

MADRAS RECORD OFFICE.

Government of Madras.

Public DEPARTMENT.

G.O. No.	350	Press
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*Proceedings of the Madras Government, Public Department,
7th April 1866.*

Read the following papers :—

No. 22. From the Officiating President of the Sanitary Commission, Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 10th March 1866, No. 839.

The Sanitary Commission for Bengal having invited the co-operation, and

Enclosures 2.
1 Dr. Billie's Etiology on cholera.
1 Memorandum by this Commission on the marching of Troops.

assistance of this Commission to furnish as much information as possible with regard to cholera, to enable them to prepare a report to be laid before the Sanitary Congress about to assemble at Constantinople, and having been instructed by Government on the same subject,* they now present their report,

* Nos. 103 and 178, dated 31st January and 19th February 1866, respectively.

with a view to its transmission to Calcutta, with such observations as may be thought necessary.

2. The queries put to this Commission in the papers referred to above are answered *seriatim*, with as much conciseness and brevity as the importance of the subject admits.

Question 1st. Is the Delta of the Ganges, as is generally believed in Europe, the permanent source of cholera? * This question is more satisfactorily answered in Bengal than in this Presidency, as it appears to this Commission that the opinion therein expressed is

purely conjectural. As far as their own knowledge extends, the Delta of the Ganges is not now the permanent source of cholera, although a very severe epidemic did originate at Jessore (a place situated there) in 1817, which rapidly spread over a large tract of country, and it is generally supposed that this was the first known outbreak of this pestilence, a fact not at all clearly proved.

Question 2nd.—This year it was imported into Egypt by the pilgrims who returned from Mecca; but had not these pilgrims brought with them the germ of the disease from their original country?

Question 3rd.—Did not these pilgrims count in their number some Musulmen who came from the Districts of India when cholera was raging?

any District where cholera was prevailing.

Question 4th.—What is, in general, the rise, progress, and advance of cholera in British India, and what are its chief characteristics?

3. The Commission have no reliable data whatever upon which to answer these two questions, and, as is shown in their answers to question No. 11, the number of pilgrims who embarked from ports in the Madras Presidency for Mecca, is remarkably small, and they have at present no evidence to show, either that those who did embark were suffering from any epidemic, or had passed through

4. This Commission are of opinion that the actual origin of this disease is still purely enigmatical, although, from long experience with its visitations, there are many well ascertained facts, with

regard to its progress, advance, and decline, which are now almost universally accepted by Medical men in this country.

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They are further of opinion that its visitations are governed by the same laws which mark the progress of other epidemics, and that the germs of the disease when once developed are propagated in various ways from one place to another, and that the virulence of the disease is increased in intensity by various local causes, more especially by the over-crowding of large masses of people.

It seems probable that the germ of the choleraic poison is spontaneously generated by the transformation of the elements of organic matter during their passage into a state of decomposition, and that the specific cholera cell thus produced rapidly re-produces itself in a similar manner, more especially in the excretions of those attacked.

The nature of this poison is purely conjectural, but probably exists either in a fluid or dry state, and in this form it may be carried about from place to place by various agencies.

Whether this poison introduces itself into the body through the agency of substances taken into the stomach, or directly into the system, through the medium of lungs, are questions still too problematical to hazard an opinion upon; but that after the introduction of the cholera poison, it rapidly exhibits its effect on the system in the most violent symptoms, which are all characterized as efforts on the part of nature to rid the system of some irritant substance.

In the majority of cases, the powers of life rapidly fail from the excessive serous discharges which take place along the whole course of the mucous lining of the intestinal canal, and the person dies in a state of collapse.

The symptoms of this disease are so well known as to render any recapitulation of them unnecessary here; this Commission will, therefore, confine their remarks to those causes which favor the propagation of the disease, and which they are justified in believing from the accumulation of evidence recorded concerning them.

This Commission have no hesitation in recording their belief that cholera is propagated from one place to another by human intercourse, and that its course on the map can be traced along the high roads from one station to another. Innumerable instances demonstrating this fact may be given as occurring in this Presidency, of which the following are examples:—

In 1860, the 35th Regiment Native Infantry marched from Hurryhur, in the Mysore country, to Bellary, in the Ceded Districts, taking with them the carriage of the 16th, the relieving Regiment. The 16th Regiment had a few sporadic cases of cholera on the line of march, but it never appeared in an epidemic form.

“On the 5th morning, after leaving Hurryhur, *en-route* to Bellary, the disease broke out with much severity. On finding that an increasing number were being daily struck down, on the recommendation of the Surgeon, the Corps, on the 19th January, was broken up into three divisions, each party proceeding by separate routes to different encamping grounds. Immediate marked benefit was the result of this step. Under instructions from the General Commanding the Division, the Regiment was again re-united on the 22nd January. The cholera instantly increased three-fold, the type of the disease being also more severe than hitherto; when, on Surgeon Hadwen's urgent recommendation, the Regiment was again broken up on the 27th January, the disease at once began to decline, and the last two cases were admitted into Hospital on the 4th and 5th February; but the

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“Corps did not re-unite until the 14th February, the day they entered the Cantonment. Each division marched five or six miles daily, and the Hospital tents were removed regularly twice a day to a fresh spot of ground. Independent of the cholera, diarrhoea prevailed largely.”

* * * *

“Ninety-two fighting men were taken ill with cholera, fifty of whom died; 129 followers were seized with the disease, and fifty-eight died. Altogether the deaths to admissions were 47·36 per cent.”

“A Company of Her Majesty's 74th Highlanders, *en-route* from Sholapoor to Bellary, in perfect health, one day struck upon an encampment of the above Regiment then suffering from cholera. Instantly, turning right about, they passed the Camp and proceeded by a forced march of 24 miles to Bellary by another route; good food and moderate stimulants were served out to them on the march, and they reached Bellary without fatigue. On the 2nd and 3rd day afterwards, ten men of this Company were seized with the disease, of whom seven died. The epidemic did not extend; precautions having been taken not to let these men mingle with the rest of the Corps.”

“In March 1857, the Left Wing of Her Majesty's 43rd Light Infantry left Bangalore 537 strong, *en-route* to Madras. For eight days their march was prosperous. On the 9th day, as cholera was reported in the village adjoining, their proposed encampment, the Commanding Officer pushed on to the next halting ground, 11 miles distant, the entire march of 21½ miles having been performed without apparent fatigue. Here a halt was called for a day. The following morning, after a seven miles march, cholera appeared epidemically in the Wing, and in 12 days

	Men.	Women.	Children.
“out of a strength of.....	537	65	130
“there were seized with cholera.....	98	9	29
“and there died from the disease... ..	41	5	13.

“It is obvious that the primary cause of this loss of life was the prevalence of the epidemic in the District through which the Corps marched; and that neither fatigue, discomfort, nor dissipation was an exciting cause, is proved by the melancholy fate of two ladies, one gentleman, one child, and one servant, who proceeded over the same road four days after the epidemic broke out in the Wing; and, although they travelled with all the comforts that affluence usually procures, with one exception, all perished from the disease.”

The introduction of cholera in the Camp of Her Majesty's 74th Highlanders, quartered near the Race Course at Guindy, is clearly shewn in the following extract from the Mortuary Report of Madras, for 1864:—

“It seems that a Hospital cooly of Her Majesty's 74th Highlanders (that Corps having at the time cholera cases in Camp) was in the habit of coming home of nights to his hut in New Town. A servant to the Quarter Master Serjeant of the 2nd Regiment Native Infantry lived in the same hut or house with this cooly, and therefore the chain of communication between the cholera camp and the house in New Town, where the first case occurred, may be regarded as complete. A child of the Quarter Master Serjeant was taken ill on the night of the 27th, another on the 28th, and both died. On the latter date, the wife and child of the Serjeant

"Major of the Regiment, living close by, were attacked and died, and from this time the other cases followed in rapid succession. It seems that the servant boy had come to the Quarter Master Serjeant's house late at night on the 27th, and that almost immediately after the first child that was attacked began to sicken."

"Curiously enough, another instance of the communicable nature of the cholera poison was afforded during the prevalence of the disease in the Camp of Her Majesty's 74th Highlanders. It is full of warning and instruction. The particulars are extracted from the Stational Report of the Zillah Surgeon of Chingleput :—

"Cholera first made its appearance on the 24th February 1864. Two bandymen belonging to this place, who were engaged in transporting tents of the 74th Highlanders from Guindy to Palaveram, where the Regiment shifted its quarters in consequence of the outbreak of cholera, in their ignorance appropriated to their own use the straw spread in the tents of the cholera patients."

"No sooner had they deposited their loads and turned homewards, than they were seized by the disease, and both fell victims to it the day after their arrival here. The disease now spread, and several cases were reported to have occurred in the town."

This Commission also believe that the transmission of the disease by cholera stools, is now sufficiently proved to lead them to urge that the greatest care be taken in the destruction of all excreta passed from the body.

They are further disposed to hold to the view that water highly charged with animal organic impurity is a great means of preparing the system to imbibe the poison.

They, also, believe the following to be acknowledged facts regarding this disease :—

1st.—That it is more prevalent during the first six months of the year.

2nd.—That those travelling are more likely to be attacked than those stationary.

3rd.—That new arrivals in places where the disease is prevailing are more subject to attack than residents.

4th.—That over crowding predisposes to the disease, and renders its attacks more fatal.

5th.—Fatigue and debility from all causes predispose to it.

6th.—That the type of the disease is most acute at the first outbreak of an epidemic when the majority of cases are fatal. The reverse takes place at its decline.

7th.—The time of attack is generally at night or early morning.

8th.—That a relation exists between the prevalence of cholera and the elevation of the surface above the level of the sea, the disease diminishing in frequency with the ascent.

Question 5th.—Are there any official documents published on cholera, and are those documents procurable?

5. In accordance with this requisition, it is suggested that, with the sanction of Government, the following documents relating to cholera, may accompany this report.

1st.—Dr. Lorimer's report on epidemic cholera from 1820 to 1844.

2nd.—Dr. Cornish's printed report on the mortality of Black Town for 1860.

3rd.—Dr. Bidie's Etiology of cholera, herewith sent.

4th.—Memorandum by this Commission on the marching of Regiments in the Madras Presidency, recorded in Proceedings of Government, Military Department, No. 2074, dated 3rd June 1865, herewith sent.

5th.—Dr. Balfour's Pamphlet on the statistics of cholera.

Question 6th.—In what Districts does cholera generally break out, and what are the localities where it rages more or less permanently?

6. As far as this question refers to this Presidency, it may be safely asserted that this disease is rarely entirely absent from any of its large Native cities; for, when not prevailing in an epidemic form, sporadic cases constantly occur. The filthy towns of Madras and Hyderabad are examples, and with regard to the latter city, it may be said to form a focus from which cholera is disseminated into the surrounding districts.

Outbreaks of this disease occur with almost unerring regularity in certain towns which are resorted to annually at certain seasons for celebrating Native festivals, and also at shrines, such as Mahadao, near Nagpore, and Juggernath, near Cuttack, where pilgrims collect by thousands from distant parts of the country. The entire absence of all conservancy arrangements amongst a large concourse of people, whose constitutions are generally depressed by fatigue and want of proper nourishment, speedily leads to a virulent outbreak; and as these vast masses immediately disperse, they carry the seeds of death with them along every route they travel, and their course may be traced by the dead and dying they leave behind them in their flight. These assemblages may be pointed to with almost prophetic truth as likely to form nurseries in which this disease will be hatched and propagated in every direction so long as present customs continue.

It has been observed that cholera more frequently breaks out in those parts of this Presidency, lying at a low sea level, where the geological formation of the surface is *regur*. The Ceded Districts and the country on the East Coast in the neighbourhood of Ongole may be taken as examples.

Question 7th.—Have any particular phenomena manifested themselves this year, and if so what are they?

7. No peculiar atmospheric or other phenomena have manifested themselves in the year 1865, as far as the knowledge of the Commission extends. The setting in of the North-east monsoon was late, and, at its first burst, was attended with a violent cyclone which was felt a considerable distance inland. It may be here remarked, however, that the almost entire absence of all scientifically recorded observations in this Presidency would place it beyond their power to answer this question at any time satisfactorily.

Question 8th.—Was the cholera unusually violent this year?

8. No—with the exception of certain isolated outbreaks amongst the pilgrims visiting certain shrines, there has been no general outbreak of cholera throughout the Presidency.

Question 9th.—About what time did it break out?

9. The particular outbreak referred to in the last paragraph took place at the temple of Mahadao, near Kamptee, in February.

Question 10th.—What is the number of deaths this year amidst the Native or European population, during the Indian Commercial year?

10. This Commission have no means of obtaining this information with any degree of accuracy.

There are no data at the disposal of this Commission for showing what the ratio of mortality from this disease has been amongst the civil population throughout this Presidency; but at Madras, where a mortuary register is kept, the past two years show a decline in the number of deaths as contrasted with previous periods.

This will be observed in the following Table:—

Years.	Deaths from cholera.	Years.	Deaths from cholera.	Years.	Deaths from cholera.
1855...	1,956	1859...	1,082	1863...	1,684
1856...	805	1860...	2,580	1864...	574
1857...	1,378	1861...	2,776	1865...	944
1858...	1,965	1862...	3,635		

During the past year there has been no very serious outbreak of cholera amongst the European Troops in Cantonment, and the Native Army has been quite as exempt from the disease.

The Principal Inspector General, Medical Department, in a letter to the Secretary to Government, Military Department, dated 11th May 1864, writes as follows:—

“The great mortality from cholera of Troops on the line of march sometime since attracted attention. As regards Europeans, in the year 1857, the practice of moving them by transit was introduced, and, although several thousands of men have been moved in this way subsequently, the cholera mortality has been exceedingly slight.”

“The measure has undoubtedly been attended by a great saving of life, and I should be sorry to see a reversion to the old practice of marching the men from place to place, through any short-sighted motives of economy.”

“The Native Troops of late years have been moved less frequently, and the cholera mortality has been diminishing in consequence.”

The following return shows the proportion of deaths from cholera to all other mortality for 23 years, from which it will be seen that of late years the disease has been somewhat diminishing.

Vide Proceedings of Government, No. 1797, dated 27th May 1861.

STATEMENT shewing the number and per centage of deaths from all causes, and separately from Cholera, among European and Native Troops, for the past 23 years.

Years.	Europeans.					Natives.				
	Average strength.	Deaths from all causes.	Deaths from cholera.	Per centage of all causes.	Deaths from cholera.	Average strength.	Deaths from all causes.	Deaths from cholera.	Per centage of all causes.	Deaths from cholera.
1842.....	12,680	508	163	4.2	1.3	74,618	1,887	741	2.5	0.9
1843.....	12,436	610	206	4.9	1.6	73,763	1,749	905	2.3	1.2
1844.....	13,057	367	54	2.8	0.4	73,083	1,458	519	1.9	0.7
1845.....	12,548	491	124	3.9	0.9	74,861	1,544	708	2.0	0.9
1846.....	11,113	402	75	3.6	0.6	74,682	2,002	1,208	2.6	1.6
1847.....	11,429	337	22	2.9	0.1	67,950	880	78	1.2	0.1
1848.....	9,679	174	2	1.7	0.02	55,946	690	93	1.2	0.1
1849.....	9,559	245	26	2.5	0.2	50,030	610	104	1.2	0.2
1850-51.....	9,136	226	21	2.4	0.2	50,448	712	183	1.4	0.3
1851-52.....	9,119	216	15	2.3	0.1	49,881	658	202	1.3	0.4
1852-53.....	9,170	478	155	5.2	1.6	49,747	739	125	1.4	0.2
1853-54.....	8,291	324	61	3.9	0.7	47,887	944	284	1.9	0.5
1854-55.....	9,021	300	65	3.3	0.7	46,988	745	190	1.5	0.4
1855-56.....	7,599	200	11	2.6	0.1	47,938	690	59	1.4	0.1
1856-57.....	7,513	215	58	2.8	0.7	47,968	785	141	1.6	0.2
1857-58.....	9,396	385	112	4.09	1.1	47,902	1,072	177	2.2	0.3
1858-59.....	15,482	655	47	4.2	0.3	57,653	1,008	227	1.7	0.3
1859-60.....	16,921	463	99	2.7	0.5	60,750	1,047	260	1.7	0.4
9 Months 1860.....	10,741	205	36	1.9	0.3	35,401	524	107	1.4	0.3
1861.....	15,121	221	43	1.4	0.2	40,315	451	69	1.1	0.1
1862.....	13,920	238	49	1.7	0.3	33,551	321	83	0.9	0.2
1863.....	12,396	201	39	1.6	0.3	30,613	295	85	0.9	0.2
1864.....	13,280	268	36	2.01	0.27	29,708	381	116	1.2	0.3

RETURN shewing the number of admissions and deaths from cholera among European Troops in the following stations in the Madras Presidency, during 1865.

Stations.	Average strength.	Admissions.	Deaths.	Stations.	Average strength.	Admissions.	Deaths.
Secunderabad.....	2604	6	5	Thyetmyo.....	566	8	4
Bangalore.....	2310	15	5	Trichinopoly.....	273	...	...
Kamptee.....	1204	15	11	Palaveram.....	247	...	...
Bellary.....	1166	18	9	Tonghoo (4 months).....	159	...	...
Madras.....	805	4	2	Singapore.....	155	...	...
Cannanore.....	771	1	1	Vizagapatam.....	132	2	2
Rangoon (11 months).....	754	...	...	Port Blair.....	110	...	...
Wellington.....	665	...	...	Malliaoorum.....	102	...	...
Saint Thomas' Mount.....	597	...	...	Calicut.....	84	...	...

RETURN shewing the number of admissions and deaths from cholera among Native Troops in the following stations in the Madras Presidency, during 1865.

Stations.	Average strength.	Admissions.	Deaths.	Stations.	Average strength.	Admissions.	Deaths.
Secunderabad	2621	21	12	Samulcottah.....	704	1	1
Bangalore.....	2467	4	3	Mysore.....	702	6	2
Madras.....	2254	19	8	Thyetmyo.....	688	1	...
Bellary.....	1904	11	4	Palamcottah.....	650	3	2
Kamptee.....	1662	37	20	Mercara.....	635	...	...
Cannanore.....	1352	...	...	Hurryhur.....	634	8	5
Trichinopoly.....	1321	19	14	Moulmein.....	628	1	...
Vizagapatam.....	935	3	1	Tonghoo.....	574	...	...
Mangalore.....	890	1	1	Singapore.....	533	2	...
Rangoon.....	824	...	...	Cuttack.....	479	...	...
Cuddapah.....	817	4	2	Kurnool.....	468	3	...
Raepoor.....	760	8	3	Quilon.....	384	5	1
Vellore.....	736	...	...	Hoshungabad.....	382	9	3
Berhampore.....	706	5	2	Malacca.....	187	...	...
Vizianagarum.....	715	2	2				

Question 11th.—What is the number, on an average, of the pilgrims who left India this year for Mecca; from what port did they start; and what was their sanitary condition at the time of starting?

11. There being no Mahomedan population in Southern India, no pilgrim ships ever proceed to Mecca from thence. On the Western Coast, however, a tribe of Moplahs, who have mixed Mohomedan tenets but are not zealots in that faith, occasionally proceed on pilgrimages. A few individuals only go at a time taking with them goods for sale, and take up their residence in Arabia, for longer or shorter periods, for commercial pursuits. Their numbers, however, are so few, and their movements so erratic, that no record of their departure out of the Presidency is officially observed by the authorities.

The Superintendent of Marine has furnished this Commission with the following list of Vessels which proceeded to Jeddah with passengers during 1865.

Vessels.	Tons.	No. of passengers.	Ports of embarkation.	Destination.	Remarks.
"Fathel Kareen, or LaFayette."	541	{ 45 63 21	Atcheen... Alleppy... Calicut...	Jeddah.	
"Iskauder Shah".....	777	{ 25 30	Calcutta... Tellicherry...		
"Fathel Ryman".....	375	{ 78 34	Atcheen... Calicut...		
"Jadool Barea".....	460	{ 75 30	Tellicherry... Calcutta...		
"Shelomith".....	816	{ 15	Tellicherry...		

MADRAS,
MARINE SUPERINTENDENT'S OFFICE,
2nd March 1866.

(Signed) J. J. FRANKLIN,
Superintendent of Marine.

From this it is observed that only 238 persons embarked from ports in this Presidency, including 63 from Alleppy. This Commission have no direct evidence of the sanitary condition of these pilgrims at the time of starting, but as all these vessels have certificates granted them in accordance with Act XXI of 1858, they would not have been allowed to leave port unless the passengers were in a good state of health; and their condition on arrival at their destination could only be known to the authorities at Jeddah.

The Inspector General of Police informs this Commission that, during a long residence on the Western Coast, he never heard of a serious outbreak of cholera on board a pilgrim ship after leaving the ports of Malabar.

Further inquiries are being made, in communication with the Collectors of Districts on the West Coast, under this head, and they will be forwarded, should it be thought desirable to do so.

They understand that the great stream of pilgrimages from British India proceed from Bombay, from which place information on this point will be obtained.

It is from this port that pilgrims from the dominions of the Nizam and other Mahomedan rulers embark; and this Commission have applied to the Minister of His Highness to tender them such information as he has it in his power, on this subject.

But as this report has already been kept back in expectation of the receipt of the information solicited, they are reluctant, under the circumstances noted in the order of Government, regarding the expectation of receiving an early reply, to delay its transmission, as an addendum to this report will be transmitted hereafter, should the intelligence received warrant it.

Question 12th.—What measures, in your opinion, should be resorted to, in order to check the evil and to extirpate it, if possible, at its origin?

12. As already stated in paragraph 6, the Commission believe that one of the great sources of cholera in this Presidency is the vast assemblages of Native devotees, which yearly take place at the various shrines and large towns, to celebrate festivals connected with their religious creeds; and they consider that to check the evil, and to extirpate one great source at its origin, can only be attained by enforcing, by Legislative enactment, the strictest and most practical conservancy arrangements possible at these yearly gatherings.

Beyond pointing out the ordinary rules which are laid down for the conservancy of towns and communities, this Commission are not in a position to suggest how these regulations are to be enforced amongst a people living in independent States and other parts of the country, where any interference with their habits and customs has, as a matter of policy, been always avoided by the authorities.

Such interference is never appreciated by the people themselves, and even the wealthier classes, if they can be induced at all to contribute funds towards conservancy arrangements, always do so grudgingly.

This Commission believe the Municipal Act will be attended with great good in all towns, when thoroughly carried out, and will be the means of checking to a great extent outbreaks of this disease; and they think that much might be done by discouraging as much as possible these yearly congregations of Natives. They are aware of the many difficulties which encompass any effectual method proposed for checking this evil; but they believe that the only real remedy will be that which

has been hinted at above, viz., to prevent, by direct legislation, the accumulation of the vast concourse of Natives at the various cities and shrines throughout the country.

Once the disease has originated amongst these pilgrims, their natural remedy, and the best for their own safety, is dispersion; and in so doing, the disease is distributed along the lines of roads into the villages and every cantonment through which they may have to pass, and tracts of country are thus rendered only passable to travellers with the greatest risk to their lives.

In order to still further check the evil caused by the diffusion of the germs of the disease, this Commission would suggest that measures should be instituted at the ports of embarkation, by which the same restrictions now applicable to those embarking under the Emigration Act should be adopted with regard to all classes of pilgrims.

The replies to questions conveyed in G. O., No. 178, dated 19th February 1866, are embodied in this letter.

MEMORANDUM ON THE MARCHING OF THE NATIVE REGIMENTS IN THE MADRAS PRESIDENCY.

1. The liability of Native Regiments to attacks of Cholera when marching has been, since the formation of the Sanitary Commission, a subject of anxious consideration.

2. This Memorandum has been drawn up by the President, with the concurrence of his colleagues in the Commission, after conferring with Colonel Scott, the Quarter Master General of the Army. It embodies the recommendations on this subject, which they think it necessary to submit to Government.

3. The experience of past years has furnished certain facts in connection with this subject which it may be convenient to recall before detailing any measures, which, in the opinion of this Commission, should be prescribed for observance during the march of a Native Regiment.

4. In 1846 a very complete Report was prepared by Dr. Lorimer on the subject of Epidemic Cholera in Camps of the Native Army—and after a most careful examination of the Statistics of 24 years the following results were obtained.

5. Of 602 marches, 144 were attended with Cholera. The Infantry and Artillery suffered most severely. The Sappers were least liable to attacks of Cholera when in Camp.

6. It was also ascertained, as shown in the following Tables, that there is an undoubted connection between the length of marches and the appearance of Cholera in Camps.

Return shewing the number of Regiments attacked on the line of march after every two hundred miles of road passed over from 1820 to 1824 inclusive.

Distance of each march.	Infantry.			Cavalry.			Artillery.			Sappers and Miners.			Total.		
	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.
Under 200 Miles.	144	14	130	9.722	16	1	15	6.250	2	0	2	...	14	0	14
From 200 to 400 do.	222	58	164	26.126	28	4	24	14.285	6	4	2	66.666	18	3	15
" 400 to 600 do.	83	27	56	32.530	12	4	8	33.333	3	1	2	33.333	1	1	0
" 600 to 800 do.	27	16	11	59.259	16	4	12	25.000	1	1	0	100.000	1	0	1
" 800 to 1052 do.	6	4	2	66.666	2	2	0	100.000	0	0	0	...	0	0	0
Total...	482	119	363	24.688	74	15	59	20.270	12	6	6	50.000	34	4	30

By the following table it will be seen that the attacks progressively increase with the duration of the march till about the end of the 3rd month when these reach as high as 61 per cent. in the Infantry after which period the proportion of attacks would appear to diminish, though amongst the Cavalry and Artillery it increases.

Table shewing the proportion of attacks according to the number of days occupied in the completion of each march, from 1820 to 1844 inclusive.

Number of days on the march.	Infantry.			Cavalry.			Artillery.			Sappers and Miners.			Total.		
	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.	Number of marches.	Attacked.	Escaped.
Under 20 days.	103	9	99	8.333	13	1	12	7.692	3	1	2	33.333	13	11	126
From 20 to 40 do.	178	34	144	19.101	22	3	19	13.636	0	0	0	...	19	39	180
" 40 to 60 do.	95	31	64	32.631	17	4	13	23.529	7	3	4	42.857	1	1	0
" 60 to 80 do.	61	25	36	40.983	12	4	8	33.333	0	0	0	...	1	1	0
" 80 to 100 do.	13	8	5	61.538	5	0	5	...	...	0	0	...	...	...	...
" 100 to 120 do.	10	5	5	50.000	3	1	2	33.333	1	1	0	100.000	0	0	0
" 120 and upwards.	17	7	10	41.176	2	2	...	100.000	1	1	0	100.000	0	0	0
Total...	482	119	363	24.688	74	15	59	20.270	12	6	6	50.000	34	4	30

7. It was also proved, as shown in the following tables, that large bodies of men are, when marching, more liable to attack than small detachments, and that the death rate is in proportion higher.

Table shewing Ratio of Deaths to strength per thousand from Cholera in bodies of men varying in strength from under 300 to 1,500 while marching.				Table shewing the number of marches made and attacks of Cholera in bodies of men varying in strength from under 300 to 1,500—from 1820 to 1844.			
				Number of marches.	Attacked.	Escaped.	Ratio of attacks to marches per cent.
100 to 300 men.....	24	24	24	53	10	43	18.867
300 to 500 do.....	29	57	42	75	15	60	20.000
500 to 700 do.....	24	39	39	98	21	77	21.428
700 to 900 do.....	35	95	00	239	54	185	22.594
900 to 1100 do.....	36	85	74	108	35	73	32.407
1100 to 1534 do.....	48	73	22	29	9	20	31.034
Average of Total...	35	52	42	Total...	602	144	458
							23.920

8. The influence of weather as a predisposing cause is not so clearly established. "In the cool and dry and hot and dry weather, the ratio of attacks is nearly the same—and in the cold and rainy and hot and rainy weather the ratio also corresponds to a unit. It is also, however that a well established fact, in rainy weather, hot or cold, the ratio of attacks is nearly doubled."

9. Of the influence of the nature of the country and soil marched over, it was remarked that the greatest number of outbreaks of Cholera in Camps have occurred on Cotton soil and what is described as open country. Nearly one-third of the whole number occurred on the banks of rivers.

10. Of 95 Regiments who marched through Districts or Villages affected with Cholera, 83 were attacked and only 12 escaped, and in the case of these 12 Regiments extraordinary care would seem to have been taken to prevent communication with infected villages.

Of 308 Regiments which marched, during a time when no Cholera was prevailing in the Districts and Villages, only 48 were attacked.

11. The practical deductions drawn by Dr. Lorimer from his elaborate investigation appear to this Commission perfectly sound, and they are as applicable and as valuable now as when they were originally announced.

1st.—That marches should not exceed two or three hundred miles.

2nd.—That as liability to attacks of Cholera increases according to the numbers marching, it is advisable to march Regiments by Wings, and to reduce as much as possible the number of followers.

3rd.—That the greatest care should be taken to ascertain, prior to marching troops and while marching, whether Cholera prevails on the line of road to be traversed by troops.

4th.—That the banks of rivers should be avoided as encamping ground, and a raised open site always selected.

5th.—That Regiments should be moved in the cool or dry, or in the hot and dry, seasons of the year—all movements in the wet season being avoided.

12. The aggregation of a very considerable number of men, women and children in Camp in itself affords the condition most favorable to the development of epidemic disease. In the case of Native Regiments not only is there this unfavorable condition, but the presence of the Regimental families adds much to the inevitable fatigue to which the Sepoy has to undergo on the march.

13. From the state of many of the roads, and from the fact that the carts containing the families are overlaid, these, though preceding by a few hours the march of the Regiment, seldom reach the halting ground till a considerable time after the arrival of the Regiment. The consequence of this is that a majority of the Sepoys return over a considerable portion of the ground traversed in the morning's march to look after and assist their families into Camp which in some cases they do not reach again till past noon.

14. During the whole of this time the Sepoys have been waiting for the meal that they should properly consume shortly after their arrival in Camp. So that since the meal of the previous evening they have nothing to support nature while undergoing great fatigue, except conjee, or a small quantity of cold rice remaining from the meal of the previous evening. The same privation is endured by the families and by the Camp followers.

15. It must also be remembered that as the families frequently start at 2 and 3 A. M., when the Sepoys assist at the packing and starting of the carts, the Native Soldier during a march is deprived of a considerable portion of his usual rest.

16. It is difficult to conceive any combination of circumstances more favourable to the development of disease than those detailed above. A change of the usual habits of life, change of climate and water, unusual and excessive fatigue, irregularity of meals and long fasting and the privation of rest at night.

17. Most of these disadvantages would be obviated if the families were marched under sufficient guard, separately from the Regiment.

But to this it is objected that the Native Army of this Presidency regard it as their right to carry their families with them on their marches on ordinary home service, and that they would feel the greatest dissatisfaction at any change in this respect. Change of Station, already a source of heavy expense to the Sepoy, would be more distasteful than it now is; and should the families be attacked by severe epidemic sickness, when separated from their Sepoy relatives, they would be utterly helpless, and the knowledge that they were exposed to this danger would create such anxiety in the Regiment as would seriously interfere with the health and discipline of the Native Soldiers.

18. These objections are urged by Officers of great experience, and it only remains for this Commission to make such suggestions as may mitigate the evils attendant on the families and followers accompanying Regiments when marching.

19. It may fairly be considered as an established fact that the ratio of attacks increases in a marked degree according to the length of march. We would therefore respectfully urge the importance of losing no opportunity of taking advantage of water communication and of the Rail-roads.

In the case of the 4th Regiment, which suffered so severely from Cholera recently while marching to Secunderabad, the only objection to their proceeding by Rail to Cuddapah at a saving of 150 miles of distance was the high price of carriage in the Cuddapah District. But this seems hardly to justify allowing a Regiment to march 392 miles by a road notorious for its unhealthiness, for the difficulty of obtaining supplies, and for the badness of the only water procurable.

20. Every precaution should be taken that Regiments should be so relieved as to ensure each Regiment having as short a march as possible. This no doubt does receive due attention; but the fact that the liability to attack by Cholera greatly depends on the duration of the march cannot be too earnestly or too often brought to notice.

21. We would also beg to bring prominently to notice another important fact, that the liability to attack increases according to the numerical strength of the men present with the Corps on a march, and we would most strongly advocate that in future Native Regiments should move by Wings.

22. Each of these Wings would have their families with them; but the total aggregation of living beings in Camp would be reduced by one-half. The only additional expense to the Government would be the providing medical assistance during the march for the divided Regiment.

23. An interval of at least ten days should be prescribed between the march of each Wing, and they should be prohibited from occupying the same Camping grounds.

* 24. Supposing a Regiment to march by Wings, the following suggestions are made as to the march itself.

I. The marching distance should, as a rule, not exceed 10 miles per diem, and the march should commence one hour before sun rise. To start earlier deprives men of their rest. If the road is bad the men cannot in the dark march briskly, and if the roads are good an earlier start is unnecessary.

II. The men should be required to step out, it being more tiring to walk slowly, under the weight of their arms, than to get over their ground at the pace of $3\frac{1}{2}$ miles an hour which will secure their reaching their halting ground in good time.

III. The bandies containing the families should all leave the Camp together between the hours of 3 and 4 P. M., with an escort of the strength of one half Company under two Native Officers. The men should be told off in equal numbers from each Company. The Quarter Master, or the Officer performing the duties of Quarter Master with the Wing of a Regiment, should follow the families at such an interval as will enable him to overtake them and reach the Camping ground in sufficient time to select as good Camping ground for the families as for the Troops.

IV. When the carts of the families arrive on the ground, the guard that has accompanied them should, under the direction of the Quarter Master, direct the Carts to spread out as much the nature of the ground will admit; no crowding must be allowed, and the bullocks instead of being tied to the cart yoke should be picketted in the rear, or to the side of the Camping ground, and at some little distance.

[The advantage of making the families move in the afternoon is that the men reach their Camping ground before night, and the Sepoys are secured from the perpetual noise and disturbance which breaks their rest if the families move late in the night, or at a very early hour in the morning. The families are also able to have a meal ready cooked for the men on their arrival at the Camping ground, and the second meal can be prepared and eaten before the families move off in the afternoon.]

V. No bandies should under any pretext be allowed to leave the camp during the night; such movements disturb the whole Camp, and the Regiment when it marches in the morning finds the road obstructed, and the men make excuses to fall out and assist the carts.

VI. The tents required for the escort, which accompanies the families, will be carried as usual on bullocks, which will start in the afternoon with the carts belonging to the families. By the time the Sepoys have eaten their morning meal prepared against their arrival all the tents will have arrived and have been pitched.

VIII. It is of great importance to select camping grounds where there is good drinking water available, and to guard these, when found, from being polluted by the careless habits of Native Soldiers and Camp followers. Unless prevented, these will not hesitate to bathe, wash dirty clothes, and water the Camp cattle in the same tank from which the drinking water is taken. It is therefore absolutely necessary to place a guard over the wells, the tank, or stream, from which the drinking water is taken, and this precaution should under no circumstances be neglected.

VIII. Care should be taken to impress on the Sepoys, and through them on their families, and Camp followers, to avoid eating on the march unripe fruit and vegetable. These they habitually consume in excess, and render themselves liable to bowel complaints which not unfrequently assume a choleraic character. Of course it is difficult effectually to prevent the Sepoys eating this unwholesome food on the line of march; but something can be done towards it by a careful inspection of the provisions offered for sale in the Camp bazaars, and by rigidly excluding any food of an unwholesome character.

25. It remains to make a few remarks upon the subject of the manner in which the Regimental Families are carried during a march. The high rate of bandy hire compels the Sepoys to join together for the conveyance of their families and to reduce the amount of carriage as much as possible. The absence of all unnecessary carriage is a matter of great importance; but the excessive crowding in carts, closed at either end by heavy purdahs, has a very injurious effect on the health of the women and children who pass several hours in these carts.

26. It is no unusual thing to see eight or ten women crowded into a single cart, the front of the cart blocked up with a miscellaneous heap of baskets and bundles, a carpet or native blanket being hung over the front as a purdah and excluding all fresh air. The women and children are seated on foul bedding and dirty clothes, and at the back of the cart is hung a similar "purdah" to that in front. The foul smells arising from dirt and overcrowding are enough to generate disease, and are perceptible to any one who has ever ridden close to the carts of a Regiment when marching.

27. There should be a halt at least once a week, and on this day orders should be issued and enforced for a thorough washing of all clothes, and for the complete purification of the carts, and the matting which forms the hood of the carts. This should be done by Companies and under the Superintendence of the Native and Non-Commissioned Officers. A report should be made by the Officers of each Company to the Adjutant of the Regiment that they have personally ascertained that this order has been carried into effect.

28. Another evil influence on the health of the Sepoys during their march is their poverty.

They have received advances of pay some considerable time before starting: a part of this advance has been retained to pay for the carts furnished for the use of the families, the rest has either been expended in paying small debts previous to leaving the station, or, as is often the case, has been spent in dissipation.

The consequence is that both the Sepoys and their families, though the former receive batta while marching are poorer and less well fed during a march than at any other time, and are consequently less able to resist the attack of epidemic disease.

29. The following short account furnished by Colonel McGoun, of the course followed by him when commanding the 6th Regiment, seems, if the Sepoys are to continue to pay for carriage, worthy of imitation.

"Notice that the Regiment would march from Secunderabad to Bangalore was received in July—the Regiment actually marching in January.

Men were put under stoppages on account of bandy-hire at the rate of one Rupee per month. This was done with the consent of the men.

Carriage was provided as follows

Native Officers, each two cart.

Havildars, each one cart.

Rank and File—One cart to four men.

Two hundred and thirty-seven carts were required to enable the Regiment to march.

Pay was drawn for the month in which they marched, January, and for February in advance. Three Rupees were disbursed to the men before they started, the balance was kept in deposit and issued to them during the march at the rate of a Rupee a week.

A body of artificers and a large working party accompanied the carts, and when any broke down, or were upset, they were speedily righted.

A steady Non-Commissioned Officer was also associated with the Cart Maistries to assist them, and so well were the arrangement carried out that even the broken down carts were up by noon.

The stoppages on account of cart-hire before the Regiment marched were Seven Rupees from each man. Nothing was stopped from the Native Officers.

The small balance due by the men for cart-hire (about one Rupee each) was recovered on the first issue of pay in April.

The total number of people in Camp was..... 3,484'

30. It is not within the province of this Commission to make recommendations to the Government regarding the pay of the Native Army, or regarding the stoppages made from it.

But it is a matter of regret that the Sepoy and his family are undoubtedly less well fed at present than they were twenty years ago, and that the prospect of a change of station is rendered most distasteful to the Sepoy from the very heavy expense which it entails on him.

31. For months before the march takes place they are suffering from the reduction which is necessary in order to pay for carriage, or else the advances made at the time of marching are nearly all swallowed up for carriage, and they are half-starved during the march. They are then under stoppages for a considerable time after they reach their new Station. When the Sepoy arrives at a new Station he is put to other petty expenses before he settles down in the Regimental Lines.

32. These expenses reduce considerably the pay upon which he has to support himself and his relations, and it may be worthy of the consideration of His Excellency the Commander-in-Chief whether the time has not come for the Government to supply the carriage required when a Native Regiment changes its station.

33. It is the established custom for the Madras Sepoy to carry his family with him, and although this system has its disadvantages it has also many advantages, as shewn in the excellent behaviour of the Madras Native Soldiers in the Cantonments and in their freedom from many of the vices attendant on other Armies who are deprived of their families. The concession above suggested would be regarded as a great boon by the Native Army, and would, I am persuaded, have a directly beneficial effect on the health of the Troops.

34. It remains to notice what should be the measures adopted when Cholera actually breaks out on a line of march. In this Memorandum, which has for its object the prevention of liability to Cholera, it is not proposed to enter into detail on the question of how best to arrest the continuance of epidemic disease when it has made its appearance in a Regiment on the line of march. Much must of course depend upon the character assumed by the disease, and whether it can clearly be traced to intercourse with infected towns and villages on the line of march, or

whether it would seem to have been generated in the Regiment itself, or the Camp followers without communication with infected localities.

35. If it appears that the Regiment is following a road which passes through an infected locality, no effort should be spared to leave the road, and move the Regiment towards its destination by a different though more circuitous route.—In an admirable Order issued by Sir H. Ros on this subject it is laid down, that “should Cholera follow the Troops, they will be moved short distances at right angles if possible to the prevalent wind and tract of the disease.” A divergence of four or five miles is often sufficient to avoid the line of progress of the epidemic and short marches, even over a difficult country, with tolerably frequent halts, will probably be found preferable to following a high road known to be infected or to halting in one place where Cholera has declared itself. The greatest care should be taken in the selection of Camping grounds, and in the conservancy of the Camps, both of the men and of their families, and it should be insisted that the Camp latrine trenches should be used instead of the usual practice of fouling the whole immediate neighbourhood of the Camp. This is essentially necessary on halting days.

36. Care should be especially directed to ensure abundant food being consumed both by the Sepoys and their families during a Cholera season, and advances to be expended for this important object should be given to the Sepoys. Imperfect nourishment is certain to predispose men to attacks of Cholera or any other epidemic disease which may be prevalent in their neighbourhood.

37. The Sepoys and the families should be encouraged to bring to speedy notice any attacks of diarrhoea, or any premonitory symptoms of Cholera, however slight, that manifest themselves. It should be explained to them how effectual Medical treatment is in the earliest stages of the disease, and of how little avail when the disease has fully declared itself.

(Signed) R. S. ELLIS,
President of the Sanitary Commission.

20th April 1865.

No. 23. From the Officiating President Sanitary Commission, Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 19th March 1866, No. 858.

In continuation of letter, No. 839, dated 10th instant, I have the honor to forward, for transmission to the Bengal Sanitary Commission, the following additional information upon the subject therein reported upon.

From the Collector of Malabar, to the Officiating President, Sanitary Commission; dated Calicut, 13th March 1866, No. 914.

I have the honor, with reference to your letter, No. 807, dated 27th ultimo, regarding the number of Moplah pilgrims who annually leave for Arabia, to furnish you with the fullest information obtainable on the points indicated.

1st.—The number of pilgrims who leave the ports of Malabar for Arabia, taking an average of the last four years, is slightly over 500 annually. In some years, the number is as large as 700 (and that from the single port of Calicut). Sometimes it falls as low as 350.

2nd.—All pilgrims from this District proceed by sea direct to Jeddah, and it may be added that, on landing, the great majority travel by land to Mecca and Medina, while a few avail themselves of small coasting craft to proceed to the same places.

3rd.—During the year 1865, the number of pilgrims from the ports of Malabar was 596, of whom 502 sailed from Calicut.

4th.—The passengers were in all cases healthy on their departure, but next to nothing is known of them thereafter. As far as can be ascertained, on inquiry, it would appear that cholera has not appeared on board the pilgrim ships. The pilgrims land in most cases in a healthy condition, but die occasionally, in considerable numbers, of cholera, in the subsequent part of their journey.

From the Superintendent of Marine, to the Officiating President Sanitary Commission; dated Madras, 16th March 1866, No. 1170.

Referring to the last paragraph of my letter of the 2nd instant, No. 947, I have the honor to annex supplementary list of vessels that left the Malabar Coast during the year 1865 with pilgrims for the Red sea.

2. The inhabitants of the Western Coast, when desirous of performing their pilgrimage, generally proceed to Bombay, embarking finally at that port for the Red Sea.

SUPPLEMENTARY list of Vessels which proceeded to Jeddah with passengers, during 1865, from the Malabar Coast, as per returns received from the Masters Attendant and Conservators.

Vessels.	Tons.	Number of Passengers.	From.	To.	Remarks
“Teazer”... ..	363	210	Calicut.....	Jeddah.	All healthy when leaving the port.
“Shah Allum”... ..	498	150	Calcutta touching to Cochin..	Do.	Do.
“Bhooj Nuggar”... ..	442	85	Do. ...	Do.	Do.

No. 24. To the President of the Sanitary Commission for Bengal, Calcutta, dated Fort Saint George, 7th April 1866. No. 350.

I am directed by His Excellency the Governor in Council to acknowledge the receipt of your letter of the 23rd January last, No. 65, requesting to be furnished with all the information available in this Presidency upon points connected with cholera. Copies of that letter and of the communication previously received on the subject from the Government of India were furnished to the Sanitary Commission for Madras, and I now forward a copy of their report, together with the papers referred to in paragraph 5.

(Signed) A. J. ARBUTHNOT,
Chief Secretary.

Exd. J. H. Burns.

despd 9/4/66
sent by Ransby.

Public Department

No. 350-

To,

The President of the

Sanitary Commission

for Bengal

Calcutta

Sir,

I am directed by His
Excellency the Governor in Council
to acknowledge the receipt of
your letter of the 23^d January last
No. 65, requesting to be furnished with
all the information available in
this Presidency upon points connect-
ed with Cholera. Copies of that
letter and of the Communication
previously received on the subject
from the Government of India were
furnished to the Sanitary Commission
for Madras, and I now forward a copy of
their report, together with the papers
referred to in paragraph 5.

For S. George
7 April 1866

by R

Public 1866 Report.

. 1857.

To get the records to the
Sanitary Commission
San Francisco
California.

Dec 27th April 1866