moorum and rocky; the subsoil and surface is feruginous sand; the station has always occupied the same ground. 9. The depth below the surface at which water is found depends upon the elevation of the ground. The depth of the hospital well is 45 feet, and the well near the native lines only 35 feet. 10. The rain-fall flows off very rapidly into a rivulet which empties itself into the sea. The station being surrounded by hills, the drainage from them necessarily passes into the subsoil of the station. 11. The water supply of the station is derived from wells. There are no tanks within half a mile of it. The river near the town is used for bathing and washing linen. When the water of the river is low and stored up in small pools nuisance occasionally proceeds from it, but does not affect the health of the station, as it only exists for about two months of the year before the setting in of the monsoon. 12. The water supply is abundant for all purposes except drinking. Excellent drinking water, however, is procurable from a spring near the Wharf. The water from wells is hard, and from its being impregnated with iron cannot be unwholesome, although not so agreeable to the taste as that procurable from the Wharf. The amount is sufficient; it is raised by leather buckets, which appears to be the best for all purposes. 13. There are no other topographical points bearing on the health of the station not included in the above replies. 14. I cannot suggest any improvements in the mode of selecting new stations.
II. CLIMATE.	1. The only means and instruments available for conducting and registering meteorological observations at the station are a thermometer and a pluviometer. 2. The following table gives the result of the observations for one year.

Year's Observations from 1st January to 31st December 1857, at the Station of Vingorla.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun's Temperature.	Rain.	Wind. Direction.	Wind. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
									Inches.				
January	—	77·22	12·16	83·32	71·12	—	—	90·09	—	N.E. & W.	Moderate	31	
February	—	77·14	14·00	84·21	70·07	—	—	95·53	—	N.E. at 6 a.m., and W. at 1 p.m.	Ditto	28	
March	—	79·81	11·19	85·41	74·22	—	—	97·55	—	Ditto	Ditto	31	
April	—	81·49	10·63	86·66	76·33	—	—	101·13	—	N.W. & W.	Calm	30	
May	—	83·12	4·16	85·70	81·54	—	—	97·16	18·2	N.W. & S.W.	Stormy	23	The S.W. monsoons.
June	—	81·15	7·50	84·90	77·40	—	—	85·80	34·89	S.W. & S S.W.	Ditto	—	
July	—	78·72	7·83	82·64	74·80	—	—	89·25	46·49	Ditto	Ditto	—	
August	—	77·72	2·22	78·83	76·61	—	—	82·00	25·92	Ditto	Ditto	20	
September	—	77·86	3·80	79·76	75·96	—	—	81·12	4·67	West & W.S.W.	Ditto	16	
October	—	81·27	4·03	83·29	79·25	—	—	84·93	3·46	Westerly	Ditto	19	
November	—	80·45	8·10	84·50	76·40	—	—	85·13	·25	Easterly & Westerly.	Fresh	27	
December	—	80·22	11·19	85·83	74·61	—	—	84·41	—	N.E. & W.	Ditto	31	

3. There is no considerable variation in the climate. It is never very cold, and the heat is moderate, but from heavy dews it is occasionally damp at night. The air is never rendered impure by any extraneous matter, owing doubtless to the daily setting in of the sea breeze. The health of the troops is generally excellent. Morning and evening exercise is very desirable for them, except during the hot months, when once a day is sufficient. The station is considered healthy at all times of the year.

4. There is no district near the station more healthy than the camp.

5. I have served at Poona, Nusseerabad, Neemuch, Kurrachee, Mulligaum, and Sawunt Warree, and found them all conducive to health, with the exception of the last named.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station.	1, 2. A sketch of the camp is forwarded. 3, 4, 5, 6. There are no barracks at the station. The hospital, which is a large commodious building, has on several occasions been used as a barrack, and for the accommodation of convalescent European soldiers from up-country stations, during which time a temporary building, constructed near the hospital, has been used for the sick. 7. No tents are used in camp. 8. The new lines are ventilated by an aperture of about 1 foot left between the top of the walls and the roof of the huts, which is sufficient for the natives. There are no means of cooling the air. 9, 10. The huts are built of mud with jungle wood roofs single tiled. The doors are of mangoe wood; they have no windows. The floors are raised about 1½ feet above the ground, and are constructed of moorum, watered and well rammed. 11. The materials of which the lines are constructed are most suitable for the climate, and they are usually kept in repair by the engineers' department. There is no cantonment at Vingorla; it is at present a civil station. 12, 13. No lavatories required for natives. All linen is usually washed at the river near the native lines. 14, 15, 16. The contents of the privies are removed by the sweepers. There are no cess-pits or foul ditches. 17. The station being a very small one there is little or no refuse, but what there is is usually burnt. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls or thick hedges, &c. interfering with the ventilation of the station or bazaar. 19. The station bazaar consists of a few shops, and the occupant of each house is required to look after the cleanliness of that part of the bazaar adjacent to his dwelling. There are few native houses within ½ a mile of the station, and their average condition is good. There are no dung heaps or cess pits; no nuisance is experienced from wind blowing over the native dwellings. 20. Animals are seldom slaughtered in the camp, and the slaughtering places are in the town, consequently too far distant to cause any nuisance. 21. Horses are very rarely picketed in camp. 22. There are no stables or picketing grounds for artillery or cavalry horses. 23. There are only two non-commissioned officers, and they do not live in camp. One of them has quarters in the depôt arsenal, and the other has a small house close by.
Officers' Quarters.	There are five bungalows for officers, two only of which are occupied by residents. They are situated in a healthy locality, and most of them being built on the side of the hill the water runs off easily. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are generally very healthy. 2. Epidemics seldom prevail among the natives; spleen disease never. A few cases of cholera have occurred, but it is a very rare occurrence. 3. The healthiness of the native population is attributable to the diurnal change of the wind to west-south-west or west-north-west, which is open to the sea. 4. The detachment of the local corps at this station arrived here in February 1859 from Sawunt Warree. All accommodation for the men at this station is in a healthy locality. 5. The men remain in their lines all the year round. 6. I have never been in charge of troops at a hill station, but I have spent a hot season at the Mahableshwur hills, which I found highly beneficial to my health. 7, 8. I approve of hill stations for troops during the hot months. 9. I have known instances of hill stations proving fatal to people subject to liver disease. 10. I am not aware of any precautions as to diet, &c., which would guard men from attacks of disease, and enable them to obtain greater benefit from residence in hill stations. 11. The period best adapted for residence in hill stations is from 1st March to 31st May, which is the shortest period to obtain benefit from such residence. 12. If troops reside at hill stations during the cold season, and then return during the hot months to the plains, it is likely to prove injurious to their health. 13. The special precaution necessary on leaving hill stations for the plains is to avoid exposure to the sun as much as possible. 14. Service in the plains during the rainy and cold seasons, and change to the hills during the hot months, would be equally conducive to the health of Europeans as to locate them for lengthened periods on hill stations. This latter plan renders them less able to resist the effects of the heat when necessity obliges them to bear it. Change of station on the plains every three or four years is beneficial to the health and spirits of troops and convalescents. 15. I am not aware of any deficiencies in the accommodation for troops at hill stations. 16. No experience. 17. Although the range of hills from the Wharf is a very desirable place for health, yet the plains now occupied are exposed freely to the same salutary influences. 18. No experience. 19. Soldiers proceeding to India should be about 16 or 17 years of age, and should land there in November or December. Recruits should be provided with good solar hats and kept as much as possible out of the sun. 20. It would be very desirable to send troops for India to an intermediate station for a certain time, and on landing in India they should be gradually accustomed to the climate by being sent to the best stations. 21. Troops usually arrive at this station by sea, the Europeans in steamers and the natives in country boats. Troops ought never to march in the hot weather except in cases of the greatest emergency. 22. About 20 years is the period a British soldier should serve in India, with an intermediate furlough after ten. 23. I have no suggestions to make in regard to invaliding by medical boards. 24. Invalids should leave India for home about December or January.
Diseases.	1. Regular inspection parades are made of all the men at the station whenever any syphilitic cases are admitted into hospital. 2. I have never known any case of scorbutic disease among the troops at this station. 3, 4. No cases of hepatic disease or dracunculus have occurred.

VINGORLA.
BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	5. The proportion of constantly sick from venereal diseases is annually 0·58 to total admissions of 101 from all other diseases. 6. The troops at the station suffer from the following diseases: *Fevers.*—Ephemeral, continued, and remittent fevers, usually of a mild description. *Cholera.*—As an epidemic very rare. A few cases have occurred during the rainy season. *Smallpox.*—A case seldom occurs except as an epidemic. *Rheumatism* is a very rare disease at this station. The proportion of admissions from cholera for the past year was 2·97, and two deaths to one cured of this disease. No casualty from all other diseases occurred. 7. Diseases of a zymotic character have not shown themselves at this station. The sanitary condition generally of the native dwellings is remarkably good, cleanliness and ventilation in the men's lines being strictly attended to. I am not aware of any habits or conditions among the troops or population which predispose to diseases. 8. Native soldiers exposed on duty are not rendered more liable to contract epidemic disease. 9. Quinine has not been tried as a prophylactic, as there is no malarial disease prevalent at the station. 10. I have no recommendations to make on any of the preceding points.
V. INTEMPERANCE.	1. There are no European soldiers at the station, and the natives are usually very temperate. There are no confirmed drunkards. 2. There have been no admissions into hospital from diseases caused directly or indirectly by intemperance. A case of drunkenness rarely occurs, but when it does the offender is punished. 3. Spirits are not procurable except at the European shops, and there is an order against selling distilled spirits to soldiers. When recommended by the medical officer arrack is occasionally administered to convalescents. Toddy and arrack are procurable in the native town. 4. There is no consumption of spirits by troops, and that consumed by convalescents is at the recommendation of the medical officer. 5, 6. There is no occasion for abolishing the use of spirits at this station. 7, 8, 9, 10. Coffee, tea, lemonade, &c. are not used by native soldiers. 11. There are no bazaar regulations.
VI. DIET.	1 to 4. There queries do not apply to native troops. 5. Soldiers' gardens could be advantageously established near the station, as there is plenty of ground in the cantonment available for the purpose. They should be under the order of the officer commanding and the sanction of the civil authority.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress here consists of a dark-green cloth coat, dark blue turban, and black accoutrements. They are very suitable for natives. I could not suggest any improvement in the dress for natives. The men are supplied each with a cumlie or blanket of dark colour which they make use of in wet weather.
Duties.	1. I should consider it very advisable to drill men before sending them out to this country. 2, 3. No reply to these queries.
VIII. INSTRUCTION AND RECREATION.	No means of instruction or recreation exist at this station.
IX. MILITARY PRISONS.	There are no military prisons.
X. FIELD SERVICE.	No information under this head.

XI. STATISTICS OF SICKNESS AND MORTALITY. EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1858-59	Detachment H.M.'s 56th Regt.	22	7	1	—	—	2	—	—	—	13	—	—	—	—	—	17	—	39	1	177·2	4·5
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	Detachment 2nd Regt. European Light Infantry	40	3	—	—	—	3	—	6	—	12	1	—	—	—	—	29	1	53	2	132·5	5·0
1851-52	Detachment 3rd Co. 1st Battn. Artillery; Detachment 2nd Regt. European Light Infantry	67	6	—	—	—	5	2	1	—	9	2	9	1	—	—	56	1	86	6	128·3	9·0
1852-53	Detachment 3rd Co. 1st Battn. Artillery; Detachment 2nd Regt. European Light Infantry	30	23	—	—	—	4	1	9	—	5	1	7	—	—	—	70	3	118	5	393·3	16·6
	NATIVE TROOPS.																					
1850-51	Detachment 4th Reg. Nat. Inf.; Do. 9th do. do.	272	29	—	—	—	1	—	—	—	4	—	2	1	—	—	35	—	71	1	26·1	0·3
1851-52	Do. 9th do. do.	243	37	—	—	—	—	—	—	—	13	—	—	—	—	—	82	—	132	—	54·2	—
1852-53	Do. 5th do. do.; Do. 9th do. do.	206	44	—	—	—	2	—	1	—	15	1	—	—	—	—	54	—	116	1	56·3	0·4
1853-54	Do. 9th do. do.; Do. 29th do. do.	145	45	—	2	—	5	—	1	—	25	—	4	—	—	—	80	—	162	—	111·7	—
1854-55	Do. 20th do. do.; Do. 29th do. do.	171	32	—	1	1	8	—	1	—	19	—	1	—	—	—	56	—	118	1	69·0	0·5
1855-56	Do. 20th do. do.; Do. 28th do. do.	217	29	—	3	—	4	—	—	—	30	1	1	—	—	—	78	—	145	1	66·8	0·4
1856-57	Do. 20th do. do.; Do. 29th do. do.	240	44	1	—	—	—	—	2	—	10	—	1	—	—	—	75	1	141	2	58·7	0·8
1857-58	Do. 15th do. do.	176	39	2	3	—	4	—	—	—	34	—	3	—	1	1	59	—	143	3	81·2	1·7
1858-59	Do. 15th do. do.; Do. 20th do. do.	138	17	—	—	—	1	—	—	—	23	—	—	—	—	—	55	—	96	—	69·5	—

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 9th November 1860.

W. C. COLES, Assistant Surgeon,
Secretary.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital is situate about 500 yards from the men's lines, and on the east side of the camp. It is near the officers' bungalows, and about 600 yards from the bazaar. The site is on an elevation, and the building is freely ventilated, nothing being near enough to interfere with ventilation. It is very good in every respect. 3. The water is wholesome, but the hospital well is at present being deepened, which will greatly improve the water-supply. 4. The refuse water about the hospital is very limited. All impurities are carefully removed by the sweeper daily, and thrown into a ditch about 300 yards distant. 5. The height of the lowest ward above the ground is about 4 feet. There is no perflation of air underneath the floors. The hospital being on a slope, the roof water runs off rapidly into the nullahs. A small drain is dug round it which is found quite sufficient for drainage. The roof of the hospital is double tiled, and the walls, which are 2 feet in thickness, are built of stone and lime, but have no ventilation between them. There are verandahs on both sides 10 feet in breadth, which afford sufficient shelter from the sun's rays. These have never yet been used for the accommodation of sick, convalescents, or others.

Table of Hospital Accommodation.

Total No. of wards - - - - 2
Total regulation No. of beds - - - 18

Wards, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number	Height.	Width
		Ft.	Ft. in.	Ft.			Feet.			Ft.	Ft.
No. 1. -	6	32	22 6	18	10,440	1,740	120	1 6	6	6	4
No. 2. -	12	60½	22 6	18	19,738	1,644⅚	113⅚	1 6	12	6	4

The hospital is so placed as to receive the full benefit of the prevailing winds. The glass windows are so placed as to admit wind from all quarters, and perfect ventilation is thereby preserved, together with coolness.

6. The means of ventilation are by large windows and doors, which are quite sufficient to keep the wards cool and free of odour at all times. There are no jalousies or jhilmils.

7, 8. There are no artificial means of cooling or warming the wards. The walls and ceilings of the wards are cleansed and limewashed annually, and oftener if necessary.

9. The contents of the privies being removed by the sweeper, they are not offensive.

10, 11. There are no lavatories at the hospital. The natives usually bathe by throwing a small quantity of water over themselves.

12. Natives wash their own linen, and when sick a comrade does it for them.

13. The storage is sufficient and dry.

14. Wooden cots laced with cotton tapes are used in the hospital. No improvement upon this can be suggested.

15. The hospital kitchen is chiefly used by natives, and they supply their own apparatus for cooking.

16. No hospital diet is as a rule adopted for native sick by Government.

17. The attendance for native sick consists of a goorgah, bheestie and sweeper, which is found ample.

18. The sanitary condition of the hospital is generally excellent. No epidemic diseases have been known to appear in any of the wards.

19. No improvements are suggested.

20. The convalescents are permitted to take exercise morning and evening round the hospital.

21. No special provision is required at this station for the treatment of soldier's sick wives and children, as the present arrangements are perfectly ample for any emergency.

22. No special local hospital regulations exist which are not included in the general presidency medical regulations.

23. The medical officer is free to prescribe any medical comforts for the sick under his care, but repairs to the building, or any sanitary improvement requiring an outlay, must be submitted for sanction to a higher authority.

24. There are no wards or hospitals for convalescents, nor are any required at this station.

XIII. Burial of the Dead.

1, 2. The burial-ground is well sheltered from the station by an high hill which intervenes. The ground is small, being about 100 yards by 80, much neglected, and contains less than a dozen graves. The soil is of moorum and rock.

3. There are no regulations with regard to the grave space allowed or the interval between each: they are about 8 feet in depth. I have never heard of one being reopened. Interment takes place at ordinary times, about 24 hours after death, but during epidemics with as little delay as possible. There are no burial-grounds used by natives within 500 yards of the camp.

4. The grave-yard is never offensive.

5, 6. The dead of Mahomedans are buried near the native towns. The Hindoos mostly burn their dead. No injury occurs from the above practice.

7. The only improvement I can suggest is, that the present burial-ground used by British troops be walled in, and the tombs repaired annually.

(Signed) G. R. C. Westropp, Lieutenant
Commanding at Vingorla.
Lewis George, Apothecary
in medical charge of Vingorla.
Robert Moore, Sub. Cond.,
Assistant Supervisor,
D. P. Works.

26th May 1860.

RUTNAGHERRY, BOMBAY.

RUTNAGHERRY.

Accommodation.—Native Infantry, 3 full companies.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is as follows: A sea-coast line of low hills with flat summits, with bare open rocky country inland. It is hilly, consisting of irregular rocky plateaux, broken into ravines and valleys; these hills are thinly covered with scrub. There is a scarcity of fresh water, but numerous springs. 2. The elevation of the station is 150 feet above the sea, but it is on a level with the adjacent country. The nearest water to the station is the sea and the salt water creeks N. and S. There is no higher nor healthier ground adjoining the station. 3. The nearest mountains are the Syndree range of Ghauts, at a distance of 30 miles, which are about 3,000 feet above this level. 4. The nearest water is on the sea-coast; the salt water creeks become muddy swamps at low tide. The vicinity is not liable to overflow. Ravines are numerous in the vicinity of the station, but health is not affected by them. 5. The station is very open, and there is nothing to interfere with free ventilation. The buildings are so few in number that no increase of temperature results from reflected sun-heat. The station is open to all winds. The land winds during the cold season are apt to cause rheumatism; the sea breezes in the hot season are healthy, but the damp winds in the monsoon produce bowel complaints. 6. The surrounding country is generally uncultivated, and works of irrigation are not in existence near the station. Rice is grown in quantities in the low ground near the coast, but indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Rutnagherry contains about 10,000 inhabitants, and adjoins the station. 8. The geological structure is of laterite, resting on trap. The station is on new ground. 9. Water is usually found, both in the dry and rainy season, at a depth of from 30 to 40 feet below the surface. 10. The rainfall in the district flows readily away,—it does not lie on the surface till evaporated. There is no higher ground near. 11. The water supply of the station is derived from wells and springs. There are no tanks. The wells are generally covered over, and no nuisance or malaria is experienced from them. 12. The wells and springs are sufficient for the demand. The water is free from taste and smell, is soft like rain water, and very good. It is raised by buckets and "lotas." None better could be had. 13. There are no other topographical points bearing on the health of the station not included in the above queries. 14. With reference to the selection of new stations the chief considerations seem to have been of a political nature, without reference to sanitary arrangements, and we would suggest that some regard be paid to these before erecting permanent barracks for troops.
II. Climate.	1. The only instruments for conducting meteorological observations at this station are the thermometer and rain-gauge. 3. The heat of the hotter months is moderated by fresh northerly sea-breezes. The climate is damp during the monsoon, and dry in the forenoon during the prevalence of land winds, from November to February. The climate may be described as generally moist, warm, and relaxing, with an annual range of about 20°, and diurnal not exceeding 12°. It is not affected by tree planting nor irrigation, nor by dust and other admixtures affecting the atmosphere. Protracted residence here would induce enervation, and render Europeans liable to sickness on transfer to other parts, where the climate is more variable. Europeans are not more affected in one month than in another; but natives suffer from fever and rheumatism in the cold season. 4. There is no district near the station the climate of which would be more conducive to health than that of the station. 5. The districts of which the Committee is able to speak from experience are, Guzerat, Deccan, the Concan and Southern Mahratta country. Of these Goozerat is certainly the most injurious to the health of Europeans, and the Deccan the most favourable.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station and surrounding country, &c., are transmitted. 4. Table of Hut Accommodation. Date of construction of huts, 1859–60. Total number of huts - - - - - - 222 Total regulation number of non-commissioned officers and men - 235

Huts.	Regulation Number of Men in each Hut.	Dimensions of Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.						Ft. In.	Ft. In.
2 huts allotted to N.C.O.	—	10	8	7½	600	—	80	—	—	—	—
1 hut to each private.	—	—	—	—	—	—	—	—	One door in front and one in rear to each hut.		
1 Guard-room -	Quarter guard -	17	11	10¼	2,337½	—	—	—	1	2 4	2 2
1 Prison cell -	Attached to quarter guard.	11	7½	10¼	845½	—	—	—	1	2 4	2 2

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	5 to 8. No barracks at this station. 9, 10. The huts are constructed of stone and mud with tiled roofs. The floors are level with the ground. 11. The materials and construction of the huts are in every respect suitable for the climate. Rutnagherry is a civil station. The public buildings are kept in repair by the executive engineer of the district. 12 to 15. No replies. 16. There are no foul ditches near the station. 17. No answer to this question. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station. 19. There is no military bazaar here. The native houses in the town are under the surveillance of the Civil Department. 20 to 23. There are no European soldiers at Rutnagherry.
Officers' Quarters.	1. No reply.
IV. Health of the Troops.	1. The population in the adjoining town is very healthy. 2. The town and station of Rutnagherry is remarkably free from cholera; but it is frequent in the districts adjoining. Lumbricus is an endemic disease, accounted for by the absence of lime in the water, and the vegetable diet. 3. The healthiness of the native population is attributable to the purity of air and water as regards the town and station, and in the districts disease is produced by the close confined localities of villages, added to insufficient diet. 4. Troops have been permanently located at Kolapore and suffered chiefly from guinea worm, which has gradually disappeared since their arrival here in December 1858. No part of the men's present accommodation is, I believe, more unhealthy than the rest. 5, 6. Troops are never camped out. I have never been in charge of troops at hill stations. 7 to 13. No experience of hill stations. 14. Frequent change of station on the plains is beneficial to the health of troops. 15, 16. No experience to enable me to answer these questions. 17. There is no higher ground very near the station that could be advantageously occupied as a hill station. 18. Rocky soil in India undoubtedly has the advantage over all others for sites of stations. 19. I am not sufficiently experienced to offer an opinion as to the best age for soldiers to proceed to India, but they should land here in the cold season. 20 to 24. No experience to enable me to answer these queries.
Diseases.	1. There are no inspection parades here for the discovery of incipient diseases. 2, 3. There has been no case of scorbutus or hepatitis at this station, and the natives are not subject to hepatic disease on the sea-coast. 4. Dracunculus is not an endemic of Rutnagherry. Sufferers generally recover from this disease, contracted before their arrival here. 5. There are no European soldiers here, and the natives usually are treated by native doctors for venereal disease; no fair proportion as to the amount of venereal disease can be stated. 6. The following are the more prevalent diseases at the station:— *Fevers.*—Simple intermittent fever, generally connected with functional derangement of the liver. *Dysentery.*—In a mild form as above. *Rheumatism*—occasionally, but the proportion is insignificant. No proportion which admissions and deaths from the above diseases bear to the total admissions and deaths can be stated. Fatal cases are very rare, and intermittent fever only proves fatal when complicated with internal congestion. 7, 8. Zymotic diseases are unknown here. 9, 10. Small doses of quinine, as a prophylactic against malarial disease, have not been administered at this station.
VII. Dress, Accoutrements, and Duties.	1. The dress in use at this station is as follows:—Tunic, linen pantaloons, forage cap, half-boots for sepoys, pouch and belt, waist-belt, knapsacks and slings. This applies only to natives, there being no European soldiers at Rutnagherry.
Duties.	No information under this head.
VIII. Instruction and Recreation.	There are no European troops at this station, consequently no information on this head can be afforded.
IX. Military Prisons.	1. There is one cell only attached to the Native Infantry Quarter Guard, and this is in every respect well adapted to the purpose required.
X. Field Service.	1. There are local regulations for field medical service, not included in the General Presidency Regulations. 2. There are no medical officers attached to the detachment of troops here. 3. The medical officer has little to do with the troops at this station, except in hospital. The huts are few in number, and well ventilated. The troops belong to a local corps. 4. No answer to this question.

RUTNAGHERRY. BOMBAY.

References to Subjects and Queries. | REPLIES.

XI. STATISTICS OF SICKNESS AND MORTALITY. | RUTNAGHERRY.

Year.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
	EUROPEAN TROOPS.																					
1857-58	Detachment 2nd Company 2nd Battalion Artillery - Detachment 2nd European Regiment Light Infantry -	40	20	—	—	—	—	—	3	—	4	—	2	—	—	—	26	—	55	—	137·5	—
1858-59	Detachment 2nd European Regiment Light Infantry -	11	3	—	—	—	—	—	2	—	3	—	1	—	—	—	12	—	21	—	191·0	—
	NATIVE TROOPS.																					
1850-51	Detachment 4th Regiment Native Infantry - - Do. 9th do. -	296	7	2	—	—	5	—	—	—	29	1	—	—	—	—	128	—	232	3	78·3	1·0
1851-52	Do. 4th do. - Do. 9th do. -	286	88	—	1	—	2	—	—	—	25	—	5	—	—	—	135	—	256	—	89·3	—
1852-53	Do. 4th do. - Do. 9th do. -	261	44	—	—	—	3	—	—	—	23	—	2	—	—	—	80	1	152	1	58·2	0·3
1853-54	Do. 4th do. - Do. 5th do. -	248	51	—	—	—	1	—	—	—	24	2	2	—	—	—	102	—	180	2	72·4	0·8
1854-55	Do. 5th do. - Do. 29th do. -	248	36	—	—	—	—	—	—	—	18	1	2	—	—	—	127	—	183	1	73·7	0·4
1855-56	Do. 27th do. - Do. 29th do. -	247	44	—	—	—	3	1	—	—	26	—	1	—	—	—	56	—	130	1	52·6	0·4
1856-57 -	Do. 27th do. -	229	51	1	2	—	2	—	—	—	44	—	2	1	—	—	113	1	214	3	93·4	1·3
1857-58 -	Do. 27th do. -	226	32	—	2	—	7	1	—	—	29	1	2	—	—	—	89	1	161	3	71·2	1·3
1858-59	Do. 15th do. - Do. 27th do. -	92	15	—	3	—	2	—	—	—	24	—	—	—	—	—	34	—	78	—	84·7	—

By order of the Acting Principal Inspector-General Medical Department,
W. C. COLES, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay 5th September 1860.

XII. HOSPITALS.

1. A plan of the hospital at Rutnagherry is transmitted.
2. The hospital is about 10 minutes' walk from the sepoys' lines, and the same distance in a southerly direction from the native houses. There is a high wall round it; but it is well adapted for a native hospital. The site, generally, as regards the elevation, drainage, absence of malaria, &c., is healthy.
3. The water supply is abundant and wholesome.
4. No means of drainage for the removal of refuse water and other impurities from the hospital, but sweepers for this purpose are employed.
5. The floors of the hospital wards are of earth, and raised two feet above the ground. The roof water sinks into the subsoil: the drainage of the hospital generally is good. The hospital is built of stone, with a tiled roof, and is cool. There are verandahs on both sides of the hospital of about six feet in breadth, but they are never used for the accommodation of sick, convalescents, or others. The hospital consists of a ground floor only.

Table of Hospital Accommodation.

Date of construction—about 40 years ago.

Total number of wards—1 large ward and 2 small rooms.

Total regulation number of beds / Cots in charge at present only - - - - - - 17

Number of Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Dimensions of Wards. Breadth.	Dimensions of Wards. Height.	Dimensions of Wards. Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Windows. Height.	Windows. Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.		Feet.	Feet.
Large ward -	40	80	20¾	13¾	22,825	570	41	1½	14	4½	3¼
Small ward -	4	16¼	20¾	13¾	4,707	1,177	85½	1½	2	4½	3¼
Do. -	4	16¼	20¾	13¾	4,634	1,158½	84¼	1½	3	4½	3¼

The hospital is so placed as to receive the full benefit of prevailing winds. The windows are in two frames, and open outwards, and are conducive to ventilation.

6. The means of ventilation are the doors and windows, usually kept open. The wards are free of closeness or odour. There are no jalousies or jhilmils.

7, 8. No means for either cooling or warming the wards are used. The walls and ceilings of the wards are cleansed and lime-washed annually.

9. The privy is in one corner of the enclosure apart from the hospital, and consists of three partitions. Sweepers are employed to cleanse it daily.

10 to 13. No answers to these questions.

14. The cots are simple frames over which broad tape is stretched, and this forms the bedding. Nothing better could be devised.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	15, 16, 17. These queries are applicable to European troops only. 18, 19. The hospital is very healthy, and no epidemic disease, hospital gangrene, or pyœmia, have appeared in its wards. No improvements are suggested. 20, 21, 22. No replies to these questions. 23. Every recommendation of the medical officer, as regards the sanitary state of his hospital, diet, medical comforts, &c., is attended to. 24. There is no ward for convalescents at this station.
XIII. Burial of the Dead.	1, 2. There is a small enclosure half a mile from the station used as a burial ground. Its soil is rocky concrete, and subsoil trap. 3, 4. There is no burial ground for Hindoos, but there is one for Mussulmans near the European burial ground. It is never offensive. 5. The dead of bazaar people are disposed of according to caste; Hindoos are burnt, and Mussulmans buried. 6, 7. No injury whatever accrues to health from the present practice, and no improvements in respect to disposal of the dead can be suggested.

(Signed) C. A. S. Milton, Lieutenant,
Commanding Detachment Kol. Infantry.
Eyre de Crespigny, Assistant Surgeon,
Civil Surgeon.
Edward Holland, Lieutenant,
Executive Engineer, S. Concan.

30th June 1860.

Replies to Questions issued by the Royal Commission on the Sanitary State of the Indian Army, made by Dr. B. P. Rooke, Principal Inspector-General, Medical Department, Bombay Presidency.

References to Subjects and Queries.	Replies.
	No. 1.—A List of all the Stations in each Presidency, arranged according to their order of salubrity, with notes on the general sanitary condition of each.

The following are the principal stations for European troops in the Bombay Presidency:—

1. Bombay and Colaba.
2. In the Deccan.—Poona, Kirkee, Ahmednuggur, Sattara, and Sholapore.
3. In the Northern Division.—Deesa, Ahmedabad, Surat, and Baroda.
4. In the Southern Division.—Belgaum.
5. In Sinde.—Kurrachee and Hyderabad.
6. In Malwa and Rajpootana.—Mhow, Neemuch, and Nusseerabad.
7. Aden.

It is only since the mutinies that European troops of the Bombay army have occupied the stations of Mhow, Neemuch, Sattara, Surat, Baroda, and Ahmedabad, and from the two latter places they have been now withdrawn. The statistics of all these new stations, therefore, only extend over three years, whilst at the other places they embrace a decade from 1850 to 1860, as will be seen from the accompanying table, marked A.

Arranged according to their comparative salubrity, as judged of by a minimum of deaths, the several stations stand as follows:—

Stations.	Proportion of Deaths per 1,000.	Proportion of Treated to Strength per Cent.	No. of Years referred to.
Asseerghur	13·5	152·7	3 years, 1858–61.
Kirkee	13·7	166·3	10 „ 1850–60.
Aden	16·7	138·6	„ „ „
Poona	17·3	184·2	„ „ „
Belgaum	17·8	144·3	„ „ „
Sattara	18·9	180·8	3 „ 1857–60.
Deesa	19·5	185·4	10 „ 1850–60.
Ahmedabad	20·8	208·8	3 „ 1857–60.
Sholapore	20·9	245·4	10 „ 1850–60.
Ahmednuggur	27·2	237·7	„ „ „
Kurrachee	27·4	185·6	„ „ „
Mhow	28·4	233·3	3 „ 1857–60.
Hyderabad	28·7	230·6	10 „ 1850–60.
Neemuch	30·3	279·0	3 „ 1857–60.
Colaba	32·0	177·5	10 „ 1850–60.
Nusseerabad	37·8	215·8	„ „ „
Baroda	42·3	260·7	3 „ 1857–60.
Surat	51·7	403·4	„ „ 1857–60.

European troops were temporarily stationed at, for a short time after the mutinies, but have since been withdrawn from, Dharwar, Rutnagherry, Kolapore, Kulladgee, Vingorla, and Malligaum.

No. 1.—Asseerghur. This is a well known hill fort on the borders of Candeish and Rajpootana. It was formerly garrisoned only by native troops, but since the mutinies one or more companies of Europeans have been stationed at Asseerghur. The statistics extend over three years, from 1858 to 1861, and show that the average annual strength has been 74, of which 112 have been treated in hospital, being in the proportion of 152·7 per cent. The number of deaths has been only one

Dr. B. P. Rooke's Report. Bombay.

References to Subjects and Queries.	Replies.
1. Asseerghur—*cont.*	a year, giving a death rate of 13·5 per thousand. There can be no doubt that it is a very healthy locality for European troops, although the barrack accommodation has been hitherto indifferent. Two new barracks have, however, been lately erected and occupied. The climate is excellent, moderately dry, and not very variable. Fuller details will be found in the separate sanitary report already transmitted.
No. 2.—Kirkee.	This has been for upwards of a quarter of a century the chief European cavalry station in the Bombay Presidency. It is now occupied by the head quarters of artillery. The annual average strength for the last 10 years has been 802; the average number of sick 1,335, being in the ratio of 166·3 per cent. of treated to strength; the average number of deaths 11 per annum, being a death rate of only 13·7, the lowest rate, with the exception of Asseerghur, of any station in the Presidency. The chief diseases, with their classes and numbers, will be seen in the accompanying table (A). Cholera, it will be observed, has visited the station in 1853 and 1855 and last year. The barracks and accommodation for troops are everything that could be desired. The details with respect to climate and meteorology will be found in the separate sanitary report already transmitted.
No. 3.—Aden.	This station has been occupied by both European and Native troops of the Madras and Bombay Presidencies since its capture in 1840. The statistics of European troops for the last 10 years furnishes the following results. The average annual strength, consisting of a wing of one of the line or local regiments, with a company of artillery, has been 479; the average number of sick treated has been 664, and the average number of deaths 8. This gives, therefore, an amount of sickness of only 138·6 per cent., being one of the lowest of any station in the Presidency, and a death rate of only 16·7 per thousand. The principal classes of disease will be seen in the accompanying table (A). Cholera, it will be observed, was altogether absent from Aden. The barrack accommodation for the troops is, on the whole, good, and additional barracks are about to be erected.
No. 4.—Poona.	Is a well known station for European troops in the Deccan, within a few hours' reach of Bombay and of the sea coast by rail. The average annual strength of European troops, consisting of horse artillery and infantry, has been 2,191, of which number the admissions into hospital average 4,037, being at the rate of 184·2 per cent. The average yearly number of deaths has been 38, giving a death rate of 17·3 per thousand. The chief classes of disease will be seen in the accompanying table (A). Cholera has been epidemic last year, and in some former years. Weak and delicate soldiers and invalids are sent to the neighbouring sanitarium of Poorundhur, which is easily accessible, and those requiring the air of the sea coast to the Colaba Sanitarium. The new barracks, hospitals, and appliances for troops at this station are of a superior description, and have been made as comfortable and salubrious as possible, and are a great contrast to the old barracks.
No. 5.—Belgaum.	This has always been a favourite station for European troops in the Southern Division. During the last 10 years, the average yearly strength of European troops has been 1,286, consisting of artillery and infantry; the average number of sick yearly treated has been 1,856, being in the proportion of 144·3 per cent. The number of deaths has been annually 23 on an average of 10 years, making the death rate 17·8 per mille. The principal classes of disease will be seen from the accompanying table (A); and it will be observed that, with the exception of last year, epidemic cholera has been almost entirely absent from the station for the past 10 years. The barracks and accommodation for troops are of a superior description, and the camp is well drained. This station is 2,500 feet above the level of the sea, the climate partaking in some degree of both the N.E. and S.W. monsoons, and very agreeable to the European soldier.
No. 6.—Sattara.	Sattara has only been occupied by European troops since the mutinies, and the accommodation has been of the most temporary nature. A site for permanent barracks has been chosen contrary to the recorded opinion of the present Deputy Inspector-General of Hospitals of the Poona Division. The statistics only extend, therefore, from the year 1857 to 1860. The average strength of artillery and infantry has been 369, whilst the admissions into hospital have been 667, or about 180·8 per cent.; the average annual number of deaths has been seven, showing a low death rate of only 19 per mille (18·9).
No. 7.—Deesa.	At Deesa, European troops have been long stationed, usually one troop of horse artillery and a wing or an entire European regiment. During the last 10 years the average annual strength has been 769, and the treated in hospital 1,426, being in the proportion of 185·4 per cent. to strength. The annual average number of deaths has been 15, giving a death rate of 19·5 per mille. The chief diseases are fevers, peculiar to Guzerat, from which the mortality is high, but has been reduced somewhat by the severe cases, which would admit of it, being sent to the neighbouring sanitarium at Mount Aboo. The accompanying table (A) will show the chief diseases from which the troops suffer.
No. 8.—Ahmedabad.	This station was only occupied by European troops since the mutinies in 1858, 1859, and 1860 and they are now withdrawn, with the exception of a company of artillery. The barracks were only of a temporary nature, but there is good and sufficient accommodation for the artillery. During the three years under report the average annual strength was 670; the average sick treated per annum was 1,399, being in the proportion of 208·8 per cent. The annual number of deaths was 14, in the ratio of 20·8 per thousand.
No. 9.—Sholapore.	A company of European artillery has been stationed at Sholapore as a portion of its regular garrison during the last 10 years, but between the years 1857 and 1860 detachments of infantry were located there. These have, however, now been withdrawn. The average annual strength has been 143; the number of sick treated has been 351 per annum, being in the proportion of 245·4 per cent. The average yearly number of deaths has been three, making the mortality rate 20·9 per mille. The chief classes of disease will be seen by the accompanying table (A). Even if it were desirable to locate a larger body of European troops at Sholapore than at present, there would not be sufficient accommodation, although the facility of easy access by rail makes it otherwise a convenient position.

References to Subjects and Queries.	Replies.
No. 10.—Ahmednuggur.	This, although a favourite station, and for many years the head quarters of the Bombay artillery, has been far from a healthy location for troops, as must be evident from it being placed *tenth* on the present list. The average annual strength has been 440, whilst the admissions and treated in hospital have amounted to 1,046 per annum, in the proportion of 237·7 per cent. The number of deaths has averaged 12 per annum, making the death rate 27·2 per mille. At Ahmednuggur, the increased hospital statistics is due chiefly to the arrival of recruits from England and to their being located there during the period of acclimatization. The barracks, hospital, and accommodation are all of a comparatively old date.
No. 11.—Kurrachee.	During the last 10 years the average annual number of troops at Kurrachee has been 1,566, consisting generally of one troop of horse artillery, a company or more of foot artillery, and a full regiment of infantry. The number, however, has been augmented by troops proceeding to or arriving from the Upper Provinces of India, and halting at Kurrachee until their arrangements were completed. There were 2,907 patients treated annually in hospital, being in the proportion of 185·6 per cent. The annual average mortality was 43, showing a death rate of 27·4 per mille. The number of deaths from the chief classes of disease is shown in the accompanying table (A). Cholera prevailed in 1853, 1854, and last year to a very considerable extent. The new barracks at Kurrachee are superior to any other, except at Hydrabad, in Scinde.
No. 12.—Mhow.	The station has for some years previous to the mutinies been occupied by Bengal troops. It is only since 1857 that a portion of the Bombay army has garrisoned it, and hence the statistics embrace only the three last years. The troops quartered at Mhow have consisted at different times of horse and foot artillery, of cavalry, and of infantry. The annual average strength of all arms has been 983; the number treated in hospital 2,295 per annum, being in the proportion of 233·3 per cent. The average annual number of deaths was 28, giving a death rate of 28·4 per thousand. The barracks and accommodation for European troops have hitherto not sufficed, and were of a temporary nature, but new permanent barracks of a superior description are now ready.
No. 13.—Hyderabad in Sinde.	Portions of different arms of the service have occupied Hyderabad during the last 10 years, but the strength has varied greatly, from 905 in 1856 to 52 in 1857. In the former year, the whole of the 2nd European Regiment was stationed at Hyderabad, previous to the Persian Campaign. The average yearly strength has been 418, and the average yearly number of patients treated in hospital 964, being in the proportion 230·6 per cent., chiefly, as it will be observed from the accompanying table (A), from fevers; but the number of deaths was only 12 per annum, making the annual death rate about 28·7 per mille. During the decade under notice, not a single instance of admission or of death from cholera took place. The barracks for European troops at Hyderabad surpass any other upon this side of India for loftiness and airiness.
No. 14.—Neemuch.	This station has been occupied by native troops of the Bombay army for a long time, but only since 1857 have European troops formed a portion of its garrison. These have consisted of artillery, infantry, and a few squadrons of cavalry. The barracks occupied by European troops were the best that could be restored and re-constructed out of the hospitals and other buildings formerly appropriated for natives. The mean annual strength of the last three years was 658; of these, 1,836 were treated in hospital, being in the proportion of 279·0 per cent. The average annual deaths were 20, giving a death rate of 30·3 per thousand.
No. 15.—Bombay and Colaba.	The average annual strength of European troops at Colaba and in Bombay appears by the tables to be 818 per annum, but this is fallacious, as the garrison merely consists of a wing of a European regiment and a company of artillery. The additional numbers are made up by the arrival of troops, chiefly invalids, for embarkation to England, and by drafts proceeding up country. In this way invalids arrive very often only to increase the sick list, and to swell the high death rate of Bombay, which, for the decade 1850 to 1860, reached as high as 32 per thousand. This state of things will not probably again happen, as the establishment of the Khandalla depôt relieves Bombay of invalids, whilst the railroad to Poona permits invalids from that large station being kept in their own hospitals until the eve of embarkation. Still, there is no doubt but that Bombay is a very unhealthy station, both for European and native troops. Very severe epidemics of fever prevailed in 1858 and in the present year, owing to the bad structure of barracks and hospitals, insufficient drainage, and unwholesome effluvia from the neighbouring beach.
No. 16.—Nusseerabad.	Between the years 1850 and 1857 only one company of European artillery belonging to the Bombay Presidency was stationed at Nusseerabad, and even this company was withdrawn in the early part of 1857; but since that period, in addition to a troop of horse artillery, some portion of a dragoon regiment and a wing or more of infantry have occupied Nusseerabad. During the first seven years of the decade, the average annual strength was about 60, but for the whole period of 10 years the average yearly strength amounts to 449, and the treated in hospital to 969, or 215·8 per cent. The number of deaths was 17, which, in proportion to the strength, makes the death rate 37·8 per mille. The accompanying table (A) shows the chief forms of disease met with at Nusseerabad.
No. 17.—Baroda.	This station was temporarily occupied by European troops from 1857 to 1860, but it has since been given up. A battery of Royal Artillery, with a few companies of an infantry regiment, formed its garrison, the annual average strength of which was about 354. Of this number, the treated in hospital amounted to 923, being in the proportion of 260·7 per cent. The annual mean mortality was 15, being at the rate of 42·3 per mille. This large mortality was due to a peculiar form of "*sun-stroke*," which, with "*apoplexy*," carried off 21 individuals out of the total number of deaths (45). The barracks and accommodation were merely temporary.
No. 18.—Surat.	A few European troops have been quartered in the fort at Surat since the mutinies, any continue to be so located, although the sickness and mortality has been greater than at any other station in the Bombay Presidency, as the following table (A) will show. The strength of the detachment was annually 58, the number of admissions and treated in hospital 234,

References to Subjects and Queries.	REPLIES.
No. 18. Surat—*cont.*	being more than 400 per cent., whilst the deaths averaged three per annum, in the proportion of 51·7 per thousand. Out of the total number of deaths, viz., nine in the (3) three years, six occurred from diseases of the stomach and bowels, diarrhœa, or dysentery. The Castle at Surat has been always considered unhealthy, and the room used as a guard room unfit to be occupied by European soldiers, whilst the drain is occasionally very offensive.
	No. 2.—A LIST of all existing SANITARIA in the PRESIDENCY, with an account of the advantages or disadvantages of each. (1.) As places of residence for preserving health. (2.) As places of recovery from sickness, with diseases for which they are adapted or not adapted. EXISTING SANITARIA. The existing sanataria are,— 1. Mahableshwur. 2. Poorundhur. 3. Mount Aboo. 4. Ghizree. 5. Taraghur. 6. Sulabat Khan's Tomb, near Ahmednuggur.
I. MAHABLESHWUR.	Mahableshwur is situated on the western slope of the table land of the Ghâts, 17° 56″ N. L., 73° 30″ E. L., and is 4,500 feet in height at its highest point. The climate is very pleasant, the annual mean temperature being 66 F., the mean range 9·7. The air is moist from the influence of the sea breeze, which reaches the hill in full force, and preserves it from the aridity so common on the hills further eastward from the coast. Mahableshwur is not made use of as a sanitarium for troops in the Deccan, as it is unsuitable during the monsoon from the amount of rain which falls, the average being upwards of 250 inches. Invalids would have to descend to the plains in the hottest period of the year, and at a season when cholera generally prevails, so that this hill is not calculated either as a place of recovery for the sick or as a permanent residence for persons in health. In the year 1829 a party of invalid soldiers was sent to this sanitarium, but the results did not warrant the experiment being repeated. Since that period it has been resorted to chiefly in the hot months of October and November, April and May, as a hill station to escape the heats of the plains. Since the introduction of the new furlough regulations few officers are sent to Malableshwur for any continued or for any serious chronic disease, as a change to England has a more beneficial and enduring effect than a resort to any hill station in the tropics. A full account of the medical topography and meteorology of the Mahableshwur Hills will be found in the 1st, 2nd, and 7th Nos. of the Transactions of the Medical and Physical Society of Bombay (copies of which are obtainable at the India House), and in Dr. Morehead's published reports on the Sanitaria of Western India (*see Morehead's Researches on Disease in India, new edition, page* 728).
II. POORUNDHUR.	Poorundhur has for the last eight or nine years been used as a sanitarium for troops in the Deccan. During that time about 2,000 invalids have been treated on the hill, 1,500 have been cured and returned to duty, 29 only have died, and the remainder were either returned to the plains, the climate being unsuited to their complaints, or are now occupants of the sanitarium. Its height is about 4,200 feet above the level of the sea, its climate is cool and invigorating, it is within the influence of the sea breeze, and the fall of rain, about 70 inches, is not so heavy as to render it uninhabitable the whole year. Poorundhur, like all the hills arising from the plain on this side of India, is not useful in cases of organic disease, but those from debility, fever, dyspepsia, derive great benefit. There is not space at Poorundhur for a cantonment for troops in health, but it is most useful as a sanitarium. A full description of Poorundhur will be found in a memorandum published by Dr. Morehead, at page 747 of the 2nd edition of his Researches, and a later Bombay account in the appendix to the sixth volume of the Bombay Medical and Physical Society's Transactions.
III. MOUNT ABOO.	Mount Aboo is situated in the territories of the Rao of Sarowy in Rajpootana, 50 miles N.E. from Deesa, the principal station for European troops in Guzerat. It is in 72° 50″ E. long. and 24° 37″ N. lat., and is about 4,500 feet in height. Aboo has been resorted to for the last 20 years as an agreeable retreat in the hot weather, and since 1851 European invalids have been located there. The climate is cool and favourable for Europeans, the scenery is picturesque, and the sites for building are very eligible. Troops remain on the hill the entire year, and Mount Aboo is, therefore, not only fitted as a sanitarium for invalids suffering from the debility of fever, induced on the plains of Guzerat, but from the ample space and excellent climate it is well adapted for a permanent station for European soldiers. The barracks have been placed in a disadvantageous position, which, however, is about to be changed. A general topographical and medical report by Assistant-Surgeon Ogilvy up to the latest date will be found in the sixth volume of the Bombay Medical and Physical Society's Transactions, page 192.
IV. GHIZREE.	Ghizree is not a hill, but a coast sanitarium, and as such has been for some years occupied for the troops in Sinde. It is elevated scarcely 60 feet above the level of the sea, but the plateau rises abruptly from the shore, and enjoys in an eminent degree the full force of the sea breeze, pure and uncontaminated, from the Indian Ocean. It is in the purity of the air, the strength of the breeze, and consequently slightly lower temperature than the camp of Kurrachee, that the value of Ghizree as a sanitarium consists, and a residence there is calculated to give a healthy tone to the weakened system, whether arising from fever or from chronic visceral disease.

References to Subjects and Queries.	Replies.
IV. Ghizree—*cont.*	Ghizree is not at all fitted for a permanent encampment for a large body of troops, owing to the want of water, of which it is entirely destitute, as all required at the sanitarium is brought from the cantonment of Kurrachee. A further account of Ghizree will be found at pages 15 and 16 of the published report on the extent and nature of the sanitary establishments, in the selections from the records of the Government of India (Military Department), Calcutta, March 1861.
V. Taraghur.	Taraghur is a hill fort, about 14 miles from Nusseerabad, close to Ajmere, which has been made use of as a hill sanitarium, and with great success. The ascent is easy, but the space on the plateau is not sufficient for more than 40 or 50 invalids. The hill is 2,800 feet above the sea, and about 1,000 above the plain. Water is collected in tanks, and supplies are abundant. The statistics do not extend beyond the present year. From April 1860 to March 1861, 178 invalids have been sent to the hill for change of air; of these, only 14 were returned without having derived any benefit. No death occurred. The cases were, however, well selected, and the experiment has proved that men suffering from debility, the result of sickness and long confinement in hospital, recover rapidly at Taraghur.
VI. Salabat Khan's Tomb.	Salabat Khan's Tomb, near Ahmednuggur, has lately been resorted to as a sanitarium for weakly and delicate soldiers from Ahmednuggur during the hot months of April and May. It is a small hill about six miles from Ahmednuggur, about 2,000 feet above the level of the sea, and 600 or 700 feet above the level of the camp of Ahmednuggur. The temperature is about two or three degrees cooler than Ahmednuggur. It is freely exposed to the high winds which prevail during the hot months in the Deccan, but on the hill these are cool, whilst in cantonment a furious hot wind may be blowing. The tomb has received certain additions and improvements since it was first occupied in 1859, and the buildings are now well adapted for the reception of invalid Europeans. About 50 or 60 men have been sent there during the hot season, with advantage and improvement to their general health. The site, from its elevation, is cool and healthy, and recent experience proves that a temporary residence is very beneficial to soldiers in a debilitated condition. There is ample space for the erection of other buildings, but the access is not good and water is not obtainable on the hill, but from a distance.
	No. 3.—A List of all Places within the Presidency where Hill Stations might be advantageously fixed for the Health of the Troops, or where Sanitaria might be established, with particulars as to the elevation, topography, climate, means of access, distance from stations, &c.
	There are many hills met with in the Ghauts and spurs leading from them well calculated for sanitaria, and where hill stations might be advantageously fixed, if they were accessible. These hills are generally about 4,000 feet above the level of the sea, and enjoy the same climate as Mahableshwur, but are for the most part inaccessible, deficient of supplies, and out of the line of the railroad. In the Satpoora range in Kandeish there are also hills varying from 4,000 to 6,000 feet in height, and one of these would probably be found very useful to the troops serving in Malwa, who have as yet no nearer resort for invalids than Poorundhur, which entails a long and wearisome march of 350 miles. The general height of the most elevated hills in this Presidency seldom exceeds 4,000 feet. In one instance alone in Kandeish is there a mountain of 6,000 feet, but the plain surrounding it is said to be very unhealthy. Between Sattara and Mahableshwur the hill of Euteshwur possesses great advantages, and is likely to prove a good locality for preserving the health of the troops. Its height is 3,600 feet, with good water, soil, and plenty of space, as well as easy of ascent. As places of residence for preserving the health of European troops, there is no want in the Bombay Presidency. One of these, Paunchgunny, 12 miles to the eastward of Mahableshwur, is sheltered from the monsoon. The fall of rain is so slight as to be of no inconvenience, the average being about 50 inches per annum. Troops might reside at Paunchgunny the whole year. The soil is laterite, and water does not remain on the surface. The sea breeze, although late in arrival, blows regularly for many hours in the day. There is ample space for drill, and the climate is favourable for horticultural pursuits. Its mean maximum temperature is 77°, and mean minimum 62°, whilst the extremes are from 56° to 86°. It is perfectly accessible. An account of Paunchgunny will be found in Dr. Morehead's Note on Deccan Hill Climates, before referred to. The sanitaria in this Presidency are generally free from malarious fever; neither does the climate produce abdominal complaints, as noticed at the hill stations of Bengal. There are two coast sanitaria for such diseases as hill climates do not suit, one at Colaba, the other at Rairee, on the southern Mahratta coast, near Belgaum. Colaba, although a convenient locality, is unhealthy, and it is to be hoped that some more pure and salutiferous site will be erelong selected on the coast of the Concan. Rairee is only now being tried, and as yet the results are not known.
	No. 4.—State in what Months Troops usually arrive in the Presidency from England, whether any restriction for preserving their health is placed upon the men on arriving, whether there is any place of resort provided for the men, or whether they are allowed to go at large; whether there is much drunkenness among the men after landing, and whether much preventible disease arises from such irregularities; how long the troops remain at the port after disembarkation and before proceeding to the interior; what precautionary measures are in use for protecting their health during the voyage or journey.
	1. Troops have of late years arrived at Bombay in the cold season, *i.e.*, from November to March or April, but instances have occurred of earlier and later arrivals, although not common. Formerly they remained in Bombay after arrival, often many weeks, until the season permitted of their marching to their destination, and they became infected with the licence and debauchery so natural to soldiers after a long voyage, and so easily indulged in at the Presidency, but now, immediately upon the ship anchoring, the troops, if recruits,

References to Subjects and Queries.	Replies.
	are inspected by a committee of two military and one medical officer, and every man undergoes examination as to his fitness to proceed or to remain. 2. Those who are too sick are again seen by the Deputy Inspector-General of Hospitals, and immediate arrangements are made to land and place them in hospital. 3. The disembarkation of the remaining troops devolves upon the Deputy Quarter-Master General, and is made within a few hours after the ship has anchored, not earlier than 3 p.m., nor later than 9 a.m. 4. The troops as they arrive from the ship by boat loads are formed on the bunder, under the officers who accompanied them from England, and are marched the distance of about half a mile to the railway terminus, *en route* to Khandalla, distant 70 miles. They are conveyed by rail to the foot of the Ghauts, and they make the ascent of the Ghauts either on foot or in country carts, the baggage in the meantime having overtaken them. At Khandalla, they are received into the new barracks prepared for them, called the "General Depôt." Here they remain along with their own and the officers of the depôt until arrangements are made to draft them to their different regiments. 5. Every precaution is taken to restrain the men from irregularities on the line of march, if it can be so called when performed by rail, and afterwards on arrival and whilst at Khandalla, which is a cool healthy locality on the top of the Ghauts and in the direct road to Poona, where the men are under discipline and without much facility of obtaining spirits. 6. If the troops are destined for Poona, they do not halt at Khandalla, but proceed on by rail to their destination. If for the stations in Malwa, they remain at Khandalla for a few days, and then proceed by bullock train in parties of 20 or more, each accompanied by a due proportion of officers, military and medical. Again, troops destined for the North and South Divisions remain at Khandalla, it may be for a few days only, or for a week or more, until steamers are ready to take them to their port of disembarkation. The steamers, often of the Indian Navy, are well found, and the numbers embarked are not large. They have then only a few marches to make on land, either to Belgaum or to Deesa, and, in the latter instance, the Bombay, Baroda, and Central India Railway takes them half the distance. 7. I do not think that anything could be better arranged than at present regarding the disembarkation of troops at Bombay, their temporary sojourn at Khandalla, and their future destination. The opening of the several railways, the establishment of a bullock train to Mhow, and the employment of steamers, have quite changed the character of "*moving troops*," and have rendered easy of accomplishment, free from danger or exposure to sickness or irregularities, what was before often attended with great trouble, risk, uncertainty, and loss of life. No. 5.—State the general result of Experience as regards the Queen's Troops and European Troops of the Indian Army on the following Points:— (1.) As to the best age for a soldier landing in India. (2.) As to the amount of previous service desirable before arriving in India. (3.) How he ought to be disposed of on landing, and what would be the best mode of life during his first years of service. (4.) The routine of stations, the length of time he should serve on hills and plains and the total length of his service in India. (5.) The marriage of soldiers, the present regulations in regard to this, with any suggestions for improving such regulations. 1. Experience has, I think, sufficiently proved that lads under 20 years of age are not fit for any arduous duty in India as soldiers; even the severe exertion of learning their drill is too much often for the unformed constitution in this country. In times of perfect peace and with light work lads of 18 would not incur much risk of their constitutions suffering from climate, but if the recruit is likely to be employed in the field, or in marching, and with much exposure, he ought not to land in India till 20 years of age. Although the mortality of lads of 18 is not large, yet they are very liable to fall sick and fill the hospital if submitted to hard work at that age. 2. I do not think there is any necessity for previous service in any intermediate climate, beyond that if a lad is enlisted at 18, it would be better to keep him in England for two years, and let him be thoroughly drilled during that period. 3. The great danger to troops upon first arrival is their propensity to indulge in vicious excesses after the irksome restraint of a long sea voyage, and it is their indulgence in all kinds of vice, intemperance, and exposure to the sun, with their heads unprotected by sufficient covering, that is the source of so much mischief to newly arrived troops, as before mentioned. Troops on arrival are now sent to Khandalla, where they are comparatively free from such exposure. 4. The routine of stations in this Presidency is very confined, and is only between the Deccan, Southern Mahratta Country, Guzerat, Sinde, Malwa, and Rajpootana. The Deccan and Southern Mahratta Country are comparatively very healthy, being elevated from 1,800 to 2,500 feet above the sea. As many European troops as possible should be massed in those favoured stations, and only such a number as the requirements of the country render absolutely necessary should be stationed in the plains of Guzerat and Malwa, and their reliefs should take place at least every three years. Fifteen years is, in my opinion, the longest tour of Indian service that an European regiment should make. 5. I think that the marriage of soldiers should be by all means encouraged, as the greater number of diseases under which European soldiers are admitted into hospital are *enthetic* diseases, arising from illicit sexual intercourse, and the only truly moral and effectual check to this is the marriage of the soldier. 6. Lock hospitals and the licensing of bazaar females are only an encouragement of vice, and all police regulations have failed in checking venereal disease among either sex. 7. In a report, dated 1st April 1861, Dr. Arnott, C.B., Deputy Inspector-General of the Mhow Division, states, "From the accompanying return, which shows the amount and nature of "the sickness in the European hospitals at Nusseerabad and Mhow on 1st March 1861, it "appears that out of 193 sick no fewer than 103 are venereal cases." "The loss to Government of the services of 103 men throughout the year must be enormous, but this return does not and cannot show the worst features of this unhappy state of matters. The consequences of the effects of this horrible complaint upon these men's

References to Subjects and Queries.	Replies.

constitutions, together with the confinement in hospital, will be felt for years. Whatever disease may prevail, wherever they may be, they will be its surest victims. Independent of the debility and rheumatic affections, which every medical officer knows they will for years suffer from, and after years of little duty and much sickness, they will have to seek a restoration to health in their mother country. The expense to Government of such men it is impossible to calculate, but there can be no doubt it would be a most economical measure to establish some institution that would protect these unfortunate men from much suffering, and the state from the enormous outlay bestowed so unsatisfactorily to all parties."

No. 6.—State any additional Recommendations or Suggestions which past experience has shown to be requisite for protecting the Health of the Troops after landing, during the transit to the interior, in stations, on the march, or in camp.

This subject has been so well cared for in this Presidency that it does not occur to me that any further steps are necessary to protect the troops from disease after landing.

No. 7.—A List of Hospital Equipments, according to existing Presidency Regulations, for 100 or any other convenient number of men,

(1.) For Station Hospitals.
(2.) For Field Hospitals.

With any additions or improvements in these equipments that can be suggested, and in the hospital regulations generally.

By Art. 45, p. 63, of the Medical Regulations of 1859, the following is the equipment of a fixed hospital :—

Presses for holding medicines	2
" clothing	6
Compounding table	1
Writing table	2
Chairs	5
Medicine trays	2
Tables and forms as required.	
Teapoys	50 per cent.
Night chairs as required.	
Cooking utensils of all sorts.	
Crockery ware.	
Bedding, clothing.	
Table service.	

The list of clothing and bedding per 100 is as follows :—

Shirts	60
Bedgowns, single	20
" double	20
" warm	5
Banians	30
Drawers	33
" warm	5
Caps	30
" warm	5
Socks	10
Slippers	30
Belly bands	5
Bed cases	20
Pillow cases	60
Sheets	60
Quilts	30

By late regulations, the Barrack Department supplies presses, tables, chairs, cots, forms, teapoys, chests for clothing and for medicines, night chairs, bathing tubs, lamps, cooking utensils, close stools, crutches, diet boards, horses wooden, rat traps, screens, steps mussal, tables, camel trunks, urine tubs, punkas, tubs for fomentation; whilst the Commissariat Department furnish bedding, clothing, table service, and petty supplies.

There is no fixed scale of the number of each article per cent., but they are furnished in such proportions as are required, and with the sanction of the Deputy Inspector-General of the Division.

The following is the equipment of a field hospital, as per G. G. O. No. 500 of May 1858 :—

Bedding.

Bed cases	16 per 100 men.
Blankets, country	8 "
" Europe	8 "
Sutterungees or carpets	8 "
Pillow cases	16 "
Quilts, lined with looie	16 "
Sheets	40 "

Clothing.

Banians, flannel	32 per 100 men.
Bands, belly	6 "
Bedgowns, lined with looie	16 "
Caps, lined with flannel	16 "
Drawers, cotton	8 "
" flannel	8 "
Shirts	48 "
Slippers, pairs	12 "
Socks, worsted, pairs	32 "

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	Cooking Utensils.
	Cooking pots - - - - 2 per 100 men.
	Dishes, tin - - - - 8 „
	Forks - - - - - 8 „
	Frying pan - - - - 1 from 100 to 500 men.
	Kettles, camp - - - - 1 per 100 men.
	Knives - - - - - 8 „
	Plates, tin - - - - 8 „
	Spoons - - - - 8 „
	Tins, quart - - - - 8 „
	Necessaries.
	Bathing tub - - - - 1 from 100 to 500 men.
	Baskets, rattan and pan - - 1 per 100 men.
	Bed pans - - - - 1 „
	Camel trunks, with straps 33 inches in length, 18 inches in breadth, 20 inches in depth - - - - 1 „
	Crates or cajavas, to contain cooking utensils - - - - 2 „
	Chairs, rattan - - - - 2 for 100 men or a regiment.
	Fomentation tub iron - - - 2 for 100 to 500 men.
	Gindee - - - - 1 for 100 men and upwards.
	Inkstand - - - - 1 for 100 men or a regiment.
	Lantern, hand - - - - 2 „
	Leather choggles for water.
	Pickaxe - - - - 1 for 100 to 500 men.
	Powrah - - - - 1 „
	Ruler - - - - - 1 for 100 men or a regiment.
	Table lamp - - - - 1 „
	„ operating - - - 1 on service for 200 men or a regiment.
	Tarpaulin to cover stores - - 1 per 100 men.
	„ to place under beds - - 2 „
	B. P. Rooke, M.D.,
Bombay, 10th August 1861.	Principal Inspector-General, Medical Department.

Table A.

General Return of the Health Statistics of the Stations for European Troops in the Bombay Presidency.

Period.	Number of Years.	Stations.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	Ratio per 1,000 to average Strength.
				Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
From 1858 to 61	3	Asseerghur - -	223	106	—	—	—	26	—	8	1	16	—	5	1	1	—	179	—	341	3	152·7	13·5
„ 1850 to 60	10	Kirkee - - -	8,026	3,919	23	13	—	701	13	339	9	1,923	40	283	7	24	11	6,150	9	13,352	112	166·3	13·7
„ ditto	10	Aden - - -	4,794	1,470	17	—	—	394	13	326	12	1,138	11	260	11	—	—	3,055	16	6,643	80	138·5	16·7
„ ditto	10	Poona - - -	21,911	12,596	38	58	6	1,771	51	1,284	48	4,970	106	902	18	111	58	18,684	54	40,376	379	184·2	17·3
„ ditto	10	Belgaum - -	12,866	3,208	18	22	5	1,104	19	835	24	2,490	91	556	20	31	22	10,323	36	18,569	235	146·6	17·8
„ 1857 to 60	3	Sattara - - -	1,106	884	1	6	1	48	1	31	—	209	4	56	2	19	11	787	—	2,000	20	180·8	18·9
„ 1850 to 60	10	Deesa - - -	7,698	4,773	38	19	2	741	15	615	12	1,589	38	291	26	21	11	6,214	19	14,263	161	185·2	19·5
„ 1857 to 60	3	Ahmedabad - -	2,012	2,204	19	—	—	189	4	78	4	483	4	41	9	3	2	1,201	1	4,199	43	208·6	20·8
„ 1850 to 60	10	Sholapoor - -	1,437	1,963	8	4	—	101	—	80	2	313	11	32	1	21	10	384	2	3,508	34	244·1	20·9
„ ditto	10	Ahmednuggur -	4,396	3,482	11	24	3	581	10	179	8	1,715	46	349	3	50	32	4,080	9	10,460	122	237·9	27·2
„ ditto	10	Kurrachee - -	15,665	10,367	90	5	—	1,493	56	996	44	4,266	128	818	35	53	26	11,072	55	29,070	434	185·5	27·4
„ 1857 to 60	3	Mhow - - -	2,950	3,100	18	4	—	252	4	158	12	855	16	68	9	36	16	2,412	9	6,885	84	233·3	28·4
„ 1850 to 60	10	Hydrabad - -	4,181	4,706	56	—	—	256	11	274	7	1,000	26	294	19	—	—	3,112	7	9,642	126	230·6	23·7
„ 1857 to 60	3	Neemuch - -	1,974	3,299	21	8	1	175	3	136	11	412	12	43	5	—	—	1,435	7	5,508	60	279·0	30·3
„ 1850 to 60	10	Bombay and Colaba	8,183	4,506	24	11	3	548	25	582	37	2,502	88	348	18	76	35	5,895	32	14,528	262	177·5	32·0
„ ditto	10	Nussecrabad -	4,485	3,538	51	32	2	269	10	224	15	1,054	47	204	30	15	3	4,360	11	9,696	169	215·7	37·8
„ 1857 to 60	3	Baroda - - -	1,062	1,733	10	—	—	106	4	35	2	210	1	61	21	7	5	617	2	2,769	45	260·7	42·3
„ ditto	3	Surat - - -	176	446	2	2	—	15	—	17	—	88	6	16	1	2	—	118	—	704	9	400·0	51·7

(The Mortality Tables for each Station, referred to in Dr. Rooke's report, which follow this General Return are the same as those given in the Bombay Statistical Returns, and are not therefore reprinted.)

CEYLON.

COLOMBO.

European Troops	Artillery	90
	Infantry	920
Native Troops	Artillery	195
	Cavalry	22
	Infantry	503

References to Subjects and Queries.	Replies.
I. Topography.	1. Colombo is a luxuriantly-cultivated flat tropical country, on the south-west coast of Ceylon, with a few patches of low jungle, grassy plains, and slightly undulating ground. The littoral parts are covered with cocoa-nut, and beyond it are seen extensive plantations of cinnamon, mango, and other fruit trees. It is intersected by a river and branches of a fresh-water lake, which communicates with the ditch round the land side of the fort and with the canal within it. There are many rice fields and swampy ground in the surrounding country.
	2. The elevation of the station above the sea is from 12 to 18 feet, and it is nearly on a level with the adjacent country. It is from 7 to 13 feet above the level of the lake and canal. The nearest hills are about two miles from the fort, but their height is so inconsiderable, scarcely 80 feet, that no commensurate advantage could be expected to be derived from them for sanitary purposes, surrounded as they are by a dense native population. About seven miles south of Colombo, on the sea coast, is Mount Lavinia, a military station for rifle practice. It is about 50 feet higher. The atmosphere here is purer, from not being tainted with the effluvia of a large town or swampy ground. To this station might be added a convalescent hospital, both for officers and men, whose recovery is long and tedious in Colombo.
	3. The nearest mountain land is Kandy, which is 72 miles from Colombo; height, 1,670 feet. Pusilawa is 87 miles distant; height, 3,200 feet. Newera Ellia, 111 miles distant; height, 6,200 feet. Horton Plains, 127 miles distant, 6,900 feet in height.
	4. The Fort of Colombo, where European troops are quartered, is bounded for more than half the extent by the sea. A wet ditch filled with lake water bounds the remainder. A canal communicating with the lake near the fort runs through the fortifications to the sea front. The barracks and huts of the native troops are on a peninsula called Slave Island, on the fresh-water lake, and in their vicinity are some marshy grounds and stagnant streams and ditches. The Calany river is about four miles north of the garrison. It communicates by a canal with the fresh-water lake. The low land near the river and lake is liable to be overflowed in the rainy season. The inundation of the river lasts for some weeks, that of the lake only a few days. The rainy seasons are in the south-west monsoon, generally in April, May, and June, and at the commencement of the north-east monsoon in October and November. There is not much broken ground near the station. The ravines and water-pits are so few that they have not been observed to affect health, particularly of the troops who are quartered far from them.
	5. The barracks for European troops at the station are within the fort, and consequently have not the free ventilation from without so desirable in a tropical climate, and of late years upper stories have been added to Government and private houses in the fort, which have still more reduced the free circulation of fresh air in the barracks. The native troops are quartered in an airy situation outside the fort, on the south side of which is a race-course, used for military exercises, public promenade, and recreation, and an esplanade planted with ornamental trees on the north. In many parts of the fort the reflected heat of the new whitewashed houses increased the temperature of the air. In the staff surgeon's quarters, where 20 years ago the temperature was not observed higher than 86° Fahrenheit, it is frequently now at 90° in the hot season. The station is exposed to both land and sea breezes. Variable winds also prevail in the decadence of one monsoon and the commencement of another. Land wind is chilly, and considered here an unhealthy wind, and produces rheumatic and catarrhal complaints.
	6. The country surrounding the station is cultivated, and there are works of irrigation within about three miles. They are deemed prejudicial even at that distance, but not materially so. The cultivation of rice is not prohibited within certain limits. No indigo, flax, or hemp is cultivated near the station.
	7. The pettah, or native town, is within half a mile to the north of the fort, and is densely populated. There is also a smaller town on Slave Island, near the Ceylon rifle barracks.
	8. In the geological structure of the district, granitic, gneiss, laterite, and lithomargic earths predominate. There is a recently-formed sandstone belt on the sea shore. The soil is chiefly clay and sand, and sea sand is found inland in sites of ancient beach. There is no alluvial soil. The station had long since been occupied by natives, previous to European conquest.
	9. Water is usually found in the fort after a long drought at from 11 feet 6 in. to 28 feet, according to the level of the ground. In the rainy season it is found at from 7½ to 24 feet; outside the fort, from 12 feet 6 inches to 5 feet in the dry season, and from 9 to 3 feet in the rainy season.
	10. There are no surface springs, but the rain-fall is rapidly absorbed by the very pervious sandy soil. There is no higher adjacent ground the drainage from which passes into the subsoil of the station.

COLOMBO.
CEYLON.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	11. Drinking water is derived from wells. A large water supply is also derived from rain-fall for bathing, &c. There are no tanks, so defined, but the fresh-water lake extends inland from the fort. The lake is generally full, forming a defence to the fortress and an inland navigation. The plants it contains are the white and purple lotus in great abundance, several species of grasses, algæ and confervæ. Of animals, there are eight or ten species of fish, shrimps, frogs, and water snakes; also the otter. The lake is used for bathing by the native troops and population, and in dry weather the water is occasionally drunk by natives. The lake and canal are liable to pollution from impurities draining into them. A large part of the drainage of the fort empties into the canal, and there are latrines and drains discharging into the lake. Some of the wells in the fort appear too near cesspools, but are not used by the troops for drinking. In the dry season some malaria would proceed from the receding of the lake, leaving its banks exposed to the sun's action. A new system of drainage for the fort, contemplated by the Colonial Government, and embanking the lake, is suggested.
	12. The water supply for the present garrison is abundant. A slightly brackish and occasional ferruginous taste is sensible in some wells. The quality of the water is generally good, and the amount sufficient. Alumen, saline substances, and traces of iron and nitrogen have been detected in some wells. The ordinary means of raising and distributing the water is by pumps, buckets, earthen vessels, and barrels. A better supply seems unnecessary.
	13. Cleanliness and more frequent emptying of cesspools by the inhabitants, and the ventilation of latrines, are suggested.
	14. No new station has for years been selected in Ceylon. The rules laid down in the Queen's army hospital regulations appear to regulate the selection of stations.
II. CLIMATE.	1. The instruments available for conducting meteorological observations are, the barometer, thermometers for registering temperature in air, in sun, on grass, temperature of evaporation, maximum and minimum; anemometer; two rain gauges, one on the ground, and one 23 feet above the ground. The amount and nature of cloud is also registered at the Royal Engineer Observatory.
	2. The following table shows the observations for seven years, from 1st January 1853 to 31st December 1859:—

—	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
January -	29·888	78·47	9·9	83·42	73·52	81	76·1	108·9	3·73	N. & N.E.	Calm.	23	The atmosphere of Colombo is generally unclouded in the dry season, except in the early morning or at night, when light clouds appear. It is clouded in the wet season, and at the changes of monsoon, about May and November, when heavy clouds are accompanied by gales. These gales do not usually continue for more than a week, and during the remainder of the year light breezes prevail. There is generally a heavy dew perceptible in the morning.
February -	29·883	78·57	8·18	82·66	74·48	82·24	77	110·9	2·28	N.E. & N.W.	Calm.	23	
March -	29·863	80·9	9·6	85·7	76·1	83·74	78·9	110·8	4·159	W.	Moderate.	24	
April -	29·817	81·76	8·68	86·12	77·44	84·2	79·95	105·03	9·471	S.W.	Storm.	16	
May -	29·818	81·255	7·09	84·8	77·71	83·37	79·8	98·3	14·309	S.W.	Monsoon.	21	
June -	29·815	81·165	5·23	83·78	78·55	82·25	79	99·12	5·786	S.W.	Occasional Gale.	20	
July -	29·821	80·445	4·67	82·78	78·11	81·75	78·2	97·8	3·584	S.W.	Occasional Gale.	20	
August -	29·832	80·385	4·77	82·77	78	80·95	77·75	102·51	3·188	S.W.	Moderate.	21	
September	29·858	80·47	5·26	83·1	77·84	81·56	77·72	102·2	4·186	W. & S.W.	Sudden squalls, variable.	19	
October -	29·862	79·47	5·82	82·38	76·56	81·15	78	103·4	10·542	W. & S.W.	Ditto.	21	
November	29·868	79·015	8·29	83·16	74·87	81	77·67	106·7	11·462	E.N.E.	Ditto.	23	
December	29·896	78·515	9·33	83·18	73·85	80·85	77	106	5·659	N. & N.E	Change of Monsoon, high wind.	22	

3. The climate of Colombo varies from great dampness, during south-west monsoon, to the opposite state of atmosphere in that of north-east. A cold and trying wind, called locally a long-shore wind, prevails. Towards the close of the year occasional fogs have been observed. The canal and irrigation are not extensive enough to influence the climate. Clouds of red dust are annoying in the vicinity of the station in the hot and dry seasons. The health both of European and native troops is materially influenced by the climate. Meat and vegetables must be immediately cooked, and cannot be so preserved. Verandahs and Venetians are required as shelter from the driving rain and great heat, and moisture is deposited on the walls and floors in the wet season. Clothing requires constant care and airing to preserve it from damp and insects. Drill duties and exercises take place in the open air only in the cool of the morning and evening; the latter being preferable on account of dew. About an hour at a time is as much as the troops can bear, not daily nor even in marching order. The most healthy months are July and August, December and January. The most unhealthy, April and May, September and October, at the decadence of one monsoon and the commencement of the other. The prevailing diseases are, fevers of the intermittent and remittent types, liver and bowel complaints.

4. Mount Lavinia, already mentioned, about 7½ miles from Colombo on the sea-shore, is about 50 feet higher than the station, easily drained, and supplied with water from wells. It is situated in the country, apart from towns, and would be desirable as a sanitarium, but is not of other military importance as a station.

5. The stations on which I have served are in Ceylon, at Colombo, Kandy, Trincomalee, Galle, Newera Ellia, and Pultam. Of these, Newera Ellia, and Galle appear comparatively salubrious; next, Kandy and Colombo, while Trincomalee and Pultam may be considered positively injurious to European constitutions.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, and 3. Plans. 4. The following tables show the barrack accommodation :— Total regulation number of non-commissioned officers and men - 890

—	Barrack Rooms or Huts.		Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length. Ft.	In.	Breadth. Ft.	In.	Height. Ft.	In.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height. Ft.	In.	Width. Ft.	In.
Barracks, and Quarters for married men within the Fort of Colombo.	No. 1. Barrack	a. -	30 single men	62	0	25	0	19	0	29,450	981	51	From 1 foot to 1 foot 6 inches.	5	5	4	6	6
		b. -	45 " -	90	0	25	0	21	0	47,250	1,050	50		8	5	4	5	0
		c. -	1 married man	12	10	12	6	9	2	1,470	1,470	160		1	2	9	3	0
	No. 5. Barrack	a. -	73 single men	150	0	23	3	16	0	55,800	764	47		15	4	1	5	0
		b. -	9 " -	23	3	18	9	16	0	6,975	775	48		2	4	1	5	0
		d. -	6 " -	26	0	12	6	10	6	3,412	568	54		3	4	1	5	0
		e. -	1 - -	18	9	14	0	10	2	2,668	2,668	262		1	3	9	3	0
		f. -	1 - -	18	9	14	0	10	2	2,668	2,668	262		1	3	9	3	0
		g. -	1 - -	18	9	14	0	10	2	2,668	2,668	262		1	3	9	3	0
		h. -	1 - -	14	0	9	3	10	2	1,316	1,316	129		1	3	9	3	0
		i. -	1 - -	14	0	8	0	10	2	1,138	1,138	112		1	3	9	3	0
		k. -	1 - -	14	0	7	6	10	2	1,067	1,067	105		2	3	9	3	0
	No. 6. Barrack	a. -	1 - -	24	0	18	0	17	8	7,632	7,632	432		2	5	5	4	0
		b. -		12	0	13	0	17	8	2,756	2,756	156		6	5	4	4	0
	No. 7. Barrack	a. -	90 single men	216	0	22	0	20	6	97,416	1,082	52		18	6	0	4	6
		b. -	1 - -	14	0	22	0	20	6	6,314	6,314	308		2	6	0	4	6
		c. -	1 - -	17	0	15	0	13	7	3,521	3,521	259		2	5	0	3	0
		d. -	1 - -	17	9	15	9	13	7	3,797	3,797	279		2	5	0	3	0
	No. 8. Barrack	f. -	1 - -	32	0	9	9	11	2	3,484	3,484	312		2	3	1	3	0
		g. -		15	6	15	0	16	3	3,778	3,778	232		1	4	10	4	0
	No. 9. Barrack	a. -	28 single men	63	3	21	0	13	10	18,374	656	47		4	4	7	4	0
	No. 10. Barrack	e. -	62 " -	129	0	22	0	15	0	42,570	686	45		9	5	6	4	6
		f. -	10 " -	25	6	24	0	18	0	11,016	1,101	61		3	5	6	4	6
	No. 11. Barrack	a. -	70 " -	207	6	16	6	13	6	46,220	660	48		9	4	2	4	6
		b. -	72 " -	214	0	16	3	13	6	46,946	652	48		9	4	2	3	0
		c. -	1 - -	14	0	13	0	12	3	2,229	2,229	182		1	3	1	2	6
		d. -	1 - -	19	0	13	0	12	3	3,025	3,025	247		1	4	0	2	6
		e -	1 - -	28	9	13	0	12	3	4,578	4.578	373		2	4	0	2	6
	No. 12. Barrack	a. -	105 single men	221	0	25	0	21	6	118,787	1,131	52		36	6	0	4	6
		b. -	1 - -	16	0	13	0	14	4	2,981	2,981	208		2	5	0	4	0
		c. -	1 - -	16	0	13	0	14	4	2,981	2,981	208		2	5	0	4	0
		d. -	1 - -	16	0	13	0	14	4	2,981	2,981	208		2	5	0	4	0
		e. -	1 - -	16	0	13	0	14	4	2,981	2,981	208		2	5	0	4	0
		f. -	1 - -	13	0	11	6	9	6	1,420	1,420	149		1	3	7	4	0
		g. -	1 - -	25	9	13	0	9	6	3,180	3,180	334		2	3	7	4	0
	No. 13. Barrack	a. -	44 single men	92	0	21	0	18	0	34,776	790	44		4	5	0	5	0
		b. -	9 " -	24	0	15	0	12	0	4,320	480	40		2	3	0	4	0
		c. -	19 " -	43	0	15	0	12	0	7,740	407	33		—	—		—	
		d. -	1 - -	15	0	15	0	12	0	2,700	2,700	225		1	3	3	2	0
		e. -	1 - -	6	0	12	0	12	0	804	864	72		—	—		—	
		f. -	1 - -	21	0	12	9	12	0	3,213	3,213	267		1	3	10	2	0
		g. -	1 - -	16	0	13	0	12	0	2,496	2,496	208		2	3	2	2	6
		h. -	1 - -	16	0	15	0	12	0	2,880	2,880	240		1	4	7	4	0
		i. -	1 - -	32	0	15	0	12	0	5,760	5,760	280		1	3	1	4	0
		k. -	1 - -	20	0	15	0	12	0	3,600	3,600	300		2	3	6	4	0
	No. 15. Staff Serjeant's Quarters	a. -	1 - -	12	0	12	0	10	0	1,440	1,440	144		2	—		3	0
		b. -		10	0	12	0	10	0	1,200	1,200	120		2	—		3	0
	No. 27. Ditto	a. -	1 - -	13	6	13	6	9	0	1,640	1,640	182		2	5	0	2	10
		b. -		11	3	13	6	9	0	1,366	1,366	151		1	5	0	2	10
		c. -	1 - -	11	3	13	6	9	0	1,366	1,366	151		1	5	0	2	10
		d. -		15	0	13	6	9	0	1,825	1,825	202		2	5	0	2	10
	No. 32. Ditto	a. -	1 - -	15	0	16	0	15	0	3,600	3,600	240		3	5	0	3	6
		b. -		12	0	16	0	15	0	2,880	2,880	192		1	5	0	3	6
		d. -	1 - -	15	0	16	0	15	0	3,600	3,600	240		2	5	0	3	6
		e. -		12	0	16	0	15	0	2,880	2,880	192		1	5	0	3	6
		g. -	1 - -	15	0	16	0	15	0	3,600	3,600	240		2	5	0	3	6
		h. -		12	0	16	0	15	0	2,880	2,880	192		2	5	0	3	6
	No. 33. Two Story Barrack	a. -	88 single men	188	0	25	0	17	6	82,250	934	53		28	6	0	4	6
		b. -	1 - -	14	3	13	3	17	6	3,304	3,304	188		2	5	0	4	0
		c. -	1 - -	14	3	13	3	17	6	3,304	3,304	188		2	5	0	4	0
		d. -	1 - -	14	3	13	3	17	6	3,304	3,304	188		2	5	0	4	0
		e. -	1 - -	14	3	13	3	17	6	3,304	3,304	188		2	5	0	4	0
		f. -	88 single men	188	0	25	0	22	0	113,400	1,175	53		24	6	0	4	6
		g. -	1 " -	15	6	14	0	15	0	3,255	3,255	217		2	5	0	4	0
		h. -	1 " -	15	6	14	0	15	0	3,255	3,255	217		2	5	0	4	0
		i. -	1 " -	15	6	14	0	15	0	3,255	3,255	217		2	5	0	4	0
		k. -	1 " -	15	6	14	0	15	0	3,255	3,255	217		2	5	0	4	0

Quartermaster-General's Office,
Colombo, July 23, 1860.

(Signed) H. A. Ouvry,
Lieut.-Col., A.Q.M.G.

COLOMBO.
CEYLON.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	Total regulation number of non-commissioned officers and men - 676

—	Barrack Rooms or Huts.		Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
				Ft. In.	Ft. In.	Ft. In.						Ft. In.	Ft. In.
Barracks and Quarters for Married Men, occupied by the Gun Lascars in Slave Island.	No. 2. Single Men's Barrack - -	a. -	50	76 0	20 0	15 0	22,800	456	30	1 Foot 6 Inches.	8	2 3	2 6
	No. 3. Married Quarters - - -	e e. -	1	13 0	13 0	9 4	1,577	1,577	169		Nil.	Nil.	Nil.
		d d. -	1	13 0	10 0	9 4	1,213	1,213	130		—	—	—
		c i. -	1	13 0	13 0	9 4	1,577	1,577	169		—	—	—
		e. -	1	13 0	11 0	9 4	1,334	1,334	133		—	—	—
		f. -	1	14 0	9 0	9 4	1,176	1,176	126		—	—	—
		g. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
		h. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
		j. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
	No. 3. Native Officers Quarters -	k. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
		l. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
		m. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
	No. 3. Married Quarters - - -	t. -	1	14 0	6 6	9 4	849	849	91		Nil.	Nil.	Nil.
		n. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		w. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		x. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		y. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		z. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		s s. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		n n. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		v v. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		w w. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		y y. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		z z. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		a a. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		b b. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		c c. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		d d. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		e e. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		f f. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
Barracks and Married Quarters occupied by the Ceylon Rifle Regiment in Slave Island.	No. 4. Single Men's Barrack - -	a. -	36	76 6	12 0	16 2	31,537	876	54		12	4 6	2 6
		b. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		c. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 5. Ditto - -	a. -	36	76 0	25 0	16 2	30,716	853	52		12	4 6	2 6
		b. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		c. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 6. Ditto - -	a. -	30	67 6	25 0	16 2	27,281	909	56		10	4 6	2 6
		b. -	1	20 0	12 0	16 2	3,880	3,880	240		2	4 6	2 6
		c. -	1	20 0	12 0	16 2	3,880	3,880	240		2	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 1. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	No. 2. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	No. 3. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	From 1 to 15. Blocks, 12 men in each.		180	12 0	12 0	15 0	388,800	2,160	144		180	4 0	2 6
	No. 7. Native Officers' Quarters - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 8. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 9. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 10. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 11. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 12. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 13. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 14. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 15. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -		20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 2. Barrack, Galle Face.	a. -	40	38 0	18 0	15 6	10,602	265	17		5	5 0	4 6
		b. -	1	10 0	7 0	10 0	700	700	70		4	2 11	2 5
	No. 3. Barrack. Used as a Schoolroom -	a. -	46	48 0	37 0	15 0	26,640	579	38		4	2 11	2 5

N.B.—The huts for the mounted orderlies at Mount Lavinia not included.

(Signed) H. A. OUVRY,
Lieut.-Col., A.Q.M.G.

—	Guard Rooms or Huts.	Regulation No. of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
			Ft. In.	Ft. In.	Ft. In.						Ft. In.	Ft. In.
Guard-rooms, Cells, Defaulters' Rooms, and the Provost Establishment for European Troops in the Fort of Colombo.	To No. 1. Barrack — Guard-room, e.	15	30 0	16 6	17 9	8,786	585	33	From 1 Foot to 1 Foot 6 Inches.	3	3 7 / 6 0	4 0
	Cell, f.	1	9 0	6 0	14 0	756	756	54		—	—	—
	Cell, g.	1	9 0	6 0	14 0	756	756	54		—	—	—
	To No. 13. Barrack — Guard-room, m.	8	17 0	11 0	11 6	2,150	268	23		1	3 2	3 9
	6 Cells, p to v.	6	17 0	14 0	11 6	2,737	456	39		—	—	—
	No. 21. Water Gate Guard, a.	16	51 6	17 0	13 4	1,156	72	54		5	5 0	3 9
	No. 22. — Governor's Guard — a.	1	12 6	22 10	14 0	3,995	3,995	285		1	5 10	3 11
	No. 22. — Governor's Guard — b.	16	41 0	22 10	17 10	16,694	1,043	58		9	5 10	3 11
	No. 23. South Gate Guard-room, a.	16	41 6	21 0	19 11	17,357	1,084	54		8	6 0	4 6
	No. 24. — Main guard, b.	24	50 0	23 0	20 6	23,575	982	47		7	6 0	4 0
	No. 24. — Defaulter's Room, c.	—	12 0	23 0	20 6	5,658	5,658	—		2	6 0	4 0
	No. 25. Main Barrier Guard, a.	4	15 0	15 0	10 6	2,362	590	56		2	5 5	3 0
	No. 26. South ditto, a.	4	17 0	9 0	11 0	1,683	420	38		4	4 0	3 0
	No. 35. Sally Port Guard, a.	8	19 6	15 0	17 8	5,167	645	36		5	6 0	4 0
	No. 8. Provost Establishment	16	6 0	14 0	11 3	945	59	5		26	1 6	2 6
By the Ceylon Gun Rifle Lascars Regt.	No. 3. — Guard-room, a.	7	22 0	14 0	13 2	4,055	579	308		—	—	—
	No. 3. — Defaulter's Room, b.	—	22 0	10 6	8 2	1,886	1,886	1,886		—	—	—
By the Ceylon Rifle Regt.	No. 3. — Guard-room, b.	15	27 3	23 0	15 6	7,314	1,044	626		—	—	—
	No. 3. — Defaulter's Room, c.	—	11 0	23 0	15 6	3,921	3,921	253		—	—	—

Quartermaster-General's Office,
Colombo, July 23, 1860.

(Signed) H. A. Ouvry,
Lieut.-Col., A.Q.M.G.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows of the barracks are on opposite sides, and are generally open, being provided with wooden shutters. In one later-built barrack, Venetian doors are provided in the verandahs up-stairs. There is a verandah on both sides, which is about 10 feet wide. The verandahs are never occupied as sleeping quarters; they are open, and do not require jalousies except in the case of upper-story barracks. 6. The bedsteads are chiefly of the usual kind, iron and wood. The bedding consists of coir (that is, cocoa-nut fibre), mattresses, one blanket each, sheets, and thin cotton coverlids, with coir pillows, for the European troops. The native troops use wooden bedsteads, mats, pillows, and woollen blankets, locally called "cumlies." 7. The tents used at Ceylon are of two sizes, double-poled and single. No. 1 double-poled tent is intended to accommodate 20 men; cubic contents in feet, 2,040. No. 2 single-poled tent, for 10 men; cubic contents, 1,190 feet. Sections of each of these tents are attached, by which it will be seen that the cubic contents of the inner compartment may be increased by removing the inner wall. 8. Besides the windows and doors, there are apertures for constant ventilation under the wall-plates of barracks, huts, and guard rooms, with ventilators at the floors. Tents are ventilated by small openings. Generally speaking, the ventilation is sufficient, but some cases admit of improvement. There are no means in use for cooling the air for barrack rooms. 9. The materials of which barracks are constructed are brick, cabook, or laterite, which cuts easily into blocks, and plastered and whitewashed with lime. They have wooden roofs, covered with tiles. Some of the native troops are in barracks built with wood, plastered with mud, and roofed with cadjans (plaited cocoa-nut leaves, of which a temporary barrack is formed at Mount Lavinia in lieu of tents). 10. Floors are generally of tile or bricks, and are raised from one to three feet above the ground. There is no passage of air under the floor. 11. The construction of floors might be improved by a better description of tiles—asphalte or wood. The barracks are kept in repair by the Royal Engineer Department, and repairs are executed quickly and efficiently. The Deputy Inspector General of Hospitals is responsible for the sanitary state of the cantonment, so far as the troops are concerned. The walls and ceilings are cleansed and limewashed whenever necessary. 12. Lavatories are provided for three barracks, and a sketch of two adjacent to one another is attached. The water which is raised from the well by means of a pump is conveyed to the tank in the centre of the building. Three stop-cocks are attached to the tank, by means of which the water is let into tubs when required for bathing or washing. The water is carried off by a barrel drain into the canal. 13. The cook-houses are provided with open hearths, on which meat may be roasted, fried, or boiled. Wood is used for the fires. An oven also is provided for baking meat. The water is supplied from wells near at hand, and the refuse water is thrown into an adjacent cesspool. The washing of linen is performed by washermen, locally called "dhobies," who are sufficient in number for the wants of the station. 14. The privies are provided with pits, which are emptied when necessary. The pits are provided with man-holes, immediately behind the privies, for access. A rough sketch of a urinal is shown in the sketch of the cook and wash houses. The urinals are provided with drains. In the case of that shown a pipe conducts water from the well, which tends to keep the urinal clean. The contents of the privies are carried outside the fort to the sea shore, where they are buried with a depth of earth of three or four feet above the deposit. 15. These buildings are lighted and ventilated by means of scuttles or windows. The barracks are lighted at night with oil (cocoa nut).

COLOMBO.
CEYLON.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	16. Most of the barrack drains lead into the canal. The ordinary dimensions are 1 ft. 6 in. diameter barrel drains. The drainage of No. 12 barrack is carried by a drain *under* the canal and into the wet ditch of the fort. All the large drains were constructed in the time of the Dutch. The outlets of these drains are but a few yards from some of the barracks. The drainage is generally sufficient, and no part of the barracks or hospital is damp. Some of the fluid refuse is both evaporated and sunk in the subsoil. Cess pits are provided for most of the privies and urinals. These cesspits are ordinarily about 5 feet to 2 ft. 3 in. deep, and 4 ft. to 2 ft. 6 in. square. From one of the wells a cesspit is but 11 feet distant, and the water is only used for washing. Other cesspits are 22 feet, 55 feet, 76 feet, and 82 feet distant from the wells. The cesspit nearest to the men's quarters is three feet beyond the verandah of one barrack, and sunk eight feet below its level. The cesspit nearest to the hospital is 10 feet distant. They are opened and cleansed out whenever necessary. The water in the ditch around the fort does not flow quickly enough to prevent a large amount of mud, &c., accumulating. Most of the fort drains empty themselves into the canal which runs through the fort, and is filled from the lake and ditch. 17. The rubbish and fallen leaves within the cantonment are regularly swept and removed. The method of disposing of the manure is described elsewhere. 18. Fatigue parties of gun lascars are employed constantly in keeping the scarps and ramparts free of rank vegetation, which grows very rapidly. There are no old walls or hedges. The principal hindrance to free ventilation is the mass of houses built in the fort. 19. The drainage of the pettah and bazaar is imperfect, and open drains in many parts give out noxious effluvia. The ventilation of the rooms and privies of small houses is defective. The houses near the fort are not crowded. The latrines are in some houses too near the wells. The water supply for drinking is sufficient, but not always of good quality. There are no regular sanitary regulations. The commissioners of roads employ scavengers to clean the streets, but the drains, from the want of a sufficient supply of water, cannot be kept always clean. The local Board of Health might show more activity. An officer of nuisances ought to be appointed, and a military medical officer might be added to the board to protect the interest of the troops. The native houses near the station are generally good, but dung heaps and cess-pits are seen within the compounds, and they are not emptied as often as desirable. Several of the inhabitants of the fort keep carriages for hire, and they have neither sufficient space nor care for cleanliness to prevent the accumulation of filth. No nuisance is observed from wind blowing over the native dwellings, except sometimes at Slave Island, near the Ceylon rifle barracks. This nuisance might be prevented by police regulations and opening out the streets of the bazaar. 20. Cattle and other animals are slaughtered in the pettah, about one mile from the fort. Slaughter-houses approved of by Government are under the surveillance of the police. No nuisance is experienced from their condition. The regulation in force is Ordinance No. 14 of 1859. There are licensed butchers. The cattle, before being killed, are exposed to public view for 24 hours; but when troops are marching cattle can be killed immediately on demand by the commissariat officer. The police can seize all unhealthy and diseased animals, and have them destroyed or otherwise disposed of. The offal is thrown into the sea. 21. The inquiry respecting the stabling or picketing of horses does not appear applicable to this station. 22. The governor's "mounted orderly" stables of cadjans are on the Galle Buck, a piece of open ground between the fort and the sea. A range of officers' stables (cabook walls, tiled roof, rail doors) is built in the fort, and the dung is cleared away once a week. It is at a distance from the soldier's barracks. The manure is taken to the sea, a few hundred yards from the fort. 23. The quarters for married non-commissioned officers and men are amply sufficient for the present strength of the garrison.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good. Some details of drainage, &c., are improvable. A new system of drainage is contemplated by the Colonial Government of Colombo.
IV. HEALTH OF THE TROOPS.	1. The district of which Colombo is the capital, and in which the station is situated, (called the Western Province), is considered the healthiest of maritime districts in the Island. 2. The diseases most prevalent among the natives are rheumatism, fever, and bowel complaints. The spleen does not often become diseased in Colombo. Cholera and small-pox do not visit the station as frequently as in former years. Measles and chicken-pox prevail nearly every year. A mild form of scarlatina is occasionally seen. Leprosy and elephantiasis are common. Beriberi is very rarely seen. 3. The causes of so much fever, bowel complaint, and rheumatism are the hot and moist state of the atmosphere, and the presence of malaria in it. Natives are also, from their general debility and poorness of living, more susceptible than Europeans to fevers. 4. The troops at this station came from England in good health—the 50th, after a stay of 10 months; the Royal Artillery, after about 18 months. With the exception of the two companies of Europeans recently arrived from Trincomalee, the European troops have been stationed in Colombo since their arrival in the colony—the Royal Artillery since November 1858, the 50th since October 1857. The diseases from which they have chiefly suffered since their arrival are liver complaints, dysentery, and fever. There is no perceptible difference in the healthiness of the different portions of the men's accommodation. 5. The troops are not camped out except in case of epidemic, &c. 6. The medical member of the board has been in charge of troops at the hill stations of Newera Ellia, and Kandy, and Badulla, and considers that better health is enjoyed there by the troops than at Colombo.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	7. We have not had many opportunities of making observations whether the troops resident for some time on hill stations are more or less liable to disease on returning to the plains, as very few men are stationed at a time at Newera Ellia. But it would appear from the present healthy state of the 50th detachment at Trincomalee, which went there after a residence of two years in Kandy, that they are less liable to fevers than the men who had long resided at Trincomalee. This immunity from the usual frequency of disease is, in our opinion, to be attributed to acclimatization, and the less debilitating effects of the climate of Kandy; the above-mentioned detachment having been moved to Kandy immediately on its arrival in Ceylon, whereas the detachment of the 50th, recently removed from Trincomalee, was sent there direct from England. 8. We approve of selecting hill stations for troops. 9. There are no diseases peculiar to hill stations. 10. The men, while at hill stations, should be supplied with extra blankets and warmer clothing, and abundant means of recreation and out-door amusements provided for them. 11. The dry season at Newera Ellia is preferable for invalids, but to the healthy any period of the year is equally good, if they will avoid exposure to the wet. Four months is the shortest period in which men merely debilitated would obtain the full benefit of a residence on the hills, and eight months or a year would be necessary for those with organic diseases. 12. We cannot speak from experience whether there is any period of residence beyond which injury to health is likely to be inflicted, but we presume that men who have been long accustomed (more than one or two years) to breathe, at an elevation of 6,000 feet, a more rarefied and colder air, are likely to suffer from pulmonary and hepatic congestions if they are brought down suddenly into the hot plains. But as Ceylon affords places for stations at various elevations, troops need not be removed at once from the highest to the lowest post. 13. No special precautions have hitherto been used on returning to the plains, and none seem necessary except greater temperance. 14. It in some measure depends on the height of the hill whether it would be desirable for health to locate troops on hill stations, with short periods of service in the plains. At moderate elevations, such as Kandy, we think residence there, with occasional change to the plains, the preferable alternative. Frequent change of station on the plains is considered beneficial. 15. The site of the former hospital (lately burnt down) and that of the present barrack at the hill station of Newera Ellia appear objectionable, and the accommodation insufficient. At Mount Lavinia, the former invalid quarter for four officers has latterly been occupied by detachments at rifle practice, leaving none available, a deficiency greatly felt. 16. The general opinion appears to point out a range of elevation from 3,000 to 4,000 feet as the best. 17. Mount Lavinia, before mentioned, might advantageously be occupied as a hill station. 18. A sandy or gravelly surface, with a clay subsoil, appears to be less healthy than a loamy soil covered with vegetation. 19. From 20 to 25 years is the best age for soldiers proceeding to Ceylon, and July and August are the best months for landing there. On first landing, the troops go into barracks, and are clothed in white cotton, with white covers to their forage caps, wearing cloth clothing in wet weather and at night. They take the usual duties of garrison and drill, but do not march out in marching order. The precautions necessary are attention to diet and temperance, and to avoid exposure to the sun, also to send recruits to Kandy on landing in Ceylon. 20. Troops might be sent direct from home depôts to Ceylon, as Kandy would answer for an intermediate station. They should be sent to hill stations on landing, and gradually accustomed to the climate. 21. In Ceylon troops proceeding from the port to the interior march 10 or 12 miles in the early morning, and are accommodated at most of the halting places in Government rest houses, and at others in tents, which is objectionable. Permanent cover ought to be provided. 22. I consider, on the average, that six years should be the term of a soldier's service in Ceylon. 23. As regards invaliding, the principal medical officer in Ceylon decides, on the report of the medical officer in immediate charge, without the intervention of a board, except in case of officers. 24. Invalids should leave Ceylon for home in January.
Diseases.	1. There are weekly inspection parades for the discovery of disease. 2. Scurvy or scorbutic diseases are rarely seen in Ceylon. A few cases have occurred at Trincomalee. They are to be attributed to a want of vegetable food, of which a proper proportion is required, but not always procurable. 3. The proportion of cases of hepatic disease amongst European troops is as 35 per 1,000 to total admissions. For native troops, 3·8 per 1,000. This disease is caused by the climate and the immoderate use of ardent spirits. It is sometimes the sequel or concomitant of fever and dysentery. The men should be cautioned to drink spirits watered, and in the cool of the evening, and not to expose themselves to solar influence or chills. 4. The only cases of dracunculus which have come under observation are the few occurring in natives of India who come over to Ceylon. No case is on record as occurring in a native of Ceylon or in a European. 5. The proportion of venereal cases to the total sick from all other diseases is very small indeed, viz., average one in 6 admissions from all diseases. It would be advantageous to the health of the army to establish lock hospitals in Ceylon.

COLOMBO. CEYLON.

References to Subjects and Queries.	REPLIES.
Diseases—*cont.*	6. The troops suffer chiefly from endemic diseases, viz., fevers of the remittent and intermittent types, of which, however, few die, since quinine is liberally administered. Dysentery is the most fatal of endemic diseases, although the mortality from it is considerably reduced since phlebotomy and mercurial ptyalism have become the exception and not the rule. Cholera seldom visits this station, and troops suffer very little from it of late years. Small-pox rarely affects the troops, even when prevailing among the native inhabitants. Rheumatism is very prevalent, but very few deaths occur from it. The proportion of admissions and deaths is given in the following table :—

—	Europeans.				Natives.			
	Admissions.	Deaths.	Proportion of Admissions from these Diseases to Total Admissions per 1,000.	Proportion of Deaths from these Diseases to Total Deaths per 1,000.	Admissions.	Deaths.	Proportion of Admissions from these Diseases to Total Admissions per 1,000.	Proportion of Deaths from these Diseases to Total Deaths per 1,000.
Fevers - - -	1,438	13	182·4	92·2	1,025	11	189·6	97·3
Hepatitis - - -	277	9	35·1	63·8	21	1	3·8	8·7
Dysentery - -	398	40	50·5	283·6	126	21	21·4	186·5
Rheumatism - -	238	2	30·1	14·1	327	5	60·4	45·1
Cholera - - -	20	10	2·5	70·9	46	25	8·5	221·2
Small Pox - -	2	—	·2	—	58	4	10·7	·5

Average total strength - - 562	Average strength - - - 710
Total admissions—	Total admissions—
All diseases - - - - 7,881	All diseases - - - - 5,405
Total deaths - - - - 141	Total deaths - - - - 113
Average annual deaths per 1,000 strength - - - - - 24·9	Average annual deaths per 1,000 strength - - - - - 18·30

7. The more frequent zymotic diseases are catarrh, boil, diarrhœa, dysentery, dysentery with abscess in the liver, cholera, ague, remittent fever, and rheumatism. Catarrh and rheumatism are most prevalent in the intervals between the monsoons and in the rainy season. Boils generally prevail in the hot weather. Fever, diarrhœa, and cholera occur in any continued hot weather, followed by showers of rain; dysentery generally in wet weather. A form of dysentery, with marked remittent fever, prevails usually in the hot weather succeeding a rainy season. The sanitary condition of the bazaar and native dwellings is very defective. They are very dirty, the drainage generally very imperfect, open drains, and large cess-pits. Ventilation is imperfect, from a deficiency of doors and windows—the latter seldom seen in opposite sides of the house or hut. The zymotic class of diseases generally prevails in the more crowded and unclean part of the native town and bazaars. The habits of the natives make them particularly liable to attacks of fever, diarrhœa, and cholera.
8. The prevalence of epidemic diseases is not materially influenced by the nature of the soldier's duties and occupations.
9. Quinine has not been used as a prophylactic, except in individual cases, where it has proved successful in warding off attacks of fever and dysentery.
10. We think that if the soldier could always have a cup of coffee or tea (as is the case with the 50th Regiment), on rising from his bed in the morning, and before he goes on any duty, it would have a salutary effect. Means should also be within his reach, when on guard, to have some drinks of this kind before he goes on guard at night.

V. INTEMPERANCE.

1. There is not more intemperance at Colombo than elsewhere where British troops are stationed. The native troops are rarely under the influence of alcohol, but frequently under that of opium. In European troops the number of confirmed drunkards is about 5 per cent. Of confirmed opium eaters the average is 20 per cent.
2. The regimental hospital records at this station do not enable us to state the proportions of admissions to hospitals caused directly or indirectly by intemperance. Drunkenness is always punished as an offence, more or less according to the circumstances of the case.
3. Distilled spirits are sold both at the canteen and bazaar. There are numerous shops for the sale of spirits everywhere. The quality of the liquor sold in the canteen is good; the bazaar liquor is very inferior, the probable amount drank is about three drams per man. Two drams of arrack per man is part of the ration in Ceylon; it is good, and the soldier cannot draw this till noon. The soldiers do not draw the spirit part of rations, as they would be obliged to drink it diluted. They are in the habit of taking a dram early if they can get it. Early drinking is most hurtful. Convalescents get the same ration as other men in barracks. There are no drinks sold at the canteen except spirits and beer, but in the bazaar they get toddy, badly made ginger beer, and lemonade.
4. The consumption of spirits is generally injurious to health, and is not conducive to the discipline or efficiency of troops.
5. It might be injurious to restrict or abolish the use of spirits as rations or the sale in the canteens, for the troops would have no difficulty in procuring worse liquor in the bazaars, which are not under military control in Ceylon.
6. Sickness and mortality appear to have diminished since the introduction of malt liquors.
7. Coffee, tea, lemonade, &c., are not much used at this station. We consider that a moderate proportion of spirits, such as the ration, and of malt liquor, used as well as coffee, tea, &c., would not influence health, efficiency, and discipline prejudicially.
8. With troops accustomed to the use of spirits previous to arrival at Ceylon, it does not seem desirable to suppress the issue, but otherwise beer, tea, or coffee appear preferable.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	9. We should think it not beneficial to prohibit the sale of spirits for the reasons already assigned. 10. We would recommend that the canteens be let to civilians under proper and stringent rules and conditions to secure good liquor being supplied. We would place no restriction on the amount of liquor a man might have, because we feel satisfied that if a soldier cannot get good liquor close to his barracks he will go a long way off for bad. 11. The canteen regulations are attached, and appear to be well obeyed.
VI. Diet.	1. The composition of the ration for European troops is beef, bread, rice, tea, coffee, sugar, and salt. The quantities are beef 1½ lb., bread 1 lb., rice ¼ pint, tea ¼ oz., coffee 1½ oz., sugar 1½ oz., salt 1 oz., salt meat once a month 1 lb. The quartermaster of the regiment and an orderly officer inspect the rations daily. 2. The ration does not include any fruit or vegetable; the stoppage is 3½*d.* per day, but the men pay extra for sweet potatoes, yams, and onions. The soldier has three meals a day, breakfast at ½ past 7, dinner at 1, tea at 5 or 6 P.M. For breakfast he has bread, tea, or coffee, and a little meat or eggs. Dinner, beef, bread, rice, soup, curry, and vegetables when procurable. For tea, tea and bread. 3. We would strongly recommend potatoes and Bombay onions occasionally as an improvement in the ration. A sentry is placed at the cookhouse of each company to prevent the rations being taken away except for the use of the soldiers. 4. The means of cooking is in iron pots, frying pans, and kettles and earthen chatties. Wood is always used for firing. The kitchens are not kept very clean; it is most difficult to make natives cook with cleanliness. No soldiers cook in the kitchens, which are open sheds; the water is close at hand and plentiful. The meat is boiled, stewed, or fried. The cooking is at all times inferior; tea and coffee are made well enough. The men have coffee every morning before a march. 5. Gardens could not be established near the station with advantage.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a cloth tunic, chako, serge trousers, leather or mohair stock, woollen or cotton socks, cotton shirts, cotton jacket and trousers, forage cap and white cover, red shell jacket, and the usual accoutrements of an infantry soldier. The native troops do not wear covers to their caps. The dress is not quite suitable for the climate, and might be improved upon. The soldier should be clothed as loosely as possible, and we would suggest the adoption of the Indian drab clothing for troops in Ceylon. The chako might be done away with, and stock should be totally discontinued. It is never required, either by day or night, at any time of the year, and is most oppressive and uncomfortable to every one who wears it. This climate does not suit patent leather. A felt helmet would be desirable as a protection from the sun. Each soldier ought to have three fine flannel shirts in possession. Soldiers are careless about their health, and cotton shirts do not sufficiently protect them from the draughts of air and the chills they are subject to. The men mount guard in white clothing, and from tattoo till relief of guards in the morning they wear shell jackets and serge trousers and great coats. They wear this last dress also by day in very wet weather. The sentries are protected by verandahs, sentry boxes, and sheds, but the protection in general is indifferent, especially from the sun.
Duties.	1. It would certainly be advisable to send out well-drilled men from home. 2. The usual routine consists of guards and pickets, and now and again fatigues for a short time. Drills are two or three times a week, sometimes from 5¾ to 6¾ A.M., or from 5½ to 6½ P.M. The men do not suffer in health from such drills; the greater number are the better for the exercise. The best hours for drills are from ¼ to 6 to 7 A.M., and from 5½ to ¼ to 7 P.M. Marches should be commenced about 4 A.M. There is a general order that no soldiers are to leave barracks without a pass from 7½ A.M. till 5 P.M. The European troops are scarcely ever exposed to the sun on duty. The men generally have four or five nights in bed during a week. 3. The guards mounted by Europeans are all in the fort of Colombo, the farthest from barracks is about ¼ of a mile. Guards are kept on for 24 hours. The native troops mount guard at the two jails about 1¾ and 2¼ miles from their barracks. There are roll calls daily at 6 A.M., 10 A.M., and at tattoo; none by night. Night duty is no doubt very fatiguing in this climate, and the weakly men cannot but suffer by it. No additional precaution can be taken to make it lighter. Men require six nights in bed
VIII Instruction and Recreation.	1. The means of recreation and instruction consist of a ball court, but which is uncovered and nearly useless, as the men are nearly always on parade at the hours it could be used; a skittle alley; the usual regimental school; a garrison library. The room is a bad one, being dark and low and badly ventilated. There are no day rooms or clubs, soldiers' gardens, workshops, theatre, or gymnasia. There is not sufficient variety of amusement for the men, but in this climate it would be difficult to provide occupation for soldiers. Men are not allowed to be out of barracks, except on duty, between 7½ a.m. and 5 p.m., which is conducive to health. 2. As improvements, we would suggest the building of a larger and cooler room for a library, and a soldier's club room, and that the rooms should be well lighted; that a gymnasium and school of arms be established, a good cricket ground formed and kept in order for the men, and that bats, balls, &c. be supplied. The fives court should be put in proper order, and covered to protect the men from sun and rain. There is a large lake at Colombo, and a couple of good strong six-oared boats would be the means of much amusement and exercise to several men. 3. The institution of soldiers' savings banks is advantageous. 4. There is scarcely sufficient shade from trees or other means to enable the men to take exercise during the day.
IX. Military Prisons.	1. The sanitary state of the garrison provost prison and of its cells is good, but the site at the north gate of the fort is confined. The cells at the Amsterdam bastion admit of better ventilation. A garrison dry room appears necessary and additional cells. European prisoners suffer from want of meat diet, which cannot be furnished for the 6*d.* per day allowed.

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References to Subjects, and Queries.	REPLIES.
X. FIELD SERVICE.	1. There appear to be no local regulations for field medical service in Ceylon. 2. There has been little opportunity of judging of the effect of the late War Office medical regulations, but they appear amply sufficient to meet every requirement as regards the conduct of the line of march, of troops camping, billeting, &c. 3. See preceding paragraph. 4. The arrangements for field hospitals, transport of sick, &c., are agreeably to the Army Medical Regulations of 1859 and General Orders of 25th October 1815, para. 13, and 16th June 1860. (G.O. attached.)
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No forms have been received. The principal civil medical officer cannot supply the information required. Number of women and children of the 50th Regiment treated in Colombo from October 1857 to June 1860:—

—	Number of Cases treated.	Number of Deaths.
Women - - -	38	3
Children - - -	35	11

Annual average strength - - { Women - - 25; Children - - 40 }

Annual average deaths - - { Women - - 1; Children - - $3\frac{2}{3}$ }

There appear to be no statistical records at this station regarding the native population.

XII. HOSPITALS.

1. Plan.
2. The European hospital is 60 yards from the nearest barrack, and 24 feet from the nearest stable, which is private property. The native hospital is 50 yards from the nearest barrack, and 500 yards from the nearest stable. The houses of civilians in the fort form the opposite sides of the streets and lanes bounding the European hospital, except in the direction of the ramparts. The native military hospital stands apart on Slave Island, and the site is open and well ventilated. The site of the European hospital is perhaps one of the best in the fort, but being lower than the walls of the fort and other buildings it is not the best position. The drains are generally clean, but from the defective system of drainage in the fort, unpleasant odours are not unfrequently complained of. The banks of the lake left uncovered with water in the dry season appear objectionable in the case of the native hospital.
3. The water supply is good and wholesome.
4. The refuse water and other impurities are carried off by barrel drains. The outlet is in the canal, about 90 yards from the hospital, which being at times choked up, causes a regurgitation of effluvia in the latrines, sometimes so abundant as to diffuse itself in the verandahs and wards.
5. In the European hospital the lowest ward is about six inches above the surface of the yard, and two feet above the road outside. In the native hospital the lowest ward is about six inches above the ground. The floors are brick, and have no perflation of air beneath. The roof water at the European hospital is led by pipes into drains, of which there are none at the native hospital, as the ground slopes towards the lake. At the European hospital the gutters and drains are capacious and sufficient, but the outlet of the principal underground drain at the canal is occasionally choked with mud. The rain, however, is carried away rapidly at both hospitals. The hospital is built of brick, laterite blocks, and mortar, wooden beams and rafters, covered with ordinary tiles. The roof is single, and the walls single, but sufficiently thick. The wards of the European hospital are not all supplied with verandahs on both sides. There is, however, sufficient shelter from the sun's rays. The native hospital has verandahs on both sides. Their breadth is 8 ft. 8 in. The verandahs of the European hospital are 8 ft. 4 in. broad. The sick are not accommodated in the verandahs. The convalescents walk and lounge there, but their beds are in the wards. The hospital consists of but one flat.

EUROPEAN HOSPITAL.

Date of construction, 1770.—Total number of wards, 10.
Total regulation number of beds, 232.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length. ft.	in.	Breadth. ft.	in.	Height. ft.	in.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor. ft.	in.	Windows. Number.	Height. ft.	in.	Width. ft.	in.
18 z. - -	6	12	0	32	0	22	0	8,448	1,408	64	1	8	1	4	3	4	3
18 y. - -	48	94	0	32	0	22	0	66,176	1,378	62	"		4 6	8 4	2 3	5 4	2 3
18 h. - -	16	29	0	23	0	22	0	14,674	917	41	"		1	8	2	5	2
18 c. - -	14	29	0	23	0	22	0	14,674	1,048	47	"		2	8	2	5	2
18 b. - -	16	30	0	23	0	22	0	15,180	948	43	"		2	8	2	5	2
18 a. - -	12	23	0	23	0	22	0	11,638	969	44	"		1 2	8 4	2 3	5 4	2 3
18 o. - -	44	87	6	23	0	22	0	44,275	1,006	45	"		6 5	8 4	2 3	5 4	3 3
18 r. - -	26	51	0	19	0	21	0	20,349	782	37	"		3 2	8 4	2 6	5 3	2 4
18 k. - -	38	75	0	23	0	22	0	37,950	998	45	"		6 3	8 4	2 3	5 4	2 3
	12	23	0	23	0	22	0	11,638	969	44	"		1 1	8 4	2 3	5 4	2 3

NATIVE HOSPITAL.

Date of construction, about 1815 and 1859.—Total number of wards, Total regulation number of beds, 50.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.						ft. in.	ft. in.
No. 1 l. - -	12	32 0	21 0	14 4	9,632	802	56	From 1ft. 3in.	6	3 9	4 6
No. 1 b. - -	2	14 0	21 3	13 6	4,016	2,008	149	to	1	3 9	4 6
No. 1 a. - -	36	83 6	21 3	13 6	23,956	665	49	1ft. 10in.	8	3 9	4 6

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The European hospital does not receive the full benefit of the prevailing winds, but the native hospital does. The windows open on both sides, but on one side the windows are placed from 8 to 11 feet above the floor, near the roof. This is unavoidable. Some glass windows would be an improvement to the native hospital. 6. There are many windows, and the wards are lofty, but improvements might be made in the ventilation. There are no jalousies or jhilmils. 7. No means of cooling the air admitted into the wards. 8. There are no means of warming. Ceilings and walls of wards are cleansed and white-washed frequently, whenever necessary. 9. The privies in the European hospital are so situated as to be reached under shelter, but their position might be improved. The privy of the Malay hospital is detached, and a covered way to it is desirable. The sketch attached is that of the last built privies and bath rooms. The soil is carried into the large drain of the fort, and thence into the canal. The other privies' soil passes by a drain into a cesspool in the hospital square. It is emptied when required. 10. There are baths and a lavatory sufficient for the sick in the European hospital. 11. The warm and cold baths in the European hospital are sufficient and convenient. Bathing at the native hospital is performed in tubs or in the lake. 12. The washing is performed by dhobies, or washermen, outside the hospital, and is sufficient. 13. The storage is sufficient and dry. 14. The bedsteads are of iron with canvass bottoms, coir mattresses, blankets, sheets, cotton coverlets, and cotton pillows. 15. There are two kitchens in the European hospital adjoining each other, situated at one end of the quadrangle next the store room and near one ward. The native hospital has a small kitchen in an isolated position opposite the large ward. The cooking apparatus are iron boilers, small pans, and earthen vessels, and an oven. The cooks being indifferent, the broths, puddings, &c., are not of the best quality. The new scale of diets is in use, which is sufficiently varied. The native hospital is non-dieted. 16. The diet tables, diet rolls, and all returns in use are those found in the new regulations for army hospitals. 17. For the additional labour required for the working of the new and admirable system, the present hospital staff of serjeants and orderlies is insufficient. A steward and wardmaster, dispenser, and well-trained orderlies are absolutely necessary, and have been applied for by the principal medical officer. The native coolies are not allowed to attend the sick, nor is it desirable. The present allowance of 18*s*. per mensem for a cook cannot secure the services of even a tolerable one. 18. The sanitary condition of the hospitals is very fair. Convalescence is, however, often long and tedious. No epidemic diseases have ever appeared in the wards. 19. The privies of the European hospital are too near the wards; the south-west wind blows the effluvia from one of the privies into one of the wards. The lower parts of the wards might be better ventilated by perflation. Great sanitary improvements can be effected by giving a second story to the European hospital, at least, to one ward of it (which would, however, be thus deprived of the shelter of the ramparts), so that the patients, particularly convalescents, might enjoy the sight of the sea and adjoining scenery. A broad verandah on the eastern side of the large ward would also be an improvement, and enclosing in front of it a portion of the green in the hospital square. 20. The European convalescents walk in the verandahs, and on a small green opposite the front entrance of their hospital. They see nothing but the walls of the hospital, and a few trees and grass. Seats are set apart. A pallisade or wall is required round the native hospital premises, where now the patients walk on the verandah near the high road, and has been applied for by the regimental surgeon. 21. The women and children are treated in their own rooms in barracks. The arrangements are satisfactory for the present strength of Europeans. Very few native women and children seek European medical advice from regimental surgeons. As their offspring supply the ranks of the Ceylon rifles, it is very desirable that a skilled native doctor be attached, as in India, to at least the head-quarters of the Ceylon rifle corps, so as to prevent the children from suffering from native quackery, and proving inefficient recruits hereafter. 22. There are no special hospital regulations in Ceylon, not included in the new regulations for the management of army hospitals. 23. The hospital buildings not being in charge of the purveyor to the forces, the medical officers have to report to the staff officer all repairs required, which are generally effected (if small) expeditiously. But as delays occasionally occur, under a system of obtaining the sanction of the Colonial Government to estimates, it would be desirable to give to the staff officer, or purveyor, some discretionary power in urgent cases, such as emptying privies, &c. The medical officers have ample powers as regards diets.

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	24. There are no convalescent wards; such an accommodation would be advantageous, particularly if it were situated at Mount Lavinia, or any place outside the walls of the fort.
XIII. BURIAL OF THE DEAD.	1. The burial-ground used by the European troops is outside the fort, about 330 yards from the nearest barrack. It is not in the direct influence of the prevailing winds. The native troops are buried in graveyards attached to their respective places of worship, which are distant from the barracks. 2. The area is two acres, one rood, 16 perches. The subsoil, clay and sand. The drainage is generally good; some part of it is under water when the lake overflows. Decomposition takes place rapidly. The ground is fenced round, and is properly kept. 3. There do not appear to be any fixed rules in regard to space of burials, but four feet intervals seem the average. The depth of graves is about six feet, and they are sometimes reopened after about two years have elapsed, when decomposition has taken place, but this does not occur when tombstones are erected. There is no compulsory rule as to the time of interment, but European soldiers are usually buried in 12 or 18 hours after death, and little or no difference is observed during epidemics. Of the native troops, the Mahommedans bury within six hours, the Hindoos within 12, and the Caffrees, being Christians, within 24 hours after death. 4. The graveyard is never known to be offensive. The usual forms of a military funeral are gone through in the case of European troops, the coffin being conveyed to the burial-ground in a wheel carriage. 5. The camp followers and bazaar people are buried like other natives, far from the European burial-ground. 6. No apparent injury to health results from the present practice, but the Dutch burial-ground nearest the fort being replete with corpses, might be closed with advantage. 7. During epidemics it would be desirable to inter the bodies in quick lime, and an ornamental cemetery for Europeans at a greater distance from the fort in the cinnamon gardens would be an improvement.

(Signed) C. WILKINSON, Colonel Commanding, Royal Engineer and Commandant.
RICHARD WADDY, Lieut.-Col. 50th Regiment.
E. F. KELAART, M.D., Staff Surgeon.

23rd July 1860.

KANDY.

Accommodation	Queen's Troops	Artillery	21.
		Infantry	486.
	Native Troops	Artillery	32.
		Infantry	374.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the surrounding country is represented by a chain of hills, which rise round the whole of Kandy to heights ranging from 300 to 1,500 feet. There is not very much wood in the vicinity of the town, but the sides of the hills are, as a general rule, covered with low thick jungle, or planted out in coffee, with clumps of cocoa-nut palms interspersed. A large body of water occupies part of the space lying between the base of the hills. This lake is fed by small streams running from the hills, and the height of water in it is regulated by a sluice or spill water at one end. In addition to this lake a large river (the Mahaville Gunge) runs a tortuous course, encircling the immediate vicinity of Kandy. 2. The station is elevated 1,678 feet above the sea, but, on account of the hills before mentioned, it is considerably under rather than above that of the adjacent country. Its elevation above the lake is only a few feet. There is a great deal of more elevated ground in the vicinity, which it is presumed would be more healthy, but in addition to its very uneven nature, it is thought it would not be suitable for the location of troops, on account of the distance that would intervene between them, and such important colonial buildings, as the Cutcherry, Treasury, &c., which could hardly be transferred from the present position. 3. The nearest mountain is about two miles from the station, and is about 1,500 feet above the level of Kandy. There is no table land. 4. The lake before mentioned is the nearest water; it is about half a mile from the European, and one-eighth of a mile from the Ceylon rifle barracks. There is no overflow of water. In the rear of the Ceylon rifle barracks there is a large piece of ground, formerly the bed of a lake; it was drained some years since, and does not now appear to affect the health of the troops quartered near it. 5. The station, from being surrounded with hills, cannot be said to be freely exposed to the winds, viz., the north-east and south-west monsoons. The buildings, however, are not exposed to reflected sun heat. The winds are not cold, and have a beneficial effect on health. 6. The surrounding country varies very much with regard to cultivation. A good deal of land has been cleared within the last few years, and planted in coffee, but still it is thought the uncultivated is in higher proportion than the cultivated ground. There are no works of irrigation near the station, with the exception of the native paddy or rice fields, which are within a quarter of a mile of the rifle barracks, but are not sufficiently extensive to interfere with the health of the troops. There is no prohibition to the cultivation of rice within certain limits. Indigo, flax, and hemp are not grown near the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	7. The town of Kandy, which adjoins the station, contains a population of 11,500 souls.
	8. The general geological structure of the district is of the primary order, the surface consisting of decomposed gneiss; limestone rock (dolomite) is found within two miles. The town of Kandy is of many years standing, but the European and rifle barracks occupy, it is thought, new ground.
	9. Water is found during the dry season at a depth of 45 feet below the surface, and at 30 feet deep during the rainy season.
	10. The rain-fall flows readily away. The station being encompassed with hills is liable to a certain amount of water from the hills passing into the subsoil, but not injuriously to health.
	11. The European troops get their drinking water from a spring, which is first led into a reservoir, and conducted thence to filters near the barracks. The men of the Ceylon rifle regiment are supplied from a well near their parade. The water is not stored in open tanks.
	12. The station is well supplied with water, except during unusually hot weather. Its colour, taste, and smell are all good. The well water contains a little muriate of lime, magnesa and carbonate of soda; the running water contains a greater proportion of the soluible carbonates. The water is filtered at the European barracks. The lake water contains a greater proportion of the carbonates, with a slight admixture of organic matter from vegetable decay. It is good for washing purposes. At the European barracks the water is raised by hand and taken where required, but it has lately been proposed that the water for washing should be laid on to the different ablution rooms, and it is very desirable that this necessary service for the comfort and convenience of the troops should be carried out early.
	13. There are no other topographical points to advert to.
	14. No new stations have been selected in Ceylon for many years, but it is suggested, when any are required, that a board of officers, consisting of a military, a medical, and an engineer officer, should always be assembled to report on the various advantages, drawbacks, &c., that may present themselves.
II. Climate.	1. There are no means or instruments available at the station for meteorological observations.
	2. The Board transmit the only tables they have been able to obtain, which are, however, far from being perfect. The observations were made at Peradenia, four miles from Kandy, 1,650 feet above the sea.

Climate from 1851 to 1858 inclusive.

From Analysis of the Climate at Peradenia (4 miles from Kandy), 1,650 feet above the Sea.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Remarks as to Clouds, Dew, Wind, Storms, &c.
January - -	74·06	85·0	52·5	4·04	Fine; sunny; heavy dew at night; hot days, cold nights and mornings.
February - -	75·76	87·75	55·0	1·625	Fine; sunny; dewy nights, foggy mornings; days hot.
March - -	77·42	89·5	59·5	3·669	Generally a very hot and oppressive month.
April - -	77·91	89·5	67·5	7·759	Sultry, showery, and oppressive weather.
May - -	77·7	88·	66·0	8·022	Cloudy, windy, rainy; monsoon generally changes.
June - -	76·69	86·0	71·0	7·155	A very wet and stormy month.
July - -	75·64	83·5	67·0	5·72	Do. Do.
August - -	75·81	85·5	67·0	8·55	Showery, but sometimes more moderate; variable.
September -	76·13	86·5	67·0	6·318	Pretty dry weather compared with next two months.
October - -	75·1	85·75	68·2	15·46	Wind variable; much rain.
November - -	74·79	84·0	62·0	14·73	Wind variable; storms from all parts of compass; wet; monsoon generally changes.
December - -	74·05	82·75	57·0	7·72	Sometimes wet, but generally more moderate; towards end of year like January weather.

Mean Yearly Temperature, 75·92°. Mean Yearly Rain-fall, 90·75 inches nearly.

3. The climate of the station is very healthy. From January to May it may be considered hot and dry, and from June to December moist. There is a good deal of variation of temperature between day and night, which is very perceptible in the months of February and March. Towards the close of the year thick fogs arise in the early morning, which, however, are invariably dispersed by eight o'clock. There is no tree planting, canal irrigation, or irrigation of any kind to influence the climate and the air is free from dust. For a tropical climate the troops are healthy, and no unusual precautions are required, with the exception of avoiding extremes of heat, cold, and moisture. The same may be said of diet. The drills, duties, &c., take place in the early morning and evening, and no particular precautions are deemed necessary. The month of May is generally the most unhealthy at this station, and the

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	months of the monsoon the most healthy. The prevailing diseases in May are fevers, cholera, bowel complaints, ophthalmia, and occasionally small-pox among the natives. 4. We have no acquaintance with any healthier district near than that of the station. 5. One of the members of this board has served at Trincomalee (another station in Ceylon), which he considers much hotter and conducive to liver complaints.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A map of the adjacent country, with plans of the station and barracks, are transmitted.

4. TABLE OF BARRACK ACCOMMODATION.

Total regulation number of non-commissioned officers and men, 913.

	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height. To wall plate.	Height. Additional to ridge.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
			ft.in.	ft.in.	ft. in.	ft. in.				ft. in.		ft.in.	ft.in.
European barracks.	No. 1 - - -	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	4	3 6	3 0
	Do. - - -	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	3	3 6	3 0
	No. 2 - - -	60	136 0	17 0	12 2	6 6	35,836	597	38	1 8	8	3 6	3 0
	No. 3 - - -	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	4	3 6	3 0
	Do. - - -	14	34 0	16 0	11 9	6 4	8,160	583	38	1 8	2	3 6	3 0
	No. 4 - - -	80	165 0	20 6	11 6	6 6	49,884	623	42	1 8	12 4	5 0 4 0	4 0 2 0
	No. 5 - - -	80	139 3	19 3	13 9	8 2	47,801	597	33	1 8	18	6 0	4 0
	No. 6, ground floor -	76	151 0	19 4	13 6	—	39,406	518	38	1 7	20	5 0	4 0
	Do. first floor - -	78	153 0	20 6	13 9	8 0	55,664	713	40	1 8	20	5 0	4 0
	Royal Artillery barrack	20	38 6	26 3	12 9	9 8	15,794	789	50	1 7	8 4	6 0 2 0	4 0 4 0
	Gun Lascar lines -	24	133 8	28 0	8 10	8 2	37,440	1,560	120	—	None.		
Ceylon Rifle barracks.	No. 1. Family barrack -	42	223 0	27 0	7 0	8 6	60,390	1,437	127	—	"		
	No. 2. Do. and single -	21 married 81 single	238 0 233 0	12 2 12 2	8 0	7 3	34,480	1,449 425	127 35	— —	"		
	No. 3. Do. do. -	10 married 36 single	112 0 110 0	12 2 12 2	8 2	6 4	15,714	436	127 37	— 1 7	" 2	3 6	4 6
	No. 4. Single men -	56	134 0	18 0	11 6	7 6	36,783	646	43	1 7	16	4 0	3 0
	No. 5. Family barrack -	24	134 0	27 0	8 4	6 6	—	1,449	126	—	None.		
	No. 6. Do. -	18	134 0	27 0	8 4	6 6	—	1,449	126	—	"		
	No. 7. Do. -	18	100 6	27 0	8 4	6 6	—	1,449	126	—	"		
	No. 8. Do. -	24	100 3	27 0	8 4	6 6	—	1,449	126	—	"		
	Castle Hill barrack (single men.)	36	73 6	21 6	8 6	9 3	21,540	598	43	1 7	7	2 6	2 0
Guard rooms.	European barrack -	15	20 4	30 8	11 6	6 0	7,476	519	41	1 7	2 2 2	4 0 3 0 3 0	3 0 3 0 1 6
	Ceylon rifle - -	22	40 6	24 0	10 9	9 0	14,823	673	44	1 7	4 3	6 0 2 0	4 0 4 0
	Hospital - - -	4	60 0	11 6	14 3		9,832	2,458	230	1 7	4	4 6	3 0
	Magazine - -	4	15 3	9 6	11 0	5 6	1,991	498	36	1 7	2 2	2 0 3 0	1 4 2 2
	Cutcherry - -	14	38 4	12 0	13 0	5 0	8,050	575	32	1 7	2	3 7	2 6
	Royal Artillery barrack	4	16 9	9 0	8 6	9 3	1,950	487	37	1 7	2	2 0	3 0
	Pavilion gate - -	7	17 9	17 0	12 0		3,621	517	43	1 7	3	5 0	3 0
					To coping of arch.	To top of arch.							
	Twenty prison cells in two stories.	Ground floor 1 First floor 1	12 0 13 0	6 6 6 6	10 6 10 6	12 8 12 8	1,057 976	1,057 976	84½ 76	1 7 1 7	2 2	2 0 2 0	1 6 1 6

5. The windows are on opposite sides of the barracks, hung so as to allow them to open to the full space of the window. There are verandahs, generally about eight feet wide, on both sides of the barracks, but they are never occupied as sleeping quarters by soldiers or other persons. There are no jalousies in the soldiers' barracks.

6. The majority of soldiers' cots are of wood (6 ft. 2 in. by 2 ft. 6 in.); a few are of iron; but the men prefer the former as more convenient during the day, and allowing the men to repose with greater ease. The bedding consists of a coir mattress, two blankets, four sheets, a rug, a mat, and a coir pillow. No improvement can be suggested.

7. Troops are not encamped at this station.

8. The windows, doors, and openings in the wall near the wall-plate afford the principal means of ventilation. The ventilation is sufficient in the barrack occupied by European soldiers, but more is required for the Ceylon Rifles. No means are provided for cooling the air of barrack rooms at this station.

9. The barracks are built of brick, and wattle and daub, with brick pillars; the roof is covered with flat or half round tiles. There are no tents or huts in use.

10. The floors of the European, and the last constructed barrack for the Ceylon Rifle regiment, are of bricks; the rest of the Ceylon Rifle barrack floors are beaten earth.

11. The materials used in the construction of the buildings appear suitable for the climate, and no improvement can be suggested. Barrack repairs are executed by the

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	Royal Engineer department, and within reasonable time. There is no special sanitary officer. The walls and ceilings of barracks are cleansed and whitewashed at no regular interval, but a sufficient quantity of lime is allowed to the troops for this purpose.
	12. The wash-houses for the European soldiers are faulty in construction, and too limited as to space. There are six of them at the European, one at the Royal Artillery barracks, and none at the Ceylon Rifle lines. These buildings are too narrow, and no one wash-house provides sufficient accommodation for the barrack to which it is attached Round the inside walls runs a brick platform for holding the small hand tubs. A large cask, containing the water for washing purposes, and bathing tubs, are crowded into the internal space. Two coolies attached to the pioneer department are allowed to each company to fill the tubs with water. The floor of the wash-houses is sloped to the centre, and an underground drain conveys away the water.
	13. The cook-houses for European soldiers are made in the native fashion. A raised brick platform against one wall acts as a hearth, on which are placed the culinary utensils, consisting of pots for boiling, and frying-pans; but there are no ovens. At the Ceylon Rifle barracks there are no cook-houses. The single men mess with the married, who are obliged to cook their food in their small dwelling-rooms and verandahs. Water is brought by the native cooks. A surface drain carries off the refuse water. All washing for the troops is done by native dhobies, away from the barracks.
	14. The privy at the European barrack is built over a cess-pit, and the soil is emptied by natives, on contract, into pits dug to receive it. As the Royal Artillery barracks are built on the side of a hill, a shallow pit receives the soil, where it remains till washed away into the jungle by surface drainage which is led into it. The privy for soldiers of the Ceylon Rifle regiment is built over a running stream, which carries away the soil. Open brickwork on the level of the ground and in the gables, together with the absence of doors, afford the means of ventilation.
	15. In the barrack rooms 1½ gills of oil are allowed to every 25 men, and half an ounce of cotton thread, every month, and the same for every excess of 13 men or more. Street lamps at convenient distances give light near the barracks.
	16. A brick barrel drain, three feet in diameter, leads from the barracks into the town drainage, and surface drains lead into this from the urinal, kitchen, wash-houses, and different parts of the barracks. The distance from the barracks to the town sewer is about 120 yards. The drainage is sufficient for all purposes. No part of the barracks or hospitals is damp.
	17. The ground near the barracks is kept cleaned by fatigue parties. The police keep the streets of the town clear by means of daily prison labour, and the refuse is carted away and burnt or buried.
	18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., to interfere with ventilation.
	19. There is no regimental bazaar, but the town of Kandy is under a civil sanitary board. The drainage and ventilation are good. The water supply is from the lake and wells, and the town is kept clean. There are some public latrines. Local ordinances empower the police to impose fines and other punishment upon individuals who neglect private cleanliness, and prisoners sweep the town daily. The existing arrangements are ample. The native houses or huts are good, and no dung-heaps are allowed. No nuisance is experienced in barracks from wind blowing over native houses.
	20. The slaughtering-houses are situate about 1½ miles from the barracks. A civil ordinance regulates their distance from the town, and provides for cleanliness, &c. The offal, &c., is carried off by a running stream.
	21, 22. There are no bazaar horses, stables, or picketing grounds at the station.
	23. For married non-commissioned officers there is sufficient accommodation. None is provided for the married private soldier, which is owing to the barracks being at present unoccupied. Sufficient separate rooms are found for them.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good, as far as the surrounding ground is concerned. An exception to this is No. 33 officers' quarter, which is too near the native buildings, with their objectionable adjuncts. The condition of some of the quarters is under consideration. As a rule, being in most cases detached bungalows, they are on too limited a scale. The sleeping apartments should be larger and loftier, and convenient bath-rooms should be added.
IV. Health of the Troops.	1. The station, district, and adjoining native population are all healthy.
	2. The most prevalent diseases among the natives are fevers, bowel complaints, cholera, and small-pox occasionally, but the latter has been checked by the introduction of vaccination. There is no spleen disease.
	3. The healthiness of the natives we attribute to the comparative elevation of the district, the general cultivation of the country, the good drainage and cleanliness of the town, and the fact that the people are as a rule in very easy circumstances.
	4. The 50th regiment arrived in Ceylon in October 1857 from England, having previously served in the Crimea and India. The detachment of the regiment at present quartered in Kandy arrived from head-quarters, Colombo, in December 1859, the greater part of the men having been there since their debarkation. On arrival at this station they were in good health, and have not suffered since from tropical diseases. The three barracks at present unoccupied would in all probability be more unhealthy than the others, on account of their relative nearness and their limited width and height; and the board are strongly of opinion that on no account should these three barracks be occupied.

KANDY, CEYLON.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	5. The troops at the station are never camped out. 6. None of the committee have ever been in charge of troops at hill stations. 7. The troops from Newera Ellia, the only hill station in Ceylon, do not appear to be more liable to attacks of febrile and other diseases on coming down. The Kandian provinces are not unusually malarious. 8 to 16. No experience of hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. In this island the soil and subsoil (decomposed gneiss and granite) are sufficiently permeable to allow moisture to pass rapidly away, and therefore they are well adapted for human occupation. 19. Soldiers should proceed to India at the age of 20 years, and should land there during the months of October and November in all parts except the Madras coast, where the troops should land in September or January. On first landing in Ceylon barracks are available for the troops. The men continue to wear their sea kit until equipped with the light clothing of the country. Drills take place in the morning and evening, and the men take their usual tour of duty. When the 50th regiment landed, two companies marched to Kandy, one to Galle, and two proceeded by water to Trincomalee. All recruits should be provided with flannel shirts and light Indian clothing (khakee uniform and basket helmet). They should not be allowed to expose themselves to the sun, and have a moderate amount of drill and duty, and have sufficient and proper bedding for the specific climate to be found as at present provided. 20. Troops should be sent direct from the home depôts to India, and it is thought it would be better if the men of a regiment were kept together for the first year or so in order to get them accustomed to the ways of the country, new mode of life, &c., suitable spacious barracks with day-rooms, &c., being provided. 21. In Ceylon the troops march always in early morning to the interior. Tents are sent on and pitched at the several halting places. The men's packs are carried in bullock bandies. A steamer conveys the troops when sent by water. No additional precaution is required, as every comfort is provided for the soldier. 22. A British soldier should on no account serve in India longer than 10 years. (P.M.O. is of opinion this term might be extended to 15 years, in certain parts of India.) 23. No difficulty has been experienced at this station in reference to invaliding by medical boards. 24. Invalids departing for home should leave India so as to arrive in England in the summer.
Diseases.	1. There is a weekly inspection parade held for the discovery of incipient diseases among the troops. 2. There is no scorbutus or scorbutic disease among the troops at the station. 3. The cases of hepatic diseases under treatment were in 1855–6, one; 1856–7, five. In 1857–8 the returns were incomplete, but in 1858–9 two cases occurred, and for the remainder of 1859 the returns show a total of seven afflicted with this disease. Its occurrence is attributed to the tropical climate; it is often combined with dysentery. We have no special prophylactic measure to propose. 4. Dracunculus is not known here. 5. The proportion of cases of venereal diseases is 13 per cent. per annum. The only precaution in reference to them appears to be the sanctioned increase of marriage among soldiers. The establishment of lock hospitals is not considered desirable. 6. Fever occurs to a limited extent among the troops, in the intermittent, remittent, and continued types. Dysentery also occurs, but to a still less extent. Cholera occasionally appears, but there has been no case of small pox for years. A limited number of cases of rheumatism also occurs. The following Table shows the proportion of admissions to total admissions from the above diseases, and the proportions of deaths to total deaths :—

Total Admissions in 4 Years from all Diseases.	Admissions from	Proportion of Admissions.	Proportion of Deaths.
736	Fevers, 174 - -	23 per Cent.	1 in 736.
	Dysentery, 27 - -	3½ Do.	Do.
	Cholera, 5 - - -	6 per Mille.	Do.
	Small-pox - - -	—	—
	Rheumatism, 42 - -	5½ per Cent.	—

7. The zymotic diseases most prevalent are fevers, rheumatism, dysentery, venereal diseases, ophthalmia, and cholera; the first four appearing in the hot season, and the rest being diffused over the year. Cholera has appeared under various and uncertain climatic conditions, often in the month of May, after the first showers of the monsoon. The town of Kandy is not unhealthy, and epidemics have almost disappeared since an efficient system of drainage has been in force. No peculiar habits or conditions have been remarked among the troops or native population as predisposing to these diseases, but cholera and small-pox follow in the train of the immigrant coolies, and generally affect those who are badly fed and housed.
8. Epidemic disease at this station is not influenced by the nature of the soldiers' duties and occupations in the barrack or habits on the march or in the field.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	9. Quinine has not been tried as a prophylactic against malarial disease, the measure being hardly deemed necessary. 10. Epidemic disease is not rife enough at this station to call for any special precaution for its mitigation.
V. Intemperance.	1. The body of the men at this station are temperate, from 18 to 20 men only in the two companies stationed here being confirmed drunkards. 2. During the six months ending the 30th June 1860 there were 131 admissions into the European hospital; of these 105 occurred among 114 temperate men and 26 among 19 intemperate men. Among the latter eight admissions are traceable directly, and 18 indirectly to intemperance.

Return showing the Admissions and Diseases of 19 Men of the Detachment, 50th Regiment at Kandy, reported intemperate, from 1st January 1860 to 30th June 1860.

Class.	Order.	Diseases.	Admitted.	Remarks.
I.	1	Tonsillitis - - -	1	This table can only be given for a period of 6 months, as the last detachment carried away their records with them.
"	"	Febris Intermittens - -	1	
"	"	Do. Remittens - -	1	
"	"	Do. Continua - -	4	
"	"	Ophthalmia - - -	1	
"	"	Diarrhœa - - -	3	
"	"	Rheumatism - - -	2	
	2	Syphilis Primitiva - -	1	
III.	"	Bronchitis - - -	2	
"	"	Obstipatio - - -	1	
"	"	Phlegmon - - -	1	
"	"	Caries (Dentis) - -	1	
V.	"	Subluxatio - - -	1	
"	"	Contusio - - -	5	
"	"	Palpitatio - - -	1	
		Total -	26	

	Number of Admissions in 6 Months.
Abstinent men, none - - -	None.
Temperate men, 114 - - - -	105
Intemperate men, 19 - - - -	26

3. Arrack is sold at the canteen and in the town. The quality of that sold at the canteen is good, but that vended in the town is much adulterated. Some confirmed drunkards will drink 10 gills a day, obtained from various sources; the temperate men drink from 1 to 2 gills. Spirit is not given as a ration either in quarters or on the line of march, but the troops are allowed to draw one gill daily from the commissariat for 1*d.*, but this must be watered, and the men do not avail themselves of it. No spirits are issued at the canteen except between 5½ and 8 p.m. The men do not take a dram before morning parade. Spirit is never given as a ration to convalescents. No deleterious drinks other than intoxicating drinks are sold at the canteen.
4. Spirits are not injurious to health in moderation, nor do they then affect the efficiency of a corps or its internal discipline.
5. Spirituous liquors are not part of the ration at the station. It would be injudicious to abolish their sale at the canteen, the article sold there being genuine, but that sold in the town bazaar is much adulterated.
6. The influence on health of malt liquors and wine is more beneficial than the use of spirits.
7. Tea and coffee are very little used, except at meal time, when the former is used. Lemonade, &c. are not drunk by the men. The effect on health of these drinks, as compared with spirits and malt liquor, cannot be stated for the want of data.
8, 9. It would not be beneficial to prohibit the sale of spirituous liquors, as the men would procure adulterated liquor in the bazaar.
10. The men at this station are, as a body, anxious to drink malt liquor, and would prefer it to arrack, but the price at present prevents their making very much use of it, and it would be of advantage if the Government could reduce the cost by importing beer on their own account. The canteen itself is badly situated, being too far from the barracks, and destitute of internal comforts.
11. The canteen is opened from 12 o'clock a.m. to half-past 1 p.m., with the exception of Sundays, when it is opened from 1 to 2 o'clock p.m. for the sale of beer, and from half-past 5 p.m. to 8 p.m. for beer and spirits. Serjeants or married men can take from the canteen one bottle of wine or two quarts of beer daily, and companies' messes, on the requisition of the orderly non-commissioned officer, at the rate of one pint of beer to any soldier at dinner time on payment.

VI. Diet.

1. The ration supplied daily to British troops by Government is 1½ lbs. fresh or 1 lb. salt meat, 1 lb. bread, 4 oz. rice, 1½ oz. sugar, 1½ oz. coffee, or ¼ oz. tea, and 1 oz. salt. The soldiers themselves buy 1 oz. sugar, 8 oz. bread, and vegetables. Salt meat is issued two days in the month, and the men have coffee one half, and tea the other half of the month. The rations are inspected by the officer on duty, assisted by a board if necessary.
2. The ration is supplied at the rate of 3½*d.*, in addition to which the soldier spends 2*d.*, and provides his own vegetables, of which about one-half is the proportion in the ration. The soldier takes three meals, breakfast at 8 a.m., dinner at 1 p.m., and tea at 5 p.m. He has also a cup of coffee at half-past 5 a.m.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	3. No practicable improvement in the ration can be suggested. A soldier looks after the ration while it is being cooked, and an officer visits the dinners to see if they are good and complete. No instance is known of the troops disposing of their ration improperly. 4. The means of cooking are by chatties, iron pots, and frying pans; there are no ovens. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled, fried, and curried, and the cooking is properly done and sufficiently varied. Ovens with an additional supply of fuel would be advantageous. Tea and coffee are properly prepared, and the men have coffee provided for them previous to a march. 5. Garden patches are allowed to such men as wish for them, and are cultivated by more than half the men quartered here, who find their own seeds, tools, &c.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a regimental shako, leather stock, coatee, shell jacket, one pair cloth or serge trousers, four white twill cotton jackets, four white twill cotton trousers, six cotton shirts, regimental cloth cap and peak, with two white cotton cap covers, two pairs of boots, four pairs of socks, and regimental great coat (about half the men wear flannel shirts under their cotton ones.) The accoutrements are a pouch belt over shoulder, with pouch for 40 rounds of ammunition, waist belt, with bayonet and pouch for 20 rounds. The present dress is suitable for the climate, and for the day and night duties. It is considered that the introduction of the basket helmet and the khakee uniform would be beneficial. The climate of Kandy being very variable, each relief is ordered to mount sentry with clothing accordingly,—either with great coat, shell jacket, or white clothing. Sentries are posted under verandahs of buildings, and sentry boxes are provided in addition.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India. 2. The routine of a soldier's duties is as follows:—The men rise at half-past 5 a.m., morning parade at 6 a.m., breakfast at 8 a.m., dinner at 1 p.m., afternoon parade, tea at 5 p.m., and roll call at 8 a.m. The men do not suffer from drill. Early morning and evening are the best times for drills, parades, and marches. There are, however, local general orders to meet the requirements of the country. The men on an average have four or five nights in bed during the week. 3. The greatest distance at which guards are mounted from their private parades is three-quarters of a mile. Guards last 24 hours; sentries are relieved every two hours. There are no roll calls by night, unless there is reason to suspect some men are absent. The men do not appear to suffer from night guards, as they are clothed according to the weather. The roll is called at meal times and parades.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at the station are as follows:—There is one ball court, not covered, one covered skittle ground, a detachment school held in the barrack room (no room being assigned for the purpose), under a corporal, a good schoolmaster, and garrison library, sufficiently lighted. No room is assigned for reading, and the one in which the books are kept is not large enough to allow the men to assemble there. A barrack room is lighted at night as a reading room. There is no day room or soldiers' clubs, but there are gardens, and the men have every facility afforded for cultivating them. A temporary theatre has lately been erected in an unoccupied barrack by the men, but there are no workshops or gymnasia. The present means are not sufficient to keep the men occupied during the wet season and the heat of the day. The men are not allowed to leave barracks from 8 a.m. till 4 p.m., and this restriction is beneficial to health. 2. The improvements suggested are, that a proper reading room should be told off, and a supply of books of a lighter description than those now on hand be furnished. A gymnasium also would be of service. 3. The institution of no other savings' bank besides the Government one is thought desirable. 4. There is sufficient shade for all purposes, the barracks being supplied with verandahs, but there are no sheds, except the skittle alley.
IX. Military Prisons.	1. The military prison has lately been erected. It is surrounded on three sides by a brick wall, and as this tends to impede a free circulation of air, it would be advisable to substitute an iron railing on a dwarf wall.
X. Field Service.	The queries under this head do not apply to the station.
XI. Statistics of Sickness and Mortality.	Return showing the Admissions and Deaths in the European Military Hospital at Kandy from 1st January 1855 to 30th June 1860 (inclusive).

Class.	Order.	Diseases.	From 1st Jan. to 31st March 1855. Average Strength, 207.		From 1st April 1855, to 31st March 1856. Average Strength, 203.		From 1st April 1856, to 31st March 1857. Average Strength, 178.		From 1st April 1857, to 31st March 1858. Average Strength, 147.		From 1st April 1858, to 31st March 1859. Average Strength, 143.		From 1st April 1859, to 31st Dec. 1859. Average Strength, 134.		From 1st. Jan. to 30th June 1860. Average Strength, 133.		Total.		Remarks.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
I.	1.	Tonsillitis -	2	–	1	–	2	–	–	–	–	–	4	–	7	–	14	–	
"	"	Febris Intermitt.	–	–	31	–	–	–	6	–	8	–	17	–	3	–	67	–	
"	"	" Remittens	1	–	18	–	38	1	4	–	1	–	2	–	1	–	65	1	
"	"	" Continua	2	–	5	–	21	–	14	–	20	–	11	–	8	–	81	–	
"	"	Ophthalmia -	–	–	–	–	4	–	4	–	5	–	6	–	11	–	30	–	
"	"	Dysenteria -	6	–	10	–	4	–	3	–	3	1	10	–	3	–	39	1	
"	"	Diarrhœa -	1	–	4	–	11	–	18	–	4	–	23	–	15	–	121	–	

Class.	Order.	Diseases.	From 1st Jan. to 31st March 1855. Average Strength, 207.		From 1st April 1855, to 31st March 1856. Average Strength, 203.		From 1st April 1856, to 31st March 1857. Average Strength, 178.		From 1st April 1857, to 31st March 1858. Average Strength, 147.		From 1st April 1858, to 31st March 1859. Average Strength, 143.		From 1st April 1859, to 31st Dec. 1859. Average Strength, 134.		From 1st Jan. to 30th June 1860. Average Strength, 133.		Total.		Remarks.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
I.	1.	Cholera - -	–	–	–	–	–	–	–	–	–	–	5	1	–	–	5	1	
„	„	Rheumatismus -	10	–	19	–	11	–	6	–	5	–	7	–	6	–	64	–	
„	2.	Syphilis Primit.	3	–	6	–	7	–	2	–	7	–	6	–	3	–	34	–	
„	„	„ Secondaria	1	–	4	–	1	–	–	–	2	–	4	–	10	–	22	–	
„	„	Gonorrhœa -	1	–	5	–	13	–	5	–	2	–	9	–	2	–	37	–	
„	„	Bubo - -	3	–	8	–	1	–	5	–	8	–	4	–	1	–	30	–	
„	„	Orchitis - -	1	–	2	–	2	–	3	–	4	–	4	–	1	–	17	–	
„	„	Strictura Urethræ	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	
„	„	Lepra - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	3.	Ebriositas -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	4.	Vermes - -	–	–	–	–	–	–	–	–	2	–	2	–	–	–	4	–	
II.	1.	Anasarca - -	–	–	1	–	–	–	–	–	–	–	2	–	–	–	3	–	
„	2.	Sorofula - -	1	–	–	–	1	–	–	–	–	–	–	–	–	–	2	–	
„	„	Phthisis Pulmon.	–	–	1	1	–	–	1	–	3	–	1	–	–	–	6	1	
„	„	Hæmoptysis -	–	–	1	–	1	–	–	–	1	–	–	–	–	–	3	–	
III.	1.	Meningitis -	–	–	–	–	–	–	1	–	1	–	1	–	–	–	3	–	
„	„	Paralysis - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	
„	„	Delirium Tremens	3	–	–	–	–	–	4	–	7	–	2	–	–	–	16	–	
„	„	Epilepsia - -	–	–	–	–	–	–	1	–	1	–	2	–	4	–	8	–	
„	„	Neuralgia -	–	–	–	–	2	–	–	–	–	–	–	–	–	–	2	–	
„	„	Otitis - -	–	–	–	–	–	–	1	–	3	–	–	–	1	–	5	–	
„	„	Dysecoea - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	2.	Morbi. Valv. Cordi.	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2	–	
„	3.	Epistaxis - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Bronchitis -	3	–	7	–	9	–	19	–	22	–	6	–	4	–	70	–	
„	„	Pleuritis - -	–	–	–	–	–	–	1	1	–	–	–	–	–	–	1	1	
„	„	Pneumonia -	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	
„	„	Asthma - -	–	–	–	–	1	–	–	–	–	–	1	–	–	–	2	–	
„	4.	Obstipatio -	–	–	–	–	–	–	1	–	–	–	2	–	4	–	7	–	
„	„	Hernia - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Dyspepsia -	–	–	1	–	1	–	3	–	6	–	11	–	1	–	23	–	
„	„	Colica - -	5	–	5	–	8	–	2	–	6	–	9	–	–	–	35	–	
„	„	Hæmorrhois -	1	–	1	–	–	–	1	–	2	–	5	–	–	–	10	–	
„	„	Hepatitis - -	–	–	1	–	5	–	4	–	2	–	7	–	8	–	27	–	
„	„	Icterus - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	5.	Diuresis - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	6.	Hydrocele -	–	–	–	–	1	–	1	–	–	–	–	–	–	–	2	–	
„	7.	Synovitis -	–	–	–	–	–	–	–	–	–	–	1	–	1	–	2	–	
„	„	Contractura -	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	
„	„	Toothache -	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	
„	„	Ostitis - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	8.	Urticaria - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Psoriasis - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	„	Phlegmon -	2	–	13	–	5	–	7	–	6	–	7	–	8	–	48	–	
„	„	Paronychia -	–	–	–	–	–	–	2	–	2	–	–	–	–	–	4	–	
„	„	Ulcus - -	5	–	–	–	4	–	14	–	12	–	8	–	1	–	44	–	
IV.	4.	Atrophia Asthenia	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
V.	1.	Subluxatio -	–	–	1	–	–	–	9	–	3	–	3	–	3	–	19	–	
„	„	Fractura - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	„	Contusio - -	–	–	5	–	7	–	13	–	6	–	11	–	18	–	60	–	
„	„	Vulnus Incis. -	1	–	3	–	1	–	8	–	5	–	1	–	1	–	20	–	
„	„	Vesicul. Pedis -	–	–	–	–	–	–	–	–	1	–	–	–	1	–	2	–	
„	6.	Punitus - -	–	–	2	–	–	–	–	–	–	–	1	–	–	–	3	–	
„	„	Observatio -	–	–	–	–	–	–	3	–	4	–	2	–	2	–	11	–	
		Total - -	52	–	158	1	162	1	169	1	211	1	205	1	131	–	1,088	5	

Recapitulation.

Annual Average Strength during the Period, 169.	Class I. Zymotic.		Class II. Constitutional.		Class III. Local.		Class IV. Developmental.		Class V. Violent.		Total.		Proportion of Deaths to Number treated.
Date.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Remarks.
Jan. to March 1855	31	–	1	–	19	–	–	–	1	–	52	–	
Apr. 1855 to Mar. 1856	113	–	3	1	31	–	–	–	11	–	158	1	
„ 1856 to „ 1857	115	1	2	–	37	–	–	–	8	–	162	1	
„ 1857 to „ 1858	70	–	1	–	65	1	–	–	33	–	169	1	
„ 1858 to „ 1859	117	1	4	–	71	–	–	–	19	–	211	1	
„ 1859 to Dec. 1859	115	1	3	–	68	–	1	–	18	–	205	1	
January to June 1860	72	–	–	–	33	–	–	–	26	–	131	–	
Total - -	633	3	14	1	324	1	1	–	116	–	1,088	5	

KANDY.
CEYLON.

RETURN showing the Admissions and Deaths of the Detachment, Royal Artillery, in Military Hospital at Kandy from 1st April 1858 to the 30th June 1860 (inclusive).

Class.	Order.	Diseases.	From 1st April 1858 to 31st March 1859. Average Strength, 7.		From 1st April to 31st Dec. 1859. Average Strength, 7.		From 1st January to 30th June 1860. Average Strength, 7.		Total.		REMARKS.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
I.	1.	Febris Intermittens -	1	–	–	–	–	–	1	–	
„	„	Diarrhœa - -	1	–	1	–	–	–	2	–	
„	„	Cholera - - -	3	3	–	–		–	3	3	
„	„	Rheumatismus - -	–	–	–	–	1	–	1	–	
III.	„	Meningitis - -	–	–	1	–	–	–	1	–	
„	4.	Obstipatio - -	–	–	2	–	–	–	2	–	
„	„	Dyspepsia - -	–	–	–	–	1	–	1	–	
„	„	Colica - - -	–	–	1	–	–	–	1	–	
„	„	Hepatitis - -	–	–	1	–	–	–	1	–	
„	5.	Diuresis - - -	–	–	1	–	–	–	1	–	
„	8.	Phlegmon - -	–	–	1	–	–	–	1	–	
„	„	Ulcus - - -	1	–	–	–	–	–	1	–	
V.	1.	Contusio - - -	–	–	–	–	1	–	1	–	
„	„	Vulnus. Incisum -	–	–	1	–	–	–	1	–	
		Total - - -	6	3	9	–	3	–	18	3	

RECAPITULATION.

Average Strength, 7. Date.	Zymotic. Admitted.	Zymotic. Died.	Constitutional. Admitted.	Constitutional. Died.	Local. Admitted.	Local. Died.	Developmental. Admitted.	Developmental. Died.	Violent. Admitted.	Violent. Died.	Total. Admitted.	Total. Died.
1st April 1858 to 31st March 1859.	5	3	–	–	1	–	–	–	–	–	6	3
1st April to 31st Dec. 1859.	1	–	–	–	7	–	–	–	1	–	9	–
1st January to 30th June 1860.	1	–	–	–	1	–	–	–	1	–	3	–
Total - -	7	3	–	–	9	–	–	–	2	–	18	3

TABLE showing Strength, Admission, and Deaths from under-mentioned Diseases annually for 10 years, from 1850 to the end of 1859 in Detachment, Ceylon Rifles, at Kandy.

Years.	Average Strength.	Admissions to Hospital.	Total Deaths.	Zymotic Diseases.	Deaths from Zymotic Diseases.	Total Fevers of all kinds. Admitted.	Total Fevers of all kinds. Died.	Intermittent Fevers. Admitted.	Intermittent Fevers. Died.	Remittent Fevers. Admitted.	Remittent Fevers. Died.	Cholera. Admitted.	Cholera. Died.	Small Pox. Admitted.	Small Pox. Died.	Dysentery. Admitted.	Dysentery. Died.	Rheumatism. Admitted.	Rheumatism. Died.	Venereal Disease. Admitted.	Venereal Disease. Died.	Ophthalmia. Admitted.	Ophthalmia. Died.
1850–51	423	469	4	262	3	136	1	87	1	1	–	1	–	–	–	5	1	41	–	20	–	22	–
1851–52	303 $\frac{5}{12}$	346	2	186	2	89	1	66	–	16	1	–	–	1	–	3	–	20	1	20	–	31	–
1852–53	330 $\frac{5}{6}$	330	3	185	2	72	1	48	–	19	1	–	–	–	–	1	–	29	1	18	–	18	–
1853–54	306 $\frac{11}{12}$	301	22	176	19	52	1	27	–	–	–	24	14	2	–	8	2	15	1	13	–	30	–
1854–55	305	370	7	248	5	96	–	68	–	14	–	6	3	4	–	6	–	13	–	10	–	60	–
1855–56	328 $\frac{10}{12}$	582	3	392	2	178	1	159	–	7	1	–	–	7	–	18	1	56	–	31	–	26	–
1856–57	281 $\frac{10}{12}$	405	9	266	5	98	3	92	2	1	–	–	–	–	–	18	2	14	–	16	–	40	–
1857–58	247	288	7	198	6	84	1	82	1	2	–	4	3	–	–	11	1	15	–	7	–	18	–
1858–59	283 $\frac{9}{12}$	223	2	122	–	38	–	38	–	–	–	1	–	–	–	13	–	6	–	9	–	28	–
1859 9 months.	236	141	–	75	–	43	–	20	–	23	–	–	–	–	–	7	–	2	–	7	–	9	–

J. J. THOMPSON,
Assistant-Surgeon, Ceylon Rifle Regiment.

References to Subjects and Queries.

REPLIES.

XI. Statistics of Sickness and Mortality—*cont.*

CIVIL POPULATION.

RETURN of Cases of Small-Pox which occurred in Kandy from 1850 to 1859 (inclusive).

Year.	In Hospital.		In Town.		Total.		REMARKS.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1850	43	16	16	4	59	20	
1851	42	12	8	5	50	17	
1852	4	–	1	–	5	–	
1853	9	–	4	–	13	–	
1854	242	81	621	90	836	171	
1855	57	16	74	13	131	29	
1856	10	–	2	–	12	–	
1857	4	–	1	–	5	–	
1858	37	8	12	4	49	12	
1859	9	3	2	–	11	3	
Total -	457	136	741	116	1,198	252	

RETURN showing the Number of Cases of Cholera which occurred in the Civil Branch of the Service from 1853 to 1859.

Year.	In Hospital.		In Town.		Total.		REMARKS.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1853	59	40	144	82	203	122	
1854	20	12	107	92	127	104	
1855	–	–	–	–	–	–	
1856	–	–	–	–	–	–	
1857	31	26	37	32	68	58	
1858	37	26	57	50	91	76	
1859	16	14	15	15	31	29	
Total -	143	118	360	271	520	389	

XII. HOSPITALS.

1, 2. The European hospital is about three-quarters of a mile from the European barracks, and the Ceylon rifle hospital is about one-eighth of a mile from the Ceylon rifle barracks. Both hospitals are about half a mile from the bazaar. The sites are open and freely ventilated. Trees surround the buildings, but do not interfere with ventilation, rather acting as a screen. The European hospital, although on the edge of the lake, suffers no disadvantage therefrom; that of the Ceylon Rifle Regiment is on more elevated ground, and both are well drained.

3. The water supply from wells is abundant and wholesome, and the lake offers an ample supply for washing purposes.

4. At the European hospital there is a brick barrel drain to convey refuse water away to the lake, which is a few feet distant.

5. The wards are all on the ground floor, slightly raised above the outside ground, the floors being of brick. At the Ceylon rifle hospital a raised brick platform, three feet high, on which are placed the cots, runs round two sides of the ward. The roof water from this latter building runs freely away, guttering being provided at the European hospital. The surface drains are of brick, laid with a slight slope. The guttering is of wood and tin, and these means are sufficient for carrying away the rain-fall. The European hospital is an old Kandian building, and was originally occupied as a zenana. Its walls are of solid mud. The Ceylon rifle hospital walls are of brick. The roofs and walls are sufficiently thick to keep the buildings cool, although neither are double. The Ceylon rifle hospital has a verandah all round seven feet wide. At the European hospital the roof projects about five feet, which is barely sufficient to give shelter from the sun's rays. The verandahs are never used for the accommodation of sick soldiers or others. The hospitals consist of ground floors only.

KANDY, CEYLON.

TABLE OF HOSPITAL ACCOMMODATION.

Total number of wards	European	6
	Ceylon Rifle Regiment	3
Total regulation number of beds	European	102
	Ceylon Rifle Regiment	49

Wards, No.		Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.		Cubic Contents in Feet.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. No.	Height.	Width.
			Average dimensions.										
	No.		ft. in.	ft. in.	ft. in.							ft. in.	ft. in.
European Hospital.	1	30	60 0	35 6	10 0		19,757	651	65 0	1 8	4	4 6	3 0†
	2	30	60 0	35 6	10 0		18,631	621	63 0	1 8	4	4 6	3 0†
	3	15	60 0	11 6	14 3		9,832	655	46 0	1 8	4	4 6	3 0†
	4	15	60 0	11 6	14 3		9,832	655	46 0	1 8	4	4 6	3 0†
	5	8	32 6	11 6	14 3		5,325	665	46 0	1 8	2	4 6	3 0
	6	4	17 6	11 6	14 3		2,850	712	50 0	1 8	1	4 6	3 0
					To Wall Plate.	To Ridge.							
Ceylon Rifle Hospital.	1	25	58 0	22 0	11 0	18 0	25,520	1,020	51 0	1 8	8	3 0	3 0
	2	14	34 0	22 0	11 0	18 0	14,960	1,068	53 0	*4 8	4	3 0	3 0
	3	10	23 0	22 0	11 0	18 0	10,120	1,012	50 0	*4 8	3	3 0	3 0

* The beds are placed on a brick platform three feet high. † Three openings into adjoining ward.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospitals are so placed as to receive the benefit of the prevailing winds, especially of the south-west monsoon, but the European hospital is not so fully exposed to the north-east. The windows are usually hung on each side of the frame, and open back to the full width of the window. 6. The means of ventilation is by doors and windows only, there being no roof ventilation, which would be desirable if occupied by a greater number of men. The present means would be quite inadequate if the hospital was occupied according to its calculated accommodation. There are no jalousies or jhilmils, only wooden shutters. 7, 8. There is no apparatus for cooling or warming the wards. The walls and ceilings are cleansed and limewashed at irregular intervals, averaging once in six months. 9. At the European hospital the soil falls into the lake, where it rapidly disappears. The patients' privy is about 30 feet from the wards, and is approached by a covered passage. There are no water-closets or urinals. At the Ceylon rifle hospitals there is an ordinary cess-pit. The privies are never offensive. 10. No room is specially provided for washing in, but there are empty wards, which are made use of. Large tubs and hand tubs are placed in them, and filled with water by hand. These arrangements are quite sufficient. 11. Large wooden and tin baths are provided for bathing the sick, which are sufficient. 12. All hospital linen is given to dhobies, who wash the things away from the building. 13. The storage is sufficient and dry. 14. The bedsteads used in hospital are of iron (6 ft. 6 in. by 3 ft. 0 in.), and the bedding consists of a coir mattress, cotton pillows, four cotton sheets, and two blankets. 15. At the rifle hospital there is no cooking carried on, but the men's diets are brought to them from their barracks. At the European hospital the kitchen is similar to those used in barracks. Chatties and pots are used for boiling, and there is a brick oven. The means are ample, and the diets are cooked in accordance with the recent regulations from the Secretary at War. Sufficient variety is allowed by this scale, which is strictly adhered to. 16. The diet tables and diet rolls used in hospital are those issued by the Secretary at War. The forms are precisely the same as in England. 17. The attendance in the European hospital is one hospital corporal, with an orderly (a soldier) for every 10 sick. A native cook and cooly are also allowed. 18. The hospitals are in a good sanitary condition; no epidemic disease has ever appeared in the wards. 19. The woodwork of the roofs of both hospitals was much decayed in parts, but they have recently been put in order. A quarter has been provided also for the hospital serjeant, Ceylon rifle regiment. The European hospital is a decayed antiquated building, and will not bear much alteration. A new structure ought to be raised in preference. 20. There is sufficient ground near the hospitals to allow the patients to take exercise under the shade of trees, and seats are provided, but in the verandah only. No shaded walks are available for the men. 21. Soldiers' sick wives and children are treated in their quarters. No provision has been made for them in the diet tables issued by the Secretary of War, and no hospital accommodation is provided for them. In consequence of this omission the women and children suffer, and a remedy is required, which would be afforded by their being permitted to be dieted in their quarters till hospitals with nurses are provided. 22. The hospital regulations in force are those of the Secretary of War. 23. The medical officer is entirely guided in matters appertaining to the sanitary state of the hospitals, by the regulations of the Secretary at War, and any suggestions he offers are attended to. 24. There are no convalescent wards or hospitals here, and none are urgently required, although it would be desirable to have a part of the hospital so apportioned by proper authority.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial-ground for British troops is close to the European hospital, but on a higher level. The south-west monsoon blows freely through it, clear of the hospital. 2. Its area is 3 acres, 1 rood, 33 perches. The soil and sub-soil is decomposed gneiss, which stands at a very steep slope. The ground is carefully kept. 3. The general space for a grave is seven feet by four feet, and the graves are put as close as possible together. They are from three to five feet deep, and are occasionally re-opened. The number of bodies in the same grave depends on the depth. There is no regulation as to interment, either at ordinary times or during epidemics, but an interval of 24 hours usually takes place between death and burial. 4. The grave-yard was never known to be offensive. The burial of British troops is conducted in every respect as in England. 5. The natives are buried in a ground about one mile distant from the town. The bodies of Buddhist priests and chiefs are burnt. 6, 7. No injury accrues to the public health from the present practice, and no improvement in the mode of disposal of the dead can be suggested.

(Signed) H. E. Weare, Bt. Lieut.-Col. 50th Regiment, Commandant.
J. MacGregor, Surgeon Major.
J. C. B. De Butts, Captain, R.E.

8th October 1860.

TRINCOMALEE.

Accommodation	Queen's troops	Artillery	One serjeant, 23 rank and file.
		Infantry	50th Queen's Own Regiment.
			Nine serjeants, two buglers.
			138 rank and file.
	Native troops	Artillery	Gun Lascars, one serjeant,
			One bugler, 44 rank and file.
		Infantry	Ceylon Rifle Regiment.
			Nine serjeants, three buglers.
			150 rank and file.

References to Subjects and Queries.	Replies.
1. Topography.	1. Near the station, the surrounding country is flat, but in the distance many lofty hills are seen. There are no swamps in the immediate neighbourhood, excepting a few "paddy fields," the nearest being about two miles distant. There is an abundance of wood and jungle in the vicinity of the station, and Fort Frederick is almost entirely surrounded by the sea. Fort Ostenburgh, situated at the western extremity of the range of hills so called, has the sea on three sides, and thick jungle on the fourth. The lines occupied by the native regiment are separated from the sea by a short street. 2. Fort Frederick is about 130 feet, and Fort Ostenburgh about 180 feet, but the native lines are only a few feet above the level of the sea. Fort Frederick is about 130 feet, and Fort Ostenburgh about 175 above the adjacent country; but the native lines are on a level with it. The native lines are about 150 yards from the sea, and there is a large tank supplied by the rains, about 600 yards from the latter, used solely by dhobies. There is no healthier ground near the station. The ridge of mountains on which For Ostenburgh stands at one extremity is a little higher than Fort Frederick. 3. The ridge of mountains alluded to in the foregoing answer is about two miles in length. The western extremity of the range is about two and a half miles from Fort Frederick, and is about two miles from the eastern extremity, which is the highest part of the ridge, and is about one and a half miles from Fort Frederick, and about 75 feet higher. 4. The sea washes the walls of Fort Frederick. Fort Ostenburgh has the sea on three of its sides, and the native lines are about 100 yards from the sea. No overflowing of water takes place in the vicinity of the station. There are no ravines, water pits, or broken ground near the station, but the water in the ditch on the land side of Fort Frederick, after a continuance of dry weather, is liable to become offensive; but neither Fort Ostenburgh nor the native lines are exposed to this inconvenience. 5. The station is open and freely exposed to the winds. No difference in the temperature of the station has been remarked from the buildings being exposed to reflected sun heat. The different barracks at the station are open to both land and sea breezes, both of which have a sanitary effect on the health, except the land wind during the night. 6. The surrounding country is uncultivated, and there are no works of irrigation near the station. There is but little land fitted for the cultivation of rice, and no restrictions are necessary. The nearest "paddy field" is about two miles distant. No indigo is cultivated, nor is there any cultivation of hemp or flax near the station. 7. The town of Trincomalee, containing a few Europeans and a considerable native population, is about half way between Fort Frederick and Fort Ostenburgh, about a mile from each. The native lines are in the town. 8. Quartz ridges, running north-east and south-west, intersect the country, and the low country is the alluvial deposit of these, and consists of sand and clay. The gruund was occupied long previous to the present station being formed. 9. Water is found, during the dry season, at a depth of about 25 feet, and in the rainy season at a depth of about 20 feet below the surface. There are no wells at Fort Ostenburgh.

TRINCOMALEE. CEYLON.

References to Subjects and Queries.

REPLIES.

I. Topography—*cont.*

10. Fort Frederick and Fort Ostenburgh are well drained. The rain-fall flows readily away, and the drains empty themselves into the sea. At the native lines the rain-fall remains upon the surface until it is absorbed. There is no adjacent higher ground.

11. At Fort Frederick and the native lines the water supply is derived from adjacent wells. Fort Ostenburgh is supplied from a well at the foot of the hill, about 350 yards distant. There is only one tank, which is at Fort Ostenburgh. Its dimensions are 60 feet by 9, by 9 feet 10 inches; but it is not in repair. The wells are so constructed that no leaves or other matter can fall into them to injure the water.

12. The water supply appears to be inexhaustible. The water is good, has no peculiarity of colour, taste, or smell; is soft, and not injurious to health. It is drawn, at Fort Frederick, from wells in buckets, by coolies employed for that purpose. They carry it from the wells to the barracks in earthenware chatties. Owing to the distance of this well from the barracks, about 250 yards, up a very steep ascent, the labour is very fatiguing. This would be avoided by means of a force pump. No better supply could be obtained. The native troops have wells close to their lines and supply themselves, and the water at Fort Ostenburgh is carried by a cooly from the dockyard well. We do not know of any other means of supplying this fort, excepting by a force pump, which would in case of a siege be absolutely necessary.

13. We are not aware of any other topographical points that are worthy of remark.

14. No new stations, that we know of, have been selected.

II. CLIMATE.

1. There are no instruments for conducting and registering meteorological observations at this station, excepting a thermometer at the European hospital.

2. There are no meteorological records going back beyond three years.

TABLE of Meteorological Observations for Three Years, from 1st May 1857 to 30th April 1860:—

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Winds.		Remarks as to Cloud, Wind, Dew, Storms, &c.
				Direction.	Force.	
January - -	78⅓	83⅓	73⅔	N.E.	Moderate	Rain in small quantities.
February - -	81	85⅔	77	Do.	Do.	Very little rain, with occasional thunder and lightning.
March - -	82⅔	88⅓	76⅔	Do.	Do.	Do. do.
April - -	85⅔	92	79⅓	Do.	Do.	Do., with more thunder and lightning.
May - -	85⅓	92⅓	78	S.W.	Do.	Much rain, with thunder and lightning.
June - - -	86⅔	93	80⅓	Do.	High winds	Little rain.
July - - -	84⅔	92	77⅓	Do.	Moderate	Do.
August - -	85⅔	92⅔	78⅔	Do.	Do.	Do.
September - -	85⅔	93⅔	77⅔	Do.	High winds	Do.
October - -	85⅓	91	76	Do.	Do.	Much rain, with thunder and lightning.
November - -	81⅔	88⅓	75	N.E.	Do.	Do. do.
December - -	80⅓	85	75⅓	Do.	Do.	Do. do.

3. Trincomalee is considered the hottest station in Ceylon. From March to August the atmosphere is dry and hot, with very little moisture, rain falling but seldom. No tree planting or irrigation is carried on, and there is nothing to affect the atmosphere excepting the land wind, which, passing over such a dense jungle, renders it unhealthy. The station is, however, so situated as to prevent the land winds from having much injurious effect. The diet, shelter, clothing, duties, drills, &c., at this station, are so regulated as not to interfere with the health of the troops. On minutely examining the returns kept at the hospital for a back period of several years, it appears that the monthly admissions so vary that it is impossible to say which are the most unhealthy months. The prevailing diseases are liver, dysentery, and intermittent fever.

4. The nearest station to this, which is considered more healthy, is Kandy, almost 120 miles distant, the road to which station is impassable for a wheeled conveyance. We are unable to give any information respecting its elevation, drainage, water supply, &c. &c.

5. Staff-surgeon Cogan is the only member of the board who has had any experience of the stations in this command. The Kandy district is the most salubrious, and that of Trincomalee the most injurious.

References to Subjects and Queries.	Replies.
III. Sanitary Condition.	1, 2, 3. Plans of the stations, surrounding country, and barracks are transmitted. 4. Table of barrack accommodation:— Date of construction, unknown. Total number of rooms or huts, 8 barrack-rooms and 150 huts. Total regulation number of non-commissioned officers and men, 305.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height of Walls.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				ft. in.		ft. in.	ft. in.
No. - - 1	87	186 0	20 0	13 6	63,240	727	42·75	1 8	12 32	3 6 1 6	4 2 1 6
2	88	186 0	20 0	13 6	63,240	718	42·27	1 2	12 32	3 6 1 6	4 2 1 6
3	87	186 0	20 0	13 6	63,240	727	42·75	1 2	12 32	3 6 1 6	4 2 1 6
5	40	83 0	20 0	12 9	27,805	695	41·50	1 2	6	3 4	4 2
6	45	96 0	20 0	12 9	32,160	715	42·66	1 2	5	3 6	4 2
58	89	190 0	18 6	10 6	48,452	545	39·44	1 2	20	5 0	4 0
C.R.R. single men 59	100	207 6	21 0	10 2	59,553	596	43·55	1 2	12	5 0	4 0
Do. married do. 59	1	9 6	11 6	10 0	1,308	1,308	109	1 2	1	3 0	2 0
Gun Lascars, single men - 59	25	60 0	21 0	10 6	17,640	705	50	1 2	14	5 0	4 0
Do. married do. 59	1	9 6	11 6	10 0	1,308	1,308	109	—	1	3 0	2 0
Total - -											
Fort Ostenburgh -	4	17 0	14 3	12 6	3,755	939	60	1 2	4	4 6	3 6
Guard room - -	12	37 0	17 6	12 0	7,724	836	53	1 6	8	7 0	3 10
Sally Port do. -	4	18 6	16 0	12 0	3,552	888	74	1 2	—	—	—
Ceylon Rifle do. -	4	20 0	11 4	10 6	2,946	737	58	1 2	4	4 0	3 0
Prison cells, each -	1	7 6	10 0	13 3	1,093	1,093	75	1 6	2	1 2	2 0

5. All the barracks at the station are so constructed that the windows are on opposite sides and open outwards. There are verandahs on both sides of all the barracks at Trincomalee, which extend their full length and are almost 9 feet in width. At each end of the different verandahs at Fort Frederick there are small rooms for married men, but no verandah in any of the barracks is used as sleeping quarters. There are jalousies at Fort Frederick, but none at any of the other barracks.
6. The bedsteads for Europeans, used in the barracks, are of iron, and each European is supplied with two pairs of sheets, one blanket, one rug, and a coir mattrass and pillow. The native soldiers have wooden cots, a cumlie, and a mat. We have no improvements to suggest.
7. There are no tents used at this station.
8. The ventilation of the buildings is effected by means of doors and windows opposite to each other, and in the European barracks by ventilators above and below, which produce a good circulation of air. These means are sufficient to keep the air pure, by night as well as by day. There are no other means used for cooling the air admitted into the barracks.
9. The barracks for Europeans are built of brick or stone and mortar, with tiled roofs. The native lines are constructed of mud, and also covered with tiles. Tents are not used here. The married native soldiers live in huts, which are constructed of mud, with tiled roofs.
10. The floors of the European barracks are generally made of satin-wood, and are raised about two feet above the level of the ground, with provision for a slight passage of air below. An asphalte floor has lately been laid down in the barracks at Fort Ostenburgh. The native lines have earthen floors, and there is no free passage of air beneath.
11. The materials of which the barracks are composed are very good. We think that all barracks should be ventilated along the ridge of the building, which would make them very much cooler, and would allow the impure air to escape. The barracks and cantonments are kept in repair by the Royal Engineer Department. The repairs are, however, very slowly executed, owing to the extreme backwardness of the place and the want of machinery. No one in particular is responsible for the sanitary state of the cantonment. The walls and ceilings of the barracks are cleaned weekly, and lime-washed when necessary.
12. There are two baths in Fort Frederick, of which a plan is transmitted. The water for them is supplied by carriers, and escapes by an open drain into the sea. The natives bathe in the sea. There are no lavatory arrangements at Fort Ostenburgh.
13. A plan of the barrack cook-houses is transmitted. They are supplied with iron boilers, and in each kitchen at Fort Frederick and Fort Ostenburgh there is a range, built of brick, on which smaller cooking utensils are used. The native soldiers have no cook-house. There is an ample supply of water, and the drainage at the European barracks is good. The refuse water at the native barracks is absorbed in the earth. The linen of all the troops is washed by the native dhobies.
14. The privies, of which a plan is transmitted, have soil-pits from 8 to 14 feet deep, and the urinals generally are near a privy, with a drain leading into its soil-pit.
15. These buildings are ventilated by means of doors and windows, which are opposite each other, and are lighted at night by oil lamps.
16. At the two forts the rain is carried from the barracks to the sea by open drains, which are of sufficient dimensions for the purpose, and in no case is the distance to the sea

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition —*cont.*	more than 250 yards. There are no sewers or drains at the native barracks. The drainage at the forts is generally sufficient. Most of the buildings are very damp in wet weather, the roofs not being water-tight. All fluid refuse not carried away by drainage evaporates on the surface. There are no cess-pits, neither are there any foul ditches, except the one at Fort Frederick, which is only offensive after a continuation of dry weather, and then but for a short time, as the water soon becomes absorbed. 17. The surface cleansing of Fort Frederick is performed twice weekly by strong fatigue parties. It is efficiently done, and the refuse, &c., is thrown into the sea at some distance from the fort. Fort Ostenburgh and the native lines are surface cleansed daily, and the refuse from them is also thrown into the sea. 18. The immediate proximity to all the barracks is kept free of vegetation, but the slopes of the hills round the two forts are thinly covered with jungle. There are no old walls, thick hedges, &c., interfering with the ventilation of any of the barracks. 19. The bazaar occupied by the natives is about one mile from Fort Frederick, about two miles from Fort Ostenburgh, and half a mile from the native lines. It appears to be kept very clean, and is well ventilated and drained. All bazaar arrangements and regulations are entirely in the hands of the civil power. Cleanliness appears to be strictly preserved. To all outward appearance the native houses are neat and clean. Manure and other refuse is carried to a large common at some distance from the town. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. All arrangements for the slaughter of animals are in the hands of the civil power. The slaughter-house is a considerable distance from the barracks, and no nuisance is experienced in the station from its condition. 21, 22. There are no bazaar horses at this station, neither are there stables nor picketing grounds for cavalry or artillery horses. 23. The accommodation for European married non-commissioned officers and men is insufficient. There are no married men in the barrack rooms at present, but an increase of one married family would cause inconvenience. The quarters constructed for the married non-commissioned officers and men of the native troops are sufficient.
Officers' Quarters.	1. The officers' quarters are generally good and well drained, but the same complaint exists as with the other buildings—the roofs are not water-tight. As these quarters are all situated in the hottest part of the fort, we would suggest that they should be two-storied.
IV. HEALTH OF THE TROOPS.	1. The district in which the station is situated is considered to be one of the most unhealthy in Ceylon, yet the mortality is not so great as might be expected. The adjoining native population is not healthy. 2. Intermittent fever and bowel complaints are most prevalent among the native population, and small-pox occasionally breaks out amongst them. 3. These diseases are attributable to the climate. 4. The two companies of the 50th Regiment came here from Kandy, where they were stationed upwards of two years, and left it in September 1859. They were not subject to any particular disease in Kandy, and on their arrival here they were generally healthy. The artillery arrived here in January 1859 from Colombo, where they had disembarked three weeks previously from England, and they were also generally healthy. One company of the Rifles came here in 1856, and the other in 1858, from Colombo. Three years is the average length of time at each station. The Europeans have chiefly suffered from liver diseases, dysentery, and fever, and the natives from the two latter, since their arrival at this station. No part of the men's present accommodation appears to be more unhealthy than the rest. 5. The troops at this station are never camped out. 6. Staff-surgeon Cogan, one of the members of this board, has twice been stationed at Newera Ellia, the only hill station in the island. The result of his experience is that the health of invalids rapidly improves by removal from the plains to hill stations. 7. Staff-surgeon Cogan is not aware that troops returning from the hills to the plains are more or less liable to attacks of febrile and other diseases. 8. After a length of service in the island, Staff-surgeon Cogan approves of selecting hill stations for troops. 9. There are no diseases peculiar to hill stations, that we are aware of, to which troops are liable to be attacked on going to them, except those arising from too great exposure to cold. 10. Every precaution is taken for the preservation of the health of the men, and they certainly do derive great benefit from a residence in hill stations. 11. The time best adapted for a residence in the hills is from January until May; but we have not had sufficient experience to say what is the shortest period of residence in the hills which would enable troops to obtain the full benefit to their health. 12. There is no period of residence in hill stations, that we are aware of, beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 13. No precautions are required in this island for protecting the health of troops on their leaving hill stations for the plains. 14. As the hill station is a small one there is not sufficient accommodation for many of the troops. We are of opinion that an occasional change from the plains to the hills would prove most conducive to the health of the troops, and we would strongly recommend that the reliefs should take place more frequently. Frequent change of stations in the plains is beneficial to the health of the troops. 15. The barrack and hospital accommodation is sufficient for the small number of troops stationed at Newera Ellia, but no provisions have been made in the shape of games and exercises for the men, which would relieve the monotony at such a lonely station. 16. No greater or more commodious elevation than that of Newera Ellia can be found in Ceylon. It is upwards of 7,000 feet above the level of the sea. 17. There is no higher ground near this station which could be advantageously occupied as a hill station.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	18. We have found no difference in the healthiness of stations from the different classes of their surface and subsoils. 19. Soldiers should certainly not be sent to India under 20 years of age, and they should land there between October and January. The men on disembarkation are marched direct to their barracks, where everything necessary has been already prepared for them. They are supplied with white clothing and taken on the regimental roster at once. I would recommend recruits on first landing in India to avoid the sun as much as possible. 20. We have no experience to say whether troops should be sent direct from the home depôts to India, or sent first to some intermediate station for a certain time. It would certainly be advantageous to send new arrivals to the hills, but in Ceylon this would be impracticable. 21. Troops landing in Ceylon are marched from the port to the interior, and the hours of marches are so arranged as not to expose the men to the effects of the sun. 22. From my experience, I consider that a British soldier should serve from seven to ten years in India, not longer. 23. The manner of conducting medical boards is not such as to avoid conflict of opinion as regards invaliding, but we have no suggestions to make. 24. Invalids proceeding home should leave India so as to arrive at their destination at the commencement of the summer months.
Diseases.	1. There are inspection parades for the discovery of incipient diseases at this station every Saturday, and on Sundays for the native troops. 2. Scorbutic disease is of rare occurrence in the island, and preventive measures are consequently unnecessary; but should it make its appearance at any time, oranges, lime juice, and vegetables are the best prophylactic. 3. During the last 10 years there have been 4,002 Europeans admitted into hospital, of which cases 172 were hepatic diseases, of which 15 were fatal. Amongst the native troops for the same period there were 2,787 cases admitted, nine of which were hepatic, and two of which died. The climate alone is generally the cause of this disease, and we are not aware of any prophylactic measures to diminish its frequency. 4. No case of dracunculus has occurred amongst the troops during Surgeon Cogan's experience in the island, which embraces a period of more than seven years. 5. Out of the 4,002 cases admitted into hospital, amongst the Europeans for the last 10 years, 186 have been from venereal diseases; and out of 2,787 cases amongst the natives, for the same period, there have been 47 cases of venereal treated. There have been no deaths. No precautions can be suggested for diminishing the liability of soldiers to this disease. Lock hospitals would not be advantageous. 6. The troops at this station suffer from the following diseases, viz.:— *Fevers.*—Intermittent fever is most prevalent, but is not of a very serious character when treated in its first stage. *Dysentery* is of common occurrence at certain seasons, and is generally of a very severe form. *Cholera.*—No case during the last 18 months amongst the Europeans, and only seven cases amongst the natives during the last 10 years. *Small-pox* is almost unknown among the European troops, and there has been no case of this disease amongst the native troops since 1855. *Rheumatism* has been of rare occurrence lately. The following table shows the proportion which admissions and deaths from these diseases have borne to the total admissions and deaths for the last 10 years:—

Diseases.	Troops.	Total Number of Admissions from each Disease.	Total Number of Deaths from each Disease.	Total Number of Deaths from all Diseases.	Total Number of Admissions from all Diseases.
Fevers	European	1,338	19		
	Native	1,393	6		
Dysentery	European	335	32		
	Native	28	2		
Cholera	European	9	3	Europeans 89	Europeans 4,002
	Native	7	5	Natives 28	Natives 2,787
Small Pox	European	—	—		
	Native	10	2		
Rheumatism	European	181	—		
	Native	148	—		

	7. The more frequent zymotic diseases are—intermittent fever, dysentery, and diarrhœa, of which dysentery is the most virulent. They vary according to the seasons, and a sudden change of weather from wet to dry, or *vice versâ*, generally precedes or accompanies their appearance. There are no bazaars or native dwellings within one mile or thereabouts of the European barracks. The sanitary condition of those portions of the station, bazaar, &c., near the native lines is good. No personal habits or conditions among the troops or the native population have been remarked to predispose to the above-mentioned diseases. 8. The soldiers' duties and occupations in barracks do not appear to have any influence in contracting any diseases. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases. 10. Owing to the nature of the climate we are unable to suggest anything that would prevent or mitigate epidemic disease.
V. Intemperance.	1. With a few exceptions the soldiers at this station are temperate, and the per-centage of confirmed drunkards among them is about four per cent. 2. During the last 10 years there have been 49 cases (out of 4,002) admitted into hospital from diseases caused directly by intemperance amongst the Europeans, but none

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	amongst the natives. It is found almost impossible to go back more than 20 months for information; but during that time there have been eight cases (out of 411) admitted for diseases caused indirectly by intemperance. Intemperance is almost unknown among the native troops, on account of their religion. There are no records at this station that will enable me to show what effect total abstinence, temperance, and drunkenness have on the amount of sickness, mortality, and crime at this station. Drunkenness is always punished as an offence. 3. Distilled spirits are sold both at the canteens and in the bazaar. The quality of the arrack at the barrack canteen is good, but that sold in the native bazaar is very bad. It is impossible to say what amount is consumed out of barracks, but at the military canteen no man is allowed to exceed. Spirit does not form part of the ration for soldiers either at the station, on the march, or in the field, but it is given to convalescents, according to the discretion of the medical officer. No injurious drinks, other than intoxicating drinks, are sold either at the canteen or bazaar. 4. Spirit is never given to convalescents unless it is considered conducive to their health. Its consumption by the troops, when carried to excess, is certain to prove injurious, but when taken in moderation it is conducive to the efficiency and internal discipline of the corps. 5. Total abstinence would be likely to prove injurious to the health of troops. 6. Malt liquor is far preferable to spirits, but wines are not procurable at this station. 7. Coffee and tea are used here morning and evening, and are indispensable as far as regards the men's diet, but lemonade, soda-water, &c., are not available. 8. There is no spirit ration here. 9. A small quantity of spirits is considered necessary for the troops. 10. I have no further recommendations to make on these points. 11. The canteen regulations are as follows:—No European or native, except the garrison, is allowed to enter the canteen without authority, nor is any liquor allowed to be taken out except under the following rules:—(1st) To a married man to the extent of one bottle of wine or one quart of beer daily; (2ndly) to companies messing in barracks, on the requisition of orderly officers of regiments, at the hour of dinner only, and then not to exceed one pint per man, or half a bottle of wine; and (3rdly) upon an order from the officer of the garrison or standing order from the commandant or staff officer. The canteen is open from twelve to one o'clock at noon, and from half-past five to eight p.m. It is closed during Divine service on Sunday. No one is allowed to enter the canteen while in liquor. No man is allowed to take liquor at the bar (except at twelve at noon, when it is peremptory) or at any other place excepting at the table, where it is delivered by the canteen attendant. All liquor issued from the canteen must be paid for on delivery.
VI. DIET.	1. The ration for Queen's British troops is composed as follows, viz., 1½ lbs. of fresh meat, or 1 lb. of salt meat, 1 lb. of bread, 1½ oz. sugar, 1½ oz. coffee, or ¼ oz. tea, 1 oz. salt, and 4 oz. rice. Salt provisions are issued twice per month. The rations are inspected previous to issue by a commissioned officer. 2. A complete ration, with vegetables (when procurable) is provided for the troops. The stoppage is 3½*d.* for the commissariat, and 2*d.* for extras, daily. The soldier takes three meals per diem. Breakfast at eight a.m., of tea or coffee and bread; dinner at one p.m., of soup, meat, rice, and vegetables, and supper at six p.m. of bread and tea or coffee. The foregoing refers to Europeans; the native troops diet themselves. The proportion of vegetables that enters into the composition of the ration varies, not being procurable every day. 3. The ration is quite sufficient in point of quantity, and it is of as good quality as can be procured. The rations are never disposed of at this station. 4. The means of cooking, available at this station, consist of large iron boilers placed on brick ranges and wooden fires. The kitchens are clean, light, well-ventilated, and well supplied with water. The food consumed by the troops here is generally boiled. The cooking is properly done, but there is no great variety. Tea and coffee are properly prepared for the men, and they have the latter beverage always before a march. 5. Gardens for the cultivation of vegetables by soldiers could not be advantageously established near the station, as the nature of the soils and climate would not admit of the cultivation of vegetables.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress at this station is composed as follows:—Jacket, trousers, and cap cover made of white American drill, in which all the duties are performed. The accoutrements are according to regulation. The present dress is suitable to the climate, and for the soldiers' duties by day and night, and we cannot suggest any improvement in it. The guards mount in white, and the sentries are protected from the sun and wet by verandahs and sentry boxes.
Duties.	1. Men should be thoroughly drilled at home before being sent to India. 2. The usual routine of the soldiers' duties at this station is as follows:—Parade at 6 a.m. and 5 p.m., each lasting from 30 to 45 minutes; guard mounting, and the usual fatigues. Their duties do not affect the health of the men. The above are the best hours for drills and parades, and there is a general order relative to the marching of troops in the morning. The average number of nights the men at this station have in bed during the week is four. 3. The guards are all mounted in their own barracks at 6 a.m. daily, and remain on duty 24 hours. Three guards, viz., the dockyard, the Cutcherry, and the Admiralty guard, mounted daily by native soldiers, are a considerable distance from their barracks. There are roll calls at ½ past 10 a.m., at every meal, and at tattoo. The night guard does not appear to affect the health of the troops. In case of inclement weather the sentries wear their great coats. The native troops have roll calls at 6 a.m., at midday, and at tattoo.
VIII. INSTRUCTION AND RECREATION.	1. There are two schools at this station, one for Europeans with a schoolmaster of an ordinary description, one for native soldiers with an indifferent schoolmaster; a library and reading room, which is also used as a day room, sufficiently lighted at night, and well supplied with books in Fort Frederick. There is also a theatre, but neither ball

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	courts, skittle grounds, soldiers' gardens, workshops, or gymnasia. The library is the only resort for the troops in hot or wet weather, and in addition to the books it contains chess, backgammon, and other amusing games. The men are not allowed outside the forts until after evening parade, after which time the sun does not affect their health. The native troops are not so much confined to their barracks, nor do they feel the effects of the sun as do the European troops. 2. We suggest there should be gymnasia, a covered ball court, and skittle grounds for Europeans and gardens for the native troops. 3. There are regimental savings banks for the Europeans, which have proved highly advantageous, but no such institutions exist for natives. 4. There are verandahs and trees, but the heat is too great at this station to admit of exercise being taken during the day.
IX. Military Prisons.	1. The military prison is in a most healthy locality, well ventilated, and is in every way suited for the purpose for which it is intended.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. Any means thought necessary by the medical officer to preserve the health of the troops on a line of march he suggests to the officer commanding. 3. The men at this station are never encamped. 4. There are no arrangements adopted for field hospitals, transport of sick and hospital supplies, ambulances, &c., &c.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The new European hospital, which is not yet occupied, is situated in the lower part of the fort, and is about 300 yards from the men's barracks. The native hospital is adjoining the barracks. There are no stables at this station. The bazaar and the houses of the civil population are nearly one mile from Fort Frederick hospital, but the native hospital is very near the civil population, and about one mile or thereabouts from the bazaar. The site of the European hospital hitherto unoccupied is partly open; but there are trees, buildings, mounds, &c., which interfere with the ventilation. The native hospital is, however, open and freely ventilated. We are of opinion that the site of the former is unhealthy as to elevation, but the drainage appears to be sufficient, and there are no river banks, or marshes, &c. in its neighbourhood. The site of the native hospital is good, and there are no ditches, nullahs, marshes, foul ground, &c., near it. 3. The water is abundant and wholesome. 4. The European hospital has not yet been occupied. Judging from appearances the drainage is sufficient, and the refuse water, &c., is emptied into the sea by drains. There is no drainage at the native hospital. 5. The centre of the roof in the European hospital is 21 feet from the ground, with a free perflation of air underneath the floors. The floor of the native hospital, which is made of cow-dung, is about six inches above the ground, and there is no perflation of air beneath. The roof water of the European hospital is carried away by drains into the sea; but at the native hospital it sinks into the subsoil. The surface drainage and guttering round the hospital are quite sufficient to carry away the rain-fall rapidly. The European hospital is composed of brick and mortar, with single roof and walls. A space is left along the wall plate, and trap-doors are provided in the walls near the ground, which ventilate to some extent; but the wards might be made cooler by adding a canvass ceiling. The native hospital is a temporary building with mud walls, and a cadjan or cocoa-nut leaf roof. The walls are single, but are sufficient to keep the building cool. The buildings are supplied on both sides with verandahs about 9 feet in breadth, which afford sufficient shelter from the sun's rays. The verandahs are never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

Table of Hospital Accommodation.

Date of construction	European hospital, commenced 7th March 1853. Not yet occupied.	
	Native hospital unknown.	
Total number of wards	European hospital	3
	Native ditto	2
Total regulation number of beds	European ditto	40
	Native ditto	20

Hospital Wards. No.		Regulation No. of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height of Walls.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
			ft. in.	ft. in.	ft.	ft.	ft.	ft.	ft. in.	ft.	ft.	ft.
European	1	14	52 0	21 0	17	22,386	1,500	78	1 8	13	7	3
	2	14	52 0	21 0	17	22,386	1,500	78	1 8	13	7	3
	3	12	53 0	16 0	17	17,384	1,500	70·33	1 8	13	7	3
Native	1	8	19 4	17 2	13	5,634	704	41	1 8	4	5	3
	2	12	48 0	17 2	13	13,872	1,156	68	1 8	8	5	3

The hospitals are not placed so as to receive the full benefit of prevailing winds. The windows all open outwards, and we are of opinion that in the European hospital their arrangement would be improved by their being nearer the ground, and venetians substituted in the place of glass.

6. In the European hospital there are ventilators on each side of the wards, both above and below the flooring; but should it be found necessary to keep the windows in their present form closed, the ventilation would be insufficient. The native hospital is sufficiently ventilated. There are no jalousies or jhilmils.

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References to Subjects and Queries.	Replies.
XI. Hospitals—*cont.*	7, 8. There are no means either for cooling or warming the air admitted into the wards, and the latter is not at all necessary. The walls and ceilings of the hospitals are cleansed and whitewashed when thought necessary by the medical officer in charge. 9. The privies are built of the same material as the hospital, and are placed over cess-pits without drainage. From the position of the privy at the new European hospital, we fear it will eventually prove offensive. 10. At the European hospital a room is applied for lavatory arrangements, but there is no such provision at the native hospital. The patients use tubs in the verandah, and convalescents are allowed to bathe in the sea. 11. The means for bathing the sick are neither sufficient nor convenient. 12. The washing and drying of the hospital linen are performed by the native washermen, of whom there are no complaints. 13. The storage is sufficient and dry. 14. European invalids are provided with iron bedsteads with sacking bottoms, and the natives have wooden cots; but all are provided with mattresses, pillows, sheets, blankets, and coverlids. We have no improvements to suggest. 15. The European hospital kitchen is in the back range of the building, and the means and apparatus for cooking appear to be ample. This is applicable to the native hospital also. 16. Copies of the diet rolls, diet tables, &c., are transmitted. 17. There is a hospital serjeant, assisted by one orderly, at each hospital, which is sufficient attendance for the average number of patients. 18. The sanitary condition of the barrack used as a hospital for the European sick and of the native hospital is good, and no epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19. In the present temporary hospital for the European sick there are many deficiencies, which will not exist in the new one when completed. There are many deficiencies in the native hospital, and the building not being suited for its purpose, I would suggest its removal to a more suitable site, and its accommodation bineg made more commodious. 20. The verandahs are the only places for taking exercise. There are no shaded walks or seats set apart for the use of convalescents. 21. The sick wives and children of the soldiers attend at the surgery for casual complaints, or, if their case require it, the medical officer attends them at their own quarters. No improvements in the present arrangements are necessary. 22. There are no special local hospital regulations which are not included in the general army medical regulations. 23. The medical officer can only report on the necessary repairs of the hospital, and forward requisitions accordingly, but he has discretionary power regarding the change of diet and the issuing of medical comforts. 24. There is no convalescent ward or hospital for convalescents at the station, nor is there any advantage in having one.
BURIAL OF THE DEAD.	1. The burial-ground for British troops is about three-quarters of a mile distant from the station, and its position to the latter is such that the prevailing winds have no effect on the health of the troops. 2. The area of the burial-ground is nearly three acres. The soil is chiefly sand, and there is no drainage but that which is natural, and this is found to be sufficient. Decomposition takes place neither very readily nor very slowly. The ground is walled in and is carefully kept. 3. The space allowed for a grave is nine feet in length by three feet in width, and the ordinary interval between the graves is three feet. They are dug six feet deep. The area of the ground is so extensive that graves are never designedly reopened, but when one is accidentally reopened it is in ground which has been undisturbed, as far as can be ascertained, 15 years and upwards. Interment is compulsory from 12 to 18 hours after death. No epidemics have occurred in our time. The natives are buried according to their own religion by their friends. 4. The graveyard is never offensive. 5. There are no camp followers or bazaar people at this station. 6, 7. No injury accrues to the public health from the present practice, nor are there any improvements to be suggested.

(Signed) F. HAMLEY, Major, 50th "Queen's Own" Regiment, Commandant, Trincomalee.
F. COGAN, Staff Surgeon.
G. N. KELSALL, Captain, R.E.

September 3, 1860.

GALLE.

Accommodation	Queen's Troops	Artillery	42
		Infantry	141
	Native Troops	Artillery	6
		Infantry	176

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The aspect of the country surrounding the station is undulating and pleasing to the observer. The hilly parts are covered with a thick luxuriant jungle, interspersed with trees of various kinds, whilst the lower portions are thickly studded with cocoa-nut trees, which grow to the water's edge, and are swampy. There is plenty of jungle, wood, and water in the vicinity. 2. The elevated part of the station is 20 feet above the level of the sea, but the elevation of the adjacent hilly country is greater than that of the station, the average height of the hills being 130 feet above the sea. The elevated part of the station is about 25

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	feet above the nearest canal. The surrounding undulating country is higher than the station, but the site of the latter is equally healthy. 3. The nearest mountain, known as the Haycock, is distant about 40 miles from, and about 3,350 feet above the level of, the station. 4. The sea washes up to the fort walls, and is, therefore, the nearest water. There are also a river, named Ginduruh, the nearest mouth of which is about one and a quarter miles from the station, and a canal about 200 yards from the fort. In parts, the vicinity is liable to overflow in the wet season (*i.e.*, during the months of October, November, December, May, and June), but they are seldom under water for more than a couple of days at a time. There are no ravines, water pits, &c., near the station. 5. The station is freely exposed to the south-west wind, which prevails during six months of the year, but the free circulation of the north-east wind, which prevails during the remaining six months, is somewhat impeded by the fort walls. The temperature of the station is not raised by exposure to reflected sun-heat. The station is exposed to both land and sea breezes. The land wind that blows during the night at certain seasons should be avoided, as it has been known in many instances to paralyze the limbs. The sea breeze is beneficial to health. 6. The surrounding country is in parts cultivated, but there are no works of artificial irrigation near the station. The cultivation of rice within 250 yards of the station is prohibited by the military authorities, who exercise a right of control over this land, and will not allow it to be cultivated. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. The preparation of the cocoa-nut fibre, however, is carried on at a distance from the station of about one and a half miles, and the odour arising from the stagnant water in which the hucks are soaked is very offensive. 7. There is no large city in the vicinity of the station. The native population within Galle, which comprises an area of 36 square miles, is,—males, 11,700, and females, 11,250; total, 22,950. The native town commences at about 450 yards from the fort, and there is also a native town within the fort. 8. The geologic condition of this district is as follows:—The surface soil is of red sand and gravel, termed cabook, with black earth in some parts, and this is mixed with a quantity of rock of a granitic character. The subsoil is slightly argillaceous, based on rock of the same granitic formation, mixed with coral. 9. Water is usually found, in the dry season, at a depth of about 15 or 16 feet, and during the rainy season, at a depth of about 10 or 11 feet below the surface. 10. Part of the rain-fall sinks into the subsoil of the station, and so drains off, and part evaporates. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells, but there are no tanks. The water used for drinking purposes is free from pollution. 12. For the use of the troops there are six wells, with an average diameter of six feet, and the average depth of water in which is, in the wet season, four feet, while in the dry weather it seldom exceeds two feet. The water from the wells is only used for cooking purposes and for ablution. All drinking water is either purchased by the troops or procured by means of matboys (soldiers' servants). The water is brought from a well about 650 yards from the fort. The water obtained from the wells within the fort has a brownish tinge, is slightly brackish, and has an earthy smell. We have no means of testing its chemical qualities or of ascertaining its microscopic character. The quality of the water obtained from within the fort is such as to render it unfit for drinking, but that from the wells outside is good and sufficient. The water from the wells is usually drawn up in hand buckets. The supply could be improved by means of pipes, which might be laid down from the wells outside; but this would be at a considerable expense. 13. The station is remarkably healthy, and there are no other topographical points bearing on its health to be remarked on. 14. No new stations have been selected, either on hills or plains, within our experience.
II. CLIMATE.	1. There is no thermometer, barometer, rain-gauge, or other instrument at the station for conducting meteorological observations, and the subject has not been much examined into in former years; but I have arranged, from the data in my possession, such facts as the returns will admit of. From examining several years of observation on the rain, I should conclude that it rains on an average about 180 days in the year; but having been here only two months and some days, I cannot give any clear explanation of the amount of rain which falls during the year. 2. Table of meteorological observations:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	REMARKS.
January	–	80	–	84½	78	Not tested.				Not in returns; but the N.E. and S.W. monsoons occur at stated regular periods.	Not explained with any accuracy.	It would appear from the returns that it rains on an average 180 days in the year.	Thunder storms of great severity, with thunder, rain, and tempestuous winds occur during the S.W. monsoon, and in the intervals oppressive heat prevails, relieved by the sea breeze, which acts most agreeably on the atmosphere.
February	–	79½	–	84	78¼								
March	–	80	–	84	77½								
April	–	82	–	85	78								
May	–	82½	–	84½	78½								
June	–	82	–	84½	78¼								
July	–	81½	–	84	77½								
August	–	81	–	84	78								
September	–	81	–	84	77½								
October	–	80	–	85½	77½								
November	–	80	–	83	77								
December	–	79	–	83½	77½								

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References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate of this station is variable, but the variations are extremely regular. There are two seasons or monsoons—one commencing in May and ending in October, while the other lasts, as a general rule, from November to April, and between these there prevails a season of dry heat from February to May. The climate of Galle is marked by being very damp at all periods, everything being soon covered with a blue mould. This peculiar condition arises, I think, from the quantity of rain which falls during the year. I do not attribute it to the trees, which are numerous over the district, or to the irrigation or non-irrigation which exists in the surrounding neighbourhood; and the air, as a general rule, is not, I believe, charged with any atmospheric admixture injurious to the health of the troops. The men are clothed judiciously, and the barrack-rooms are large and lofty and cool, considering the great heat which prevails outside the buildings. Parades are ordered at such hours as are suited to the climate and the health of the soldiers serving in it. It would appear that May is the most unhealthy month, and April the next, but not in a very marked degree. The heat is generally greater at this period of the year, to which, I suppose, the amount of sickness is to be attributed. The prevailing forms of disease are fevers, affections of the stomach and bowels, and catarrh. The first may be referred to the heat, and the catarrhal affections to the indiscreet exposure at night, after the great heat generated during the day, the men throwing off all covering and getting chilled in consequence. At this period also the men eat a quantity of fruit, probably unripe and indigestible, and thus affections of the bowels are often produced. 4. There is no district at or near this station more eligible than the present, compatible with the defence of the station (which must have its due weight), to which the troops could be removed. This station is generally considered to be healthy. Having been less than three months in the colony, I have no further suggestions to make.
RY CONDITION	5. I have not served at any other station in this colony than the present.
III. SANITA OF STATION.	1, 2, 3. Plans of the station, with the barracks and Malay lines, are herewith transmitted. 4. TABLE of Barrack Accommodation. Total number of barrack-rooms, 2. Total regulation number of non-commissioned officers and men, 99.

Barrack-Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft.	ft. in.			ft.	ft. in.		ft. in.	ft. in.
Barrack-room not occupied by European troops.	53	106 6	27	16 6	62,542	1,180	54	1 7	8	6 5	7 0
Barrack No. 2 -	46	94 0	27	16 6	55,201	1,200	55	1 7	8	6 5	7 0
Guard-room - -	23	48 0	21	15 2	19,152	833	43	—	5	5 5	5 3
Prison cells - -	1	9 8	6	7 3	425	425	58	—	4 Ventilators.	8 0	20 0

5. The windows of the rooms are on opposite sides, and consist of an open grating, which admits a large amount of air. These do not open outwards, but there are shutters attached to each, which are capable of being opened or closed, as is most convenient. On both sides of the barrack-rooms there are large verandahs, extending their whole length. The front verandah is 9 feet broad, and that at the back 9 feet 4 inches. They are not used as places for the soldiers or others to sleep in. There are no jalousies to the barracks; but, as I have above mentioned, an open grating with shutters.

6. The bedding for each man consists of one blanket, one rug, two sheets, one mattress made of coir, and two pillows of the same material. This makes a mattress of a firm, uniform nature, which is of as cool and smooth a quality as any substance generally used. These remarks apply chiefly to the European soldiers' quarters, and I have no further suggestions to offer.

7. There are 25 tents in the commissariat store at this station—12 small and 13 large. The small tents contain a cubic space of 1,132 feet, and the large 1,800 cubic feet each, and are constructed of canvass, having a lining of blue serge. Many of them are out of repair, but still capable of being made serviceable. The small tents are returned as intended for 10 men in each, and the large are constructed for 20 men each. I should consider that six men in the small and 15 in the large would be more compatible with the preservation of health in this climate

The tents are very defective in point of ventilation, having no means of admitting air but the doors. The barrack-rooms have no other means of ventilation than the doors and windows, but if a few openings were made in the side walls, I am of opinion that the purity of the air would be improved. The only way of cooling the rooms is by sprinkling water occasionally over the floors and doorways. The guard-room is of the most convenient description. It is large and airy, and has five large circular holes made in the walls for ventilation. The cells are dry, and of the usual dimensions, with two openings in each, facing the sea. One of these is grated, and opposed to them are two oblong openings, on a lower level, on each side of the door of each cell, so that I think they may be considered as being well adapted to the purpose intended.

9. The barracks are constructed of bricks, stones, and a species of mortar, with laths or sticks interlaced.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	10. The floors are made of tiles and bricks, and have a stone paving running through the centre of the rooms. They are not raised above the level of the ground, that is to say, there is no room for the passage of any air beneath them. 11. The barracks are built of solid masonry, on the Dutch principle. I believe that brick walls will keep out heat, and I must state my opinion, that, as a general rule, the barrack-rooms are as cool as in this climate could be expected. The floor of one barrack-room of the Ceylon rifles is made of sand, and I think a brick paving to it would be a decided improvement. The barracks are kept in repair by the Engineer Department, on requisition made by the Assistant Quartermaster-General. The medical officer is responsible for the general sanitary state of the barracks, and he makes any suggestions which may appear necessary to the commanding officer. There are no stated times for lime-washing the barracks, but it is done as often as is considered desirable. The walls are kept clean by the men. 12. There are no large baths provided for the men at this station, but they bathe in the sea twice a week. The lavatory is a square building, with a stone flooring and a large channel running down its centre, which affords free drainage to the refuse water. It is open all round between the roof, which is tiled, and the body of the building, by which means a sensation of coolness is perceived on entering. The building is furnished with eight washing tubs for the men. The water for washing is obtained from the wells in the fort, and conveyed by puneins kept in the barracks for that purpose. The water for drinking purposes is obtained from the wells outside the fort. 13. The cook-house at the 50th's barracks is constructed under a verandah, which is kept waterproof. It is close to the men's lavatory, and a channel of communication for the purpose of drainage is established between them. The cooking is performed by natives. The washing of the men's linen is performed by natives outside the fort. 14. The privies for the men are built over the shore; the sea at high tide washes completely underneath them, and thus the places are kept in a pure state. At night the men have urine tubs in their rooms or in the barracks. These are removed every morning at early dawn to a place erected for the reception of their contents. There is a sort of tank, which is connected with the main sewer, which empties itself into the sea, and no perceptible nuisance of importance arises from this source. 15. The barrack-rooms are ventilated by large grated windows and doors, and are lighted by two large lamps suspended from the ceiling. These do not afford the men sufficient light to read after dark. 16. On each side of the men's barracks runs a broad, but not deep drain, with sides and bottom of brickwork, which carries the refuse water from the cook-house into a deep sewer, having communication with one of the main sewers of the fort, which carries all refuse matter into the sea. The sea does the duty of scavenger to the privies, and the urinals are removed from the barrack-rooms at daylight to a cesspool which is in connexion with a main sewer. The ground in front and rear of the European barracks is flat, and wants draining, as after rains the water collects and remains on the surface, causing, doubtless, an increase of dampness in that quarter. There is a projecting wall at one side of the hospital, which receives the droppings from the eaves of the buildings, and which has been noticed to generate dampness. A verandah on this side would be very beneficial, and it would have the effect of carrying the drainage from the roof beyond that point. There is only one cesspit connected with the barracks. It is not emptied at any time, but discharges itself into the general drain leading to the sea. The fort has a broad ditch, filled with stagnant water and rank weeds, on the land side, immediately under the ramparts. Within the fort there are cocoa-nut trees, bananas, and other vegetation. 17, 18. There is no regular surface cleansing resorted to, except such as is adopted by the residents themselves; but the prisoners are daily employed in keeping the surface of the ramparts, esplanade, &c. free of rank vegetation. The cesspool is near the men's privies, and not far from the European hospital; but no offensive odours are produced thereby. The ventilation of the fort is rendered in a measure imperfect by the ramparts and the numerous houses belonging to civilians. 19. The sanitary condition of the fort, taking the drainage, ventilation, water supply, &c. into consideration, must be considered as favourable. I have no remarks to make relative to the police of the bazaar. There is a fish market and a market for meat about a quarter of a mile from the fort, in and near which there is a bad odour; but this is not greater than is generally noticed in such places, and they are kept in good order. The houses of the natives inside and near the fort are of simple construction and kept tolerably clean. There are no dungheaps or cesspits within them to all appearance. No nuisance of a very noticeable character is caused in the fort by the wind which blows from the direction of the native buildings; yet at the same time I must remark that all along the beach human excretions are to be observed, which after all is greatly corrected by the strong sea breeze which blows over the fort. 20. The slaughter-house for the military and the whole district is built some way out on the sea shore. The sea washes at high tide much beyond it, and carries away with it the offal. It is at least a quarter of a mile from the fort, and does not produce any offensive effluvia in the interior of the station. These places are under the supervision of the police, who have strict injunctions to enforce cleanliness, and to cause the removal of offal. 21, 22. There are no horses, stables, or picketing grounds at this station. 23. The married non-commissioned officers and men occupy separate rooms from the single men, and are tolerably well supplied with room. The "Ceylon Rifle" married men are also separated from the single men; but there is a part of their quarters which is objectionable, and which has been officially represented to the military authorities as being so.
Officers' Quarters.	1. There is a range of officers' quarters for four, which is just completed. It is high in elevation, opened to the sea breeze, and thus not deficient in ventilation. The drainage is of an ample nature, and the buildings are well furnished with every convenience.

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References to Subjects and Queries.	REPLIES.
IV. HEALTH OF THE TROOPS.	1. The station and surrounding country, as well as the small locations in this district, are almost free from epidemic diseases, and the general state of health of the population is very satisfactory. The military have also enjoyed a fair amount of health. 2. The diseases most prevalent among the native population are fevers, bowel complaints, and a peculiar disease arising from the impoverished condition of their blood, and also from hereditary syphilis. About two years ago cholera appeared in this province. Diseases of the spleen have not been particularly frequent. 3. The causes of unhealthiness among the natives are want of cleanliness, imperfect ventilation of their inside dwellings, and an impoverished diet. The hereditary syphilis to which sometimes a whole village is subject is kept up by these causes. 4. The 50th regiment, or rather a detachment at present at Galle, came to this station about 2¾ years since from Ireland. This detachment was six months at Colombo previous to being ordered to Galle. I cannot make the comparison between the present health of the men at this fort and that which they enjoyed at other stations without reference to the books at head-quarters. With regard to the general health of the company of the 50th regiment stationed here, I can speak favourably. The principal diseases have been febrile, for the most part of a severe nature. Rheumatism, boils, ulcers, and bowel complaints are the diseases from which they have chiefly suffered. I do not think there is any difference in the healthiness of the men's accommodation at Galle, comparing the 50th regiment with that of the Ceylon rifles. One portion of the men's barracks at this station is certainly more healthy than the rest by reason of its great height from the ground and openness to the sea breeze, but unfortunately that portion is occupied, by order of the local civil authorities, as the Custom House, P. and O. Company's office, &c., though essentially military buildings. 5. The troops have not been camped out since their arrival at this station. 6 to 16. No experience of hill stations. 17. There are few elevated sites near this station which would be advantageous over the present position occupied by the troops, as in the fort we get the full effect of the sea breeze unpolluted by passing over any land near it. There is a place about 1½ miles from this called "Bona Vista," which, I should suppose, is about 300 feet above the sea, and which also receives the effect of the sea breeze; but at its rear are paddy fields, and it might not prove much superior as a station to the present; and though its climate might be better than that of Galle, yet there might be many disadvantages. 18. The soil of the above-named place ("Bona Vista") is one of sand or gravel, with a subsoil of a clayey nature, and this I have observed to be the most favourable for military stations. 19. The best age for a soldier to be sent out to India is at 20 or 25 years. 20. I should think it would be of little advantage delaying troops at an intermediate station; they should be sent to India direct from the home depôts. I am of opinion that if the troops are landed in India at a favourable season, and precautions taken to prevent excesses, the men would suffer as little during the first months as at any other period of their service. 21. The mode of transport for troops from the port to the interior is by easy marches, there being no railway. No additional precautions are required for preserving the health of the troops on the route, but they should arrive at the halting place for the night before 8 o'clock a.m. 22. I should think 5 or 6 or 7 years for a continued time the longest period a British soldier should serve in India. 23. There is no conflict of opinion in the medical boards as regards invaliding. 24. I should consider that the best time for invalids to leave India for England would be about the month of March.
Diseases.	1. There is a health inspection in this garrison every Wednesday morning for the detection of cutaneous and every other disease. 2. Scorbutic disease has been almost unknown at this station for the last 10 years, only one admission into hospital having taken place from this cause; and this man was *en route* from India to Australia, and contracted it on board ship. The disease is attributable to the want of fresh meat and vegetables, combined with the want of exercise and the confined atmosphere between the decks of ships, and is for the most part prevented by the removal of these unfavourable circumstances. Bad water, or a too scanty supply, may also be considered as a great cause of this disease. 3. The proportion of hepatic diseases for 10 years was as follows:—Out of 1,581 cases treated during that period, 42 of hepatic diseases were admitted; and this is by no means a large number. Only one man died from hepatitis in 10 years. The causes of this disease may be considered to be obstructed perspiration, in consequence of incautious exposure at nights, redundance of bile caused by long-continued heat, irregular habits, and bad spirits. 4. Dracunculus I have never seen; and no case is recorded as having occurred among the troops for 14 years. 5. The venereal disease is by no means common among the troops at Galle; but I understand it prevails to a great extent among the native population. One hundred and ninety-five cases have been admitted in 10 years in all its forms. A lock hospital would be a benefit to the community at large, as well as to the soldiers. The only precaution for diminishing the liability of the soldier to this disease would be to cause all the infected women to go to hospital. The proportion of admissions from venereal diseases is 195 to 1,581 admissions from all diseases. 6. I am of opinion from my short experience that epidemic and endemic diseases are rare among the troops in this garrison, and I find that for 10 years there has been very little of either. Small-pox occurred in 1855, when three of the Ceylon rifles were mildly attacked by it. The following is a statement of the number treated in hospital during 10 years; viz., 1,621 admissions, of which 205 were from fevers. The medical officers in charge, at different periods, have all agreed in stating that they were mild in form; and this is clearly proved by the fact that out of 205 cases treated, only one death resulted. There were three forms of fever; remittent, of which 46 cases occurred.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	quotidian, five; and the remainder were common fevers; the death was referred to the common order. Three cases of cholera and one death occurred during the period referred to; a casual case or so, not justly referable to endemic or epidemic causes. Sixty admissions from dysentery, acute and chronic, occurred, with only two deaths out of that number. The cases of rheumatism were, acute, 52; chronic, 23. It appears, then, from the records of the European hospital for 10 years, that out of 1,621 soldiers treated, there were only 14 deaths, a proportion under one per cent.; and this must be a proof that the diseases generally were not of a severe nature, and the climate and station not inimical to the European constitution. 7. The most prevalent form of fever is the common continued. Ague is rare, and the remittent not of a severe nature. Rheumatism is not very common, and presents no remarkable appearances; in fact, the zymotic diseases are not of common occurrence. These diseases prevail, for the most part, during the hot weather; but there are no atmospheric conditions connected with their appearance that I am aware of. The irregular habits of some of the men are a common cause of fever and rheumatic affections; but I do not believe that want of ventilation, over-crowding, or bad drainage has been actually a cause of these diseases. The men bathe regularly twice a week, and attention is paid to cleanliness. There is one disease of a local nature, which is very common among the natives, viz., elephantiasis; this affects the lower extremities very frequently, and often the scrotum. It partly owes its rise to a venereal taint, want of cleanliness, and the relaxation of the climate. Europeans are also subject here, more than they are elsewhere, to a swelling of the scrotum and enlargement of the testes of a temporary nature, and not venereal. 8. Epidemic disease is of very rare occurrence, and there is nothing in the description of duty which can be considered as likely to have an injurious effect on the troops. Habits of irregularity are the only actual or apparently real causes of disease, with the continuance of hot weather during the dry season. 9. Small doses of quinine, as a prophylactic against malarial diseases, have not been tried at this station, as such a precaution did not appear necessary. 10. The station has been exempt from any epidemic disease for many years. My experience, and that of the medical officers who have preceded me, is of this nature, that the station is not one which has demanded any exertions of ours in the prophylactic department.
V. Intemperance.	1. The soldiers at this station are usually temperate; and I believe there are but few confirmed drunkards among them. 2. I find, on consulting the records of the European corps for 10 years, that only 14 cases were directly produced by drink. Intemperance I believe to be an indirect cause of an injurious character on the health of the troops. I cannot exhibit a table of the effect of total abstinence among soldiers, as there is no notice furnished on that point; but of this I have no doubt, that a man of temperate habits is much more likely to retain his health than either a total abstinence man or a drunkard. The statistics I have obtained from the records are as follows:—Out of 1,621 admissions in 10 years, only 14 were admissions from diseases caused directly by intemperance; but this, of course, is no positive criterion of the amount of drunkenness during that period. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the military canteen after evening parade; but they are to be had at the bazaar almost at all hours. The quality of the spirit is good. Some men drink more than others, and therefore no average quantity could be arrived at of any value. There is no spirit ration at this station; but on the march the men (Europeans) are allowed one gill a day, and in this instance I have very little doubt it is attended with very good effects. This allowance is in the shape of arrack, which is obtained from the commissariat department, and is of the best quality. One or two men may take an early dram; but it is not a common practice at this station. Spirit is never given as a ration to convalescents. Lemonade and soda water are sold at the canteens in the bazaar; but I am not aware that any injury to the health of the troops has resulted from the use of them. 4. The moderate use of spirits to most men is perfectly innocent, and indeed beneficial to many; but excess in this respect is injurious to health in all instances. If used in moderation, spirit is not conducive to any departure from discipline; but if taken in excess, it is often subversive of discipline. 5. There is no spirit ration at this station, and I do not think it necessary to recommend it. There are, however, two or three canteens of a low description inside the fort, over which the military authorities have no control, and if these were abolished good must necessarily result. The men get cheaper and inferior spirits at these places, which is a strong temptation for them to avoid the military canteens. 6. Malt liquors and wines, when of a good quality, have a great advantage over spirits; but cheap wine is generally very injurious to health. 7. Coffee, tea, lemonade, and soda water are used at this station in moderation, and are not injurious to health. As a rule they are superior to beer or spirit; as regards discipline certainly so. 8. There is no spirit ration, and I cannot recommend one to be resorted to. No case has come under my knowledge of convalescents being allowed spirits. 9, 10. No good would result from prohibiting the sale of spirituous liquors. If the men are inclined to drink spirit, they will if it is unattainable in the military canteens, go to places outside the fort, where bad spirits are sold by natives, over whom the military authorities have no control. Indeed this nuisance is carried to such an extent that we have at present a native canteen inside the fort, and it is not in the power of the military authorities to prevent it, though it has been represented as a positive nuisance, involving a bad example to the soldiers of the garrison, and causing additional work in the shape of soldier policemen, to prevent one from entering it. 11. The military canteen regulations are as follows:—The canteen to be opened from 12 o'clock to 10 p.m. for the sale of wine and beer only. No liquor of any sort to leave the canteen without a pass; but married men are permitted a restricted quantity for home consumption. No soldier is allowed more than a bottle of beer or a pint of wine in the afternoon. From 5 p.m. (or after parade) till 8 p.m. arrack is also

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	sold. No civilian is allowed liquor without a pass. The serjeant in charge of the canteen is held responsible for due order.
VI. DIET.	1. The ration of the Queen's British troops consists of 1 lb. bread, 1½ lbs. beef, 4 ozs. rice, 1½ oz. coffee, ¼ oz. tea, 1 oz. salt, and 1½ oz. sugar. Vegetables and other condiments or extra articles are purchased by the men themselves. These things are done in messes, which constitute a very superior diet to that which would be the result if they were cooked separately. The orderly officer of the day goes round the barracks with the view of examining the rations, and inquiring if the men have any complaints, and he is responsible to the commanding officer for the due performance of this duty. 2. There is not a complete ration at this station, including fruit and vegetables, but there is a stoppage of 1½*d.* a day from the men's pay for these articles. The men have three meals a day, viz., breakfast at a quarter to 8 a.m., dinner at 1 p.m., and tea at half-past 5 p.m. The whole stoppage daily from the men for messing is 5*d.* At breakfast they have coffee, bread, and ½ lb. meat fried; at dinner soup, made of beef and vegetables and bread. Tea consists of bread only, but most of them purchase milk for themselves, also eggs and fruits. The vegetables, for which the men themselves pay 1½*d.* a day, and which are made into soup for dinner, are generally in good quantity. 3. The ration the men get is very excellent, if vegetables were supplied by Government. The men are stout, active soldiers, and as a rule are in very strong health, and this is the best criterion that the ration is excellent in quality and sufficient in quantity. The men eat their meals in companies, and are all present at breakfast, dinner, and tea. They are not allowed to sell their rations, but they are permitted to exchange them for eggs, puddings, rice, and curry. 4. The cooking is performed by natives, who are supplied by the commissariat with the necessary utensils, viz., boilers, frying pans, saucepans, and pots of different descriptions. The kitchens are clean, well ventilated, and sufficiently supplied with water. The cooking is properly done, and there are no complaints among the men. Vegetables are supplied in good quantity, and tea and coffee are properly prepared for the men. They have coffee before a march. 5. The climate of this station is not suitable for gardening, as it requires much exposure to the sun, which is prejudicial to the health of European soldiers.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are as follows, viz., forage cap with a peak and white calico cover, white calico shirt, jacket, and trousers made of white American drill, boots of the usual ammunition pattern, and socks, either worsted or cotton. On night duties the red shell jacket is worn; pouch-belt with a waist-belt, from which are suspended the smaller pouch and bayonet. The present dress is considered as suitable to the climate, and I have no suggestions to offer regarding it. The guard dress consists of white American drill trousers, with jacket of the same material. Men on guard have the protection of good substantial guard-houses with verandahs.
Duties.	1. It is advisable that men be drilled at home before being sent to India; but so far as regards their health it makes no difference. 2. The usual routine of the soldiers' duties here is as follows, viz., gun fire at 5 o'clock a.m.; morning parade at 6 a.m. till half-past; garrison fatigue bathing or drill without arms; roll-call at 10 a.m.; evening parade from 5 till half-past p.m.; drill with arms. On Saturday marching order. Mounting guard about every fifth day. Company fatigues few. The best time for drills and parades is between 6 and 7 a.m., and between 5 and 6 p.m., and for marches between 3 and 7 a.m. There are general orders respecting these. The average number of nights the men have in bed during the week is four or five. 3. All the guards, with the exception of the Cutcherry guard, which is about a mile from barracks, are within a few hundred yards of each other. Guards last 24 hours by day and night. There are two roll-calls by night, and by day two and sometimes three. The effect of night guards on the health of the troops is not prejudicial. No additional precautions are requisite at this station.
VIII. INSTRUCTION AND RECREATION.	1. We have no ball courts or skittle grounds at this station, but there are a school (with a schoolmaster), a library, and a reading-room, which are sufficiently lighted at night. The detachment of gun lascars has a small garden attached to their quarters, which the men manage themselves. The school-room is now and then converted into a theatre, which is managed by the detachment of the 50th regiment. The detachment of the rifles and that of the 50th regiment play at cricket twice a week on the esplanade. These means of recreation and instruction appear sufficient to keep the men employed off duty. European troops off duty are restricted as to exposure to sun and rain out of the green facing their barracks, which is planted with sooraroo trees. 2. I have no improvements to suggest. 3. Soldiers' savings banks are in existence, and they are advantageous. 4. There is sufficient shade from trees called sooraroo, which are planted before the men's barracks and all round the parade ground facing the barracks.
IX. MILITARY PRISONS.	1. The military prisons here are well ventilated and arranged, and no case of sickness has originated, since my arrival here, out of any defect in their construction.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Regulations. 2. The practical working of the powers of the medical officers is harmonious enough. 3. No reply to this query. 4. The sick are generally transported in the "Pearl" steamer; but there are no special regulations bearing on these matters. The hospital supplies are conveyed in carts drawn by bullocks.

References to Subjects and Queries.	Replies.

XI. Statistics of Sickness and Mortality.

The following table shows the strength of white and native troops for ten years, with total admissions and deaths for that period:—

White.		Native.	
1st year	96	1st year	163
2nd ,,	126	2nd ,,	88
3rd ,,	127	3rd ,,	65
4th ,,	126	4th ,,	75
5th ,,	116	5th ,,	92
6th ,,	117	6th ,,	99
7th ,,	123	7th ,,	103
8th ,,	127	8th ,,	129
9th ,,	109	9th ,,	163
10th ,,	100	10th ,,	189
	1,167		1,166
Total admissions	1,846	Total admissions	1,163
Total deaths	14	Total deaths	7

This is a remarkably small per-centage of deaths. Colonel Tulloch gives the proportion of deaths to strength at Ceylon as 23 per 1,000; but this is less than half that proportion.

XII. Hospitals.

1. Plans of the hospital are herewith transmitted.
2. The position of the hospital as regards the barracks is very convenient. It is within 100 yards of the European barracks, on its left, right, and rear, with the exception of the quarter occupied by the royal artillery, which is about 450 yards from the hospital. There are no cavalry stables at this station. The bazaar, properly so called, is outside of and about half a mile from the fort. The houses of the civil population inside the fort are close to the hospital. The site of the latter is open, freely ventilated, and decidedly healthy.
3. The water supply of the hospital is abundant and good.
4. The hospital is built on a point of land projecting towards the sea. The impurities, refuse water, &c. &c., are emptied at the extreme point, and the sea at high tide effectually removes them.
5. The ward, the only one in use, is built on the solid earth, with no perflation of air beneath it. The soil is generally dry, and the ward also, but the atmosphere is damp. This arises from the strong sea breezes which prevail. There is a broad drain which runs along the side of the hospital, into which the roof water empties itself. This only occupies two sides, and on the others the rain is absorbed into the earth. On one side of the hospital the surface drainage requires to be attended to, but on the other side it is sufficient. The walls of the hospital are built of coral stones laid in mortar, and the roof is a tiled one. The walls and roof are single. The floors of the rooms and verandah are paved with tiles. The verandah of the patient's ward is 7 feet 8 inches wide. It affords sufficient shelter from the sun's rays, and is not used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

Table of Hospital Accommodation.

Date of construction unknown. It is believed to have been originally built by the Dutch.

Total number of wards, 1.

Total regulation number of beds, 16.

Ward. No.	Regulation Number of Sick in Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		ft.	ft.	ft.	ft.	ft.	ft.	ft.			
1	16	70	21	11	19,845	1,240	92	21	—	—	—

The hospital is placed so as to receive the full benefit of the prevailing winds. The front windows consist of a frame, to which are hung vertically, on pivots, venetianed shutters opening outwards. The back windows have not venetian shutters, but paneled ones, opening outwards. This arrangement is conducive to ventilation and coolness.

6. There are no artificial means of ventilation to the wards, the air being admitted through the doorways and windows, and when the doors are closed, by means of the venetian shutters above alluded to, this arrangement is sufficient to keep the wards free from closeness and odour. The jalousies consist of flat pieces of wood, half an inch in thickness, and three inches in breadth. The circular mortices are drilled in the shutter frames, into which circular tenons, projecting from either end of each flap, are let. They are opened by means of a wooden rod, passing down the centre of the jalousies, and fastened to each flap with a wire, and the rod is kept in position by means of a button at top and bottom.

7, 8. There are no artificial means used either for cooling or warming the air admitted into the wards. The hospital is cleansed and lime-washed twice a year, or whenever it is considered advisable, on the requisition of the medical officer.

9. There are no waterclosets. The privy is situated at a projecting point of the ramparts, overhanging the sea shore, and is kept well washed by the waves at high tide, and it may be stated that it is very little offensive.

10. The patients are supplied with china or earthenware washing basins, and there is a large bath tub, which is only used when specially ordered. The convalescents are allowed to

GALLE. CEYLON.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	bathe in the sea occasionally, in charge of a non-commissioned officer. A bath-room is required. 11. For the men who are seriously ill the only means of bathing is a bath tub, which is used when ordered by the medical officer. The washing basins are supplied by the commissariat. 12. The washing and drying of the hospital linen is performed by the natives per contract. 13. The store-room is sufficiently large and dry, but is much infested with rats, which often do much damage. 14. The bedsteads are large sized (of iron), with sacking bottoms, and some of them are furnished with the power of being elevated to any required height. The beds are filled with coir, but rather scantily at times, and I should recommend a larger quantity than that ordinarily used. The rest of the bedding is good in every respect. The hospital kitchen is situated in a back yard, sufficiently convenient to the wards, but not so close as to be in any way an annoyance from smoke or other cause. It is rather dark, and not sufficiently ventilated. There are boilers, frying pans, and other means of cooking, but there is no convenience for baking or roasting, otherwise than in chatties, which is inconvenient and not an efficient means. 16. The diet tables, diet rolls, &c. in use at this station are received from head-quarters, Colombo. The statistics of sickness, mortality, &c. are gathered from the annual sanitary returns of the station. 17. There are an acting hospital serjeant and one orderly to the European hospital. There are no nurses; but the two men are quite sufficient. 18. The sanitary condition of the hospital is such as to render any complaint unnecessary. No epidemic disease, hospital gangrene, or pyæmia, or any infectious malady has prevailed at any time in the wards. 19. There are really no suggestions required, except an additional drain along one side of the building, where at present the rain from the roof is absorbed into the ground at the base of the building. 20. The patients who are in the stage of convalescence have a broad verandah to walk in, which runs the whole length of the hospital. This, however, is barely sufficient, and of course a more extended means of exercise would be very advantageous. 21. Soldiers' wives and children are entitled to medical attendance and medicines. No further arrangements are made on this point; but I am of opinion that they should be entitled to medical comforts, such as wine, sago, milk, and other support, as the nature of their cases seem to require. At present there is always some difficulty in this respect. 22. There are no special local hospital regulations not included in the General Army Medical Regulations. 23. The medical officer has the power of suggesting improvements in everthing connected with the hospital. He can vary the diet, and has the power of giving such medical comforts as he may deem necessary. 24. There is no separate ward for convalescents. The hospital has generally been so little crowded that there has been no difficulty on this point; but should the hospital have its full complement of sick, a convalescent ward would be a great acquisition.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for British troops is outside the fort, and the wind generally blows from the fort over it, seldom indeed from the burial ground. The distance is at least a quarter of a mile from the fort, and no perceptible influence springs from it, such as to affect the garrison. Its area is about an acre. The ground slopes very much, and the greater part is kept drained. The soil is Cabook gravel and some black earth, and underneath rock. No means can I discover of ascertaining the rate of decomposition positively. The burial grounds are kept in good order. 3. The regulations for the interment of bodies are as follows:—The graves are generally 7 feet 3 inches, or 7 feet 4 inches in length, 3 feet or 4 feet in breadth, a space of about 2 feet being allowed between each. The graves have never been re-opened, the burial ground being only of recent adoption. The depth of graves is about six feet. The general practice with respect to the military interments may be stated thus:—If a man dies during the night, he is generally buried about 5 o'clock on the following evening; but if the disease is of an epidemic nature, or very infectious, interment takes place sooner. This refers to native as well as to European troops. 4. The graveyards are never offensive. The usual practice is for the burial to take place about 18 hours after the decease of the soldier, but this rule is not strictly adhered to; if the disease has been of an infectious or putrescent character, it is performed earlier. The distance between the fort and the burial ground of the natives is greater. 5, 6, 7. No injury accrues to the public health from the present mode of disposal of the dead, nor are there any suggestions to be made.

(Signed) WM. C. VANDERSPAR, Major, C.R.R., Commandant.
F. R. WARING, Surgeon Major.
W. S. BOILEAU, Lt. R.E.

20th September 1860.

NEWERA ELLIA.

Accommodation—Queen's Troops—Infantry - 100.

References to Subjects and Queries.	Replies.
I. Topography.	1. The plain upon which the station of Newera Ellia is situated is surrounded on all sides by a mountainous country. The hills are covered with wood, and a dense forest intersected with ravines, which latter after a fall of rain are filled with water, envelopes the station. The plains upon which the cantonment is situated are swampy. 2. The elevation of the station above the sea is 6,200 feet, the adjacent country being on the same level. There is higher ground, called the "Horton Plains," about 20 miles distant, which is not subject to the continuous rains that fall in Newera Ellia during seven months of the year. The frosts, however, are more intense, and the air clearer, but there is not a plentiful supply of water near the plains. 3. The station is situate at the foot of a range of hills, without any table land near. Pedro-talagalla, the highest point in Ceylon, overhangs the plains, its summit being about two miles distant from the barracks. 4. The only water near the station is a small stream, which runs through it, and empties itself into the Mahawhilla Ganga. The vicinity is not liable to overflow at any season. There are several ravines running from the mountains above the station, but they have no injurious effect on health, being nearly dry during the fine season. 5. The station is freely exposed on all sides, and there is no impediment to free ventilation. The buildings in the cantonment are not exposed to reflected sun heat. The only two winds that blow over the station are the two monsoons, viz., the N.E. and the S.W., which are the only ones to which it is exposed. 6. The surrounding country is uncultivated, the cultivation of rice being prevented by the frosts. 7. A small native town, containing about 200 inhabitants, stands about a mile distant from the station. 8. The general surface of the soil of the district is black peat; the subsoil being either gravel or a species of soft cabook stone. There is no appearance of the ground having been occupied before the present station was formed. 9. There is always an abundance of water during the dry and rainy seasons, both from springs and small rivulets, which rise in the mountains over the station. 10. All the water, both from the rainfall and surface springs, is conducted by various streams into a small river, which, owing to the fall in the ground, carries off any quantity with great rapidity. No drainage from higher ground passes into the subsoil of the station, the drainage from the high lands being carried off by the ravines, which lead at once to the river. 11. The water supply of the station is derived partly from the river and partly from surface springs; none being stored in tanks. 12. The quantity of water at all seasons is unlimited, and its quality is good in every respect. 13, 14. No reply to these queries.
II. Climate.	1, 2. There are no instruments of any description for meteorological purposes. 3. The climate from the beginning of January to the middle of May is very dry; during the day the sun is powerful, but the nights are cold, the thermometer falling frequently below freezing point. For the remainder of the year the temperature, day and night, is much the same, the thermometer varying between 56° and 63° in the 24 hours. During this season few days pass without rain of a small drizzling kind, which sometimes lasts for weeks without intermission, accompanied by a dense fog. The climate is considered healthy for Europeans, as it has been selected as the sanitarium of the island; it is not, however, favourable for dysentery or acute disease of the lungs; in other cases the cool air has a very bracing effect on the constitutions of invalids sent from the low country. A portion of the men are employed by the Royal Engineer Department in keeping the buildings, &c., in repair, and they are able to work during any part of the day without injury to their health. There is no difference in the salubrity of the station during the wet or dry seasons, nor are there any diseases, except chronic cases sent here from the low country. 4. There is no district near the station the climate of which is more conducive to health than that of the station. 5. No reply to this query.
III. Sanitary Condition of the Station.	1, 2, 3, 4. Table of Barrack Accommodation. Total number of rooms, 2. Total regulation number of non-commissioned officers and men, 100.

Barrack-Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft.	ft.	ft.	ft.	ft.	ft.	ft. in.		ft. in.	ft. in.
1 barrack-room -	50	100	23½	17	39,950	799	47	1 8	8	4 5½	2 11
1 barrack-room -	50	100	23½	17	39,950	799	47	1 8	8	4 5½	2 11
Total -	100	—	—	—	—	—	—	—	—	—	—
Guard-room -	—	29	20	15	8,700	—	—	—	—	—	—
4 prison cells -	Each cell for one man.	8½	6	9	459	459	51	—	—	—	—

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of the Station—*cont.*	5. The windows are on opposite sides, and open in two pieces on hinges. There are no verandahs to the barracks, nor any jalousies or jhilmils. 6. Wooden cots are in use in the barracks, the mattresses and pillows for which are filled with loose coir. Iron bedsteads would be much preferable, as they would not harbour the fleas, which abound at the station, so much as the wooden cots. 7. No reply to this query. 8. The ventilation is kept up principally by means of the windows, but there are holes in the walls beneath the floor boards, which admit a current of air. The ventilation is sufficient to keep the air pure night and day. 9. The barracks are built of stone and roofed with felt. 10. The floors are of plank raised about 2½ feet from the ground, and have always a free current of air under them, introduced by ventilators in the walls. 11. The materials used in the construction of the barracks are quite suitable in a sanitary point of view. The barracks are kept in repair by the Royal Engineer Department, but from want of labour are not executed with any rapidity. The walls are coloured about once every year. 12. No reply to this query. 13. There is no washing carried on in the barracks. 14. The contents of the privies, which are collected in cesspools, are emptied from time to time as required, and buried at some distance from the barracks. 15. The barracks are lighted at night by four lamps in each room, which, however, give a very indifferent light. 16. There are no sewers; the barracks are drained by gutters on the surface, the contents of which fall, after traversing about 10 yards, into a small brook, which has always a certain amount of fresh water in it; the drainage is quite sufficient for all purposes. No part of any of the buildings is damp. There are no foul ditches. 17, 18. There are no old walls, hedges, or other obstructions to interfere with the ventilation of the station. 19. The bazaar is generally clean, with plenty of water flowing through it. The general condition of the native houses near the station is very filthy. No nuisance is experienced in barracks from wind blowing over the native houses. 20. Animals are slaughtered more than a mile from the station by a contractor, and no nuisance whatever is experienced from the condition of the slaughtering places. 21, 22. No reply to these queries. 23. The married men at the station are provided with separate accommodation.
Officers' Quarters.	1. The sanitary condition of the officers' houses is good.
IV. HEALTH OF THE TROOP	1, 2. The station, district, and adjoining population are very healthy, the prevailing disease with the latter being bowel complaints. 3. No reply to this query. 4. The troops at the station are composed of invalids from all parts of the island. No part of the men's present accommodation is more unhealthy than the rest. 5. The troops at the station are never camped out. 6 to 24. No reply to these queries.
Diseases.	1. There are inspection parades for the discovery of incipient diseases once a week. 2. There has been no scorbutus among the troops. 3. No hepatic disease occurs at this station. There are sometimes a few chronic cases sent from the low country for change of air. 4. No case of dracunculus has occurred at the station. 5. Venereal disease is of very rare occurrence here. 6. There are occasionally cases of dysentery and rheumatism among the troops; the proportion of admissions from these diseases to total admissions,—between the 1st January and the 30th September 1860,—being 7 in 26, and that of deaths to total admissions during the same period, being 2 in 26. 7. Dysentery is the only zymotic disease, and occurs generally during the wet season; but there is nothing peculiar in the atmospheric conditions which precede or accompany its appearance. 8. There is no epidemic disease at the station. 9. Small doses of quinine have not been tried as a prophylactic against malaria diseases. 10. No reply to this query.
V. INTEMPERANCE.	1. Intemperance is not greater here than at other stations in the island. There are no confirmed drunkards. 2. From the 1st January 1860 to the 30th September there have been altogether 26 admissions into hospital, and out of this number two cases have been directly from intemperance, but none indirectly. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteen, but the probable amount consumed by each man cannot be ascertained. Spirit is part of the ration at the station, but not on the march. One gill of arrack is issued daily at the dinner hour. It is never given to convalescents. No drinks other than intoxicating drinks are sold in the canteen or bazaar which are injurious to health. 4. The amount of spirit consumed by the men does not appear to have any injurious effect on their health. 5. If the sale of spirits was abolished in the military canteen, it would drive the men to the native arrack shops, where they would obtain a very injurious kind of spirit. 6. If malt liquor could be obtained at a reasonable price by the men, it would be much more beneficial than spirits. 7. Coffee, tea, lemonade, &c. are not much used at the station. 8. If beer could be substituted for spirits as a ration, it would be much better for the men. 9. It would not be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, &c., to be sold to the troops, because those men who prefer spirits to malt liquor would be driven to the native arrack shops. 10, 11. No reply to these queries.

References to Subjects and Queries.	Replies.
VI. Diet.	1. The soldiers' ration consists of fresh meat, 1½ lb., or salt meat, 1 lb.; bread, 1 lb., or biscuit, ¾ lb.; rice, 4 oz.; sugar, 1½ oz.; tea, ¼ oz., or coffee, 1½ oz. The ration is inspected by the officer commanding the detachment, or the surgeon. 2. Vegetables are paid for by the soldiers themselves, in addition to the stoppage for rations, which is 3½*d.*; they do not form part of the rations. The men have breakfast at 7½ a.m., which consists of ½ lb. of meat, tea or coffee, and bread. Dinner at 12 o'clock, consisting of 1 lb. meat, bread, rice, and vegetables. Supper is at 5½ p.m., at which the remainder of the bread and either tea or coffee are then taken. The quantity of vegetables bought daily is about 1½ lb. of either potatoes or cabbages for each man. 3. The ration is good and sufficient. It cannot be disposed of, at least not in an uncooked state, as the whole of the ration is handed over to the cook by the orderly corporal, who sees that the whole is returned when dressed. 4. There is an open fire-place with boilers and frying-pans for cooking the food. The kitchen is light, well ventilated, with plenty of water near. The food is boiled, baked, or fried, and is cooked in a satisfactory manner. Coffee is always taken before a march. 5. The men are at liberty to cultivate any portion of the ground in the vicinity of the barracks, and a great many gardens are in cultivation, filled with potatoes and the ordinary vegetables grown in England.
VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the soldiers are the same as those in use on home service, and are quite suitable to the climate at all seasons. The guard dress is exactly the same as that used on home service. The sentry is protected by a wide verandah in front of the guard-room.
Duties.	1, 2. The men at this station are either invalids sent from the low country for the benefit of their health, or artificers sent up for the purpose of building and keeping in repair the military buildings. The drill is only occasional, and takes place in the early morning. The climate will permit of drills, parades, and marches at any hour of the day without injury to the health of the men. The average number of nights the men have in bed during the week is four. 3. There is only one guard mounted, which is about 50 yards from the barrack-room, and is relieved every 24 hours. There is a roll-call three times a day, but none after 9 p.m. The night guard does not affect the health of the men.
VIII. Instruction and Recreation.	1. There is no ball court, and only a skittle ground at this station and a library, but no light is allowed at night. Soldiers are at liberty to cultivate any portion of the military reserve in the vicinity of the barracks, of which privilege about one half of the detachment avail themselves. The means are not sufficient to occupy the men, and some additional recreation is required during the wet season. No restriction is placed on the men with regard to exposure to the sun and rain when off duty. 2. A covered ball court would be the best additional means of recreation. 3, 4. No reply to these queries.
IX. Military Prisons.	1. The cells at this station have been built so far from the other barrack buildings that they are quite useless.
X. Field Service. XI. Statistics of Sickness and Mortality.	No information under these heads.
XII. Hospitals.	1, 2. The hospital was destroyed by fire a few months ago. One of the barrack-rooms is used as a hospital till a new one can be built. 3 to 13. No reply to these queries. 14. Iron bedsteads are used. The mattresses are stuffed with loose coir and the pillows with cotton. The bedding consists of blankets, sheets, and bed covers. 15. No reply to this query. 16. The diet tables and returns in use are those laid down in the Medical Regulations of the year 1859. 17. One hospital corporal, a private as orderly and another as cook, is the attendance provided for the sick, and is quite sufficient for the number of patients usually in hospital. 18, 19. The sanitary condition of the hospital is good, and no epidemic has occurred therein. No deficiencies are recorded. 20. No provision is made for the exercise of convalescents. 21. Soldiers' wives and children are treated in their own quarters. The present arrangements are merely temporary. 22. There are no special local hospital regulations not included in the General Army Medical Regulations. 23. The medical officer has the sole management of the sanitary matters connected with the hospital, as also of the diet and medical comforts. 24. There is no convalescent ward or hospital at the station, and none is required.
XIII. Burial of the Dead.	1 to 4. The dead of the British troops are buried in the church-yard, which is nearly a mile from the barracks, without particular regulation as to graves, &c., but the graves are made about 6 feet deep, and are usually about 4 feet apart from each other. 5, 6. The dead of camp followers or bazaar people are buried in a piece of ground outside the bazaar. No injury accrues from the present practice.

30th September 1860.

(Signed) E. Antrobus, Captain, 50th Regiment.
G. F. Davis, Assistant Surgeon, 50th Regiment.

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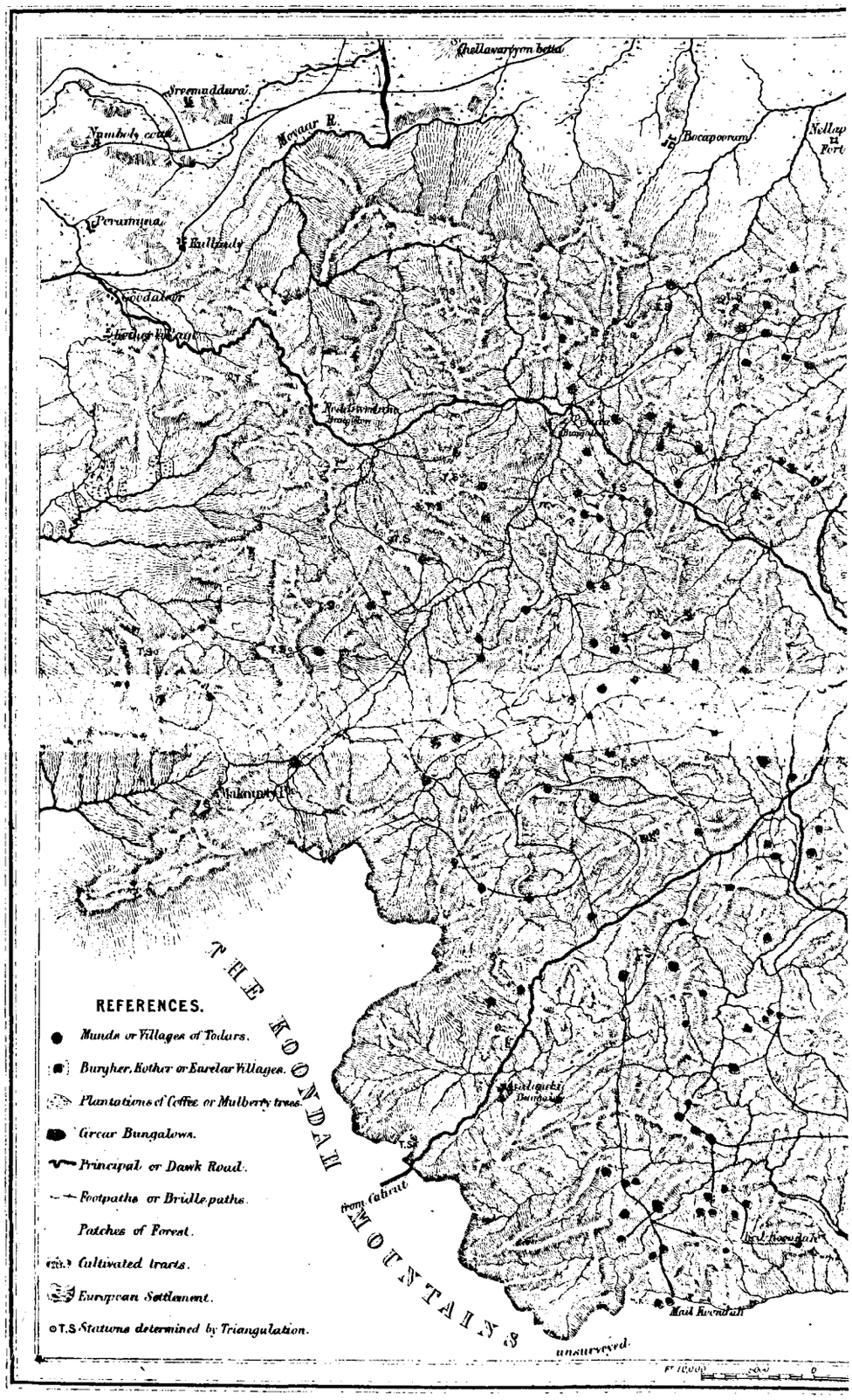
MAP

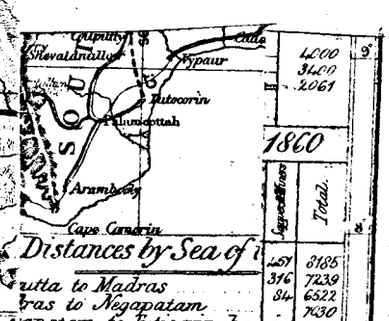


Chellavaryon betta
Sreemuddura
Namboly coat
Moyaar R.
Bocapooram
Nellap
Fort
Peramuna
Kullady
Goodaloor
Kothar Village
Maknurty Pt.
THE KOONDAH MOUNTAINS
from Calicut
Mail Koondah
unsurveyed
REFERENCES.
Munds or Villages of Todars.
Burgher, Kother or Eurelar Villages.
Plantations of Coffee or Mulberry trees.
Circar Bungalows.
Principal or Dawk Road.
Footpaths or Bridle paths.
Patches of Forest.
Cultivated tracts.
European Settlement.
T.S Stations determined by Triangulation.

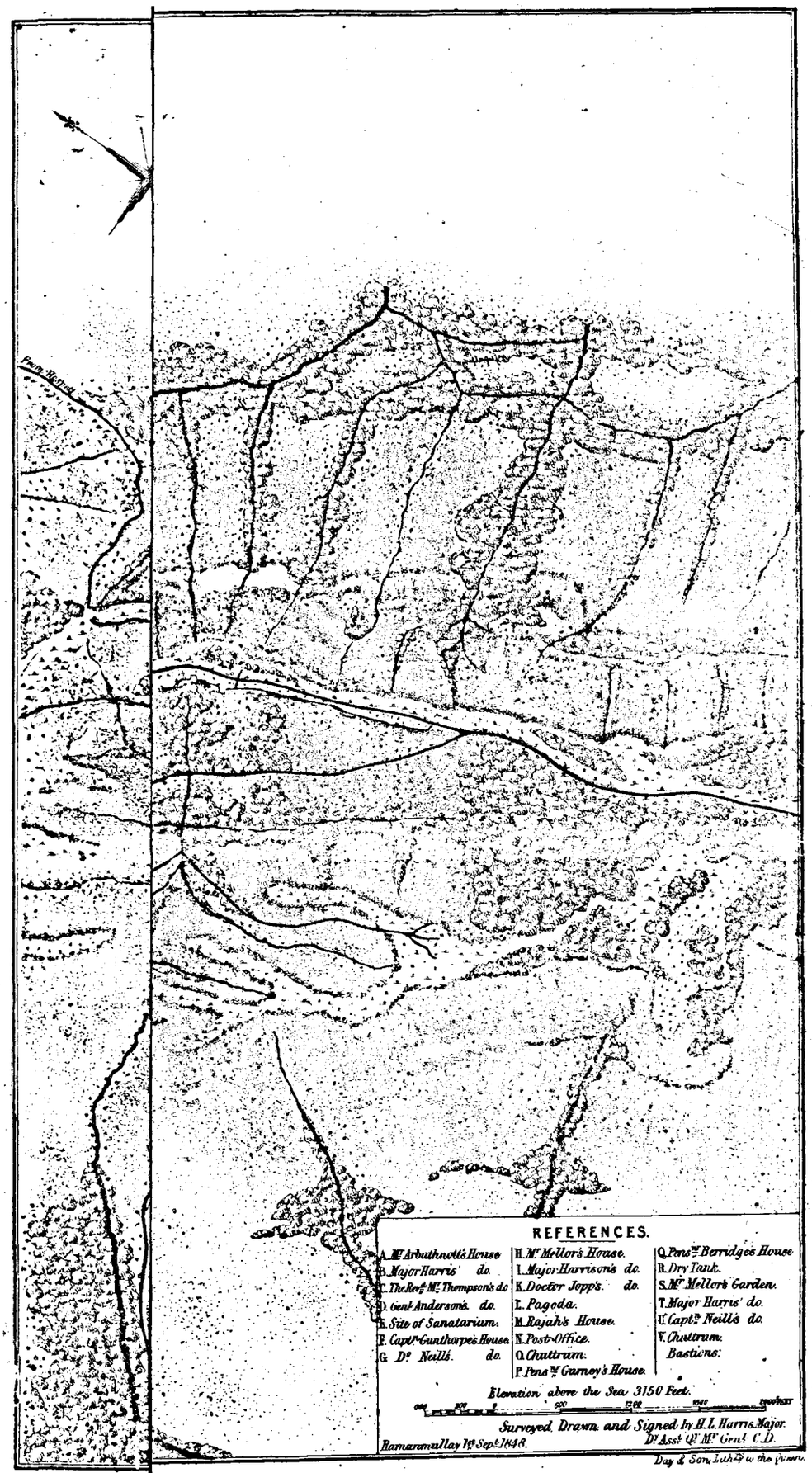
THE NEILGHERRY MOUNTAIN

REDUCED FROM THE RECENT SURVEY.

Day & Son, Lith^rs to the Queen



	4000	
	3400	
	2061	
1860		
	Sq. Miles	Total.
Distances by Sea of	457	8185
utta to Madras	316	7239
ras to Negapatam	84	6522
apatam to Tuticorin by		7030
D° D° R	128	4804
		4948
ay to Beitkul Bay	56	8506
kul Bay to Mangalore		6438
galore to Beypoor	446	16797
Mang^r Press	1481	69469


REFERENCES.
A. Mr Arbuthnott's House
B. Major Harris' do.
C. The Revd Mr Thompson's do
D. Genl Anderson's do.
E. Site of Sanatarium.
F. Captn Gunthorpe's House.
G. Dr Neill's do.
H. Mr Mellor's House.
I. Major Harrison's do.
K. Doctor Jopp's do.
L. Pagoda.
M. Rajah's House.
N. Post-Office.
O. Chuttrum.
P. Pensnr Gurney's House.
Q. Pensnr Berridge's House
R. Dry Tank.
S. Mr Mellor's Garden.
T. Major Harris' do.
U. Captn Neill's do.
V. Chuttrum.
Bastions.
Elevation above the Sea 3150 Feet.
Surveyed, Drawn and Signed by H. L. Harris Major.
Ramanmullay 1st Sept 1848.
Dy Asst Qr Mr Genl C.D.
Day & Son, Lithrs to the Queen.