

MADRAS RECORD OFFICE.

Government of Madras.

Rubbie DEPARTMENT.

G.O. No.	<i>11436</i>	Press ~~Mis.~~
Dated	<i>16-11-1967</i>	

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3/11/67

Proceedings of the Madras Government, Public Department,
16th November 1867.

No. 112. Read the following letter from the Acting Sanitary Commissioner, Madras, to the Acting Chief Secretary to Government, Fort Saint George; dated Madras, 6th September 1867, No. 352.

I have the honor to submit, for the information and orders of Government, the accompanying report on the deaths in Madras during the second quarter of 1867.

2. Owing to the difficulty of procuring the services of a draughtsman, the preparation of the report has been unavoidably delayed.

REPORT.

ON THE
CAUSES OF DEATH IN MADRAS,
FOR THE SECOND QUARTER 1867.

The health of Madras during the second quarter has in some respects not been satisfactory. An examination of the following tables shows that the total number of deaths amounted to 2925, which, contrasted with the mean (for ten years—1857 to 1866) of similar quarters, 2582, shows an increase of 343.

2. This calculation, however, is partly based upon a series of returns, from 1857 to 1859 inclusive, which are not so reliable as those of later years, and if we examine the subsequent returns we find that the actual mortality of this quarter is only 134 in excess of that of the seven preceding years.

TABLE I, showing average deaths in Madras during the second quarters of seven years ending 1866.

	Small-pox.	Fevers.	Dysentery.	Diarrhoea.	Cholera.	Other Diseases.	Total.
Second Quarter 1860.....	90	519	305	114	115	1,551	2,694
Do. 1861.....	163	532	305	254	430	1,283	2,967
Do. 1862.....	397	525	249	222	558	1,309	3,260
Do. 1863.....	44	560	319	212	257	1,557	2,949
Do. 1864.....	59	481	244	233	52	1,353	2,422
Do. 1865.....	12	543	231	225	34	1,274	2,319
Do. 1866.....	34	553	287	225	320	1,507	2,926
Total...	799	3,713	1,940	1,485	1,766	9,834	19,537
Average...	114.1	530.4	277.1	212.1	252.2	1404.8	2791.0

3. The first quarter of the present year had been unhealthy, as noted in my last report, and the second quarter was, comparatively to it, less unhealthy—the first quarter showing 3715 deaths (731 above the average of ten previous years), the second quarter showing an increase of 343 in deaths. The actual number of deaths in the period now under review is observed to be within one of that recorded in the same quarter in 1866; it exceeds that of 1860, 1864 and 1865, and is less than that of 1861, 1862, and 1863.

4. The death rate has been at the annual rate of 26.0 per mille of the whole population, estimated at 450,000, as against 33.62 of the preceding quarter. The mortality among Europeans and East Indians amounted to an annual rate of 28.59 per mille, if the last census of the Municipal Commissioners be taken as the basis of calculation; but this census is now nearly five years old, and the total of all inhabitants in Madras (427,771) is now always assumed to have risen to

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not less than 450,000. If, therefore, a corresponding increase has taken place in the European and East Indian community, then the original 16,368 has risen to 17,219, and the death rate has been an annual one of 27·17 per mille, or slightly in excess of that of the general population.

5. Here I must bring to the notice of Government that the present census tables (those of the Municipal Commissioners) are, both from the date at which they were drawn up and from the method of their compilation, extremely unreliable. Should the Municipal Act (IX of 1867, Madras) receive the sanction of the Supreme Government, I trust that the Municipal Commissioners may be moved to take early action to bring into effect the course indicated in Section 225 of that Act. Until this is done, it is impossible to estimate correctly the *pro rata* mortality of the population of Madras. The very valuable and interesting reports of Mr. Cornish and Dr. W. A. Smith on the subject lose much of their value from the necessity of their adopting arbitrary numbers as the basis of their calculations; the former Officer taking 450,000, and the latter, in his annual report for 1865, 427,771, or, for facility of calculation, 430,000.

6. The quarter under review is usually the healthiest season in Madras, but, like the same period in 1866, it has not proved generally remarkable in this respect.

7. It is deserving of notice that a most marked discrepancy is apparent in the general totals of deaths from various diseases of miasmatic origin in the second quarters of these two years, while the total mortality was almost identical. Of the total deaths from miasmatic disease in the two years, there were as follows:—

TABLE II.

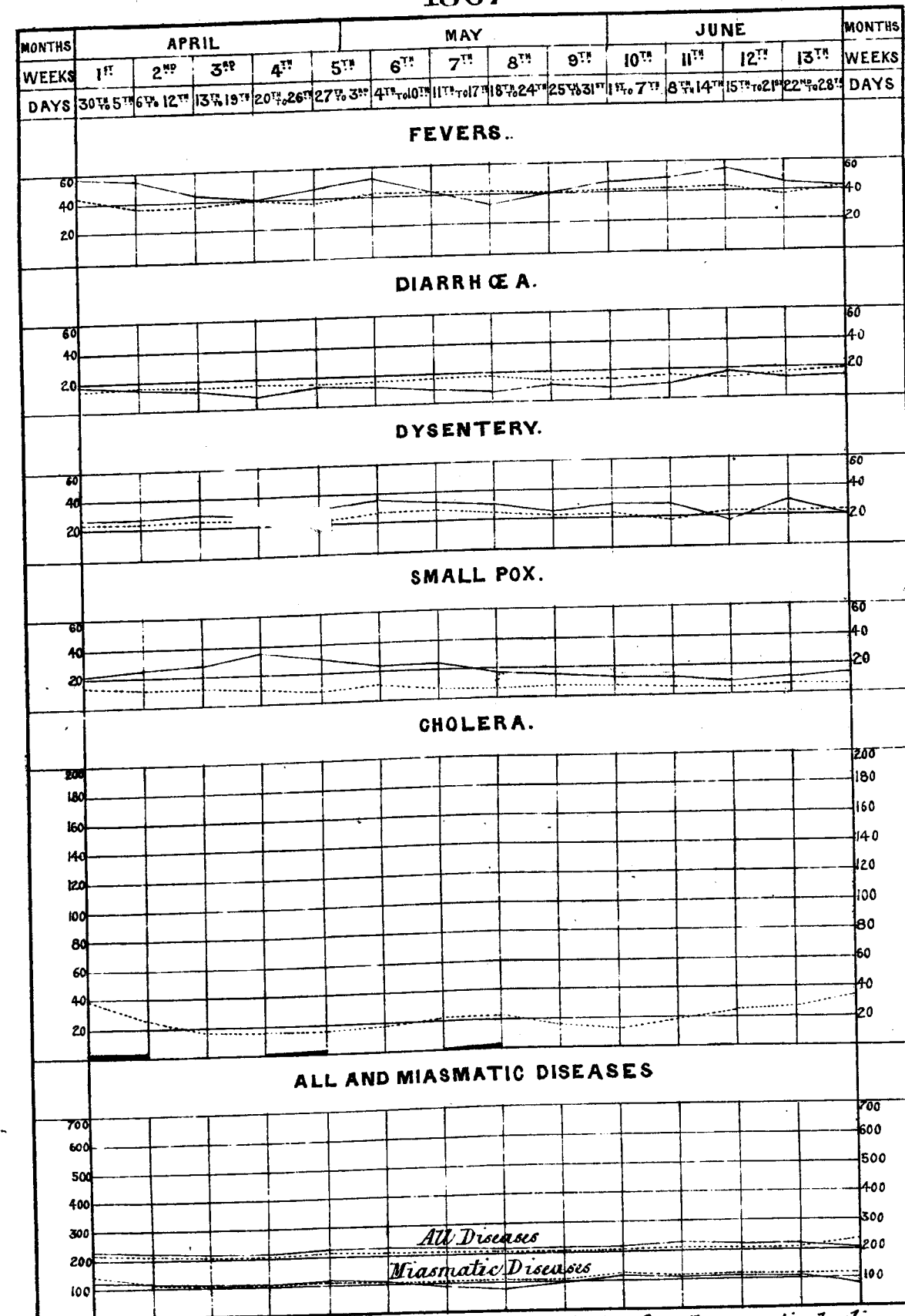
Disease.	1866.	1867.	Increase.	Decrease.
Small-pox	34	248	214	...
Fevers	553	593	40	...
Dysentery	287	340	53	...
Diarrhoea	225	152	...	73
Cholera	320	2	...	318
Other miasmatic diseases	50	35	...	15
Total miasmatic diseases	1,469	1,370	...	99
Total of all other diseases	1,457	1,555	98	...
Grand total...	2,926	2,925	...	1

8. The following will show the comparative death-rate of the first and second quarters of this year:—

TABLE III.

Disease.	First Quarter.	Second Quarter.	Increase.	Decrease.
Small-pox... ..	98	248	150	...
Fevers... ..	697	593	...	104
Dysentery... ..	484	340	...	144
Diarrhoea... ..	277	152	...	125
Cholera... ..	600	2	...	598
Other miasmatic diseases... ..	27	35	8	...
Total miasmatic diseases... ..	2,183	1,370	...	813
Total of all other diseases... ..	1,532	1,555	23	...
Grand total...	3,715	2,925	...	790

DIAGRAM SHOWING THE MORTALITY FROM MIASMATIC DISEASES IN
MADRAS DURING THE 2ND QUARTER
1867



N.B. The total Mortality from each disease during each week is plotted on the perpendicular lines which represent these periods. The horizontal dotted wave lines show the average mortality from each disease for the previous five years.

Government Lithographic Press, Chepauk, Madras, 1867.

10. I have reason to believe that this latter cause was especially potent in the case of the less affluent portion of the East Indian community ; hence the notable increase in the number of deaths occurring among them.

TABLE IV.—Deaths in the second quarter of 1867, arranged by race and caste.

	Euro- peans.		East Indians.		Hindoos.		Mahomedans.		Total.		General Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
<i>Miasmatic Dis- eases.</i>											
Small-pox.....	...	...	6	3	108	86	23	22	137	111	248
Fevers.....	2	1	5	6	270	259	27	23	304	289	593
Dysentery.....	...	...	3	2	169	130	12	24	184	156	340
Diarrhœa.....	...	...	3	2	59	79	4	5	66	86	152
Cholera.....	...	...	...	...	1	...	1	...	2	...	2
Other miasmatic dis- eases.....	...	...	...	5	13	13	3	1	16	19	35
Total miasmatic diseases... ..	2	1	17	18	620	567	70	75	709	661	1,370
Total of all other diseases... ..	23	10	26	20	657	552	139	128	845	710	1,555
Total...	25	11	43	38	1,277	1,119	209	203	1,554	1,371	2,925
<i>Mean mortality of ten second quar- ters from 1857 to 1866.</i>											
Miasmatic diseases..	8·0	3·2	14·4	13·7	565·8	527·3	73·4	77·9	661·6	622·1	1283·7
Other diseases... ..	17·4	6·1	21·0	21·3	542·2	467·8	110·7	112·4	691·3	607·6	1298·9
Total...	25·4	9·3	35·4	35·0	1108·0	995·1	184·1	190·3	1352·9	1229·7	2582·6
Increase.....	1·3		10·6		292·9		37·6		...		342·4
Decrease.....	...		...		...		...		...		...

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12. The marked decrease in the number of deaths arising from fevers, dysentery, diarrhoea and cholera in the second quarter, as compared with the first quarter, are clearly referable to the increased temperature of the air, and to the absence of any introduction of cholera into Madras as noted below.

13. As regards the several classes of the population, it has been already observed that the East Indian community suffered severely: there were 35 deaths from miasmatic disease against an average of 28 in ten preceding years; and 46 cases of non-miasmatic disease proved fatal, being slightly over the average. As regards miasmatic disease, it should be remembered that there was no cholera fatal in Madras among East Indians in the period under notice, and if this cause of mortality be eliminated from the previous quarter, an increase of five fatal cases of miasmatic disease is shown in the second quarter, and an increase of thirteen upon the experience of the same quarter of 1866. The chief cause of this was the occurrence of nine fatal cases of small-pox.

14. The deaths from miasmatic disease among Europeans were remarkably few, only three having occurred.

15. Among Hindoos and Mahomedans, an amount of mortality above the average of ten previous years occurred from all causes. The former showed a marked increase in the amount of fatal miasmatic disease. This form of disease constituted the cause of nearly half of the total mortality of the whole population.

16. *Small-pox.*—Small-pox proved fatal in 248 cases, being more than double the average of the preceding seven years. In 1866 only 34 cases died in this quarter from this cause. A reference to the accompanying diagram will show that this disease, which had very slowly commenced as an epidemic early in January and risen rather suddenly about the middle of March, continued to rise in fatality until the early part of April, when it slowly declined, and continued doing so for two months, and at the conclusion of the

SMALL-POX.				
1860	...	...	...	90
1861	...	...	...	163
1862	...	...	...	397
1863	...	...	...	44
1864	...	...	...	59
1865	...	...	...	12
1866	...	...	...	34
Total...				799
Average...				114.1

quarter it again showed a tendency to rise. The absence of the disease among Europeans is very satisfactory, but the large number of casualties occurring from it indicates the urgent necessity of increased exertions to extend the operations of the Vaccination Department. Hindoos do not seem to have been affected more than Mahomedans *pro rata* of population.

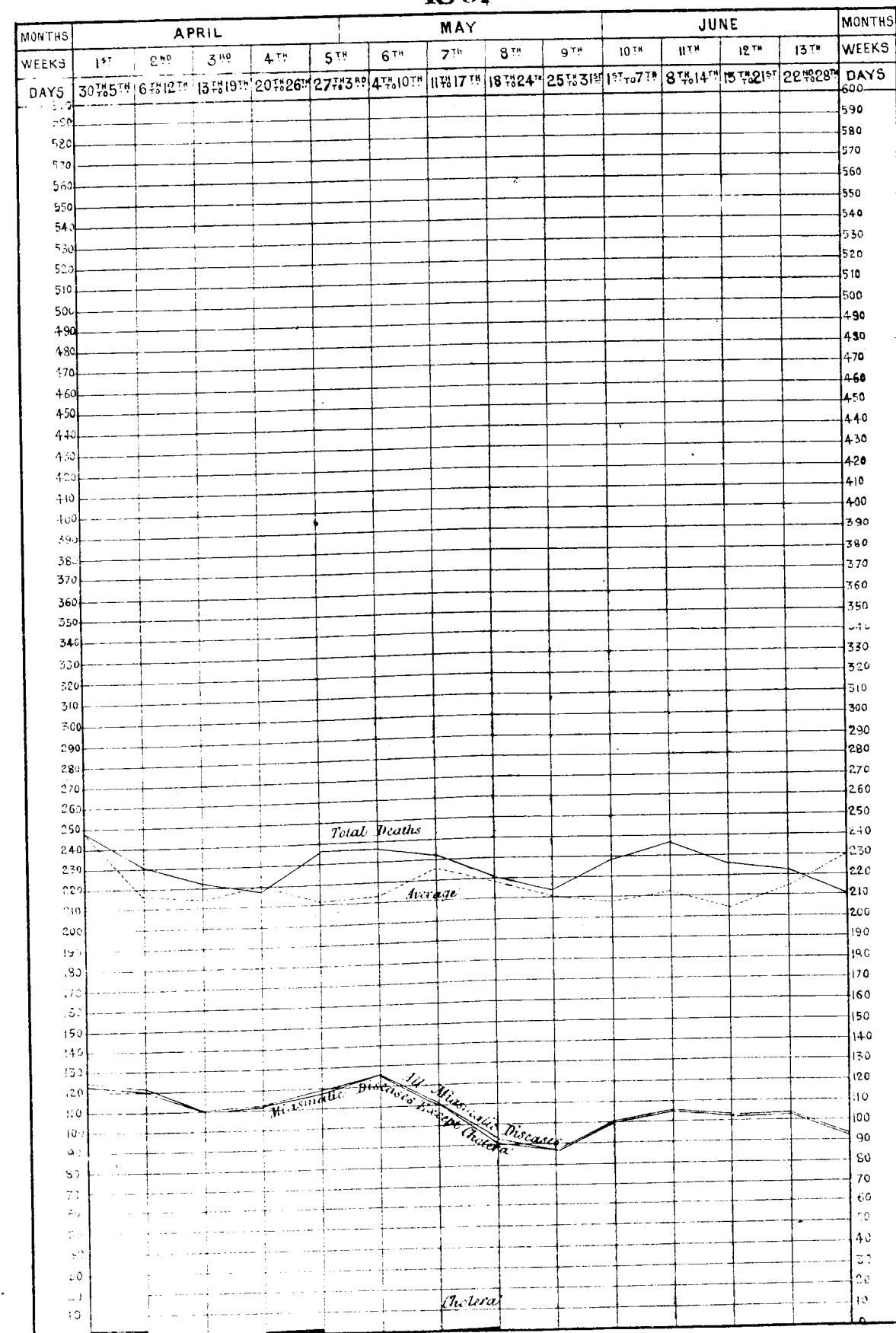
17. *Fevers.*—The total mortality from fevers was 593—the highest number witnessed in eight years, as a comparison with the figures in the margin will show, the septennial average for this quarter being only 530. It may be here remarked that all through the South of India fever of a low type has proved rapidly and unusually fatal in 1866 and 1867. It is observed that the fatality from this disease is much greater among males than females, except in the case of Hindoos, where the proportion of deaths is *pro rata* of the population, classified by sexes.

FEVERS.				
1860	...	...	...	519
1861	...	...	...	532
1862	...	...	...	525
1863	...	...	...	569
1864	...	...	...	481
1865	...	...	...	543
1866	...	...	...	553
Total...				3,712
Average...				530.4

DYSENTERY.				
1860	...	...	...	305
1861	...	...	...	305
1862	...	...	...	249
1863	...	...	...	319
1864	...	...	...	244
1865	...	...	...	231
1866	...	...	...	287
Total...				1,940
Average...				277.1

18. *Dysentery.*—Dysentery, like fever, has been unusually fatal, being nearly 23 per cent. more than the average of seven previous years. The diagram does not show any remarkable coincidence between the course of this disease and that of small-pox, except in the tendency of both diseases to decline during the month of May.

DIAGRAM SHOWING THE MORTALITY FROM ALL CAUSES,
MIASMATIC DISEASES AND CHOLERA IN MADRAS
DURING THE 2ND QUARTER
1867



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19. *Diarrhœa*—Notwithstanding the large number of deaths from dysentery, it is observed

DIARRHŒA.			
1860	...	...	114
1861	...	...	254
1862	...	...	222
1863	...	...	212
1864	...	...	233
1865	...	...	235
1866	...	...	225
Total.			1,485
Average...			212.1

that diarrhœa has fallen much below the average of previous years. Only 152 fatal cases of diarrhœa occurred; and as 340 of dysentery took place, the disproportion between the cases of these cognate diseases is very remarkable. It is to be observed that the total mortality from the two causes (492) is almost identical with that of the previous seven years (489). The only explanation that suggested itself is that, as the great mass

of the lower orders had been suffering from distress, deficient clothing, and insufficient and non-nutritious food, there was a tendency on the part of bowel complaint to at once assume, or eventually pass into, its more severe form. The minor disease showed little intensity at any time, and although it continued steadily through the whole quarter, it showed little variation in intensity: the weekly average number of deaths was from 6 to 18, the minimum and maximum numbers. On examining in detail the several reports of death from this disease, I find that of the 152 cases, the ages were as noted below.

20. No death from diarrhœa occurred among Europeans during the quarter. Of the five deaths among East Indians, three were under two years of age, and one of an old person. A large proportion (one-third) of those among Mahomedans, were persons of advanced age—75 to 85; one under three years; and the remainder middle aged. Among one-third of all deaths were children under five years of age, and one-fifth persons from 65 to 85 years of age.

21. I am unable, however, to account for the much greater prevalence of diarrhœa among Hindoos than among Mahomedans.

TABLE V.—Return showing the deaths from diarrhœa during the second quarter of 1867, according to ages and class.

Class.	Ages at death.																
	All ages.	Total under 1 year.	1	2	3	4	Total under 5 years.	5	10	15	25	35	45	55	65	75	85 and upwards.
Europeans ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Indians..	5	2	1	0	0	0	3	0	0	0	1	0	0	1	0	0	0
Mahomedans. ...	9	0	0	1	0	0	1	0	0	1	2	0	1	1	0	2	1
Hindoos....	138	5	16	17	7	2	47	7	6	4	4	8	13	21	12	13	3
Total...	152	7	17	18	7	2	51	7	6	5	7	8	14	23	12	15	4

22. *Cholera*.—The experience of the quarter under review, as regards this disease, cannot, I regret to say, be regarded as other than excep-

CHOLERA.			
1860	...	...	115
1861	...	...	431
1862	...	...	558
1863	...	...	257
1864	...	...	52
1865	...	...	34
1866	...	...	320
Total...			1,766
Average...			252.2

tional. Among the whole population only two deaths were recorded, and so far as our information goes, both were imported cases. The disease which had been prevalent in the early part of January, after a slight decline, rose to 100 in the fourth week of that month (5408 per annum) or 62.4 more than the average of weekly mortality for seven years. The disease then steadily declined,

until it had almost disappeared, and two cases occurring in the the last two days of the month of March seemed to terminate the disease. It was then absent for more than three weeks, but on the 26th of April, a Native merchant, who had on the previous day arrived at the village of Pereamootoo, was seized with the disease and died. None of the persons residing in the same

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house were attacked. The other case occurred on 17th May, in a Mahomedan resident in Triplicane, who was seized with the disease at Trivatore, where he had been exposed to the contagion of the disease; no persons residing in the house were attacked.

23. The remarkable immunity from this disease clearly disproves the assertion of the endemicity of cholera in Madras, so unhesitatingly put forward by the Cholera Congress at Constantinople. [I may here anticipate my next quarterly report by stating that an accidental delay in the preparation of the diagram to accompany this report enables me to add that up to this day (September 6th) only one other case of death from cholera has been reported: it was that of a man at 36, resident in Triplicane, and who had not been exposed to the contagion of the disease.

24. As the supposed endemicity of cholera in Madras has been by many writers attributed to the existence of high heat, I have prepared the following table, which tends to disprove any supposed connection between the disease and the state of the atmospheric heat.

25. It will be seen that this mysterious disease assumes its most intense form at all times and seasons of the year; and I may add that in the second quarter of last year the disease reached its weekly minimum on 5th May; it then suddenly rose, a fortnight afterwards fell slightly, and in the penultimate week reached its maximum, 50.

TABLE VI, showing deaths from cholera in all Madras for each month of 7 years, and for 8 months of 1867.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Weekly average.
1860.....	3	12	2	6	22	87	1,218	637	278	160	91	76	2,580	49.6
1861.....	53	75	51	150	201	76	183	599	786	343	107	161	2,770	53.3
1862.....	425	485	229	102	189	267	126	222	242	501	519	323	3,635	69.9
1863.....	372	452	455	154	81	19	5	8	12	46	10	77	1,681	32.3
1864.....	121	72	51	20	10	4	3	302	120	118	45	45	914	18.1
1865.....	99	73	149	83	77	100	577	544	531	283	93	312	2,984	57.3
Total...	1,191	1,269	1,049	560	589	617	2,116	2,409	1,998	1,466	874	1,009	15,177	...
Average...	170.1	181.2	149.8	80.0	81.1	88.1	302.2	314.1	285.4	209.4	124.8	144.1	2168.1	41.6
1867.....	364	178	58	1	1	...	...	1	...	...	...	...	...	...

* Up to 6th.

26. From the foregoing, it appears that the months of April, May, and June show a less total of deaths in seven years than any other months in the year, while the three subsequent months show the highest average of the whole year, while the temperature is little less than that of April, May and June. So far, therefore, as these returns go, they lead to the negative inference that high heat does not promote the epidemicity of, nor does it afford immunity from, cholera.

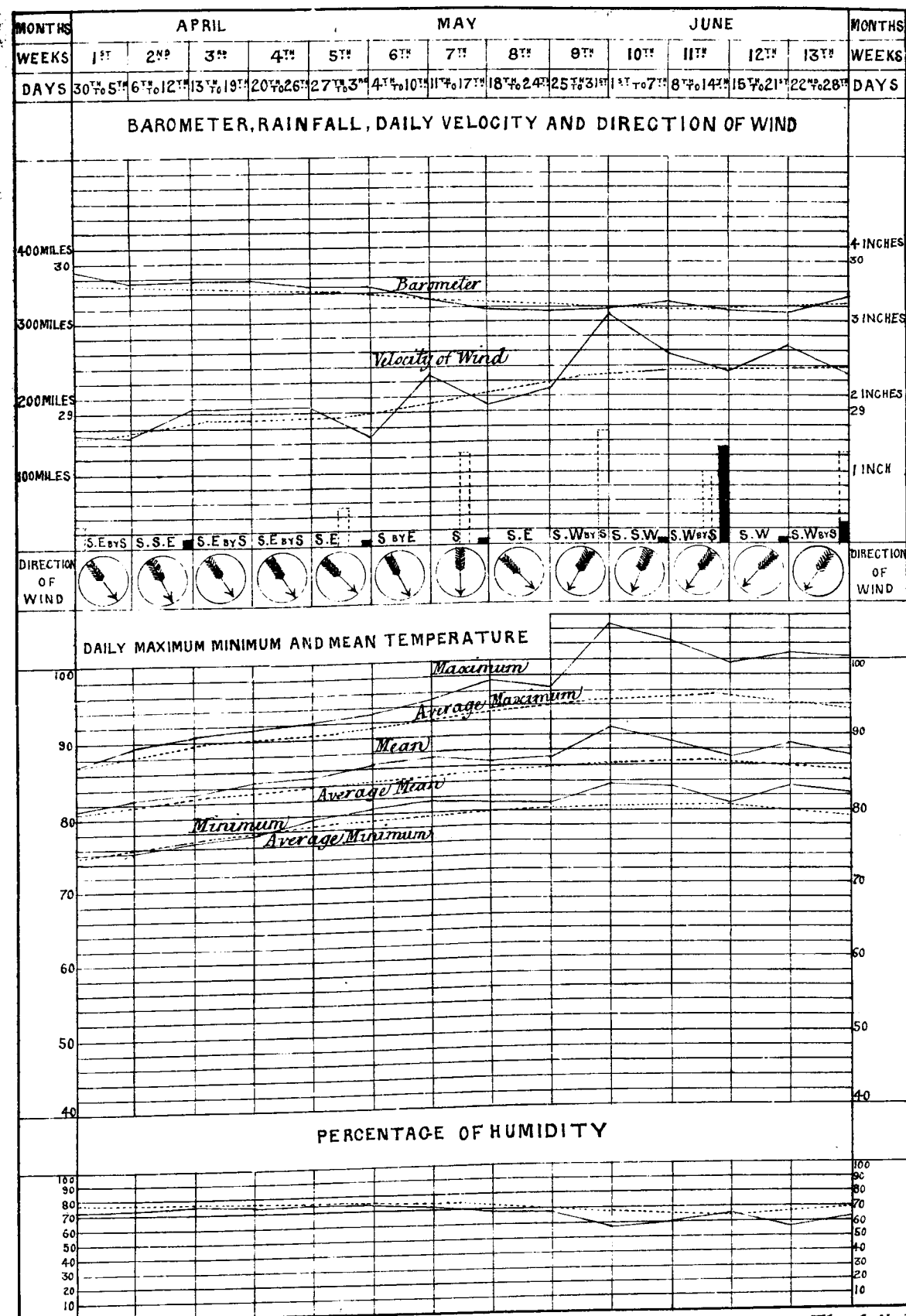
27. I cannot, however, fail to direct the attention of Government to the singularly small number of fatal cases observed in May and June 1864 and 1865.

28. Up to 1864, the festival at Conjeveram had almost invariably resulted in an out-break of cholera, either at the feast or among the travellers returning from it. Sanitary measures were adopted, on the recommendation of the Honorable Mr. Ellis, in 1864-65-66 and 67, and the reports, now before me show that in not one of these four years did cholera appear. From Conjeveram, previously, the disease had been imported into Madras, and hence, I believe, the high death-rate shown in April, May, and June of 1861, 1862, and 1863.

29. This subject is now under special report by a Committee appointed by Government.

30. It is not a little remarkable that, while the records of this office prove that the year 1866 was unusually attended by cholera in Madras and in several of the military stations trooped by Europeans and Natives, the second quarter of the present year should have been singularly free from this disease. I have already shown how forcibly this applies to Madras. I am happy to add that only two cases of cholera (both at Secunderabad) were witnessed among all the European Troops of the Presidency during this quarter. Among Native Troops, one (not fatal) occurred at Quilon

**DIAGRAM SHOWING THE METEOROLOGICAL CONDITION OF
MADRAS DURING THE 2ND QUARTER
1867**



N.B. The mean weekly meteorological elements are plotted on the perpendicular lines. The dotted wave lines show the bimonthly average for twenty years from observations kept at the Madras Observatory.

Government Lithographic Press Chepauk Madras 1867.

Table showing the mortality from miasmatic diseases in the last 13 weeks.

Average of the corresponding weeks for 7 previous years.

Average of the corresponding years																
	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	Total
Fever.....	35.0	33.5	40.0	39.3	42.4	41.8	41.7	40.4	42.6	40.7	42.0	39.8	42.1	530.2		
Dysentery.....	15.1	14.1	15.9	14.1	15.9	16.6	17.1	13.5	15.8	15.2	13.5	15.8	17.2	200.8		
Dysentery.....	20.8	22.7	23.1	23.1	20.4	23.1	23.6	21.6	20.5	20.0	18.0	20.5	21.4	277.8		
Sand-dipex.....	12.9	12.2	11.9	9.0	10.2	8.5	7.6	8.1	5.9	4.7	4.9	5.1	4.5	105.6		
Cholera.....	22.2	19.3	17.6	17.4	18.5	20.7	20.1	15.8	13.6	19.3	21.9	24.8	34.2	265.4		
Other miasmatic diseases.....	4.8	2.9	3.8	4.9	2.9	4.0	3.2	3.2	3.1	3.9	3.1	3.9	2.8	46.5		
Total miasmatic diseases.....	114.8	109.7	112.3	107.8	110.3	114.7	112.3	102.6	101.5	103.8	104.3	109.9	122.2	1426.2		
All diseases.....	216.5	213.1	220.0	211.5	214.5	226.2	218.5	210.6	209.2	213.2	205.1	13.2	229.8	2801.2		

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Mean meteorological observations for the past 13 weeks.

	29.861	29.866	29.871	29.842	29.837	29.763	29.697	29.678	29.691	29.711	29.661	29.623	29.757	Average
Barometer reduced to 32° F.	29.861	29.866	29.871	29.842	29.837	29.763	29.697	29.678	29.691	29.711	29.661	29.623	29.757	29.758
Mean maximum temperature.	89.5	90.7	91.7	92.2	93.3	95.0	97.6	96.6	105.4	102.2	99.9	100.6	106.2	96.5
Do. minimum do.	75.7	76.6	77.7	79.7	80.7	81.5	81.2	81.4	83.9	83.6	81.2	83.2	82.3	80.6
Do. temperature.	82.4	83.4	84.4	85.6	86.1	87.6	86.7	87.1	90.8	89.6	87.0	89.0	87.2	86.8
Do. humidity.	72	73	73	74	74	71	69	67	59	60	65	58	62	67
Prevailing wind.	S. E.	S. S. E.	S. E.	S. E.	S. E.	S. by E.	S.	S. E.	S. W.	S. S. W.	S. W.	S. W.	S. W.	S.
Mean velocity in miles.	152	183	184	185	143	226	194	210	305	278	252	281	249	219
Rain-fall.	...	0.10	...	...	0.01	...	0.07	...	...	0.01	1.36	0.11	0.34	2.00

Table showing the mean half-monthly meteorological condition of Madras, for the past 20 years, 1841—1861.

	Half month ending 15th April.	Half month ending 30th April.	Half month ending 15th May.	Half month ending 31st May.	Half month ending 15th June.	Half month ending 30th June.	Average.
Barometer reduced to 32° F.	29.843	29.806	29.756	29.707	29.692	29.704	29.751
Mean maximum temperature.	90.0	91.0	93.0	95.1	95.8	93.7	93.1
Do. minimum do.	77.4	78.4	79.8	80.4	80.7	79.4	79.3
Do. temperature.	83.1	84.0	85.3	86.2	86.6	85.0	85.0
Do. humidity.	76	75	73	68	64	67	70
Prevailing wind.	S. by E.	S. by E.	S.	S. S. W.	S. W.	S. W.	S. by W.
Mean velocity in miles.	173	173	200	225	236	210	208
Rain-fall.	0.16	0.65	1.32	1.40	0.92	1.29	5.94

[In noting thus the mean humidity, I have put it as "mean humidity per cent;" this, however, can only be regarded as an approximation to perfect accuracy. As regards "prevailing wind," I note the statical mean, and not the statical resultant direction as has hitherto been done by Dr. W. Smith. The mean velocity in miles is entered as being the simple arithmetical mean. If, however, it be desired to record the statical resultants they are in the first table, direction S., velocity 184 miles; and in the second table, direction S. S. W., velocity 198 miles. I have adopted the returns included in the above tables after consultation with Mr. Pogson, Government Astronomer, for whose kind explanation on the subject (summarized above) I am much obliged.]

(Signed) H. B. MONTGOMERY, M. D.,
Acting Sanitary Commissioner.

No. 113. ORDER THEREON, 16th November 1867, No. 1436.

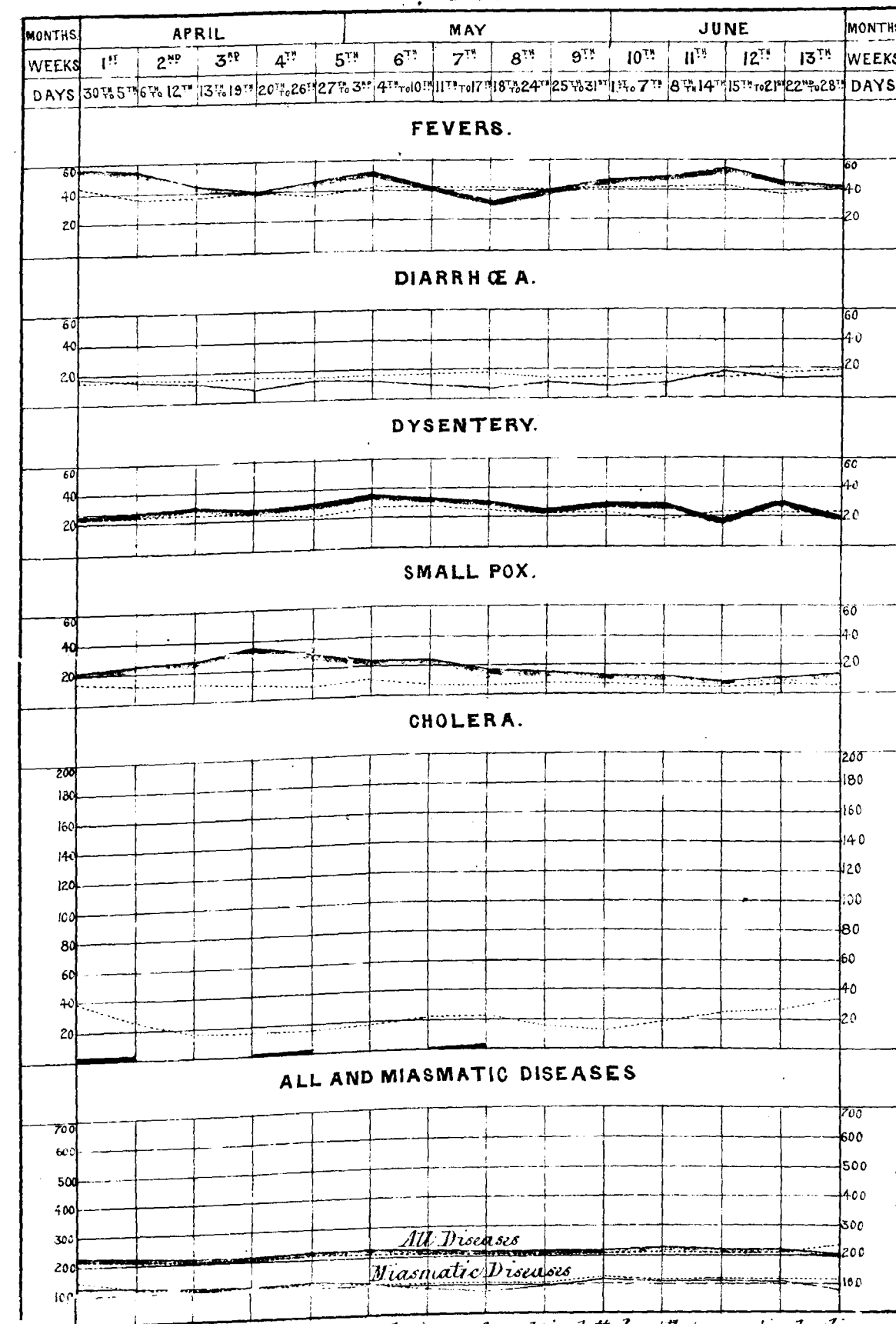
Ordered that the report be sent to the President of the Municipal Commission, and his attention drawn to the suggestion contained in paragraph 5.
(True Extract).

Chief Secretary.

To the President of the Municipal Commission for the town of Madras.
,, Sanitary Commissioner, Madras.

Ed J. H. Burns.

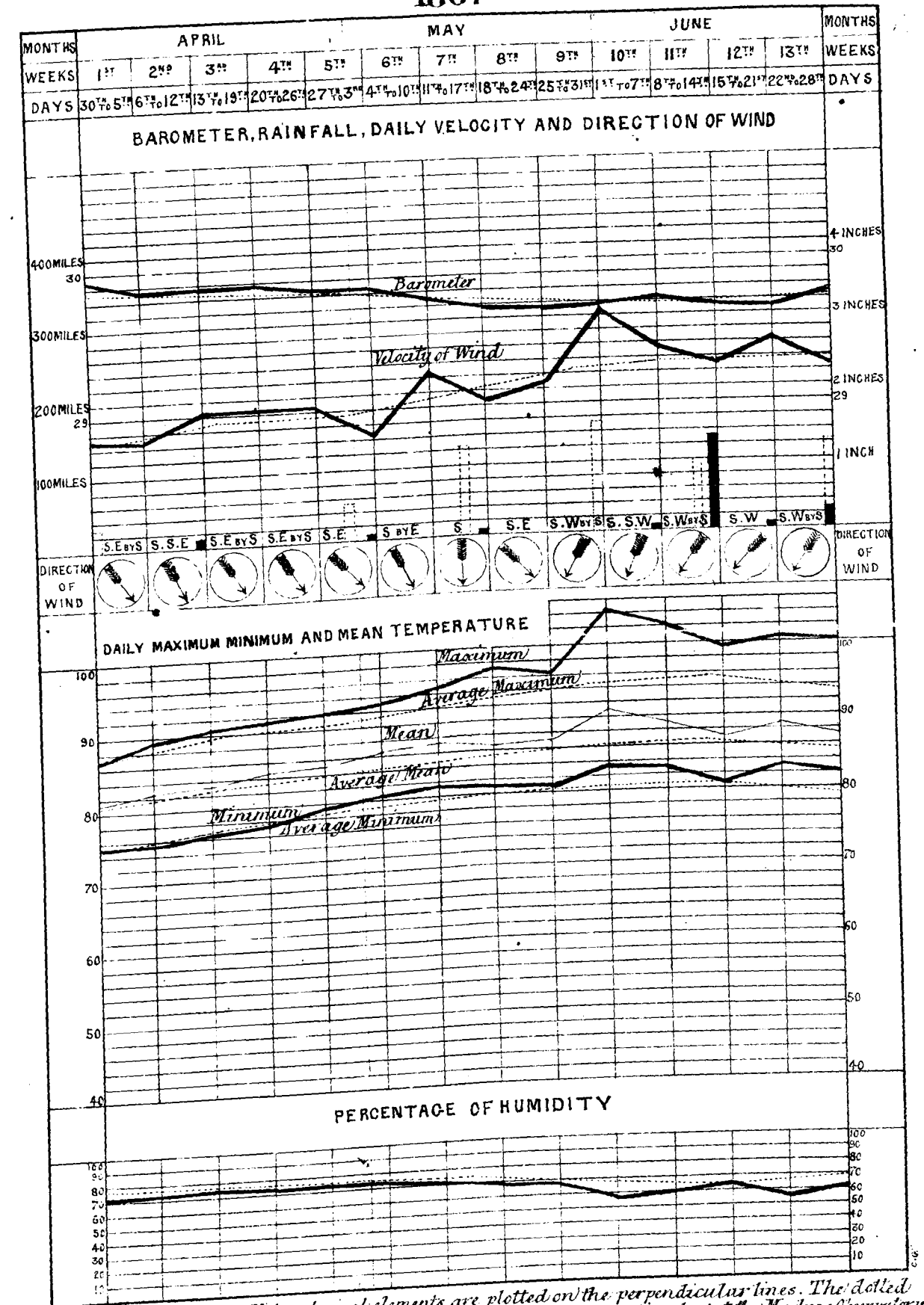
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MADRAS DURING THE 2ND QUARTER
1867**



N.B. The total Mortality from each disease during each week is plotted on the perpendicular lines which represent these periods. The horizontal dotted wave lines show the average mortality from each disease for the previous five years.

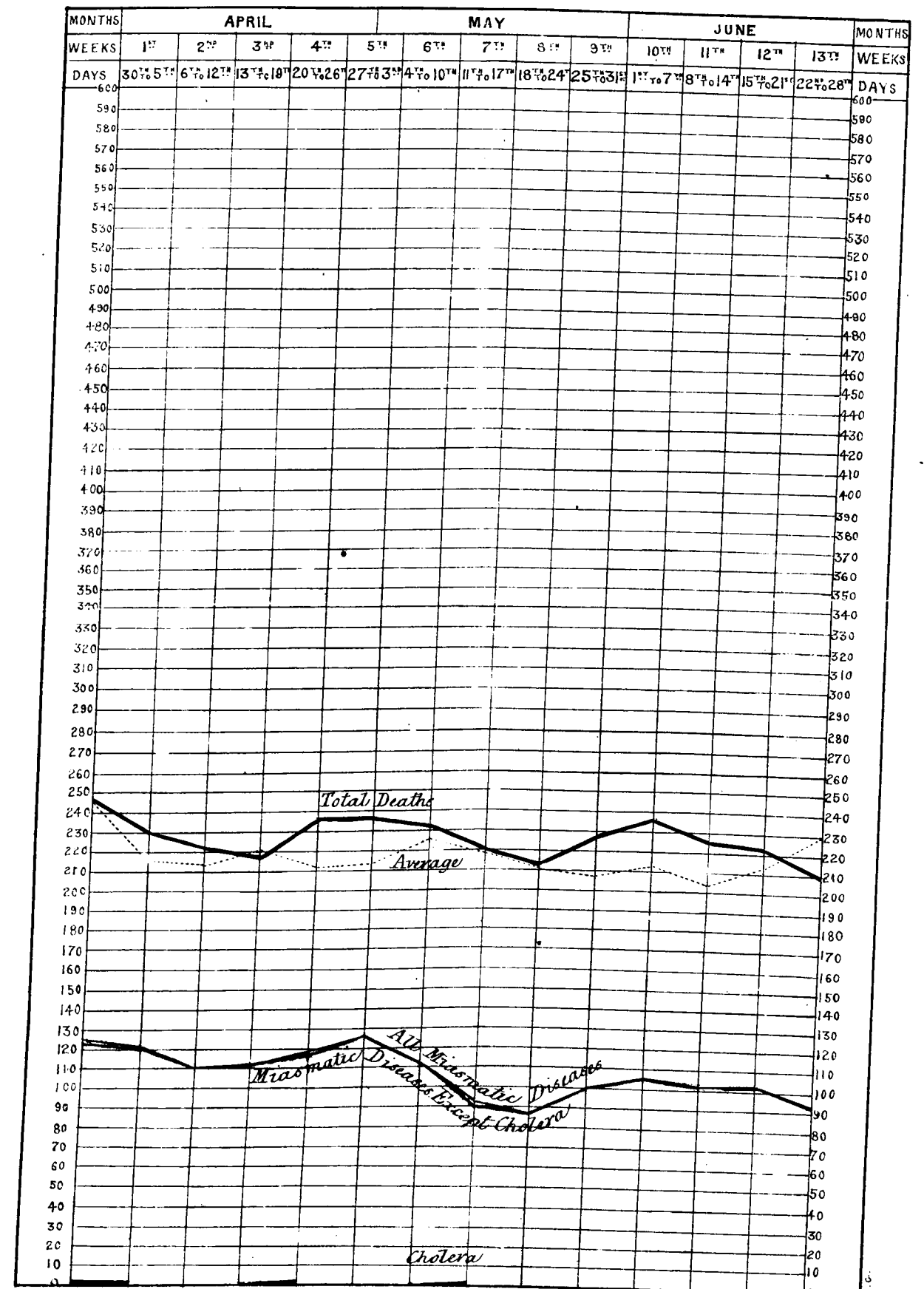
Government Lithographic Press, Chepauk, Madras, 1867.

DIAGRAM SHOWING THE METEOROLOGICAL CONDITION OF MADRAS DURING THE 2ND QUARTER 1867



N.B. The mean weekly Meteorological elements are plotted on the perpendicular lines. The dotted wave lines show the bimonthly average for twenty years from observations kept at the Madras Observatory.

**DIAGRAM SHOWING THE MORTALITY FROM ALL CAUSES,
MIASMATIC DISEASES AND CHOLERA IN MADRAS
DURING THE 2ND QUARTER
1867**



No. 352.

OFFICE OF SANITARY COMMISSIONER

Madras, 6th September 1867.

From

Actg Sanitary Commissioner, Madras,

To

Acting Chief Secretary to Government
Fort Saint George

SIR,

I have the honor to submit for the
information and orders of Government the accompanying
Report on the Deaths in Madras during 2nd quarter
of 1867.

2. Owing to the difficulty of procuring the services
of a Draughtsman the preparation of the Report has
been unavoidably delayed.

I have the honor to be
Sir

Your most obedient servant

Harriet Sturges
Off^r Sanitary Commissioner for Madras.

Pro. Humphrey Nov. 5/99

For the 1st report of the

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The following will show the comparative death-rate of the first and second quarters of this year.

TABLE III.

DISEASE.	First Quarter.	Second Quarter.	Increase.	Decrease.
Small-pox	98	248	150	...
Fevers	697	593	...	104
Dysentery	484	340	...	144
Diarrhoea	277	152	...	125
Cholera	600	2	...	598
Other Miasmatic diseases	27	35	8	...
Total Miasmatic diseases	2,183	1,370	...	813
Total of all other diseases	1,532	1,555	23	...
Grand Total.....	3715	2925	...	790

While, therefore, the salubrity of the second quarter is shewn as considerably higher than that of the first quarter, it cannot be overlooked that in all the more serious forms of Miasmatic diseases, except cholera, there was a marked increase in mortality as compared with the second quarter of 1866. The total deaths from all Miasmatic diseases amounted to 1,370, as against the preceding decennial average of 1283·7. Of non-miasmatic diseases, 1,555 cases proved fatal as against a similar average of 1298·9. The total deaths amounted to 2,925 as against the same previous average of 2582·6 for ten years and 2,791 for seven years; not only, however, was there an increase of total mortality among the population, but every class shewed an increased rate of mortality. To this three causes have contributed. *First*, the incorrect returns from 1857 to 1859, which do not fully exhibit the total mortality. *Second*, the prevalence of small-pox, fever, and dysentery, all contagious diseases. *Third*, the high price of provisions by which insufficient food was too often used, and those suffering from want were debilitated and rendered obnoxious to any disease.

I have reason to believe that this latter cause was especially potent in the case of the less affluent portion of the East Indian community, hence the notable increase in the number of deaths occurring among them.

The details of these items of information are shewn in the following table :—

TABLE IV., *Deaths in the Second Quarter of 1867, 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	...	...	6	3	108	86	23	22	137	111	248
Fevers	2	1	5	6	270	259	27	23	304	289	593
Dysentery	...	...	3	2	169	130	12	24	184	156	340
Diarrhoea	...	...	3	2	59	79	4	5	66	86	152
Cholera	...	...	...	...	1	...	1	...	2	...	2
Other Miasmatic diseases	...	...	...	5	13	13	3	1	16	19	35
Total Miasmatic diseases	2	1	17	18	620	567	70	75	709	661	1,370
Total of all other diseases	23	10	26	20	657	552	139	128	845	710	1,555
Total	25	11	43	38	1,277	1,119	209	203	1,554	1,371	2,925
Mean Mortality of ten Second Quarters, from 1857 to 1866.											
Miasmatic diseases	8.0	3.2	14.4	13.7	565.8	527.3	73.4	77.9	661.6	622.1	1283.7
Other diseases	17.4	6.1	21.0	21.3	542.2	467.8	110.7	112.4	691.3	607.6	1298.9
Total	25.4	9.3	35.4	35.0	1108.0	995.1	184.1	190.3	1352.9	1229.7	2582.6
Increase	...	1.3	...	10.6	...	292.9	...	37.6	...	...	342.4
Decrease	...	...	...	...	...	...	...	...	...	...	...

The marked decrease in the number of deaths arising from fevers, dysentery, diarrhoea and cholera in the second quarter, as compared with the first quarter, are clearly referable to the increased temperature of the air, and to the absence of any introduction of cholera into Madras as noted below.

As regards the several classes of the population, it has been already observed that the East Indian community suffered severely, there were 35 deaths from miasmatic disease against an average of 28 in ten preceding years, and 46 cases of non-miasmatic disease proved fatal, being slightly over the average. As regards miasmatic disease, it should be remembered that there was no cholera fatal in Madras among East Indians, in the period under notice, and if this cause of mortality be eliminated from the previous quarter, an increase of five fatal cases of miasmatic disease is shewn in the second quarter and an increase of 13 upon the experience of the same quarter of 1866. The chief cause of this was the occurrence of nine fatal cases of small-pox.

The deaths from miasmatic disease among Europeans were remarkably few, only three having occurred.

Among Hindoos and Mahomedans, an amount of mortality above the average of ten previous years occurred from all causes. The former shewed a marked increase in the amount of fatal miasmatic disease. This form of disease constituted the cause of nearly half of the total mortality of the whole population.

Small-pox proved fatal in 248 cases, being more than double the average of the preceding seven years. In 1866 only 34 cases died in this quarter from this cause. A reference to the accompanying diagram will shew that this disease, which had very slowly commenced as an epidemic early in January and risen rather suddenly about the middle of March, continued to rise in fatality until the early part of April, when it slowly declined and continued doing so for two months, and at the conclusion of the			
1860	...	...	90
1861	...	...	163
1862	...	...	397
1863	...	...	44
1864	...	...	59
1865	...	...	12
1866	...	...	34
Total	...	...	799
Average	...	...	114.1

quarter, it again shewed a tendency to rise. The absence of the disease among Europeans is very satisfactory, but the large number of casualties occurring from it, indicates the urgent necessity of increased exertions to extend the operations of the Vaccination Department. Hindoos do not seem to have been affected more than Mahomedans *pro rata* of population.

The total mortality from Fevers was 593, the highest number witnessed in eight

Fevers.			
1860	...	...	519
1861	...	...	532
1862	...	...	525
1863	...	...	560
1864	...	...	481
1865	...	...	543
1866	...	...	553
Total	...	...	3,713
Average	...	...	590.4

years as a comparison with the figures in the margin will shew. The septennial average for this quarter being only 530. It may be here remarked that all through the South of India fever of a low type has proved rapidly and unusually fatal in 1866 and 1867. It is observed that the fatality from this disease is much greater among males than females, except in the case of Hindoos, where the proportion of deaths is *pro rata* of the population, classified by sexes.

Dysentery.			
1860	...	...	305
1861	...	...	305
1862	...	...	249
1863	...	...	319
1864	...	...	244
1865	...	...	231
1866	...	...	287
Total	...	...	1,940

Notwithstanding the large number of deaths from Dysentery, it is observed that

Diarrhoea.			
1860	...	...	114
1861	...	...	254
1862	...	...	222
1863	...	...	212
1864	...	...	233
1865	...	...	225
1866	...	...	225
Total	...	...	1,485
Average	...	...	212.1

Diarrhoea has fallen much below the average of previous years. Only 152 fatal cases of Diarrhoea occurred, and as 340 of Dysentery took place, the disproportion between the cases of these cognate diseases is very remarkable. It is to be observed that the total mortality from the two causes (492) is almost identical with that of the previous seven years (489). The only explanation that suggested itself is, that as the great mass of the lower orders had been suffering from distress, deficient clothing, and insufficient and non-nutritious food, there was a tendency on the part of bowel complaint to at once assume, or eventually pass into, its more severe form. The minor disease shewed little intensity at any time, and although it continued steadily through the whole quarter, it shewed little variation in intensity. The weekly average number of deaths was from 6 to 18, the minimum and maximum numbers. On examining in detail the several reports of death from this disease, I find that of the 152 cases, the ages were, as noted below.

No death from Diarrhoea occurred among Europeans during the quarter. Of the five deaths among East Indians, three were under two years of age, and one of an old person. A large proportion, one-third, of those among Mahomedans, were persons of advanced age, 75 to 85; one under three years, and the remainder middle aged. Among one-third of all deaths were children under five years of age, and one-fifth persons from 65 to 85 years of age.

I am unable, however, to account for the much greater prevalence of Diarrhoea among Hindoos than among Mahomedans.

TABLE V., Return shewing the deaths from Diarrhœa during the second Quarter of 1867, according to Ages and Class.

CLASS.	AGES AT DEATH.																
	All ages.	Total under 1 year.	1	2	3	4	Total under 5 years.	5	10	15	25	35	45	55	65	75	85 and upwards.
Europeans.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Indians.....	5	2	1	0	0	0	3	0	0	0	1	0	0	1	0	0	0
Mahomedans.....	9	0	0	1	0	0	1	0	0	1	2	0	1	1	0	2	1
Hindoos.....	138	5	16	17	7	2	47	7	6	4	4	8	13	21	12	13	3
Total...	152	7	17	18	7	2	51	7	6	5	7	8	14	23	12	15	4

The experience of the quarter under review, as regards this disease cannot, I regret

to say, be regarded as other than exceptional. Among the whole population only two deaths were recorded, and so far as our information goes, both were imported cases. The disease which had been prevalent in the early part of January after a slight decline, rose to 104 in the fourth week of that month (5,408 per annum) or 62.4 more than the average of weekly until it had almost disappeared, and two cases occurring during the last two days of the month of March seemed to terminate the disease. It was then absent for more than three weeks, but on the 26th of April, a native merchant who had on the previous day arrived at the village of Percamootoo, was seized with the disease and died. None of the persons residing in the same house were attacked. The other case occurred on 17th May, in a Mahomedan resident in Triplicane, who was seized with the disease at Trivatore where he had been exposed to the contagion of the disease; no persons residing in the house were attacked.

The remarkable immunity from this disease clearly disproves the assertion of the endemicity of Cholera in Madras so unhesitatingly put forward by the Cholera Congress at Constantinople. [I may here anticipate my next quarterly Report by stating that an accidental delay in the preparation of the diagram to accompany this Report enables me to add, that up to this day (September 6th) only one other case of death from Cholera has been reported. It was that of a man at 36, resident in Triplicane and who had not been exposed to the contagion of the disease.—H. B. M.]

As the supposed endemicity of Cholera in Madras has been by many writers attributed to the existence of high heat, I have prepared the following table, which tends to disprove any supposed connection between the disease and the state of the atmospheric heat.

It will be seen that this mysterious disease assumes its most intense form at all times and seasons of the year; and, I may add, that in second quarter of last year the disease reached its weekly minimum on 5th May, it then suddenly rose, a fortnight afterwards fell slightly, and in the penultimate week reached its maximum, 50.

TABLE VI., shewing deaths from Cholera in all Madras for each month of 7 years, and for 8 months of 1867.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Weekly average.
1860.....	3	2	2	6	22	87	1,218	637	276	160	91	76	2,586	49.6
1861.....	28	75	54	150	204	76	183	599	786	343	107	161	2,776	53.3
1862.....	425	485	229	102	189	267	128	222	242	501	519	328	3,635	69.9
1863.....	372	452	455	154	84	19	5	8	2	46	10	77	1,684	32.3
1864.....	133	110	106	45	3	4	4	97	38	15	9	10	574	11.0
1865.....	121	72	54	20	10	4	3	302	120	118	45	45	944	18.1
1866.....	99	73	149	83	77	160	577	544	534	283	93	312	2,984	57.3
Total...	1,191	1,269	1,649	560	589	617	2,116	2,409	1,998	1,466	874	1,009	15,177	...
Average...	170.1	181.2	149.8	80.0	84.1	88.1	302.2	344.1	285.4	209.4	124.8	144.1	2168.1	41.6
1867.....	364	173	58	1	1	...	...	1	*	...	...	...	...	...

* Up to 6th.

From the foregoing, it appears that the months of April, May and June shew a less total of deaths in seven years than any other months in the year while the three subsequent months shew the highest average of the whole year, while the temperature is little less than that of April, May and June. So far therefore as these returns go, they lead to the negative inference that high heat does not promote the epidemicity of, nor does it afford immunity from, Cholera.

I cannot, however, fail to direct the attention of Government to the singularly small number of fatal cases observed in May and June 1864 and 1865.

Up to 1864 the festival at Conjeveram had almost invariably resulted in an outbreak of Cholera either at the feast or among the travellers returning from it. Sanitary measures were adopted on the recommendation of Honorable Mr. Ellis in 1864-65-66 and 67, and the reports, now before me, show that in not one of these four years did Cholera appear. From Conjeveram, previously, the disease had been imported into Madras and hence, I believe, the high death rate shewn in April, May and June of 1861, 62 and 63.

This subject is now under special report by a Committee appointed by Government.

It is not a little remarkable that while the records of this Office prove that the year 1866 was unusually attended by Cholera in Madras and in several of the Military Stations trooped by Europeans and Natives, the second quarter of the present year should have been singularly free from this disease. I have already shewn how forcibly this applies to Madras. I am happy to add that only two cases of Cholera, both at Secunderabad, were witnessed among all the European Troops of the Presidency during this quarter. Among Native Troops, one (not fatal) occurred at Quilon in the tenth week; and one in the sixth, two in the eleventh and two in the twelfth week at Kurnool, where the disease was epidemic among the Civil population. In the corresponding quarter of 1866, the admissions among European Troops were 5 and those among Native Troops 22.

The accompanying Diagram, which shews the Meteorological condition of Madras during the second quarter of this year, gives full details on the following subjects.

ATMOSPHERIC PRESSURE.—This has averaged during the quarter 29.758, being .007 above the average; being some slight variation from the corresponding period of 1866 when it was .006 below the average. A slight fall of the Barometer took place in the

fourth week and from a previous general average of 29.868, a gradual fall took place until it was only read at 29.623 in the penultimate week.

TEMPERATURE.—The heat during the quarter was considerable, reaching in the ninth week to 105.4°, being only .6 lower than the corresponding week in 1866, which contained in it the hottest day on record. There was a very rapid rise in temperature after the fourth week up to the ninth; there was then a slight decline. But the average mean maximum temperature was 96.5° as against the twenty years' average of 93.1; the season was, however, on the whole much less hot than that of 1866, when the mean maximum temperature amounted to 98.81°.

The mean minimum temperature was 80.6° being 1.3 in excess of the twenty years' average and 1.1 below that of corresponding quarter of 1866. The mean temperature was 86.8, being 1.8 above the twenty years' average and 1.70 below 1866. The season may therefore be regarded as hotter than the average.

HUMIDITY.—The percentage of Humidity was 67, being 3 less than the average and 4 above that of 1866. The increase of Humidity thus shewn, as compared with last year, was less favorable to the public health.

RAINFALL.—This amounted only to 2 inches against a previous average of 5.94. From 1st January to 30th June only 2.17 inches of rain have fallen: there should be 7.64, shewing a deficiency of 5.47.

VELOCITY AND DIRECTION.—The wind has shewn a velocity somewhat more than the average. It has been on an average at the rate of 219, the previous average being 208. The velocity, however, this year is 17 miles daily less than in 1866. This also tends, with high heat, to render this quarter unhealthy as compared with last year.

Table shewing the mortality from Miasmatic Diseases in the last 13 weeks.

	April 5.	April 12.	April 19.	April 26.	May 3.	May 10.	May 17.	May 24.	May 31.	June 7.	June 14.	June 21.	June 28.	Total.
Fevers.....	54	42	40	45	54	43	36	40	48	51	56	45	44	598
Diarrhoea.....	11	12	7	13	12	9	6	10	8	9	18	13	15	146
Dysentery.....	24	27	24	23	34	31	28	22	29	29	19	28	20	313
Small-pox.....	26	27	36	31	23	24	18	13	13	13	7	10	12	253
Cholera.....	2	...	...	1	...	...	1	...	...	...	...	...	...	4
Other Miasmatic Dis- eases.....	2	2	5	1	2	6	2	2	2	3	2	3	3	38
Total Miasmatic Dis- eases.....	122	112	112	116	125	113	91	87	100	105	102	102	94	1,352
All Diseases.....	122	112	112	116	125	113	91	87	100	105	102	102	94	1,352

Average of the corresponding weeks for 7 previous years.

Fevers.....	38.0	38.5	40.0	39.3	42.4	41.8	41.7	40.4	42.6	40.7	42.9	39.8	42.1	530.2
Diarrhoea.....	16.1	14.1	15.9	14.1	15.9	16.6	17.1	13.5	15.8	15.2	13.5	15.8	17.2	200.8
Dysentery.....	20.8	22.7	23.1	23.1	20.4	23.1	22.6	21.6	20.5	20.0	18.0	20.5	21.4	277.8
Small-pox.....	12.9	12.2	11.9	9.0	16.2	8.5	7.6	8.1	5.9	4.7	4.9	5.1	4.5	105.5
Cholera.....	22.2	19.3	17.6	17.4	18.5	20.7	20.1	15.8	13.6	19.3	21.9	24.8	24.2	265.4
Other Miasmatic Dis- eases.....	4.5	2.9	3.8	4.9	2.9	4.0	3.2	3.2	3.1	3.9	3.1	3.9	2.8	46.5
Total Miasmatic Dis- eases.....	114.5	109.7	112.3	107.8	116.3	114.7	112.3	102.6	101.5	103.8	104.3	109.9	122.2	1,426.2
All Diseases.....	114.5	109.7	112.3	107.8	116.3	114.7	112.3	102.6	101.5	103.8	104.3	109.9	122.2	1,426.2

Mean Meteorological Observations, for the past 13 weeks.

	29-861	29-866	29-871	29-842	29-837	29-763	29-697	29-678	29-691	29-711	29-661	29-623	29-757	Average 29-758
Barometer reduced 32° F.....	29.861	29.866	29.871	29.842	29.837	29.763	29.697	29.678	29.691	29.711	29.661	29.623	29.757	29.758
Mean Maximum Temperature.....	89.5	90.7	91.7	92.2	93.3	95.0	97.6	96.6	105.4	102.2	99.9	100.6	100.2	96.5
Do. Minimum do.....	75.7	76.6	77.7	79.7	89.7	81.5	81.2	81.4	83.9	83.6	81.2	83.2	82.3	80.6
Do. Temperature.....	82.4	83.4	84.4	85.6	86.1	87.6	86.7	87.1	90.8	89.6	87.0	89.0	87.2	86.8
Do. Humidity.....	72	73	73	74	74	71	69	67	59	60	65	58	62	67
Prevailing Wind.....	S. E.	S. S. E.	S. E.	S. E.	S. E.	S. by E.	S.	S. E.	S. W.	S. S.	S. W.	S. W.	S. W.	S.
Mean velocity in Miles by S.....	152	183	184	185	143	226	194	210	305	278	252	281	249	219
Rain-fall.....	...	0.10	...	...	0.01	...	0.07	...	...	0.01	1.36	0.11	0.34	2.00

Table shewing the Mean Half-Monthly Meteorological condition of Madras,
for the past 20 years 1841-1861.

	Half month ending 15th April.	Half month ending 30th April.	Half month ending 16th May.	Half month ending 31st May.	Half month ending 15th June.	Half month ending 30th June.	Average.
Barometer reduced to 32° F.....	29.843	29.806	29.756	29.707	29.692	29.704	29.751
Mean Maximum Tem- perature.....	90.0	91.0	93.0	95.1	95.8	93.7	93.1
Do. Minimum do.....	77.4	78.4	79.8	80.4	80.7	79.4	79.3
Do. Temperature.....	83.1	84.0	85.3	86.2	86.6	85.0	85.0
Do. Humidity.....	76	75	73	68	64	67	70
Prevailing Wind.....	S. by E.	S. by E.	S	S. S. W.	S. W.	S. W.	S. by W.
Mean velocity in Miles. by S.....	173	173	200	225	236	240	208
Rain-fall.....	0.16	0.65	1.32	1.60	0.92	1.29	5.94

[In noting thus the mean Humidity, I have put it as "*Mean Humidity per cent*;" this however can only be regarded as an approximation to perfect accuracy. As re-
sultants, as has hitherto been done by Dr. W. Smith. The mean Velocity in miles
is entered as being the simple Arithmetical mean. If however it be desired to record
the Statical Resultants they are in the first table, Direction S. velocity 184 miles, and
in the second table, Direction SSW. velocity 198 miles. I have adopted the returns
included in the above tables after consultation with Mr. Pogson, Government Astrono-
mer, for whose kind explanation on the subject (summarized above) I am much
obliged.—H. B. M.]

Howard Montgomery Indle
Acting Sanitary Commissioner

