

1. Number of pages.
2. Date of repair.
3. Initials of Inspector.

M.R.O. 1-30,000-10-10-20.

MADRAS RECORD OFFICE.

Government of Madras.

Public DEPARTMENT.

G.O. No.	456	Press Mis.
Dated	9-4-	19-1869

Not to be folded or roughly handled

15/10/36

Proceedings of the Madras Government, Public Department,
9th April 1869.

No. 78. Read the following letter from the Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 18th March 1869, No. 797.

I have the honor to forward, for submission to Government, the accompanying report on the causes of death in Madras during the fourth quarter of 1868, drawn up by my Secretary, Surgeon H. B. Montgomery, M. D.

Report on the causes of Death in Madras in the fourth Quarter of 1868.

The health of Madras during the past quarter has been satisfactory. The death-rate amounted to 2,633 being, at an annual death-rate on an estimated population of 450,000, of 23·2 per mille. Of these deaths, two were from cholera and twelve from small-pox, as against an average during the previous eight years of 419·5 of the former, and 43·9 of the latter, disease. The total mortality, when compared with that recorded in eight previous quarters, appears to represent that the fourth quarter of 1868 was nearly second of all the nine quarters. But if cholera be excluded from the Returns, the actual total mortality from all other causes would be shown as in Table II. appended below:—

TABLE I. *Average Deaths in Madras during the Fourth Quarter of eight previous years ending 1867, as contrasted with the mortality of the Fourth Quarter of 1868.*

	Small-pox.	Fevers.	Dysentery	Diarrhoea	Cholera.	Other diseases.	Total.
Fourth quarter, 1860 ...	43	689	409	409	327	1,479	3,356
Do. 1861 ...	126	585	361	253	614	1,364	3,303
Do. 1862 ...	17	569	305	288	1,341	1,486	4,006
Do. 1863 ...	19	512	300	236	133	1,429	2,629
Do. 1864 ...	3	493	252	217	34	1,413	2,412
Do. 1865 ...	12	624	375	286	208	1,572	3,077
Do. 1866 ...	12	662	409	283	688	1,773	3,827
Do. 1867 ...	119	561	315	188	11	1,638	2,832
Total...	351	4,695	2,726	2,160	3,356	12,154	25,442
Average...	43·9	586·9	340·7	270·0	419·5	1519·2	3180·2
1868 ...	12	448	183	128	2	1,860	2,633
Increase ...	...	...	...	...	...	340·8	...
Decrease...	31·9	138·9	157·7	142·0	417·5	...	547·2

From Table I. it appears that of the total mortality 2633, there were 448 cases of fever. This number is absolutely the lowest in the whole of the nine years, and is the more satisfactory as fever was so widely prevalent through the country generally through the whole year. I shall allude below to other causes that might have contributed to render the quarter under review much less healthy than it proved to be. Cholera was almost entirely absent, thus happily terminating a year of almost unexampled immunity from this prolific cause of mortality.

*Proceedings of the Madras Government, Public Department,
9th April 1869.*

Dysentery caused 183 deaths, being 157·7 lower than the average, being, in fact, little above half the average mortality of eight previous fourth quarters, and being absolutely the lowest death-rate from this cause recorded in nine consecutive years.

Diarrhoea caused 128 deaths, being 142 below the average, and less than half the average of previous years. This disease, like dysentery, shows an absolutely lower mortality than in any previous year.

These results are peculiarly interesting as contrasted with the experience of the third quarter of 1868, in which fevers, dysentery, and diarrhoea all exceeded the average of previous third quarters. The third quarter is almost invariably the most unhealthy of the year.

The general group of "other diseases" shows a total mortality of 1860, being, I regret to report, in excess of the average of previous years. It should, however, be borne in mind that this group includes many non-preventible and non-curable diseases and accidents. Asthenia, privatio, suicides, murders, accidents, old age, and convulsions, are floating elements of mortality dependent more upon constitutional and non-natural causes, than upon climatic influence or sanitation.

TABLE II. *Showing Total Death-rate, exclusive of Cholera for nine fourth quarters.*

Years.	Total mortality from all causes.	Order of salubrity calculated on Column 2.	Total mortality from cholera only.	Order of salubrity calculated on Column 4.	Mortality from causes other than cholera.	Order of salubrity calculated on Column 6.
1	2	3	4	5	6	7
1860	3,356	7	327	6	3,029	8
1861	3,303	6	614	7	2,689	5
1862	4,006	9	1,341	9	2,665	4
1863	2,629	2	133	4	2,496	2
1864	2,412	1	34	3	2,378	1
1865	3,077	5	208	5	2,869	7
1866	3,827	8	688	8	3,139	9
1867	2,832	4	11	2	2,821	6
Total...	25,442	.....	3,356	.....	22,086	.....
Average...	3180·2	.....	419·5	.....	2760·7	.....
1868	2,633	3	2	1	2,631	3
Increase ...	.....	.....	.....	.....	.....	.....
Decrease...	547·2	.....	417·5	.....	129·7	.....

From the foregoing Table II. we are enabled to estimate the total mortality exclusive of that from cholera. We find that in this respect, as in regard to total mortality, the quarter under review appears to stand well. It should also be borne in mind that, in the absence of a reliable census, we cannot definitely fix the per mille rate in any year. For though absolute figures give a method of comparison *inter se*, they do not show the actual number of deaths as compared with population. If, then, due allowance be made for the increment of population between 1864 and 1868, it is not improbable that, from all causes exclusive of cholera, the mortality in the fourth quarter of 1868 was possibly as low as in that of any previous year. In support of this belief we should bear in mind that the system of Registration of Deaths has been improved by experience, and that the double check of the Conicopillay's reports and those of the Registrars of Death under the Municipal Act ensures a much more accurate view of the real total mortality than was attainable formerly.

*Proceedings of the Madras Government, Public Department,
9th April 1869.*

The Municipal Registrars, however, will not for some time be able to do without the assistance of the Conicopillays, and it will require extreme vigilance on their part, if unassisted, to ensure full returns of mortality.

It is interesting to compare the records of deaths in the concluding quarters of two years, for the disparity shown is very considerable, as appears from the following table (III.) :—

TABLE III. *Showing the number of Deaths from Miasmatic and all other Diseases in the Fourth Quarter of 1868 compared with that of 1867.*

Diseases.	1867.	1868.	Increase.	Decrease.
Small-pox	119	12	...	107
Fevers	561	448	...	113
Dysentery	315	183	...	132
Diarrhoea	188	128	...	60
Cholera	11	2	1	9
Other Miasmatic diseases	71	72	...	...
Total Miasmatic diseases	1,265	845	...	420
Do. of all other do.	1,567	1,788	221	...
General Total...	2,832	2,633	...	199

Equally satisfactory is the comparison with the previous quarters of the year 1868, for it appears that, with the sole exception of cholera, in all classes of disease was there a marked diminution of mortality. As regards cholera, it is observable that only thirteen cases occurred in the whole year, and that for nine months only two deaths were recorded: a fact without precedent in the history of Madras :—

TABLE IV. *Showing the comparative Death-rate of the first, second, third, and fourth Quarters (1868) from Miasmatic and all diseases.*

Diseases.	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Increase in fourth quarter compared with			Decrease in fourth quarter compared with		
					First quarter.	Second quarter.	Third quarter.	First quarter.	Second quarter.	Third quarter.
Small-pox	372	361	54	12	...	...	...	360	349	43
Fevers	524	629	731	448	...	...	...	76	81	283
Dysentery	306	199	331	183	...	...	...	123	16	149
Diarrhoea	223	176	285	128	...	...	...	95	48	157
Cholera	11	...	...	2	...	2	2	9	73	30
Other Miasmatic diseases	106	145	102	72	...	...	...	...	...	...
Total Miasmatic diseases	1,542	1,410	1,503	845	...	...	...	697	565	658
Do. of all other do.	1,600	1,602	1,912	1,788	188	186	...	...	...	124
General Total...	3,142	3,012	3,415	2,633	...	...	...	509	379	782

In conclusion of these general remarks, I may note the mortality in each of the several quarters of the year among the total population :—

Year.	Period.	Total deaths.	Rate per mille per quarter.	Annual rate calculated on Column 4.	Rate of fourth quarter as against preceding quarters by Column 4.	Annual rate calculated as between rate shown by fourth quarter and previous quarters in Column 5.
1	2	3	4	5	6	7
1868.	1st quarter	3,142	6·98	27·92	Decrease 1·13	Decrease 4·53
	2nd do. ...	3,012	6·69	26·76	Do. .84	Do. 8·36
	3rd do. ...	3,415	7·58	30·32	Do. 1·73	Do. 6·92
	4th do. ...	2,633	5·85	23·40	.....	.....

REPORT

ON THE

CAUSES OF DEATH IN MADRAS IN THE FOURTH QUARTER OF 1868.

The health of Madras during the past quarter has been satisfactory. The death rate amounted to 2,633 being, at an annual death rate on an estimated population of 450,000, of 23·2 per mille. Of these deaths two were from cholera and twelve from small-pox: as against an average during the previous eight years of 419·5 of the former, and 43·9 of the latter, disease. The total mortality when compared with that recorded in eight previous quarters appears to represent that the fourth quarter of 1868 was nearly second of all the nine quarters. But if cholera be excluded from the Returns, the actual total mortality from all other causes would be shown as in Table II. appended below.

TABLE I. Average deaths in Madras during the Fourth Quarter of eight previous years ending 1867, as contrasted with the mortality of the Fourth Quarter of 1868.

	Small-Pox.	Fever.	Dysentery	Diarrhoea	Cholera.	Other diseases.	Total.
Fourth quarter. 1860	43	789	409	409	327	1,479	3,356
Do. ... 1861	126	585	361	253	614	1,364	3,303
Do. ... 1862	17	569	305	288	1,341	1,486	4,006
Do. ... 1863	19	512	300	236	133	1,429	2,629
Do. ... 1864	3	493	252	217	34	1,413	2,412
Do. ... 1865	12	624	375	286	208	1,572	3,077
Do. ... 1866	12	662	409	283	688	1,773	3,827
Do. ... 1867	149	561	315	188	11	1,638	2,832
Total...	351	4,695	2,726	2,160	3,356	12,154	25,442
Average...	43·9	586·9	340·7	270·0	419·5	1519·2	3180·2
1868...	12	448	183	128	2	1,860	2,633
Increase.....	...	...	...	...	...	340·8	...
Decrease	31·9	138·9	157·7	142·0	417·5	...	547·2

From Table I. it appears that of the total mortality 2,633, two were from cholera and twelve from small-pox. This number is absolutely the lowest in the whole of the nine years; and is the more satisfactory, as fever was so widely prevalent through the country generally, through the whole year. I shall allude below to other causes that might have contributed to render the quarter under review much less healthy than it proved to be. Cholera was almost entirely absent thus happily terminating a year of almost unexampled immunity from this prolific cause of mortality. Dysentery caused 183 deaths being 157·7 lower than the average, being in fact little

above half the average mortality of eight previous fourth quarters: and being absolutely the lowest death-rate from this cause recorded in nine consecutive years.

Diarrhoea caused 128 deaths being 142 below the average and less than half the average of previous years. This disease, like dysentery, shows an absolutely lower mortality than in any previous year.

These results are peculiarly interesting as contrasted with the experience of the third quarter of 1868, in which fevers, dysentery and diarrhoea all exceeded the average of previous third quarters. The third quarter is almost invariably the most unhealthy of the year.

The general group of "other diseases" shows a total mortality of 1860, being, I regret to report, in excess of the average of previous years. It should, however, be borne in mind that this group includes many non-preventible and non-curable diseases and accidents. Asthenia, privatio, suicides, murders, accidents, old age, and convulsions, are floating elements of mortality dependent more upon constitutional and non-natural causes, than upon climatic influence or sanitation.

TABLE II, shewing total Death-rate exclusive of Cholera for nine fourth quarters.

YEARS.	Total mortality from all causes	Order of salubrity calculated on column 2.	Total mortality from Cholera only.	Order of salubrity calculated on column 4.	Mortality from causes other than Cholera.	Order of salubrity calculated on column 6.
1	2	3	4	5	6	7
1860	3,356	7	327	6	3,029	8
1861	3,303	6	614	7	2,689	5
1862	4,000	9	1,341	9	2,659	4
1863	2,622	2	133	4	2,489	2
1864	2,412	1	34	3	2,378	1
1865	3,977	5	208	5	3,769	7
1866	3,827	8	688	8	3,139	9
1867	2,832	4	11	2	2,821	6
Total...	25,442	.....	3,356	.....	22,086	.....
Average...	3180.2	.....	419.5	.....	2760.7	.....
1868	2,633	3	2	1	2,631	3
Increase...	.....	.....	.....	.....	.....	.....
Decrease...	547.2	.....	417.5	.....	129.7	.....

From the foregoing Table II, we are enabled to estimate the total mortality exclusive of that from cholera. We find that in this respect, as in regard to total mortality, the quarter under review appears to stand well. It should also be borne in mind that in the absence of a reliable census we cannot definitely fix the mortality rate in any year. For though absolute figures give a method of with population. If, then due allowance be made for the increment of population between 1864 and 1868, it is not improbable that from all causes exclusive of cholera the mortality in the fourth quarter of 1868 was possibly as low as in that of any previous year. In support of this belief we should bear in mind that the system of Registration of Deaths has been improved by experience; and that the double check of the Conicopillays' Reports and those of the Registrars of Death under the Municipal Act ensures a much more accurate view of the real total mortality than was attainable formerly.

The Municipal Registrars, however, will not for some time be able to do without the assistance of the Conicopillays, and it will require extreme vigilance on their part, if unassisted, to ensure full returns of mortality.

It is interesting to compare the records of deaths in the concluding quarters of two years for the disparity shown is very considerable, as appears from the following Table (III.):—

TABLE III, shewing the number of Deaths from Miasmatic and all other Diseases in the fourth quarter of 1867, compared with that of 1867.

Diseases.	1867.	1868.	Increase.	Decrease.
Small-pox...	119	12	...	107
Fevers ...	561	448	...	113
Dysentery ...	315	183	...	132
Diarrhoea ...	188	128	...	60
Cholera ...	11	2	...	9
Other Miasmatic diseases...	71	72	1	...
Total Miasmatic diseases...	1,265	845	...	420
Total of all other diseases	1,567	1,788	221	...
General Total...	2,832	2,633	...	199

Equally satisfactory is the comparison with the previous quarters of the year 1868, for it appears that, with the sole exception of cholera, in all classes of disease was there a marked diminution of mortality. As regards cholera it is observable that only thirteen cases occurred in the whole year, and that for nine months only two deaths were recorded a fact without precedent in the history of Madras.

TABLE IV, shewing the comparative Death-rate of the first, second, third and fourth quarters (1868) from Miasmatic and all diseases.

Diseases.	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Increase in fourth quarter compared with			Decrease in fourth quarter compared with		
					First quarter.	Second quarter.	Third quarter.	First quarter.	Second quarter.	Third quarter.
Small-pox ...	372	361	54	12	...	...	...	360	349	42
Fevers ...	524	529	731	448	...	...	...	76	81	283
Dysentery ...	306	199	331	183	...	...	...	123	16	148
Diarrhoea ...	223	176	285	128	...	...	...	95	48	157
Cholera ...	11	...	...	2	...	2	2	9	...	...
Other Miasmatic diseases ...	106	145	102	72	...	...	...	34	73	30
Total Miasmatic diseases ...	1,542	1,410	1,503	845	...	...	...	697	565	658
Total of all other diseases...	1,600	1,602	1,912	1,788	188	186	...	...	...	124
General Total...	3,142	3,012	3,415	2,633	...	...	...	509	379	782

In conclusion of these general remarks I may note the mortality in each of the several quarters of the year among the total population.

Year	Period.	Total deaths.	Rate per mille per quarter.	Annual rate calculated on column 4.	Rate of 4th quarter as against preceding quarters by column 4.	Annual rate calculated as between 4th quarter and previous quarters in Column 5.
1.	2.	3.	4.	5.	6.	7.
1868.	1st quarter	3,142	6.98	27.92	Decrease 1.13	Decrease 4.52
	2nd " ...	3,012	6.69	26.76	Do. .84	Do. 3.36
	3rd " ...	3,415	7.58	30.32	Do. 1.73	Do. 6.92
	4th " ...	2,633	5.85	23.40	.....	.....

An analysis of the Returns of the various classes of the community during the year shows the following general results:—

TABLE V, Deaths in Madras during the fourth quarter of 1868, arranged by Race and Caste.

	Europeans.		East Indians.		Hindoos.		Mahomedans.		Total.		General Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Miasmatic Diseases.											
Small Pox.....	...	...	1	...	4	6	...	1	5	7	12
Fevors	2	1	9	6	178	203	21	28	210	238	448
Dysentery	...	1	2	3	71	66	21	19	94	89	183
Diarrhoea	1	...	...	2	58	59	4	4	63	65	128
Cholera	...	...	...	1	2	...	...	...	2	...	2
Other Miasmatic Diseases...	...	...	...	...	32	27	8	2	42	30	72
Total Miasmatic Diseases...	3	2	14	12	345	361	54	54	416	429	845
Total of all other Diseases...	20	2	21	26	724	738	151	106	916	872	1,788
Total...	23	4	55	38	1,069	1,099	205	160	1,332	1,301	2,633
Mean mortality of ten fourth quarters from 1858 to 1867.											
Miasmatic Diseases...	10.5	3.6	16.9	17.1	685.4	652.0	93.9	102.9	806.7	775.0	1582.3
Other Diseases	16.8	7.8	23.5	21.6	647.9	511.2	116.3	114.9	804.5	655.5	1480.0
Total...	27.3	11.4	40.4	38.7	1333.3	1163.2	210.2	217.8	1611.2	1431.1	3042.3
Increase											
Decrease											
	11.7		6.1		328.5		63.0		409.3		409.3

Among Europeans the total mortality amounted to twenty seven, of whom twenty-three were males and four females, and among East Indians seventy-three, of whom thirty-five were males and thirty-eight females. The total mortality, and the ratio it bears to supposed total population of these and all classes of the community are shewn by the following Table for the whole year:—

I. EUROPEANS AND EAST INDIANS.							
Year.	* Estimated population.	Period.	Total Deaths of both sexes.	Rate per mille, per quarter.	Annual rate calculated on column 4.	Rate of 4th. against preceding quarters by column 4.	Annual rate calculated as between rate shown by 4th as against previous quarters by column 5.
1.	2.	3.	4.	5.	6.	7.	
1868.	17,219	1st quarter...	104	6.03	24.12	Decrease .23	Decrease .92
		2nd " "	127	7.37	29.48	Do. 1.57	Do. 6.28
		3rd " "	142	8.24	32.96	Do. 2.44	Do. 9.76
		4th " "	100	5.80	23.20	.....	.....
	365,576	II. HINDOOS.					
		1st quarter...	2,613	7.14	28.56	Decrease 1.21	Decrease 4.84
		2nd " "	2,501	6.84	27.36	Do. .91	Do. 3.64
		3rd " "	2,851	7.79	31.16	Do. 1.86	Do. 7.44
		4th " "	2,168	5.93	23.72	.....	.....
	67,206	III. MAHOMEDANS.					
		1st quarter...	425	6.22	25.28	Decrease .89	Decrease 3.56
		2nd " "	384	5.71	23.84	Do. .28	Do. 1.12
		3rd " "	422	6.27	25.08	Do. .84	Do. 3.36
		4th " "	365	5.43	21.72	.....	.....

In every respect the concluding quarter of the year shows a very marked superiority over preceding quarters among each of the several classes of the community. It is noteworthy how very equally the death rate in each class approximated to that of the others in the last quarter, but it is unsatisfactory to find that that of Europeans and East Indians is higher than among Mahomedans.

I cannot, however, fail to recognize that this difference may be merely a matter of registration, and that the Mahomedans may be less accurate in furnishing death returns than Europeans and East Indians.

* Vide my Annual Report for 1866.—H. B. M.

The more secluded habits of life of the families of the former, the ignorance of many of them, as to the requirements of the law, the dense population of the bazaars in which they reside (whereby deaths are less observable by the Registrars), are all elements of difficulty in the way of complete Registration.

I have before had occasion to remark* in a former Report on the disparity observed between the mortality of the different sexes of the several sections of the general community classified by race and caste. The following Table gives all particulars regarding this interesting subject during 1868.

Supposed population.	Period 1868.	Total deaths.	Men.	Women.	Proportion of deaths of sexes to total population.		Proportion of deaths of men and women, inter se.
					Men.	Women.	
17,219	1st quarter	104	56	48	1 in 307†	1 in 371†	100 men to † 86 women.
	2nd do.	127	76	51	1 in 236†	1 in 338†	100 " to † 67 do.
	3rd do.	142	71	71	1 in 242†	1 in 242†	100 " to † 100 do.
	4th do.	100	58	42	1 in 297†	1 in 410†	100 " to † 72 do.
HINDOOS.							
3,65,576	1st quarter	2,613	1,366	1,247	1 in 267†	1 in 293†	100 men to † 91 women.
	2nd do.	2,501	1,225	1,276	1 in 298†	1 in 266†	100 " to † 104 " "
	3rd do.	2,851	1,475	1,376	1 in 248†	1 in 266†	100 " to † 98 " "
	4th do.	2,168	1,089	1,099	1 in 342†	1 in 233†	100 " to † 102 " "
MAHOMEDANS.							
67,206	1st quarter	425	198	227	1 in 348†	1 in 289	100 men to † 120 women.
	2nd do.	384	212	172	1 in 317†	1 in 391	100 " to † 104 " "
	3rd do.	422	218	210	1 in 317†	1 in 320	100 " to † 99 " "
	4th do.	365	205	160	1 in 328†	1 in 420	100 " to † 78 " "

Small-pox.—This disease had been extremely prevalent throughout the whole of the Madras Presidency during the first three quarters of the year, but a diminution was generally apparent early in the fourth quarter. The same observation applies to the population of Madras itself. As compared with the experience of former years, the quarter stands second equally with those of 1865 and 1866; the latter of these two quarters was characterized by a large mortality from cholera; the former by a moderate amount of cholera; while that of 1868, exhibited an almost complete exemption from the same disease. The wave line of small-pox in the quarter is as might be expected much below the average, the latter being invariably higher even in each several week except the first, when only one case of small-pox occurred in 1868. In six several weeks (not continuous, however, but divided into groups of two, three, and one) no casualties occurred from the disease. The maximum weekly mortality was three in the weeks ending 13th November and 31st December, in all other weeks in which mortality occurred (six) it only amounted to one per week. A wave line of disease indicating such slight variation is not

* Vide my Report on 1st quarter of 1868. H. B. M.
† An approximation only.

likely to be co-incident in its fluctuations with any disease synchronously co-existent; it is in fact only when diseases of special type prevail epidemically that mutual relationship can be satisfactorily demonstrated. Hence, the comparison of small-pox with fevers generally, with dysentery or diarrhoea, is in the present instance impracticable. For the same reason the examination of the condition of the barometer and thermometer and of the other Meteorological phenomena is of little interest as regards this disease in the present instance. Relatively to the preceding quarters of the year, that under report, presents a very favourable appearance. The deaths previously recorded, were 372, 361, and 54, or an average of 262 per quarter against only 12 in the last three months.

Fevers prevailed to a less extent than

Fevers.	Order of salubrity for nine years.
1860.....	689
1861.....	585
1862.....	569
1863.....	512
1864.....	493
1865.....	624
1866.....	662
1867.....	561
Total ...	4,695
Average... 1868.....	586.9
	448

exceptional weather of this quarter is taken into account. High heat following a comparatively trifling amount of rain-fall would under ordinary circumstances prove to be productive of an increase of Fever, and it was so in the middle of December when rain had fallen (in the week ending December 4th, to the amount of 3.19 inches). Fever was widely prevalent throughout the whole Presidency during the previous three quarters of the year, and the city of Madras had suffered materially from the same disease. The casualties in Madras amounted to 524 in the first, 529 in the second, and 731 in the third, quarter. The high heat considered in that quarter to be the cause of increased mortality from Fevers was continued in the fourth quarter, but the number of casualties declined. The minimum rate was observed in the week ending 20th November and amounted to only 26. The rapid fall in the minimum temperature would appear the only probable cause of the undue prevalence and fatality of Fever at the end of the quarter. I believe that this is a pregnant source of disease among Natives, and one that is too frequently overlooked. High heat by the generation of miasma does no doubt cause much mortality—and this is enhanced if trifling and irregular rain-fall has occurred, but the more serious effect of having rain is a rapid reduction of the minimum temperature which the native constitution, and to a degree that of East Indians, is unable to withstand.

Dysentery was less prevalent than is usual in fourth quarters of the year. The per-centage of humidity was on the average two less than that shewn by the average of the preceding years, although, however, a high maximum (86) in the weeks ending 23rd October and 6th November. An examination of the rate of humidity, and the progress of Dysentery only reveals a fresh series of the remarkable anomalies that have characterized the quarter under review.

Diarrhoea, as before remarked, was witnessed to an exceptionally small degree.

Diarrhoea.	Order of salubrity for nine years.
1860.....	409
1861.....	253
1862.....	288
1863.....	236
1864.....	217
1865.....	285
1866.....	288
1867.....	188
Total.....	2,160
Average... 1868.....	270.0
	128

The wave line of the disease is singularly irregular, and is not coincident with that of any other disease even dysentery. I have carefully examined the various causes supposed to influence public health and failed to find any explanation of these irregularities. Lest, however, this admission be held as invalidating some results that in other instances are trustworthy, I

may note that in diseases of uncertain duration, and which are due to constitutional as well as seasonal causes the date of commencement, and not of the end of the disease is of importance (vide my Report on third quarter of 1868, item Dysentery). The data for such a calculation, as that indicated, are not now available.

Cholera—In continuation of the favorable Report, I have had the pleasure to submit, for a period of six quarters, regarding this disease I have only to note that two cases occurred in the period under review.

Cholera.	Order of salubrity for nine years.
1860.....	327
1861.....	614
1862.....	1,341
1863.....	133
1864.....	34
1865.....	308
1866.....	688
1867.....	11
Total...	3,356
Average... 1868.....	419.5
	2

I have been careful to ascertain the details of these two cases. The first was that of a Native Carpenter, who was seized with the disease on board a vessel in the roads, which sailed subsequently and was lost sight of.

The man died in seven hours, the disease did not spread, either to the general population.

The second case was that of one of the inmates of the institution. A delicate child always, the patient rapidly succumbed to the disease, which Dr. vanSomeren informed me was true cholera. Under the vigilant care of that officer, the extension of the disease was happily avoided both in the institution, where it commenced, and in the adjacent Hospital (Native Infirmary) to which the patient was transferred for treatment.

I cannot conclude this portion of the Report without noting that the condition of the drains in Madras still continues very unsatisfactory. Conservancy generally is decidedly improved, and the public latrines, and rubbish depôts, have been so carefully looked after, that a great abatement has been effected of the intolerable nuisances formerly occasioned by them. But the drains of Madras were never more offensive than in 1868. The urgent need of an improvement in this respect cannot be too strongly, or too frequently reiterated.

The water supply is abominable in quality, and signally deficient in quantity, and the Cooum river is a foul and noisome cess-pool.

Under these circumstances the healthiness of Madras, during the period under review, must be attributed to higher than human influences, but it is no less incumbent on the authorities to expedite the carrying out of systems of drainage, and water supply, and the improvement of the Cooum. It is our bounden and imperative duty to protect the population from diseases of preventable origin, and not, as we now do, to permit a soil to be prepared for the growth of epidemic disease, seeds of which may be sown on any day.

Table showing the Mortality from Miasmatic diseases in the fourth quarter of 1868.

	1st to 2nd October	Week end- ing 9th October	Week end- ing 16th October	Week end- ing 23rd October	Week end- ing 30th October	Week end- ing 6th November	Week end- ing 13th November	Week end- ing 20th November	Week end- ing 27th November	Week end- ing 4th December	Week end- ing 11th December	Week end- ing 18th December	Week end- ing 25th December	Total.
Small-pox	1	1	1	1	1	1	1	1	1	1	1	1	1	12
Fever	11	35	38	27	28	31	31	26	29	30	35	54	34	36
Dysentery	5	11	17	15	12	15	15	17	13	7	16	13	6	448
Diarrhoea	2	13	5	20	5	8	8	11	11	12	7	11	4	23
Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	18
Other Miasmatic diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Total Miasmatic diseases	19	67	65	71	50	65	65	63	59	58	77	81	47	845
All diseases	53	191	168	307	174	224	212	213	210	216	187	243	160	2,633

Average of the fourth quarters of eight previous years arranged according to weeks.

	1st to 2nd October	Week end- ing 9th October	Week end- ing 16th October	Week end- ing 23rd October	Week end- ing 30th October	Week end- ing 6th November	Week end- ing 13th November	Week end- ing 20th November	Week end- ing 27th November	Week end- ing 4th December	Week end- ing 11th December	Week end- ing 18th December	Week end- ing 25th December	Total.
Small-pox	...	3.4	2.3	1.9	2.9	3.1	3.4	3.6	3.6	1.9	1.9	4.1	4.0	43.9
Fever	9.5	46.6	42.3	45.3	44.3	44.7	44.1	42.6	42.6	44.6	44.6	45.3	45.3	585.9
Dysentery	4.3	25.1	25.5	26.6	23.4	24.0	25.3	25.5	25.5	29.8	29.8	27.7	25.3	340.7
Diarrhoea	37.5	20.0	18.5	19.1	17.8	17.7	16.6	18.0	18.0	15.4	15.4	18.5	16.5	270.0
Cholera	22.1	44.5	41.4	21.1	30.4	26.3	19.1	25.7	25.7	25.0	25.0	28.2	24.1	419.5
Other Miasmatic diseases	1.0	2.6	1.9	2.9	2.5	3.5	2.8	8.5	8.5	2.9	2.9	2.5	3.0	38.3
Total Miasmatic diseases	74.4	142.2	131.9	126.7	121.2	119.3	111.7	118.9	118.9	119.9	119.9	136.8	121.0	1,699.2
All diseases	69.6	254.5	249.6	244.6	234.1	236.7	236.3	233.8	233.8	238.4	240.9	226.0	245.5	3,180.2

Mean Meteorological Observations for the past quarters.

	1st to 2nd October	Week end- ing 9th October	Week end- ing 16th October	Week end- ing 23rd October	Week end- ing 30th October	Week end- ing 6th November	Week end- ing 13th November	Week end- ing 20th November	Week end- ing 27th November	Week end- ing 4th December	Week end- ing 11th December	Week end- ing 18th December	Week end- ing 25th December	26th to 31st Dec. Average.
Barometer reduced to 32° F.	29.813	29.799	29.879	29.890	29.868	29.824	29.905	29.905	29.905	30.005	30.005	30.005	29.991	29.909
Mean Maximum temperature	92.9	96.4	92.1	86.9	83.4	87.9	87.3	85.7	85.7	84.3	84.1	84.1	84.5	87.1
Minimum	77.0	77.7	75.8	74.9	75.5	69.7	67.7	67.4	67.4	74.6	67.7	67.6	67.6	71.8
Temperature	83.3	84.6	83.6	78.9	78.2	77.1	77.0	76.3	76.3	77.7	74.5	74.9	75.6	78.3
Humidity	78	74	70	86	86	75	69	68	68	82	78	74	74	76
Prevailing wind	S. by E.	S. E. by S.	E. N. E.	N. N. by E.	N. N. by E.	W. S. W.	N. E.	N. N. E.	N. N. E.	N. N. E.	N. N. E.	N. N. E.	N. N. E.	E. N. E.
Mean velocity in miles	160	153	123	107	183	170	146	194	194	230	175	191	207	168
Rain-fall	0.32	...	0.25	1.74	3.46	...	...	...	...	3.19	...	...	...	13.78

Table showing the Mean half monthly Meteorological condition of Madras for twenty years past.

	Half month ending 1st October.	Half month ending 15th November.	Half month ending 30th November.	Half month ending 15th December.	Average.
Barometer reduced to 32° F.	29.871	29.944	29.950	29.957	29.933
Mean Maximum temperature	84.4	83.8	82.1	81.5	83.1
Minimum	73.9	72.4	71.3	70.2	71.9
Temperature	79.0	77.5	76.5	75.6	77.3
Humidity	81	77	76	79	78
Prevailing wind	E. N. E.	N. N. E.	N. N. E.	N. N. E.	N. E. by N.
Mean velocity in miles	129	148	177	181	158
Rain-fall	7.01	6.94	5.96	3.43	29.22

The meteorological condition of Madras during the period under review is fully detailed in the foregoing table, and accompanying diagram.

The barometer showed an average mean atmospheric pressure of 29.909, reduced to 32° F, during the quarter, being .014 lower than the average of twenty previous years, which, however, may be accounted for by a less quantity of rain (13.78 inches) having fallen during the quarter than that witnessed during twenty years past, when an average of 29.22 inches fell. Compared with the corresponding period of 1867, the mercury, during the quarter under review stood at .036 degrees lower. The weekly registers indicate that no very marked fluctuations took place in the rise and fall of the barometer. The first four weeks show a slight and gradual increase from 29.023 to 29.909 degrees, after which a corresponding gradual decrease is observed in the next three weeks, the mercury standing at 29.824 degrees in the seventh week, being the lowest point at which it stood excepting the last five days of the quarter when an average of 29.823 degrees were registered. The greatest amount of pressure registered during the quarter took place in the twelfth week when the barometer rose to 30.020 degrees.

The mean maximum heat registered during the quarter under review averaged 87.1, being four degrees greater than the average of twenty previous years, and three degrees in excess of that noted in the corresponding period of 1867. On an examination of the foregoing table it will be observed that the wave line of temperature never once descended below the average experience and that any fall indicated in the thermometer during the quarter took place only in those weeks when some amount of rain was registered. A reference to the foregoing table and accompany chart will give at a glance further particulars regarding this element of the meteorological condition of Madras.

As must be expected from the foregoing, the humidity during the fourth quarter of 1868, averaged two degrees less than the twenty years' experience, the per-centage of humidity registered being seventy-six against an average of seventy-eight for twenty years past. It is, however, identical with the amount witnessed in the corresponding quarter of 1867. Considerable variation is observed in the wave line of humidity during the quarter and the highest point (eighty-six degrees) to which it rose took place in the fourth and sixth weeks, being co-incident with a heavy fall of rain of 4.84 and 3.46 inches respectively.

The velocity of the wind which generally blew from a east-north-easterly direction, averaged 168 miles, being ten miles more than the average of twenty previous years. Compared with the fourth quarter of 1867, it blew with less violence by eight miles. The greatest average daily velocity took place during the week ending 4th December, when it rose to 230 miles, it afterwards fell and rose again to 207 miles in the last week of the quarter.

The total amount of rain that fell during the quarter, I regret to say, has been very scanty, only 13.78 inches were registered against an average of 29.22, showing thereby a deficiency of 15.44 inches. An examination of the above table will show that the only three occasions during which any amount of rain fell were the weeks ending 23rd October, 6th November, and 4th December, when 4.84, 3.46, and 3.19 inches were registered, respectively.

From an analysis of the mortality and meteorological charts it will be observed that no definite connection can be traced between the prevalence and fatality of disease and any of the meteorological elements detailed above. The quarter under review has been a markedly exceptional period. The thermometer has indicated a higher range of temperature than the average experience of twenty past years, the per-centage of humidity has been lower and the rain-fall registered has been considerably below the average. This deficiency of rain-fall is already making itself felt; great scarcity of water is experienced throughout the city and many of the wells whose sources have been long ago or less contaminated have ceased to yield a pure supply of drinking water.

James *Thompson*
Secretary Sanitary Commissioner for Madras.

Adm. Serv. Unit 169
26.6.78

the
ees

No. 797

OFFICE OF SANITARY COMMISSIONER,
Madras, 18th March 1869.

From

The Sanitary Commissioner for Madras,

To

The ^{Chief} Secretary to Government,
Fort Saint George.

Sir,

Enclosures 1

I have the honor to forward, for submission to Government, the accompanying Report on the Causes of Death in Madras during the fourth Quarter of 1868; drawn up by my Secretary, Surgeon W.B. Montgomery M.D.

I have the honor to be,
Sir,

Your most obedient Servant

A. Murray
Sanitary Commissioner
for Madras

No 8-2 February 1888 No 338.

456

69

22 May 1888

Public Works Dept

From

The Sanitary Commissioner

for Madras,

To
The Chief Secretary
to Government
Fort St. George
Dated 18th
Despatched 20-
Received 19- March 1888

No. 797.

Enclosures. 1 ✓

Forward Report of Results
Madras during the fourth
Quarter of 1888.

231 March
1888-1889.

78

9th April 1869.

An analysis of the returns of the various classes of the community during the year shows the following general results:—

TABLE V. Deaths in Madras during the fourth Quarter of 1868, arranged by Race and Caste.

	Europeans.		East Indians.		Hindoos.		Mahomedans.		Total.		General Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
<i>Miasmatic Diseases.</i>											
Small-pox	...	...	1	...	4	6	...	1	5	7	12
Fevers	2	1	9	6	178	203	21	28	210	238	448
Dysentery	...	1	2	3	71	66	21	19	94	89	183
Diarrhoea	1	...	...	2	58	59	4	4	63	65	128
Cholera	...	...	...	...	2	.....	...	...	2	...	2
Other Miasmatic Diseases...	...	...	2	1	32	27	8	2	42	30	72
Total Miasmatic Diseases...	3	2	14	12	345	361	54	54	416	429	845
Total of all other Diseases...	20	2	21	26	724	738	151	106	916	872	1,788
Total...	23	4	35	38	1,069	1,099	205	160	1,332	1,301	2,633
<i>Mean mortality of ten fourth quarters from 1858 to 1867.</i>											
Miasmatic Diseases...	10.5	3.6	16.9	17.1	685.4	652.0	93.9	102.9	806.7	776.0	1582.3
Other Diseases	16.8	7.8	23.5	21.6	647.9	511.2	116.3	114.9	804.5	655.5	1460.0
Total...	27.3	11.4	40.4	38.7	1333.3	1163.2	210.2	217.8	1611.2	1431.1	3042.3
Increase ... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decrease	11.7	.....	6.1	.....	328.5	.....	63.0	.....	409.3	.....	409.3

Among Europeans the total mortality amounted to twenty-seven, of whom twenty-three were males and four females, and among East Indians seventy-three, of whom thirty-five were males and thirty-eight females. The total mortality, and the ratio it bears to supposed total population of these and all classes of the community, are shown by the following table for the whole year:—

I. EUROPEANS AND EAST INDIANS.								
Year.	* Estimated population.	Period.	Total Deaths of both sexes.	Rate per mille, per quarter.	Annual rate calculated on Column 4.	Rate of 4th as against preceding quarters by Column 4.	Annual rate calculated as between rate shown by 4th as against previous quarters by Column 5.	
	1	2	3	4	5	6	7	
1868.	17,219	1st quarter...	104	6.03	24.12	Decrease .23 Do. 1.57 Do. 2.44	Decrease .92 Do. 6.28 Do. 9.76	
		2nd "	127	7.37	29.48			
		3rd "	142	8.24	32.96			
		4th "	100	5.80	23.20			
	II. HINDOOS.							
	365,576	1st quarter...	2,613	7.14	28.56	Decrease 1.21 Do. .91 Do. 1.86	Decrease 4.84 Do. 3.64 Do. 7.44	
		2nd "	2,501	6.84	27.36			
		3rd "	2,851	7.79	31.16			
		4th "	2,168	5.93	23.72			
	III. MAHOMEDANS.							
	67,205	1st quarter...	425	6.32	25.28	Decrease .80 Do. .28 Do. .84	Decrease 3.56 Do. 1.12 Do. 3.36	
		2nd "	384	5.71	22.84			
		3rd "	422	6.27	25.08			
		4th "	365	5.43	21.72			

* Vide my Annual Report for 1866.—H. M. B.

9th April 1869.

very respect the concluding quarter of the year shows a very marked superiority over quarters among each of the several classes of the community. It is noteworthy how the death-rate in each class approximated to that of the others in the last quarter, unsatisfactory to find that that of Europeans and East Indians is higher than among

ans. not, however, fail to recognise that this difference may be merely a matter of registration that the Mahomedans may be less accurate in furnishing death returns than Europeans Indians.

more secluded habits of life of the families of the former, the ignorance of many of them requirements of the law, the dense population of the bazaars in which they reside, deaths are less observable by the Registrars,) are all elements of difficulty in the way of registration.

before had occasion to remark* in a former report on the disparity observed between the different sexes of the several sections of the general community classified by caste. The following table gives all particulars regarding this interesting subject 8:—

EUROPEANS AND EAST INDIANS.							
Period 1868.	Total deaths.	Men.	Women.	Proportion of deaths of sexes to total population.		Proportion of deaths of men and women, inter se.	
				Men.	Women.		
1st quarter ...	104	56	48	1 in 307†	1 in 371†	100 men to	† 86 women.
2nd do. ...	127	76	51	1 in 226†	1 in 333†	100 " to	† 67 do.
3rd do. ...	142	71	71	1 in 242†	1 in 242†	100 " to	† 100 do.
4th do. ...	100	58	42	1 in 297†	1 in 410†	100 " to	† 72 do.
HINDOOS.							
1st quarter ...	2,613	1,366	1,247	1 in 267†	1 in 293†	100 men to	† 91 women.
2nd do. ...	2,501	1,225	1,276	1 in 286†	1 in 286†	100 " to	† 104 "
3rd do. ...	2,851	1,475	1,376	1 in 248†	1 in 266†	100 " to	† 93 "
4th do. ...	2,168	1,069	1,099	1 in 342†	1 in 383†	100 " to	† 102 "
MAHOMEDANS.							
1st quarter ...	425	193	232	1 in 348†	1 in 289	100 men to	† 120 women.
2nd do. ...	384	212	172	1 in 317†	1 in 391	100 " to	† 81 "
3rd do. ...	422	212	210	1 in 317†	1 in 320	100 " to	† 99 "
4th do. ...	365	205	160	1 in 328†	1 in 420	100 " to	† 78 "

ox.—This disease had been extremely prevalent throughout the whole of the Madras

Presidency during the first three quarters of the year, but a diminution was generally apparent early in the fourth quarter. The same observation applies to the population of Madras itself. As compared with the experience of former years, the quarter stands second equally with those of 1865 and 1866; the latter of these two quarters was characterized by a large mortality from cholera; the former by a moderate amount of cholera; while that of 1868 exhibited an almost complete exemption from the

* Vide my Report on 1st quarter of 1868.—H. B. M.

† An approximation only.

Proceedings of the Madras Government, Public Department,
9th April 1869.

same disease. The wave line of small-pox in the quarter is, as might be expected, much below the average, the latter being invariably higher even in each several week except the first, when only one case of small-pox occurred in 1868. In six several weeks (not continuous, however, but divided into groups of two, three, and one,) no casualties occurred from the disease. The maximum weekly mortality was three in the weeks ending 13th November and 31st December, in all other weeks in which mortality occurred (six) it only amounted to one per week. A wave line of disease indicating such slight variation is not likely to be coincident in its fluctuations with any small-pox with fevers generally, with dysentery or diarrhoea, is in the present instance impracticable. For the same reason the examination of the condition of the barometer and thermometer and of the other Meteorological phenomena is of little interest as regards this disease in the present instance. Relatively to the preceding quarters of the year, that under report presents a very favorable appearance. The deaths previously recorded were 372, 361, and 54, or an average of 262 per quarter against only 12 in the last three months.

Fevers prevailed to a less extent than might have been expected if the very exceptional weather of this quarter is taken into account. High heat following a comparatively trifling amount of rain-fall would, under ordinary circumstances, prove to be productive of an increase of fever, and it was so in the middle of December when rain had fallen (in the week ending December 4th, to the amount of 3.19 inches). Fever was widely prevalent throughout the whole Presidency during the previous three quarters of the year, and the city of Madras had suffered

Fevers.	Order of salubrity for nine years.
1860	689 9
1861	585 6
1862	509 5
1863	512 3
1864	493 2
1865	624 7
1866	662 8
1867	561 4
Total...	4,695
Average...	586.9
1868	448 1

materially from the same disease. The casualties in Madras amounted to 524 in the first, 529 in the second, and 731 in the third, quarter. The high heat considered in that quarter to be the cause of increased mortality from fevers was continued in the fourth quarter, but the number of casualties declined. The maximum weekly mortality was recorded in the week ending 18th December when it amounted to 54 cases. The minimum rate was observed in the week ending 20th November and amounted to only 26. The rapid fall in the minimum temperature would appear the only probable cause of the undue prevalence and fatality of fever at the end of the quarter. I believe that this is a pregnant source of disease among Natives, and one that is too frequently overlooked. High heat by the general rainfall has occurred, but the more serious effect of having rain is a rapid reduction of the minimum temperature which the native constitution, and to a degree that of East Indians, is unable to withstand.

Dysentery was less prevalent than is usual in fourth-quarters of the year. The percentage of humidity was on the average two less than that shown by the average of previous years. It attained, however, a high maximum (86) in the weeks ending 23rd October and 6th November. An examination of the rate of humidity, and the progress of Dysentery only reveals a fresh series of the remarkable anomalies that have characterized the quarter under review.

Proceedings of the Madras Government, Public Department,
9th April 1869.

Diarrhoea, as before remarked, was witnessed to an exceptionally small degree. The wave line of the disease is singularly irregular, and is

DIARRHOEA.	Order of salubrity for nine years.
1860... ..	409 9
1861... ..	253 5
1862... ..	288 8
1863... ..	236 4
1864... ..	217 3
1865... ..	286 7
1866... ..	283 6
1867... ..	188 2
Total...	2,160
Average...	270.0
1868... ..	123 1

not coincident with that of any other disease even dysentery. I have carefully examined the various causes supposed to influence public health, and failed to find any explanation of these irregularities. Lest, however, this admission be held as invalidating some results that in other instances are trustworthy, I may note that in diseases of uncertain duration, and which are due to constitutional as well as seasonal causes, the date of commencement, and not of the end of the disease is of importance (vide my report on third quarter of 1868, item dysentery. The data for such a calculation, as that indicated, are not now available.

Cholera.—In continuation of the favorable report I have had the pleasure to submit for a period of six quarters regarding this disease, I have only to note that two cases occurred in the period under review. I have been careful to ascertain the details of these two cases. The first was that of a Native Carpenter, who was seized with the disease on board a vessel in the roads, which sailed subsequently, and was lost sight of. The man died in fifteen hours, the disease did not spread, either to the occupants of his house, or to the general population.

The second case was that of one of the inmates of the Foundling Hospital. A delicate child always, the patient rapidly succumbed to the disease, which Dr. vanSomeren informed me was true cholera. Under the vigilant care of that officer, the extension of the disease was happily avoided both in the institution, where it commenced, and in the adjacent Hospital (Native Infirmary) to which the patient was transferred for treatment.

I cannot conclude this portion of the Report without noting that the condition of the drains in Madras still continues very unsatisfactory. Conservancy generally is decidedly improved, and the public latrines, and rubbish depôts, have been so carefully looked after, that a great abatement has been effected of the intolerable nuisances formerly occasioned by them. But the drains of Madras were never more offensive than in 1868. The urgent need of an improvement in this respect cannot be too strongly, or too frequently reiterated.

The water supply is abominable in quality, and signally deficient in quantity, and the Cooum river is a foul and noisome cesspool.

Under these circumstances the healthiness of Madras, during the period under review, must be attributed to higher than human influences, but it is no less incumbent upon the authorities to expedite the carrying out of systems of drainage, and water-supply, and the improvement of the Cooum. It is our bounden and imperative duty to protect the population from diseases of preventable origin, and not, as we now do, to permit a soil to be prepared for the growth of epidemic disease, seeds of which may be sown on any day.

Table showing the Mortality from Miasmatic diseases in the fourth quarter of 1868.

	1st to 2nd Oct.	Week ending 9th Oct.	Week ending 16th Oct.	Week ending 23rd Oct.	Week ending 30th Oct.	Week ending 6th Nov.	Week ending 13th Nov.	Week ending 20th Nov.	Week ending 27th Nov.	Week ending 4th Dec.	Week ending 11th Dec.	Week ending 18th Dec.	Week ending 25th Dec.	26th to 31st December.	Total.
Small-pox...	1	1	36	36	1	1	3	1	29	30	35	1	34	3	12
Fevers...	11	35	17	13	27	28	31	26	13	7	16	54	6	86	448
Dysentery...	5	11	5	6	15	12	15	17	11	12	7	13	4	23	183
Diarrhoea...	2	13	7	3	20	5	8	11	6	7	5	11	4	13	18
Cholera...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	2
Other Miasmatic diseases...	...	7	7	3	8	3	8	6	6	7	5	2	3	7	72
Total Miasmatic diseases...	19	67	65	58	71	50	65	62	59	56	63	81	47	82	845
All diseases...	53	191	168	173	207	174	224	212	210	216	187	243	160	214	2,632

Average of the fourth quarters of eight previous years arranged according to weeks.

	Total.	1st to 2nd Oct.	Week ending 9th Oct.	Week ending 16th Oct.	Week ending 23rd Oct.	Week ending 30th Oct.	Week ending 6th Nov.	Week ending 13th Nov.	Week ending 20th Nov.	Week ending 27th Nov.	Week ending 4th Dec.	Week ending 11th Dec.	Week ending 18th Dec.	Week ending 25th Dec.	26th to 31st December.	Total.
Small-pox...	...	...	3.4	2.3	2.6	1.9	2.9	3.1	3.4	3.6	1.8	3.7	4.1	4.0	7.1	43.9
Fevers...	...	9.5	46.6	42.3	45.0	45.3	44.2	44.7	44.1	42.6	44.8	46.3	45.3	40.9	45.3	586.9
Dysentery...	...	4.3	25.1	25.5	26.0	26.8	23.4	24.0	25.3	25.5	29.8	27.0	27.7	25.3	25.0	340.7
Diarrhoea...	...	37.5	20.0	18.5	19.8	21.1	17.8	17.7	16.6	18.0	15.6	16.1	18.5	16.3	16.5	270.0
Cholera...	...	22.1	44.5	41.4	37.8	29.7	30.4	26.3	19.1	25.7	25.0	25.3	28.2	29.9	34.1	419.5
Other Miasmatic diseases...	...	1.0	2.6	1.9	3.2	1.9	2.5	3.5	2.8	3.5	2.9	3.9	2.5	3.0	3.0	38.2
Total Miasmatic diseases...	...	74.4	142.2	131.9	134.4	126.7	121.2	119.3	111.7	118.9	119.9	122.3	126.3	119.4	131.0	1699.2
All diseases...	...	69.6	254.5	249.6	247.5	244.6	234.1	236.7	226.3	233.8	236.7	233.8	240.9	226.6	245.5	3180.2

Mean Meteorological Observations for the past quarters.

	1st to 2nd Oct.	Week ending 9th Oct.	Week ending 16th Oct.	Week ending 23rd Oct.	Week ending 30th Oct.	Week ending 6th Nov.	Week ending 13th Nov.	Week ending 20th Nov.	Week ending 27th Nov.	Week ending 4th Dec.	Week ending 11th Dec.	Week ending 18th Dec.	Week ending 25th Dec.	26th to 31st December.	Average.
Barometer reduced to 32° F.	29.813	29.799	29.879	29.909	29.890	29.868	29.824	29.995	30.005	30.005	30.003	30.020	29.291	29.823	29.909
Mean maximum temperature	92.9	96.4	92.1	85.5	86.9	83.4	87.9	87.3	85.7	84.3	84.1	84.1	84.5	85.2	87.1
Minimum temperature	77.0	77.7	75.8	74.8	74.9	75.5	69.7	67.7	67.4	74.6	67.7	67.6	67.6	67.3	71.8
Humidity	88.2	84.6	83.8	79.0	79.9	78.2	77.1	77.0	76.2	77.7	74.5	74.9	75.6	75.4	78.3
Prevailing wind	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.	S. by E.
Mean velocity in miles	160	152	123	101	183	170	146	144	194	230	175	191	207	177	168
Rainfall	0.32	...	0.23	4.84	1.74	3.46	...	...	...	3.19	...	...	...	...	13.78

Table showing the Mean half monthly Meteorological condition of Madras for twenty years past.

	Half month ending 16th October.	Half month ending 31st October.	Half month ending 15th November.	Half month ending 30th November.	Half month ending 15th December.	Half month ending 31st December.	Average.
Barometer reduced to 32° F.	29.822	29.871	29.944	29.950	29.957	29.996	29.923
Mean maximum temperature	86.7	84.4	82.8	82.1	81.5	81.5	83.1
Minimum temperature	75.0	73.9	72.4	71.3	70.2	68.8	71.9
Humidity	80.5	79.0	77.5	76.6	75.6	74.8	77.3
Prevailing wind	S. by E.	E. N. E.	N. N. E.	N. N. E.	N. N. E.	N. E. by N.	78
Mean velocity in miles	122	129	148	177	181	190	158
Rainfall	3.89	7.01	6.94	5.96	3.48	1.94	29.22

The meteorological condition of Madras during the period under review is fully detailed in the foregoing table, and accompanying diagram.

The barometer showed an average mean atmospheric pressure of 29.909, reduced to 32° F, during the quarter, being .014 lower than the average of twenty previous years, which, however, may be accounted for by a less quantity of rain (13.78 inches) having fallen during the quarter than that witnessed during twenty years past, when an average of 29.22 inches fell. Compared with the corresponding period of 1867, the mercury, during the quarter under review, stood at .036 degrees lower. The weekly registers indicate that no very marked fluctuations took place in the rise and fall of the barometer. The first four weeks show a slight and gradual increase from 29.023 to 29.909 degrees, after which a corresponding gradual decrease is observed in the next three weeks, the mercury standing at 29.824 degrees in the seventh week, being the lowest point at which it stood excepting the last five days of the quarter when an average of 29.823 degrees were registered. The greatest amount of pressure registered during the quarter took place in the twelfth week when the barometer rose to 30.020 degrees.

The mean maximum heat registered during the quarter under review averaged 87.1, being four degrees greater than the average of twenty previous years, and three degrees in excess of that noted in the corresponding period of 1867. On an examination of the foregoing table it will be observed that the wave line of temperature never once descended below the average experience, and that any fall indicated in the thermometer during the quarter took place only in those weeks when some amount of rain was registered. A reference to the foregoing table and accompanying chart will give at a glance further particulars regarding this element of the meteorological condition of Madras.

As must be expected from an increased temperature the mean humidity, during the fourth quarter of 1868, averaged two degrees less than the twenty years' experience, the percentage of humidity registered being seventy-six against an average of seventy-eight for twenty years past. It is, however, identical with the amount witnessed in the corresponding quarter of 1867. Considerable variation is observed in the wave line of humidity during the quarter and the highest point (eighty-six degrees) to which it rose took place in the fourth and sixth weeks, being coincident with a heavy fall of rain of 4.84 and 3.46 inches, respectively.

The velocity of the wind which generally blew from a east-north-easterly direction, averaged 168 miles, being ten miles more than the average of twenty previous years. Compared with the fourth quarter of 1867, it blew with less violence by eight miles. The greatest average daily velocity took place during the week ending 4th December, when it rose to 230 miles, it afterwards fell and rose again to 207 miles in the last week of the quarter.

The total amount of rain that fell during the quarter, I regret to say, has been very scanty, only 13.78 inches were registered against an average of 29.22, showing thereby a deficiency of 15.44 inches. An examination of the above table will show that the only three occasions during which any amount of rain fell were the weeks ending 23rd October, 6th November, and 4th December, when 4.84, 3.46, and 3.19 inches were registered, respectively.

From an analysis of the mortality and meteorological charts it will be observed that no definite connexion can be traced between the prevalence and fatality of disease and any of the meteorological elements detailed above. The quarter under review has been a markedly exceptional period.

The thermometer has indicated a higher range of temperature than the average experience of twenty past years, the percentage of humidity has been lower and the rainfall registered has been considerably below the average. This deficiency of rainfall is already making itself felt; great scarcity of water is experienced throughout the city, and many of the wells, whose sources have been long more or less contaminated, have ceased to yield a pure supply of drinking water.

No. 79. ORDER THEREON, 9th April 1869, No. 456.

The report submitted with the foregoing letter shows that the public health, during the fourth quarter of 1868, was satisfactory, the total mortality during that period, compared with that of the fourth quarter of the eight preceding years, with the exception of 1863 and 1864, having been the lowest on record.

2. The attention of the President of the Municipal Commission, Madras, will be called to the remarks contained in the three last paragraphs on page 7 of the report, relative to the drainage, the water supply, and the state of the Cooum river.

(True Extract).

Chief Secretary.

To the Sanitary Commissioner for Madras.

„ President of the Municipal Commission, Madras.
„ Inspector General, Indian Medical Department.

Ed. J. Wright.

Cont. of 1869 ~~Madras~~

PUBLIC.

To

THE SANITARY COMMISSIONER,

Madras

Secy, Secy, &c.

Dated April, 9th.

Recd.

Encl.

G. O., 9th April 1869, No. 458.

APRIL.
Nos. 78-79.

Passing orders on the Monthly Report of
the town of Madras for the fourth quarter of 1868.

Public Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Read the following letter from the

Sanitary Commissioner for Madras

(Here enter 18th March 1869 N^o 797)

Order thereon 9th ^{April} March 1869 N^o 456.

The report submitted with the foregoing letter shows that the public health during the fourth quarter of 1868 was satisfactory, the total mortality during that period, compared with that of the fourth quarter of the eight preceding years, with the exception of 1863 & 1864, having been the lowest on record.

The attention of the President of the Municipal Commission, Madras, will be called to the remarks contained in

1057

M. N.

in the three last paragraphs on page
7 of the report, relative to the
drainage, the water supply, and
the state of the Coum river.

RM

to the Sanitary Commⁿ for Madras
President of the Commⁿ for Madras
" Mr. Genl. S. Macdonald }
} dated 20/11.

Cont. of 186 } 204

Index

To
The Secretary of the
Board.
See

Date of birth G. } 1809, No. 4
Reed.

Nos. 78, 79.

Having orders on the Pres-
-ident, report of the Com-
-missioner of the South
of the Board for the fourth
year of 1868.