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REPORT

OF THE

BOMBAY PLAGUE COMMITTEE;

APPOINTED BY GOVERNMENT RESOLUTION No. $\frac{1204}{720P}$,

ON THE

PLAGUE IN BOMBAY,

FOR THE PERIOD EXTENDING FROM THE 1st JULY 1897 TO THE 30th APRIL 1898.

Under the Chairmanship of

Sir JAMES MacNABB CAMPBELL, K.C.I.E.

EXAMINED BY

CAPTAIN THE HON. R. MOSTYN, R.A.,

EXTRA SECRETARY, BOMBAY PLAGUE COMMITTEE.

Bombay:

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PLANS.

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MAPS (SEPARATE).

No. 1	Bombay, showing Wards and Hospitals.
" 2	Bombay, showing the course of the Epidemic.
" 3	Mortality Chart.

Corrigenda.

Page 7, l. 2, *read* Never above 500.

Page 26, l. 1-23, *read* The results were not satisfactory.
Though the reports stated that a
great many houses had been
visited, nevertheless the Cemetery
reports, &c.

Page 52, l. 31, *for* abundance *read* abstinence.

INTRODUCTION.

The first epidemic began in August 1896. It reached its climax on January 19th, 1897, with a total death-rate for the month of 7,627, which fell in February to 6,732, to 5,436 in March, and, in spite of a serious renewal in Mandvi, to 4,578 in April, and to 2,331 in May. During June the total mortality was 2,308, which is only 174 in excess of the average of the five previous years. But taking into account the estimated decline in population from the previous average of 850,000 to an actual strength of about 750,000, the June returns show a comparative excess of 462 deaths, or of 17 per cent.

Two main features of the Plague history of the hot-weather months (March-June) of 1897 were (1st) the activity and thoroughness with which, under the direction of Brigadier-General Gatacre, the waning epidemic was dealt with by the fresh and powerful organisation of the Plague Committee; and (2nd) the special difficulty with which that body had to deal in the arrival in Bombay of, perhaps, 250,000 to 300,000 immigrants during the months of April, May and June.

With the 30th of June, at which date the Report presented by General Gatacre closes, the Plague had been almost extinguished. The City, however, was crowded with the destitute immigrants above alluded to from the mofussil, most of them in search of work. Labour was scarce, and the price of grain very high. Thus, many houses which had been declared unfit for habitation were unavoidably re-occupied. It is not surprising, then, that, in spite of the extinction of the Plague for the time being, an excessive mortality from all causes should have set in. The excess in the first week of June had been 40, which had sunk in the second week to 17, but had then risen through 36 to 84 in the fourth week.

The Report now presented covers the succeeding ten months, *viz.*, from July 1st, 1897, to April 1898.

The first chapter narrates the history of those ten months, detailing the progress of sickness and death, the movements of the people, the seasonal conditions, the difficulties encountered, and the measures introduced in each month. Succeeding chapters are devoted to each of the more important features or measures of the Committee's administration.

In the Appendices concise aspects or details of more or less importance are dealt with ; a selection of orders, rules, circulars, &c., most of which are referred to in the volume of the Report are presented ; the charts which accompany the Report are explained ; and, finally, a list is given of the volunteer workers who responded to His Excellency the Governor's appeal to the City to take its preservation into its own keeping.

APPENDIX No. 1.

Administrative Details.

*Bombay Plague Committee and Staff from its Establishment,
March 2nd, 1897.*

COMMITTEE :

Brig.-General W. F. Gatacre, C.B., D.S.O., *Chairman.*

P. C. H. Snow, Esq., I.C.S., Barrister-at-Law, Municipal Commissioner.

C. C. James, Esq., C. E.

Surg.-Major H. P. Dimmock, I.M.S.

SECRETARY :

Major W. F. Cahusac, D.A.A.G.

ASSISTANT SECRETARIES :

Capt. C. W. Chitty ; Lt. G. Warneford.

STORE OFFICERS :

Lieut. A. J. Thompson, R.A. ; Lieut. Windham, R.I.M.

ACCOUNTANT.

Mr. Kaikhoshro N. Ranina.

On Lieut. Warneford's retirement, Lieut. F. W. F. Vining, R.N., succeeded him on the 31st of March.

On Capt. Chitty being invalided to Poona on March 15th, Capt. D. S. Welsh of the 2nd Border Regt. was appointed in his place.

Brig.-Surg.-Lieut.-Col. T. S. Weir, Health Officer, was attached as Chief Medical Officer until the 5th of June, when he reverted to the Municipality.

Lieut. Thompson, R.A., and Lieut. Windham, R.I.M., served as Store Officers from March 2nd to the end of May.

When General Gatacre departed from India on July 23rd, Sir James MacNabb Campbell, M.A., LL.D., K.C.I.E., I.C.S., became Chairman of the Plague Committee, and at the close of August Mr. F. W. F. Vining, R.N., became Secretary in place of Major Cahusac.

On Capt. Welsh being summoned to Quetta on military duty, Mr. J. Wastie Green, M.A. (Camb.), was appointed Assistant Secretary.

On December 3rd Mr. W. Barker, B.A. (Camb.), arrived from England and joined the Committee's staff as an Assistant Secretary.

On November 3rd, 1897, the Committee was strengthened by the appointment of Surg.-Major-General G. Bainbridge and on 3rd February following by Surg.-Col. G. Hay, I. M. S., and Mr. Playford Reynolds, M.I.C.E., Superintending Engineer to Government, P. W. D.

In the first week of December Capt. R. M. Betham and Lieut. H. Strong of the 8th Bo. I. came down from Baroda with a detachment, 300 strong, of that regiment for general plague work. The Officers and troops were domiciled on the Kennedy Sea-face.

Capt. H. G. Swayne, R.E., joined the staff on February 9th for the construction of camps and the alteration to houses.

Capt. Clowes, Commissariat Officer, joined the staff as Director of Stores on February 9th and Commander J. Hewett, R.I.M., as District Officer in Tardeo on 12th February.

Messrs. R. B. Stewart, I.C.S., J. H. DuBoulay, I.C.S., and A. M. Wood, I.C.S., assumed charge of Wards A, E, D, as District Plague Officers on February 14th, January 29th, and February 1st respectively.

On Capt. Betham departing on leave on March 26th, Capt. the Hon. R. E. Mostyn, R.A., became Extra Secretary.

On Mr. F. W. Vining, R.N., being placed on sick list on April 1st, Lieut. G. Warneford was appointed *pro tem.* Secretary.

Early in February through the courtesy of Capt. H. Fleet, R.N., Lieut. Mansergh with Lieuts. Henderson, Mason, and Mr. J. Jenkin, (Chief Engineer, H.M.S. "Assaye") and 20 Blue Jackets were put at the disposal of the Committee. These Officers and men were housed in a camp on the Kennedy Sea-face and were chiefly employed in the vacating of infected houses and chawls. In view of the declining epidemic the Naval authorities were informed at the end of March that the services of the above Officers and men could be dispensed with, and accordingly, with the exception of Lieut. Mason, they returned to Naval duty after giving the Committee every satisfaction.

In the first week of February a company of the Durham Light Infantry under Major Ross with Lieuts. Way and Davis arrived from Poona for plague work. Major Ross assumed charge of C Ward South as District Plague Officer, and under him worked the Officers and men of the Durham Light Infantry. On Major Ross' retirement on 25th March, the charge of C Ward was taken over by Captain Bingley, 7th Bengal Infantry.

Early in March a detachment of Sappers and Miners, 50 in number, with two Engineer Sergeants arrived in Bombay for plague duty and were put under the orders of Capt. Swayne for the alteration to houses.

On February 1st Capt. the Hon. R. E. Mostyn with Lieut. Lough and 25 men of the Royal Artillery were placed at the disposal of the Committee and remained on plague duty until March 15th, when Lieut. Lough and the gunners returned to military duty.

On February 2nd, Lieut. Jordan with 2nd Lieuts. Robinson and Rundall with 50 men of the King's Own Shropshire Light Infantry, who had been on plague duty in Hongkong, joined the staff of the Committee and remained on plague duty until the end of March.

Surgeon Julius R.N.'s services were placed at the disposal of the Committee on 24th September 1897. He was placed in charge of the Committee's Detention Camps and a Plague Hospital until he retired through ill-health at the end of February. Staff Surgeon Nicholson, R.N., and Surgeon Bernard, R.N., took his place and remained with the Committee until early in April.

The following Doctors and Nurses arrived in Bombay from England for plague duty in October 1897 and February 1898 and were placed at the disposal of the Plague Committee by the Surgeon-General:—

October 3rd, 1897.

February 1898.

Doctors.

Dr. Miss Corthorne.
 „ F. M. Gibson.
 „ L. G. Haydon.
 „ R. H. Castellotte.
 „ J. T. Leon.
 „ E. L. Hunt.
 „ F. A. Foy.
 „ L. A. R. Hutchinson.
 „ S. Nariman.
 „ T. F. Pearse.

Dr. Parsons.
 „ Hornabrook.
 „ W. A. Justice.
 „ G. J. Blackmore.
 „ McKenzie.
 „ H. D. Packer.
 „ A. E. R. Laing.

Nurses.

Mrs. Pearse.
 Miss Evans.
 „ Hodges.
 „ Harris.
 „ Rawlings.
 „ Dawson.
 „ McDougall (deceased).
 „ Murphy.
 „ Grieverson.
 „ Fry.
 „ Hitchman.

Miss Buckley.
 „ Barrow.
 „ Bleaney.
 „ Campbell.
 „ Cracknell.
 „ Chick.
 „ Gardiner.
 „ Foxlee.
 „ Bradshaw.
 „ Hyland.
 „ Truman.

Miss Harvey.
 „ Greene.
 „ Smith.
 „ Crowdy.
 „ Wood.
 „ Richardson.
 „ Riley.
 „ Boyd.
 „ Greening.
 „ Brown.

The accompanying statement shows the District Staffs from June 1897 to April 1898, and the increase and reduction with the rise and fall in the epidemic :—

Year and Month.	District Officers.	District Medical Officers.	Sub-Medical Officer.	Hospital Asst. Surg.	Medical Students.	Lady Doctors.	Nurses.	Inspectors.	Sub-Inspectors.	Store-keepers.	Clerks.	Workmen.	Total.
1897.													
June ...	5	18	8	1	1	2	0	6	25	0	23	658	727
July...	5	17	8	1	1	2	0	4	0	2	12	275	347
August ...	5	17	9	0	1	1	0	8	21	2	13	332	404
September ...	6	23	7	0	3	1	1	6	18	2	14	299	379
October ...	5	21	7	0	5	1	2	6	18	2	14	286	366
November ...	5	22	7	0	3	1	2	9	20	2	17	367	455
December ...	5	16	4	0	5	2	4	6	24	1	21	422	500
1898.													
January ...	5	23	15	0	5	2	4	8	28	1	19	735	847
February ...	9	27	19	0	9	3	15	11	53	1	35	1,841	2,023
March...	10	29	22	0	10	3	14	10	65	1	26	2,051	2,351
April ...	8	23	16	0	0	3	8	4	33	0	26	1,219	1,355

The following table shows the distribution and the names of the chief members of the Staff at the beginning of March 1898 :—

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sections.	District Officers.	Sectional M. Officers.	Disinfecting Inspectors.	Contact Inspectors.	Vacating Officers.	Military Officers.	Medical Students.	Hospital Assistants.	Nurses.
A. Ward, S. ...	Brig.-Surg. - Lieut.-Col. Barker.	Surg.-Lieut. Sealy ...	Mr. D. Riens and 4 Sub-Inspectors.	Mr. C. Clark ...	Lt. Mansergh, R.N. Police Constable S. Carter	.....	4	.....	Mrs. Hudson.
" N. ...	J. H. DuBoulay, Esq., I.O.S.	Dr. Molegumwalla, Dr. Divecha, Dr. Kutar, Dr. Dalal.	.....	.....	.....	.....	.....	.....	.....
B Ward. ...	Brig. - Surg. - Lieut.-Col. Wilkins, D.S.O.	Dr. Haydon ...	.....	.....	Lieut. Henderson E.N.	Lieut. Jordan ...	1	.....	Miss Sinclair.
MANDVI ...	.....	Dr. Hussein (M). Dr. Packer. Dr. Joykar.	Mr. Atts Mr. Glen	Each sub-section sends its contacts to Camp.	.....	Lieut. Rendell; Lieut. Robinson	1	1	Miss O'Neil.
CHACKLA ...	.....	Miss Brennan, Asst Surg. Feawick, Dr. Nariman, Dr. Setna.	.....	.....	.....	Capt. the Hon. R. E. Mostyn R.A. Lieut. Lough B.A.	1	.....	Mrs. Birlean, Mrs. Collet,
UMARKHADI ...	.....	Dr. Mrs. Van Ingen. Dr. Sorabjee, Dr. Finbo.	.....	.....	.....	.....	.....	.....	Mrs. Fitzgerald Mrs. Booth.
DONGRI ...	.....	.....	.....	.....	.....	.....	.....	.....	Mrs. Myer.
O Ward, N. ...	Surg.-Capt. Arnim ...	Dr. Hornabrook ...	Mr. G. Cooper ...	Mr. Allen ...	Lieut. Jenkin ...	Lieut. Way Lieut. Davis	8	.....	Mrs. Cooper.
DHOBI TALAO ...	.....	Dr. Blackmore, Dr. Hustice, Dr. Munsli, Dr. Chubb, Dr. Godinho	Mr. Hughes Mr. O. Kelly Mr. P. Rodrigues Mr. D'Souza	Mr. Willard	.....	.....	.....	.....	.....
C Ward, S. ...	Maj. W. Ross, D.L.I. Capt. Bingley	.....	.....	.....	.....	.....	.....	.....	.....
MARKET PHANASWADI ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
D Ward ...	A. Wood, Esq., I.O.S.	Dr. Shroff Dr. Foy. Dr. Seervai	.....	.....	Lieut. Mansergh E.N.	.....	.....	.....	Mrs. Hanson.
KHETWADI ...	W. T. Morrison, Esq., I.O.S. (Chairman of Committees), D.	.....	.....	.....	.....	.....	.....	.....	.....
GIRGAUM AND CHOWPATI.	.....	Dr. Mackenzie Dr. Jethar.	.....	.....	.....	.....	.....	.....	.....
E Ward ...	R. B. Stewart, Esq., I.O.S.	Dr. Gallagher ...	Mr. Murphoy ...	.....	Lieut. Mason, R.N.	Lieut. Warnford	2	.....	Mrs. Murphoy.
BYODLLA ...	.....	Dr. Gibson	.....	.....	.....	Lieut. Christie...	.....	.....	Mrs. Turner.
MAZAGAON ...	.....	Dr. Britto (M). Dr. Laing	Mr. Lyons	.....	.....	Capt. Hartigan...	9	8	Mrs. Wells-Willis.
NAGPADA ...	.....	Dr. Dalsi, Surg.-Major Barry	.....	.....	.....	.....	1	.....	.....
KAMATHIPURA.	.....	Dr. Parsons	.....	.....	.....	.....	.....	.....	.....
TARDEO ...	Comdr. G. S. Hewett.	Dr. Hutchinson.	.....	.....	.....	.....	.....	.....	.....
F & G Wards ..	Surg.-Capt. Jennings.	Dr. Bhatwadekar (M) Miss A. Corthorne. Dr. Contractor (M).	Mr. Hurley ...	Messrs. Valladerer Mosira Miller Munis Mr. Holmes Mr. DeSouza Mr. Gonsalves Mr. Fernandez	Messrs. Dominga, Lewis, Pappi.	.....	.....	Messrs. Godwelkar, Narayan, Fernandez	Mrs. Armstrong, Mrs. Overthrow.
PAREL ...	Lieut. C. E. Lewis.	Dr. Tavaris	Mr. Wolf	.....	.....	.....	.....	.....	Miss Storrie.
SION ...	.....	Dr. Dady Burjorjee.	Mr. Hinks	.....	Mr. Holmes	.....	.....	.....	Miss Fernandez.
MAHIM & WORLI	.....	Dr. Clemow	Mr. Carol	.....	Mr. Muers	.....	.....	.....	Miss Crowdy.
PAREL HOSPITAL.	.....	Dr. Castellotto	.....	.....	Mr. Whelpdale	.....	.....	.....	Miss Mill.
DADAR CAMP ...	.....	.....	.....	.....	Mr. De Souza	.....	.....	.....	Mrs. Graham, Mrs. Gibson.

APPENDIX No. 2.

Finance.

The accompanying statement shows that during the ten months under report (July 1897 to April 1898) the Committee have spent a little under ten and-a-half lakhs of Rupees. The expenditure during the four months of operations against the first epidemic was about three lakhs. The outlay during the past ten months falls under two periods—the six months ending December 1897 and the four months ending April 1898. The totals show that during the first period of six months the charges fell from Rs. 88,901 in July to Rs. 27,089 in September, when they rose to Rs. 49,016 in October, Rs. 53,591 in November, and Rs. 86,047 in December. The average monthly outlay during these six months was Rs. 60,250. It is doubtful whether during these six months the Committee did not err on the side of economy. They made every effort to reduce expenditure, hoping that the disease would gradually depart. At the same time, as has been noticed in the summaries of the months of July to October in Chapter I, the Committee had no alternative but to allow the efficiency of the staff to be reduced. Almost all the covenanted Medical Officers were removed for service on the frontier and in consequence of the united demands of famine and plague neither Military nor Civil Officers could be spared. The chief items that increased the expenditure from Rs. 49,010 in October to Rs. 76,047 in December were the expense connected with the building and maintenance of segregation camps, increased hospital charges, and the additional staff of Medical Officers and Nurses brought from England.

The period of the second epidemic shows an increased expenditure from Rs. 93,057 in January to about Rs. 2,50,000 in April and an average monthly charge of Rs. 1,57,553 or roughly $1\frac{1}{2}$ lakhs. The low expenditure in March (Rs. 1,64,037) as compared with the very high expenditure in April (about Rs. 3,00,000) is a matter of account. The actual expenditure in April has been less than in March; but the bills for the construction of the great health camps have been held over and were not finally disposed of till after the beginning of April. The increase in expenditure from Rs. 76,047 in December to an average of Rs. $1\frac{1}{2}$ lakhs during the three

following months comes mainly under three heads—(1) Large additions in the number of the staff in all its branches and the employment of several officers of a much higher grade than any whose services had been previously available for district work. (2) Additions to hospitals and hospital charges. (3) Expenditure on camps. The amount expended is doubtless large. Still it may perhaps be admitted that ten lakhs is not too large a contribution to secure the two great objects which have been attained (though by no means solely by the plague measures enforced by the Committee), namely, first the subjection of the death-rate below such a figure as would have caused general panic and flight from the city; and second the reduction of the death-rate in April to so moderate a figure that it ceases to hamper the city and leaves Bombay free to take full advantage of the possibilities of a season of unusual activity and prosperity in most branches of trade.

Plague Committee's Expenditure from March to July 1897 and July 1897 to April 1898.

Epidemic of 1896-97.		Epidemic of 1897-98.	
Month.	Amount.	Month.	Amount.
	Rs.	July 1897	Rs. 88,901
March 1897... ..	4,972	August "	66,887
April "	28,407	September "	27,089
May "	95,539	October "	49,016
June "	1,39,922	November "	53,591
		December "	76,047
	2,68,640	January 1898	93,057
Pay of Government Officers debited to advances ...	22,163	February "	1,23,117
		March "	1,64,027
		April "	3,00,000 (about)
Total ... Rs.	2,91,003	Total ... Rs.	10,41,742

The estimate for April covers all the usual charges for establishment, etc., for the month and also all outstanding liabilities for work done and salaries due, etc., since the appointment of the Committee.

The following table shows the details of expenditure from March 1897 to March 1898.

	1897.												1898.			Total.
	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.			
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.			
Establishment	97 4 2	11,373 7 10	70,425 7 3	43,334 9 10	24,765 2 10	15,323 13 2	14,059 0 4	*21,561 7 10	18,616 14 0	21,495 1 0	21,149 0 7	48,300 11 8	76,123 10 0			
Contingencies, &c.	1,645 7 0	2,061 1 7	6,969 13 0	11,823 4 2	8,068 13 3	3,181 8 2	1,018 6 11	1,025 9 8	88 15 11	5,912 5 0	1,464 0 8	17,686 12 11	2,621 1 1			
Purchase of Furniture	630 0 0	2,250 7 0	4,566 0 0	7,752 1 8	7,105 9 6	37 0 0	1,102 0 0	53 4 0	21 12 1	30 0 1	300 2 0	4,800 1 0	608 0 7			
Hire of Furniture	140 0 0	.....	1,059 0 0	77 0 0	28 0 0	74 1 8	78 0 0	620 0 0	69 5 8	.....	.....	.....	178 8 9	
Cooking Utensils, Tables, Articles, &c.	416 4 0	181 6 0	592 8 8	1,737 7 8	273 12 8	10 5 1	1 1 8	16 12 0	23 12 0	2 1 2	145 11 2	9 12 0	12 10 0			
Food Supply	12 12 0	2,768 10 4	4,379 5 6	6,537 7 5	2,849 12 5	214 11 1	818 11 7	222 5 2	684 5 2	252 6 2	1,021 6 8	4,278 15 3	4,624 2 11			
Disinfectants and Linens	15 10 10	1,708 14 2	71 4 8	22,491 11 1	2,005 4 2	2,168 11 1	1,497 8 0	1,070 4 4	.....	1,122 8 0	928 0 0	889 1 8	22,561 2 2		
Compostion .. . . .	.....	229 0 0	112 12 0	69 8 0	11 0 0	6 0 0	29 12 0	200 0 0	7 8 0	4 0 0	10 0 0	17 6 0	27 8 0		
Medicines .. . . .	.....	22 6 8	1,972 14 10	4,209 10 4	2,240 8 5	567 15 8	127 7 0	144 12 5	122 4 6	4,172 8 2	1,620 5 0	2,142 15 9	5,422 2 2		
Cost of taking Minutes of Meetings ..	120 0 0	112 8 0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Telephone Connections and Alterations.	.....	5 0 0	50 0 0	2,280 0 0	65 0 0	25 0 0	.....	.....	.....	.....	.....	128 8 9	.....		
Clothing	1,294 12 10	1,282 10 0	1,228 2 6	2,025 2 5	22 8 2	142 7 1	227 12 6	68 5 6	55 0 2	242 8 10	219 2 7	1,427 14 0	275 12 0			
Construction .. . . .	.....	12 10 0	4,866 4 1	2,022 10 7	12,268 7 7	26,222 12 1	102 11 7	226 4 5	221 6 4	22 8 0	225 5 11	2,551 4 4	262 0 0		
Gratuity to Patrons .. . . .	.....	127 0 0	127 0 0	222 0 0	27 8 0	.....	9 0 0	.....	.....	.....	.....	0 2 0	.....		
Rent of Grounds and Quarters .. . . .	.....	.....	28 2 5	25 0 0	222 5 4	7,191 2 2	222 12 11	1,222 8 10	200 12 10	212 12 10	222 12 10	242 0 0	2,222 12 7	
Assessment Taxes .. . . .	.....	.....	.....	9 12 0	.....	22 5 0	.....	.....	47 5 4	.....	.....	.....	.....
Contribution towards Private Hospitals and Camps	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,020 0 0	.....	.....	
Modykhana Paroo Ward .. . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27 14 4	
Total	4,972 8 10	26,407 1 5	92,529 11 8	1,14,917 8 7	70,228 12 1	54,222 12 8	16,421 10 4	127,202 7 2	20,728 2 2	24,272 12 0	22,222 12 2	24,421 10 2	1,27,122 8 8	7,27,422 11 10		
* Railway Inspection .. . . .	.....	.....	.....	5,122 12 2	2,012 5 7	4,722 0 11	2,222 8 0	2,222 1 7	2,722 2 2	4,222 11 2	6,012 7 2	7,722 4 2	6,242 5 2	
* Road Inspection .. . . .	.....	.....	.....	124 4 0	2,012 4 8	1,772 0 9	1,202 12 7	2,212 12 4	1,221 8 0	1,240 5 7	1,272 12 8	2,102 7 6	1,222 12 11	
* Sea do. .. . . .	.....	.....	.....	5,222 12 0	4,702 4 2	2,221 10 2	2,242 14 7	10,222 4 11	7,212 11 5	7,212 14 7	6,422 2 0	5,122 5 1	2,222 12 2	
* Observation Camps .. . . .	.....	.....	.....	12,221 12 7	2,202 1 11	2,422 0 2	2,222 7 10	2,222 2 2	12,271 14 0	21,422 12 4	27,022 2 2	21,242 10 11	24,274 4 10	
* Palghar Inspection .. . . .	.....	.....	.....	.....	.....	.....	.....	.....	1,201 1 6	1,224 12 2	722 5 5	402 12 2	102 12 2	
* Kalyan do. .. . . .	.....	.....	.....	.....	.....	.....	.....	.....	2,202 12 10	2,722 1 1	222 2 2	222 6 7	2 0 0	
* Disinfecting Instruction Class	.....	.....	.....	.....	.....	.....	.....	.....	10 0 0	212 1 2	1,222 2 2	242 2 2	222 2 2	
Total .. . . .	.....	.....	.....	22,022 2 10	12,242 0 2	12,212 12 1	10,222 6 0	22,272 12 1	22,222 6 2	41,022 1 7	24,222 12 2	22,222 2 2	22,222 2 2	2,02,222 6 10
GRAND TOTAL	4,972 8 10	26,407 1 5	92,529 11 8	1,22,222 2 2	22,201 12 2	22,222 8 0	27,022 0 4	171,220 4 2	22,222 12 2	72,027 12 7	22,027 2 2	1,22,112 12 2	1,22,027 2 2	1,22,722 1 2		

* This amount is inclusive of Rs. 22,122-2-4 on account of the pay, from March to September 1897, of Government officers deputed on Pledge duty and which was in previous months debited to advance accounts adjusted in October as it was not deemed expedient to recover the charges from Government.

† Deducting Rs. 22,122-2-4, the total is Rs. 12,022-11-10.

‡ Deducting Rs. 22,122-2-4, the Grand total is Rs. 42,022-11-11.

APPENDIX No. 3.

A Selection of Orders, Rules, Notifications and Circulars issued by the Bombay Plague Committee.

- A (1). Government of Bombay Resolution, 8th January 1898.
- A (2). Plague Authority.
- B (1). Duties of District Medical Officers.
- B (2). Suggestions for information and guidance of District Medical Officers.
- B (3). Duties of District Plague Officers.
- B (4). Rules for Sectional Sub-Inspectors.
- B (5). Rules for Sub-Inspectors for Disinfection.
- B (6). Rules for Disinfection of Buildings, &c.
- B (7). List of Stores and Chemicals required on Disinfecting Work.
- B (8). Rules for Segregation of Contacts.
- B (9). Circular to House-holders *re* Servants' Quarters.
- B (10). Circular to District Plague Officers limiting Plague Operations (after riots of 9th March 1898).
- B (11). Suggested arrangements for working Native Agencies.
- B (12). Instructions to District Plague Officers embodying the New Policy.
- B (13). Circulating further Government Instructions.
- C (1). Rules for Camps.
- C (2). Rules for Disinfection at Health Camps.
- C (3). Regulations for the Management of Segregation Camps.
- C (4). Notification and Rules for Private Camps in Thana District.
- C (5). Circular to labour employers *re* Health Camps.
- F (1). Rules for Passes to Travellers leaving Bombay.
- F (2). Resolution *re* Sion and Mahim Causeways.
- F (3). Rules for Detention of Passengers from infected areas.
- F (4). Notice to the Public *re* Surveillance Passes.
- F (5). Notice prohibiting passage of suspicious persons to Malabar Hill and neighbourhood.
- F (6). Notice prohibiting passage of suspicious persons to North of the Island.
- F (7). Special Plague Authority for (5) and (6).

A (1)

Government of Bombay Resolution, 8th January 1898.

RESOLUTION.—In continuation of Government Notification No. 1204-702-P, dated 5th March 1897, His Excellency the Governor in Council is pleased to prescribe the following additional rules for the City and Island of Bombay under the Epidemic Diseases Act, 1897 :—

1. The Plague Committee may appoint Special Officers, either by name or by virtue of office, to carry out or perform, under the general directions of the Committee, any measures or acts devised or ordered by them to be taken for the suppression or prevention of the spread of Plague. Such Special Officers may be known as 'Plague Authorities,' and their powers and duties may be limited as directed by the Committee, and their appointment shall be subject to revocation at any time by the Committee.

2. In the event of any death (whatever may have been the cause thereof) occurring in any house or any building, shed, stable or other place used as a human dwelling (not being an hospital), it shall be incumbent on the principal adult surviving member of the family to which the deceased belonged, or on any adult person who was present or attended on the deceased at the time of death, to give immediate and full information of the death and place where it occurred and of the name and caste of the deceased to the nearest District Medical Officer or Sub-divisional Medical Officer or Plague Authority appointed for this purpose.

3. On receipt of the said information the District Medical Officer or Sub-divisional Medical Officer or Plague Authority aforesaid, as the case may be, shall immediately register the death, and either himself go or send a trustworthy subordinate to the place indicated in order to verify the information given; and thereafter may give the informant a certificate that the death has been registered, which certificate shall, when duly demanded, be produced by the person or persons who shall carry or accompany the corpse to the place of cremation or burial or to a Tower of Silence.

4. Any District Medical Officer or Sub-divisional Medical Officer or Plague Authority aforesaid is empowered to demand production of such a certificate from the persons carrying or accompanying a corpse as aforesaid; and, in the event of such a certificate being not produced, is empowered to detain, or cause to be detained, any one of the funeral party at the place of cremation or burial or Tower of Silence until the name and caste of the deceased and the place where the death occurred have been clearly ascertained.

8th January 1898,

A (2).

Plague Authority.

BOMBAY PLAGUE COMMITTEE OFFICE.

189 .

By order of the Bombay Plague Committee, in exercise of the powers vested in them by Government Notification No. 1204—702-P of the 5th March 1897, it is hereby notified that

Name _____

Address _____

Description _____

is employed by the Committee, until further orders, to carry into effect, under the general directions of the Committee and within the district specified below, such measures as the Committee may be authorized to take, to suppress and prevent the spread of the Bubonic Plague in the City of Bombay, by virtue of the sections and notifications specified on the back hereof, or other the powers enabling them in that behalf.

By order of the Bombay Plague Committee,

Chairman.

District.

Bombay Municipal Act, 1888, sections 422 to 427 (both inclusive) and section 429.

Notification of Municipal Commissioner for the City of Bombay, dated 6th October 1896.

Government Notifications—

No. 228-P, dated 10th February 1897.

No. 1204-702-P, dated 5th March 1897.

No. 1638-A—1107-A. P., dated 23rd March 1897.

B (1).

Duties of District Medical Officers.

(B) The following duties will be assigned to the District Medical Officers, who should, if possible, reside in their own districts :—

- (1) To superintend and exercise the sanitary supervision of the whole district in their charge, reporting to the Plague Committee and the Health Officer daily.

Note.—Police Commissioner to be asked to arrange this postal service.

- (2) To supervise the working of their District Hospitals and to attend the same in routine.
- (3) To supervise the work of Search-Parties in conjunction with the Justices of the Peace.
- (4) To control the disinfection of infected areas and buildings, latrines and night-soil depôts.
- (5) To inspect all Segregation Camps in their districts.
- (6) To call the attention at once of the Officer appointed by Government for the condemnation of insanitary buildings to any such premises in their districts.
- (7) To report on registration of burials and cremations in their districts and to supervise the sanitary condition of cemeteries.
- (8) To send daily reports to the Plague Committee and Health Officer from 6 a.m. to 6 p.m., giving details of—
 - (a) What has transpired during the preceding 24 hours in their districts.
 - (b) Any suggestions they have to offer.

B (2).

Suggestions for Information and Guidance of District Medical Officers.

The following suggestions in reference to house-to-house visitation and disinfection are drawn up for the information and guidance of District Medical Officers ; no hard-and-fast rules can in most instances be laid down for this work, and the Committee therefore depend in a great measure on the judgment, discretion, and tact of their District Medical Officers :—

1. It is proposed to employ, as far as possible, the Justices of the Peace who have volunteered their services ; each district will be divided into sub-divisions, and sub-divisions into sections for this duty.
2. The Justices will be asked to attend at the office of their sub-divisions at 7 a.m. on each day.
3. After the muster of the staff under each Justice, they will proceed to their sub-divisions with their staff for house-to-house visitation.

4. It is not expected that the Justices can personally visit every house daily, though it is hoped they will visit as many as possible, and it is presumed that they know their sub-divisions so well that information in regard to sick persons will be quickly obtained by them.
5. The staff allowed to each Justice will be organised according to the number of houses in the sub-division, but the minimum staff will be one Sub-Inspector or Muocadam (native), one Police sepoy, and four Military sepoy. Each Justice, on receiving intimation of, or on finding, a sick person, will make a note of the name of the place and the number or description of the premises, leaving a sepoy on guard to prevent the patient being removed until an ambulance can be obtained.
6. Each Justice, on having inspected the whole of his sub-division, will return to the office of the sub-division to fill in and hand over a report of his morning's work in a printed form provided for the purpose.
7. This procedure will be followed from day to day, and any Justice prevented from attending on any particular day is requested to send an early intimation to the Sub-divisional Medical Officer, who will delegate the work to someone else.
8. Sub-divisional Medical Officers, on receiving reports from Justices, will immediately arrange to send ambulances to the houses in which cases have been reported.
9. Before removal, cases should be visited by the Sub-divisional Medical Officers or one of their qualified assistants, or, in the case of females, by a Lady Doctor, who will arrange for their removal.
10. The bullock carriage at each sub-division should be utilized to convey the family of each patient to the segregation quarters at the hospital in which the patient has been placed.
11. In the removal of sick persons, the Sub-divisional Medical Officer should, in the absence of the District Medical Officer of Health, personally supervise the procedure and submit a detailed report to the District Medical Officer of Health.
12. All commissariat and other arrangements for those people removed will be made by the District Medical Officer of Health or such official as he may appoint in each sub-division.
13. As soon as the sick shall have been removed, Sub-divisional Medical Officers will make immediate arrangements for the thorough disinfection of the infected places as follows :—
 - (a) All rugs, bedding, cloths, etc., belonging to persons affected, as well as all kutohra in infected places, shall be carefully removed and immediately burned.
 - (b) The infected place shall then be washed down thoroughly with a solution of Perchloride of Mercury in the proportion of 4 oz. to 30 gals. of clean water in a wooden tub or bucket, a mop being used for all parts within reach, and a wooden hand-pump for parts beyond reach. In the use of Perchloride of Mercury, it must be remembered that it is a virulent poison. In dissolving it, a little common salt should be used.

(c) For the general treatment of the building, the measures of the Health Department will proceed as usual.

(d) Immediately on the drying up of the disinfected place, lime-washing with quicklime laid on hot should proceed.

(e) Sub-divisional Medical Officers will see that this work is thoroughly done, as the checking of the spread of the disease depends upon it.

(f) Re-occupation of places so treated should not be permitted without the sanction of the District Medical Officer.

(g) Disinfect the morse, nani, privies, and traps, scraping such places as are likely to retain filth.

(h) Open out the roofs so as to admit light and air thoroughly.

B (3).

Duties of District Plague Officers.

To carry the increased burthen of work falling on the District Medical Officers, Civil or Military Officers were in most districts appointed to take executive charge, and the following instructions were issued to them :—

To

THE DISTRICT PLAGUE OFFICER.

The District Plague Officer is the Chief Local Plague Officer in his district and is invested with the general control of all Plague operations in his district, ward, or division, of the City of Bombay.

His duties fall under the following heads :—

(a) To distribute his charge into suitable major and minor inspection units.

On the correct division of a district the success of Plague measures mainly depends. As a rule the scheme of local sub-divisions should be worked out either in communication with, or with the approval of, the Committee.

(b) To arrange and enforce regular daily and special house-to-house visitations. These house-to-house visitations are of four classes :—

(1) Justices' visits.

(2) Visits by local officers.

(3) Occasional district visitations where more than one party combine to search considerable area.

(4) Special general visitations in which a large area is cordoned by police or troops, and many parties unite in searching a whole district.

The discovery of cases greatly depends on the zealous inspections by Justices and local officers, together with the occasional examination of large blocks or areas.

(c) To employ and organize a body of informers paid by the month, or better, by results, for the discovery of concealed or other cases of Plague.

The successful Plague management of any badly infected section of Bombay depends to a very great extent on the exertions of an active staff of informers.

(d) To discover all local deaths.

Deaths are discovered —

- (i) By local Plague and Health Staff.
- (ii) By cemetery returns.

An efficient local staff should before the close of each day know every death that has occurred in its charge. For certain reasons this knowledge has to be supplemented by information from cemetery returns. Till lately the efficiency of cemetery returns has been marred by the vagueness or the inaccuracy of the corpse addresses. To remove this defect a notification has recently been issued. It is hoped that before long this notification will secure the clear and true address from which every funeral party starts. The notification does not require the entry of the cause of death. It follows that in each case the ascertaining of the cause of death, whether Plague or not Plague, rests with the local staff. This important detail must, as far as possible, in each case, be ascertained from the family or neighbours of the deceased. Every doubtful case should be treated as a case of Plague, and disinfection of the room and segregation of the family of the deceased should be enforced.

To ascertain daily all deaths in his charge and to satisfy himself whether Plague is the cause of death, is the fundamental duty of a District Plague Officer.

(e) To secure that all rooms where Plague cases occur are disinfected and that all members of the infected family are segregated as Contacts.

District Plague Officers should give special attention to the question of Contacts, that is, of members of the family or others who have lived in the room with a Plague case. The necessity of isolating Contacts is undoubted. The practical difficulties in the way of enforcing the necessary isolation are serious. The concessions found advisable in Bombay are shown in the Contact Rules. Since the passing of these rules experience shows that unless worked with energy and strictness, only a small proportion of Contacts are isolated. A considerable and probably the most seriously infected class of Contacts go with patients to hospital. All hospitals have accommodation for one or two relations of each inmate. Even making allowance for this safeguard the number of Contacts in Government Camps (about 400) and in Community Houses (about 100) falls short of the total which should be isolated. The question of securing the isolation of a greater number of Contacts without causing public dissatisfaction is one of the most difficult with which the District Plague Officer has to deal.

(f) To remove to Contact Camps or Houses all Contacts whether discovered after or before the death of the Plague case.

The remarks under (e) apply to this head. But difficult cases occur. As a rule the correct procedure is to despatch all members of the family found in the sick room to a Contact camp or house at the same time as the patient is sent to hospital.

(g) To disinfect infected houses.

The District Plague Officer is responsible for all disinfection whether of vacated rooms or of vacated houses. A room is vacated when a case of Plague occurs in it; a house is vacated in which Plague cases have occurred both during the last and the present epidemic. A special assistant is allotted to each District Plague Officer to carry out disinfection.

(h) To vacate infected houses.

The choice of such houses or blocks of dwellings as require to be vacated should be made by the Committee in consultation with the District Plague Officer. As a rule no house should be vacated except houses in which a large or a repeated number of Plague attacks have occurred. The actual work of vacating the houses is entrusted to a special officer, Captain Betham. The duties of the vacating officer are—

(i) To see the house is vacated and closed and marked with the letter V

(ii) To hand all unclaimed property to the Police or other authority.

(iii) To see that the inmates with their belongings are taken to the Segregation Camp. The time during which the persons evicted are kept in the Health Camp should not be less than 10 days. The District Plague Officer is responsible that all Evicts are brought back to their houses at the end of the 10 days or other appointed period of segregation. The District Plague Officer is further responsible that every vacated house, after disinfection, and with such alterations as make it fit for human use, is ready to receive its former tenants. As a rule no shop should be vacated. The premises should be disinfected, and communication with the rest of the building be carefully cut off. Similarly, the workshops of home craftsmen—handloom-weavers, blacksmiths, coppersmiths, and others—should not be closed. In such cases the bread-winners should be encouraged to live with their family in a camp at night, and to return to their workshop during the day.

(i) To condemn vacated houses incapable of improvement.

The condemning of vacated houses will be settled by the Committee in consultation with the District Plague Officer.

No house should be condemned until an attempt has been made to make the house or certain portions of the house fit for human use. With this object alterations should be attempted to secure sufficient horizontal and vertical ventilation. As a rule vertical ventilation can be best secured by cutting a four feet square opening through each floor, and horizontal ventilation by driving openings through each partition and over every door.

In large lodgings or chawls it may not always be necessary or advisable to vacate more than the ground floor or the floor in which Plague cases have occurred.

In the case of certain houses condemnation may be avoided provided the landlord agrees either to keep certain insanitary portions permanently closed, or to remove the defect by which the entrance of air and light is prevented. In most lodging houses or chawls the offending portion is the basement; in a few the most unwholesome quarters are the attics. Again, in certain buildings the removal of wooden partitions secures for a reduced number of rooms a sufficient supply of light and air.

In many ground floor or one-storeyed tenements, even if uninfected, it is advisable or even necessary to strip the roof of a portion of its tiles.

- (j) To pay close attention to all rumours and complaints regarding sick or dead rats. To satisfy himself of the correctness of the information. To have the dead rats burned and to secure that every effort is made to stop the progress of rats by flushing drains and closing openings with cement.
- (k) On such subjects as the flushing of drains and the removal of nuisances the District Plague Officer should communicate direct with the Health Officer to the Municipality.
- (l) A Plague District is well administered—
 - (i) When all deaths are accounted for.
 - (ii) When the bulk of Plague deaths occur in hospital.
 - (iii) When the number of attacks, that is, of cases discovered before death, falls little short of the total of probable Plague deaths.

B (4).

Rules for Sectional Sub-Inspectors.

1. Each Sub-Inspector is to be present at the Section Head Office for muster not later than 6-45 a. m. Their morning work goes on till 10 a. m.
2. The afternoon hours of work are from 2 till 5.
3. Before and after the hours of work, morning and afternoon, they must present themselves at the Section Office or they will be marked "absent" and be dealt with accordingly.
4. Each Sub-Inspector will have charge of a group of houses assigned him by the Medical Officer, which must be visited thrice a week. He is held responsible for finding out Plague cases occurring in that group and for notifying them to the Medical Officer for examination and removal.
5. He is required to keep a note book for recording the names and addresses of persons removed to hospital and of buildings in which a death has occurred.
6. He must in Plague cases communicate at once with the Sub-Inspector in charge of Disinfection, in order to have that work promptly proceeded with.

7. He must submit to the Medical Officer, when the day's work is over, a list of the houses he has visited, the number of cases, real or suspected, he has discovered, and state whether notice has been duly given to the Disinfecting Offices.

8. The Sectional Sub-Inspectors must clearly understand that the principal duties of the entire staff resolve themselves into two :—

Firstly, the discovery of Plague cases and deaths.

Secondly, the disinfection of Plague premises.

9. They are not to interfere in any way with halacores or the sanitary staff of the Municipality. They should bring nuisances to the notice of the Medical Officer and leave it to him to take action.

10. The Sub-Inspector must understand that any Plague case or death reported late or from outside sources, and not through his instrumentality, reflects on his efficiency. If he keeps actively in touch with his section, he ought to know what happens in it.

B (5).

Rules for Sub-Inspectors for Disinfection.

1. It is the duty of the Sub-Inspector in charge of Disinfection to secure the thorough disinfection of all rooms where a Plague case has occurred. The disinfection by Perchloride of Mercury must be complete within 6 hours of removal of a case by day. The period may extend to 12 hours if the cases are removed at night.

2. The value of a Sub-Inspector will depend not only on the thoroughness of his work, but also on the promptitude with which it is executed.

3. The disinfecting procedure is as laid down in Plague Committee's Circular, dated 1st January 1898. Each Sub-Inspector must have a copy with him and is responsible for instructing his staff in the details of his work.

4. He is expected to work cordially with the Sectional Sub-Inspectors, each member of the staff loyally co-operating with the other for the discovery of cases and speedy disinfection of rooms.

5. He will keep a note book for recording day by day—

(a) the rooms or houses he has disinfected ;

(b) those remaining to be disinfected.

6. He is responsible for painting the Plague mark and date on every place he disinfects.

B (6).

Rules for Disinfection of Buildings, &c.

1. Immediately a patient has been removed, the following disinfecting measures should be put in operation.

2. All rags, bedding, clothing of the patient, and kutchra generally should be carefully lifted, removed, and burned outside the building. In placing the articles outside they should be carefully laid down (*not thrown down*) so as not to raise dust.

3. No brushing of walls or floor should on any account be permitted. This is a most dangerous proceeding and likely to spread infection.

4. The first work in all instances is to flood the floor of the infected room with a solution of Perchloride of Mercury not weaker than 1—1,000. The junction of floor and walls and all corners should then be mopped with the solution, as well as the walls as far as the mop will reach, and beyond this a small hand-pump should be used. The floor, if of earth, should then be dug up to a depth of 4 inches. (But this must on no account be done before the surface has been flooded with the solution.)

N. B.—The solution of Perchloride of Mercury, 1 to 1,000, may be prepared by adding 2 lbs. crude of Hydrochloric Acid to 100 gallons of water and then dissolving the mercury in it, with a handful of common salt to expedite dissolution.

5. All furniture that can be dealt with should be likewise disinfected with this solution either with a pump or a cloth.

6. After the work has been thoroughly done and the solution has dried, lime hot, and in as strong a solution as possible, should be laid on all the walls, the floor and ceiling.

7. Articles of value, likely to have been infected, should be classified according to their nature —

- (1) Those which can be boiled, if of cotton, to be boiled for 3 hours in a 3 per cent. solution of soft soap with water, or steeped in Perchloride of Mercury solution after being washed (woollen clothes worn by a patient to be burned), and then exposed to the sun.
- (2) Articles which from their size or value cannot be boiled should be disinfected with a 5 per cent. solution of Carbolic Acid, which should be allowed to dry upon them.
- (3) Articles which can neither be boiled nor so disinfected, should be exposed to the sun.

8. In parts of buildings where insects are likely to be harboured, kerosine oil should be applied with a syringe, or boiling water poured over them.

9. In the event of the whole house requiring disinfection, the order of procedure should be—

- (1) Privies with their shafts ;
- (2) Staircases and corridors ;
- (3) The rooms in order ;

first by washing every part with the Perchloride of Mercury solution, and then laying on the hot quicklime.

10. All nahanis, nahani pipes, morees and traps should be carefully flooded with Perchloride, and where necessary, entirely replaced at the expense of the owner of the premises.

11. As a measure of precaution Carbolic Acid powder or dry Chloride of Lime may be sprinkled inside buildings adjoining the infected one.

12. In the use of Perchloride of Mercury, a virulent poison, its properties, when coming in contact with organic compounds, should be remembered.

13. A reward for dead rats may be given. They should be burned with straw and kerosine oil.

N. B.—The disinfectant action of Perchloride on clothes is increased by the subsequent soaking of them in Phenyls.

B (7).

List of Stores and Chemicals required on Disinfecting Work.

Names of Articles.	Rate.	Per	Amount required per 1,000 square feet.
	Rs. a. p.		
Leather Dhols ... ..	.....	.....	.....
Manual Fire-engine with 60 ft. delivery hose, "nozzle," the usual suction hose	650 0 0 to 800 0 0	Each.	Vide Notes.
American rotary pumps with 3 ft. suction hose and 50 ft. delivery hose with nozzle 10 inches long and couplings to fit the pumps	108 0 0	"	Do.
Brass hand garden pump	7-0-0 to 22-0-0	"	.....
Wooden pump	2 8 0	"	10 for 25 houses.
60-gallon casks to be fitted on country carts	5 0 0	"	4 for every $\frac{1}{2}$ furlong.
50-gallon tubs	2 10 0	"	12 always.
Wooden buckets ... ..	.....	.....	24 do.
Wooden hand-cart from Municipality ... ..	.....	.....	1.
Coir rope, 2 inches thick	1 4 0	100 ft.	.....
Hemp rope, 1" do. ... ..	.....	.....	.....
Coir string... ..	0 10 0	Cwt.	.....
Coir rope for fastening water casks ... ..	.....	.....	.....
Reed lime-washing brushes ... ..	.....	.....	.....
Old paint tins, empty, for lime-washing... ..	.....	.....	40 or more.
Curry-stones with rollers for grinding disinfectants... ..	1 2 0	Each.	2 always.
Teakwood planks, 10' x 12" x 2", for rotary pumps	0 6 0	Ft.	2 cut into 5 ft. lengths.
Bamboo ladders, 10 ft. long	1 0 0	Each.	8.
Bamboos, 2 $\frac{1}{2}$ " dia., 30 ft. long	0 6 0	"	50.
Do. 2" do.	0 5 0	"	50.
Red ochre in lumps for marking houses	0 3 0	Lb.	2 lbs.
Hurricane lanterns	3 8 0	Each.	3.
Kerosine oil for lamps and burning clothes	2 4 0	Tin.	As required.
Wick for above for Hurricane lanterns	0 1 0	Yard.	.....
Galvanized-iron buckets... ..	0 14 0	.....	6.
Scales and weights, $\frac{1}{2}$ oz., 2 oz., 4 oz., 8 oz., 1 lb. ... ..	.....	.....	1 set.
Garden watering cans with hose. Copper wire for binding hose	0 12 0	Each.	12 for 500 houses. 36 feet.
Pickaxes ... ..	.....	.....	.....
Powders ... ..	.....	.....	.....
Cocconut oil ... ..	.....	.....	.....
Earthen pans for Nitric Peroxide. Tin funnels, large size	0 4 0	.....	12. 1 to each cask.
DISINFECTANTS.			
Perchloride of Mercury	5 0 0	Lb.	$\frac{1}{2}$ lb. to 1,000 sq. ft.
Common salt	2 0 0	Maund.	14 ozs. to the above.
Carbolic Acid	2 8 0	Gallon.	1 gallon to 800 sq. ft.
Chloride of Lime... ..	15 0 0	Cwt.	As required, vide Notes.
Unslaked lime	25 0 0	Ton.	1 $\frac{1}{2}$ cwt. to 800 sq. ft.
Pernanganate of Potash	1 12 0	Lb.	6 ozs. to 2,250 sq. ft.
Copper filings } for Nitric Peroxide {	0 9 0	Lb. }	Vide Notes.
Nitric Acid }	5 5 0	Gallon. }	

B (8).

Rules for Segregation of Contacts.

Definition of terms :—

(1). A "contact" means a person who has lived or is living in the same room or part of a dwelling with another person attacked by plague, or who has visited or waited upon such person.

NOTE.—Public officials visiting infected dwellings on duty are exempted from this definition.

(2). A "Public Segregation Camp" means a camp or place established for the segregation of "contacts" or of travellers suspected of having been exposed to infection.

(3). A "Private Segregation Camp" means a camp, house, or other place approved by the Plague Committee or the District Medical Officer for the purpose of the segregation of "contacts."

(4). A "District Medical Officer" is a qualified medical man serving under the Bombay Plague Committee, who is for the time being in charge of a district of the City of Bombay.

In any room where a person has been attacked with illness so suspiciously like Plague that the case has been sent to hospital, the family who live in the same room must be kept under medical observation till the Hospital Authorities declare whether the case is, or is not, one of Plague.

If the Hospital Authorities declare the case to be Plague, the members of the family living in the same room, who have not accompanied the patient to the Hospital, must, under the special conditions stated below, be considered to be contacts, and taken to a Segregation Camp :—

(a) On occurrence of a case of Plague in a small house or dwelling, all the contacts are to be removed to a Segregation Camp, public or private, as may be directed by the District Medical Officer
Plague Authority.

(b) In the case of a seizure in a large chawl, unless several attacks occur in different parts of the building, it will not usually be necessary to segregate the inmates of more than from one to three rooms. But in other cases it will be essential to empty a storey, or even the entire building, and to segregate the contacts in Public Segregation Camp or, under the special permission of the Committee, in a Private Segregation Camp.

(c) In large private houses or hotels the occurrence of a case or two of Plague may, in the first instance, be treated (after the isolation, in an Hospital, of those attacked) by segregating the Contacts in other parts of the same building, or in buildings, tents, or huts immediately adjoining the infected house, or within the same enclosure. But with a further spread of the disease complete evacuation of the suite of rooms, or the storey, or the whole building (as may be thought necessary), together with segregation of the inmates and other Contacts, is to be carried out.

(d) With the written consent of the Bombay Plague Committee or of the District Medical Officers
a Plague Authority, and provided that they remain segregated and otherwise comply with the orders from time to time issued by the said Committee or by the District Medical Officers
Plague Authority, the inmates of large or isolated private houses or hotels of the better class among those above-mentioned [Clause (c)], and situated in fairly healthy localities, will be permitted to pass the period of segregation in a Private Segregation Camp. In the absence of an approved Private Segregation Camp, the inmates, and other Contacts, of all such dwellings will be removed to a Public Segregation Camp.

If Plague appears among the occupants of large rooms inhabited by several families of persons,—Moochis for example,—it will at first be enough to segregate the infected family in a Public Segregation Camp, and disinfect and limewash their portion of the room, and the common privies and bathing-places.

If a second attack should occur, all the inmates of the dwelling will be removed to a Public Segregation Camp.

A casual guest attacked by Plague in an inn or eating-house shall be detained in an Hospital, but it will not be necessary to treat others in the house as contacts unless the person attacked has lived in the house.

In the latter case the treatment of the other inmates will depend upon the circumstances, and ^{District Medical Officers} ~~Plague Authorities~~ are empowered to take the requisite action for their segregation, if necessary.

When persons attacked by Plague are found in dwellings other than their own homes, full inquiry should be made at the latter by the District Medical Officers as to the existence of Plague therein.

Contacts in the dwellings of infected persons who work in their houses (goldsmiths, coppersmiths, hand-loom weavers, &c.) will be dealt with according to the judgment of the ^{District Medical Officers} ~~Plague Authority~~; provided that the sick are isolated in Hospital and the dwellings disinfected.

The period of segregation for contacts shall be ten days, but this may, under the orders of the Plague Committee, and for urgent reasons, such as overcrowding of the camps, be reduced to seven days.

In special cases, when supervision can be ensured, contacts may be released on surveillance, under the orders of the Plague Committee, after passing seven days in a Segregation Camp.

2nd December 1897.

B (9).

Circular to House-holders re Servants' Quarters.

Two cases of Plague have recently been found, one among the servants and in the compound of a gentleman residing on the Cumballa Hill, and the other under similar condition on Malabar Hill.

Previous to this no cases have been recorded on the Hill for several months.

Residents are, therefore, requested to second the efforts of the Plague Officers and to see that—

- (1) All the servants' quarters and cook-houses are at once cleaned and white-washed.
- (2) That no outsiders live in the compound among the servants, and that families of servants do not reside with them, thereby reducing the population as much as possible.
- (3) That all kutobas is daily swept up and burned.
- (4) That on a case of sickness occurring among the servants intimation is at once sent—
 - (a) to the Plague Office near the Post Office, Malabar Hill, or
 - (b) to the Office near Messrs. Kemp and Co.'s Shop, Cumballa Hill.

B (10).

**Circular to District Plague Officers limiting Plague
Operations after Riots of 9th March 1898.**

17th March 1898.

To
THE DISTRICT OFFICER,
WARD.

MEMORANDUM.

In accordance with instructions issued by Government, all Divisional and Sub-divisional Officers are to see that—

- (1) There is to be no compulsory search in any house unless the fact is reasonably established that it is a Plague-infected house.
- (2) No patient is to be removed to a plague hospital unless the case is undoubtedly a Plague case ; and no medical certificate shall be accepted as evidence that the case is one of Plague, unless it is signed by a fully qualified Medical Officer.
- (3) No Plague case which a fully qualified Plague Medical Officer may pronounce to be hopeless, shall be removed to hospital without the consent of the relatives.
- (4) No inmates of a house are to be removed without intimation being given to the head of family.
- (5) When any damage is caused by destruction of property (to diminish risk of infection) compensation must in the case of the poor be paid on the spot ; and that there should be no destruction of property when disinfection will suffice.

B (11).

Suggested Arrangements for working Native Agencies.

In each District or Sub-division of a District a Committee of Native Gentlemen should be formed, whose duty will be to discover cases of Plague in their districts.

The best means of doing so is to sub-divide the District into small portions, each under a house-visitor appointed by Local Committee, who should look after from 200 to 400 inhabitants.

Each member of the Committee should have a certain number of such house-visitors working under him, and should receive daily reports from each.

Each house-visitor should daily see or enquire about all the people put under his care, and, when there is a case of sickness, report it to his superior, who should arrange to send a medical man or nurse to see the sick person.

Should the sickness prove Plague, arrangements should be made by the Committee to send the sick person to hospital, and to have the Contacts segregated. Also to have dirty clothes burnt and bedding and other clothes disinfected at one of the Steam Disinfectors.

All cases of Plague should be reported to the District Plague Officer, who will arrange for the necessary disinfection of the house, &c. It will be a sign of careless work on the part of a house-visitor if repeated cases of death occur without it being previously known that the persons were sick.

Each Committee should amplify the above where considered necessary.

B (12)

**Instructions to District Plague Officers embodying
the new Policy.**

22nd March 1898.

To

THE DISTRICT OFFICER,

WARD.

In continuation of the rules forwarded to you on the 17th instant, as laid down by the Secretary to Government in his No. 1904 of the 17th, the Committee desire to draw your attention to the following observations :—

Under the revised system of Plague operations which Government desire should be brought into force immediately, the chief principle involved is that of house-visitation being carried on by the people themselves, as indicated in the above mentioned rules. Plague officials will search only those houses where the fact is reasonably established that Plague cases or deaths have recently occurred. There are many such houses within the City, but unless a house is shown by the rings or is known to the District Officer to have recently had Plague, it must not be considered to be an infected house ; neither should houses where Plague cases have recently occurred be kept longer under surveillance than is considered absolutely necessary by the District Officer. A house thoroughly disinfected may, after that operation has been completed, be considered a clean house.

In regard to house-visitation by native gentlemen, the best means to effect this visitation is to form a series of small Plague Committees for each district or sub-district within each ward. If a district has too large an area it should be divided twice or thrice or into smaller sub-divisions of such size as can be thoroughly inspected in two or three days by a small Committee ; this small Committee to be appointed from the names of those gentlemen who have already been working or who have volunteered their services to Government. Each Committee will be under the District Officer and Sectional District Officer, to whom they will be directly responsible. The gentlemen appointed to this Committee should be chosen from those who principally live or have large interests in the neighbourhood. Each Committee should appoint its own Chairman and Secretary, and the District or Sectional Officer, who in every case is the official Chairman, should arrange to meet these gentlemen and help to apportion streets or parts of streets in which one or more members of the Committee will be responsible for the house-visitation.

The success of the new organization will depend very greatly on the close touch the District Officers or Sectional District Officers keep with these Committees, as, unless backed by help, the movement will in many parts of the City be a failure, and His Excellency the Governor in Council desires to impress upon District Officers the paramount importance of securing the cordial and energetic co-operation of Heads of Communities of Sections of Communities, however humble their nominal social position may be, and he looks to them to secure by tact, patience and kindness, the cheerful good-will of the population and the success of the volunteer organization now initiated.

Reports from the Committee will go to the Sectional District Officer, and from him in the ordinary way to District Officers daily. Disinfection will continue as before and contacts will be removed as laid down in Rule 4 of Government letter. The rules in regard to the vacating of houses will continue, but should be modified and

worked in conjunction with these Committees. Government desire also that these Committees shall be worked in conjunction with the Central Grievance Committee sitting under the Chairmanship of Mr. DuBoulay at the Town Hall, and complaints heard by that Committee, if well founded, will be referred to the District Officer and the Local Committee of the area to which they refer. It is requested that arrangements be made to give such complaints thorough investigation, after which a report should be forwarded to the Bombay Plague Committee, who will take the necessary action.

Another revision which Government desire shall be immediately attended to is, that under the new arrangements the services of as many subordinates and lower subordinates as possible shall be dispensed with. It having been laid down that only a Medical Officer with fully qualified degrees is to give an opinion on Plague cases, it follows that Medical Students and Hospital Assistants will no longer be of use in house-visitation. District Officers should therefore give this matter their early consideration and submit lists of staff which they propose to reduce.

In the event of a case of plague occurring in the family of a well-known and well-to-do respectable person, Government desire that if the house is a detached one, and if the patient can be isolated, and if the family agree to remove to one of the Committee's Health Camps or dwell where they can be placed under supervision, the Plague Committee will allow the patient to remain in the house and can be attended to there by his own Doctor and one or two members of his family.

B (13)

Circulating further Government Instructions

No. $\frac{2137}{F}$

GENERAL DEPARTMENT,

25th March 1898.

To
THE CHAIRMAN,
BOMBAY PLAGUE COMMITTEE.

SIR,—In continuation of my letter No. $\frac{1288}{F}$, dated the 18th instant, I am directed to convey the following further instructions for the guidance of your Committee :—

- (1). Persons should only be compulsorily removed by order of a Plague authority to a health or segregation camp when their house is known to be infected with Plague and when they are unable to satisfy the Plague authority that they will remain under observation in a sufficiently isolated and convenient place.
- (2). Voluntarily removal to a health camp or other place of safety should be encouraged by all means possible.
- (3). If a Plague case can be suitably treated and isolated in a house of sanitary situation free from danger of spreading infection, the patient may be allowed to remain provided the other occupants (save the immediate attendants) remove themselves elsewhere as above stated.
- (4). In the case of all removals sufficient time should be allowed, under proper observation, for the making of the necessary arrangements.—I have, &c.,

H. S. LAWRENCE,
 for Secretary to Government.

Copy forwarded for information and guidance to District Officer, Ward.

C (1)

Rules for Camps.

I. On admission to the camp everyone before being allowed into the wards must be medically examined and have their names, castes, and date of arrival, &c., registered.

II. The wards have been detailed according to the various castes, and new arrivals ought immediately to make known their caste in order that they may be shown to their proper wards.

III. At 7-30 a.m. and 4-30 p.m. a bell will be rung and everyone must assemble between the wards for the muster-roll to be called. All must attend excepting the patients in the observation and hospital wards, and those to whom special permission has been given for being absent. No one after falling in will be allowed to leave the place assigned till discharged by the officer taking the roll.

IV. All clothing is to be disinfected on admission and before discharge from camp.

Cotton clothing is to be placed in the sun for two hours; woollen and cloth fabrics are to be put in a disinfecting tank.

No one will be allowed to leave the camp unless these two disinfections have been performed.

V. A post-box is placed at the main entrance gate, and is cleared twice a day. Stamp and writing materials may be obtained at the shop at current rates.

VI. No smoking or naked lights will be allowed in the wards at any time.

VII. All complaints must be addressed to the Chief Medical Officer.

VIII. A case of persistent temperature that does not show any sign of yielding to treatment should be sent to hospital after 24 hours.

IX. Rations will be issued after morning roll. It must be understood that those only whose subsistence depends solely upon their daily wages are entitled to Government ration. Those who can afford to pay for rations must obtain them from the camp contractor at the established rate.

C (2)

Rules for Disinfection at Health Camps.

If there is a Steam Disinfector at or near a camp, all clothing and bedding should be passed through it—(it would be well to have Central Disinfection Station for camps)—and the people arriving should have their persons washed and be given a douche of 2 per cent. solution of carbolic acid or phenyle solution.

If there is no Steam Disinfector at or near camp, arrivals from a healthy locality may enter the camp at once after washing, if their kit is clean.

But arrivals from a suspected locality and dirty people should have their persons washed, the washing being finished with a douche of 2 per cent. carbolic acid solution. Their personal clothing should be put to soak in a 1-1000 solution of perchloride of mercury for ten minutes. The clothing of children should be dipped in plain water after being soaked, to prevent risk of poisoning.

All clothing and bedding in the camp should be exposed to the sun daily for a few hours.

C (3).

Regulations for the Management of Segregation Camps.

(Framed under G. R. No. 4474-P of 29th September 1897.)

1. The area occupied by a Segregation Camp shall be deemed to be a place of observation within the meaning of Rule 29 of the General Rules under Act III of 1897.

2. No person or persons shall enter a camp without a pass from the Bombay Plague Committee except (a) persons sent to the camp for segregation; (b) Superior Officers holding powers under the Plague Committee; (c) Police Officers on duty.

3. No visitor or pass-holder shall on any pretext enter a camp between sunset and sunrise.

4. Visitors may enter a camp between the hours of 8 a.m. and 5 p.m., provided they have first obtained a brass pass at the entrance gate and have entered their names and addresses in the address book kept there. This regulation may be suspended at any time by the Chief Medical Officer of a camp for such period as he may think fit.

5. No visitor will be allowed to leave a camp until he has returned his brass pass and signed his name against his former signature in the address book at the entrance gate.

6. The number of visitors in a camp at any one time during the day shall not exceed 200. All visitors and temporary pass-holders must leave a camp when ordered to do so, or, failing orders, before 5 p.m.

7. Permanent pass-holders on showing their passes may enter a camp at any time between sunrise and sunset, but must leave the camp before sunset.

8. Surveillance passes may be granted by the Chief Medical Officer of a camp to such applicants as he may think fit, provided he is satisfied that such applicants are persons of respectability and position, and provided the headman or one of the leaders of the community or communities to which such persons belong (on direct personal knowledge or after special satisfactory inquiry) stands surety for them and undertakes that they will return to the camp for medical inspection when and as often as they may be required to do so; and provided also that such persons show no suspicious symptoms. If inmates let out of camp on surveillance fail to appear and produce the members of their party at any of the times appointed by the Chief Medical Officer of the camp, the sureties of such inmates will be posted as defaulters and the continuance of the concession of surveillance will be endangered. It follows that all leaders should take such zealous and intelligent interest in each candidate as to prevent the risk that the candidate will incur on failing to carry out his undertaking, and the surety, equally with the defaulter, be involved in the disgrace attendant thereto.

9. Surveillance passes may be granted by the Chief Medical Officer of a camp at his own discretion in extraordinary cases (such as for marriage or funeral ceremonies or other cases which do not permit of delay), provided the grantees show no suspicious symptoms.

10. Surveillance tickets will be issued only between the hours of 8 a.m. and 11 a.m.

11. No person will be granted a surveillance ticket who has not first been photographed.

12. Surveillance ticket-holders shall return to the camp from which they procured such tickets between the hours of 8 a.m. and 11 a.m., on the day or days specified by the Chief Medical Officer of the camp, and shall not depart again from such camp until their tickets shall have been duly endorsed.

13. No person detained within a camp shall be allowed to communicate with persons outside the limits of the camp where he is detained, except with the express permission of the Chief Medical Officer of the camp.

14. No person or an inmate, whether a pass-holder or a camp servant, shall leave a camp at any time otherwise than by the recognized entrance gate and with a pass or special permit signed by the Chief Medical Officer of the camp.

15. All persons whatsoever, detained or being within a camp or occupied or employed in connection therewith, shall be subject to the orders of the Chief Medical Officer of the camp.

16. Any person leaving or attempting to leave a camp, except as laid down in Rule 12, or in any other respect disobeying these Regulations, is liable to be prosecuted under section 188 of the Indian Penal Code and will be dealt with accordingly.

C (4).

Notification and Rules for Private Camps in Thana Districts.

Persons resident in Bombay will be permitted to reside in camps of their own construction at selected places in the Thana District on the following conditions :—

1. Parties consisting of any number of parties to be formed. For each family a person (headman) who can, in the opinion of the Collector (or other person authorized by him), be trusted, will make himself responsible.
2. The site to be occupied will be allotted by the Collector and as far as possible according to the wishes of the party.
3. Each family to build its own shed. Ten feet to be left between each shed and thirty feet between each line of sheds.
4. The headman to be responsible for the cleanliness of his party's camp and for the using of an allotted site for natural purposes.
5. A register of persons permitted to reside in the camp to be kept, showing the number of persons in each shed. The register to be open to inspection by any Plague Authority at any time.
6. The headman to be responsible that every case of sickness in the camp is at once reported to the nearest Plague Authority or to such person as may be appointed for each camp.
7. The headman to be responsible that all orders which the District Magistrate may find it necessary to issue by reason of Plague in the camp will be obeyed without trouble.
8. The headman to be responsible for damage done to trees or other property near the camp by members of his party.

9. Each member of the party to undergo medical inspection before leaving Bombay in the first instance.
10. Only the working members of each party to be allowed to go to Bombay daily. Each such person to travel only on a monthly railway pass.
11. The headman to be responsible that no member of his party leaves the camp to live elsewhere. Any person sleeping out of the camp for one night to be considered to have gone to live elsewhere.
12. Each party to make its own arrangements for its supply of food. Until ten days have elapsed from the arrival of the party in camp, none of its members to go into neighbouring villages.
13. The camp site to be vacated and sheds cleared away within a week from the receipt of an order from the Collector, when the latter shall consider that there is no longer any reason why persons should not return to Bombay.
14. These conditions to be accepted in writing by the headman. Any breach thereof may be punished at the Collector's direction by withdrawal of permission to use the camp site.

R. P. BARROW,

Collector and District Magistrate, Thana.

BANDRA, 9th February 1898.

C (6).

Circular to Labour Employers *re* Health Camps.

To prevent the departure of dock labourers the Port Trust Contractors have, I believe, put up sheds for their men, and I understand have by this means succeeded in securing their stopping in Bombay.

II. The Plague Committee are anxious that provision should be made for all persons whose departure from Bombay would cause inconvenience to the trade of the City. Large camps are being got ready in the Dadar rice fields, most of which area is at present wholesome and suitable. If applications are made to the Secretary to the Plague Committee sheds will be reserved and handed over at cost price. Negotiations are also in hand to secure cheap or free workmen's trains. The site of the camps is close to the Dadar Station and the inmates would probably enjoy good health.

III. If Dadar is too far for working men there is an admirable site at Sewri, and also good sites on Port Trust land near Narielwadi.

IV. If arrangements can be made with the Muccadums or other organisers of labour I think camps for 500 to 1,000 persons could be got ready in 10 to 15 days; cost price being paid for the huts and the Committee arranging for water and sanitation.

V. I am hopeful that many Marathas and other labourers will be found ready to take advantage of these arrangements.

VI. The Committee consider the planting out of the working classes in the fields a matter of great importance and are ready to take any steps to encourage such settlements.

BOMBAY, 15th February 1898.

F (1).

Rules for Passes to Travellers leaving Bombay.

With the following exceptions, no passes will, from this date, be issued by the Plague Committee unless the applicants have stayed in a Detention Camp appointed by the Committee for a period not exceeding ten days immediately preceding the date of the pass :—

Exception (1).—Those persons who reside in parts of the city believed to be uninfected.

Exception (2).—Those persons with regard to whom the District Medical Officer certifies—

(a) that they have been under his supervision for a period not exceeding ten days immediately preceding the date of the application.

(b) that, to the best of his belief, there has been no plague in the dwelling occupied by the applicants or in its immediate vicinity for a period of not less than one month immediately preceding the date of application.

Exception (3).—Persons leaving Bombay on business and returning within a week, if living in uninfected localities and on producing certificates of good health from the Medical Officers in charge of the Committee's Camp at Wari Bunder or Modikhana, will, with the approval of the Committee, be granted passes for return to Bombay within seven days.

NOTE.—All persons travelling from Bombay without passes are certain to be detained.

BOMBAY, 21st January 1898.

F (2).

Resolutions re Sion and Mahim Causeways.

December 1897.

At a meeting of the Plague Committee held on the 4th instant, the following Resolutions were agreed to in regard to the Sion and Mahim Causeways :—

1. A census of the daily passengers passing through to be completed for a week.
2. On the completion of the census monthly passes to be given by the Chief Medical Officer of the Inspection Staff at certain hours.
3. After the 15th December, all persons not possessing passes to be quarantined or not allowed to pass through.
4. Persons leaving Bombay and intending to return to be given a token at the Causeway on payment of 2 annas which will be returned when the token is given up.

F (3).

Rules for Detention of Passengers from Infected Areas.

1 Third class passengers from infected villages, towns, groups of villages, sections of districts, districts, collectorates, or states shall be detained on arrival in Bombay for a period not exceeding seven days.

2. First and second class passengers will usually be exempt from detention. But the Inspecting Medical Officers are empowered, at their discretion, to detain such persons from infected areas travelling by first or second class, especially such as they may reasonably believe would usually travel third class.

NOTE.—This would include, for instance, those persons who, in order to evade detention, change from third to first or second class at an intermediate station.

3. Surveillance passes may be granted to applicants of assured respectability and position, and provided that the headman or one of the leaders of the community or communities to which such persons belong (on direct personal knowledge or after special satisfactory inquiry) stands surety for them and undertakes that they will return to the camp for medical inspection when, and as often as, they may be required to do so; and provided also that such persons show no suspicious symptoms. If inmates let out of camp on surveillance fail to appear and produce the members of their party at any of the times appointed by the Chief Medical Officer of the camp, the sureties of such inmates will be posted as defaulters, and the continuance of the concession of surveillance will be endangered.

It follows that all leaders should take such zealous and intelligent interest in each candidate as to prevent the risk that the candidate will incur on failing to carry out his undertaking, and the surety, equally with the defaulter, be involved in disgrace attendant thereon.

4. In accordance with Government Resolution No. ⁵²²¹/₁₅₃₅ P., dated 5th October 1897, Government officers on duty and their servants shall be passed without detention, provided they shew no signs of illness.

5. Holders of certificates from Plague Authorities or Authorised Medical Officers in infected areas, stating bearer to be free from exposure to infection for a period of ten days immediately preceding his departure, will be exempt from detention.

6. Servants of any European or leading Native will be exempt from detention under the following conditions :—

- (a) The holding of a certificate in accordance with Rule 5.
- (b) The holding of a certificate from the Secretary of the Bombay Plague Committee to the effect that the traveller has agreed—
 - (1) To have all servants placed under medical supervision at his house for ten days after their arrival in Bombay.
 - (2) To have their clothes washed and disinfected within 24 hours after arrival in Bombay.

NOTE.—Such certificate should be shown to the Medical Inspecting Officer at the Railway Station and retained by the holder.

DISINFECTION.

7. The clothes and baggage of those detained in camp must be subjected to thorough disinfection before the owners are discharged from the camp.

At the discretion of the Chief Medical Officer of the camp, unclean persons shall be bathed in a disinfecting fluid.

8. Rations to the value not exceeding 4 annas per diem will be supplied by Government to such persons as depend on each day's wage for a livelihood and whose savings do not represent more than a few days' sustenance. But those who are capable of paying for their own subsistence will be required to do so. With these objects a shop supplied with the necessary articles will be maintained within the camp.

F (4).

Notice to the Public *re* Surveillance Passes.

CIRCULAR.

BOMBAY, 20th October 1897.

The Committee are desirous of meeting, as far as possible consistent with safety, the wishes of the different communities in regard to the issuing of the surveillance tickets, but it has been noticed that several heads of castes and leaders are in the habit of standing surety for large numbers of these caste-people daily. When the Committee introduced the concession of surveillance certificates, it was with the object of liberating well-to-do merchants and their families, to whom quarantine was especially irksome, and persons whose presence was urgently necessary in the city. So far people have answered to their surveillance fairly well, but there is an inclination to avoid it, and the Committee desire to draw the attention of the heads of communities and others who are standing surety to this notification, that, should persons not return as instructed on the surveillance ticket by the Chief Medical Officer, the permanent pass to the camp and to the gentleman standing surety will be withdrawn, his name will be posted in the camp as a defaulter, and further he will not be allowed to again stand surety for his caste-fellows. It is hoped that leaders of communities will give this matter their careful attention.

F (5).

Notice prohibiting Passage of Suspicious Persons to Malabar Hill and neighbourhood.

Notice is hereby given that by virtue of the powers conferred by Government upon the Bombay Plague Committee, and in particular by notification of Government in the General Department, No. ⁵²⁷⁹/₃₁₁₁ P., dated 29th September 1897, published in the *Bombay Government Gazette*, Part I, dated September 30th, 1897, at page 1687, Rule 29 of the General Plague Rules is specially applied to the following local area, *viz.*, those portions of the Island of Bombay known as Walkeshwar, Malabar Hill, Cumballa Hill and Mahalakshmi, which local area is bounded as follows: on the north and north-west by the Sea, on the south and south-east by Back Bay, on the east by the Gamdevi Road, Tardeo Road and Mahalakshmi Road.

By virtue of the said Rule 29, Plague Authorities specially appointed by the Bombay Plague Committee for the purpose are authorised to prevent the passage of suspicious persons and their clothing, baggage, &c., into the local area above defined.

2nd January 1898.

F (6).

Notice prohibiting Passage of Suspicious Persons to North of the Island.

Notice is hereby given that by virtue of the powers conferred by Government upon the Bombay Plague Committee, and in particular by notification of Government in the General Department, No. ⁵²⁷⁹/₃₁₁₁ P., dated 29th September 1897, published

in the *Bombay Government Gazette*, Part I, dated September 30, 1897, at page 1637, Rule 29 of the General Plague Rules is specially applied to the following local area, *viz.*, those portions of the Island of Bombay known as Parel, Sewri, Sion, Mahim and Worli, which local area is bounded on the north, east and west by the Sea and on the south by Clerk Road West, Jacob's Circle, Arthur Road East and Kala Chowki Road and Sewri Road to the Sea.

By virtue of the said Rule 29, Plague Authorities specially appointed by the Bombay Plague Committee for the purpose, are authorized to prevent the passage of suspicious persons and their clothing, baggage, etc., into the local area above defined, unless the persons in question are holders of a pass from the Plague Committee.

F (7).

Special Plague Authority for F (6) & (7) preceding.

BOMBAY PLAGUE COMMITTEE OFFICE,

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By order of the Bombay Plague Committee, in exercise of the powers vested in them by Government Notification No. ⁵²⁷⁹/₅₄₃₄ P. of the 29th September 1897, it is hereby notified that—

Name _____

Address _____

Description _____

is appointed by the Committee, until further orders, a Plague Authority within the district specified below, for the purposes of Rule 29 of the General Rules under Act III of 1897, printed on the back hereof.

By order of the Bombay Plague Committee,

_____ Chairman.

District _____

Rule 29 under Act III of 1897.

Plague Authorities, specially appointed by a Commissioner for this purpose, are authorized to prevent the passage of suspicious persons from any town, village or local area, or into any town, village or local area to which this rule may be applied by the Commissioner, unless such persons have been detained in a place of observation for a period prescribed by the Commissioner, and unless, if arrangements for disinfection of their clothing, baggage, &c., have been made under the Commissioner's orders, such disinfection has been effected. Such Plague Authorities shall have the widest discretionary power, subject to the general or special orders of the Commissioner, to decide what persons shall be considered 'suspicious' for the purposes of this rule. So long as he remains in a place of observation under this rule no person shall be allowed to communicate, except with the permission of the Plague Authority, with persons outside the limits of the place. He shall obey such orders as may be issued by the Plague Authority for the cleanliness or protection from infection of the persons, property or quarters of the persons detained.

NOTE.—This rule was applied to the City and Island of Bombay by Government Notification No. ⁵²⁷⁹/₅₄₃₄ P. of the 29th September 1897, and the words "the Committee" should be read for the words "a Commissioner" or "the Commissioner" where such words occur in the rule.

APPENDIX No. 4.

Notes on Disinfectants.

In September some correspondence took place on the several disinfectants in use, as respects their relative cost, efficacy and ease of application. On the last point the Committee were of opinion that the directions for use by them on April 2nd, and published in their Report for 1896-97, fulfilled all purposes. However, as it seemed evident that the solution of perchloride of mercury in disinfecting work was often very incomplete, a circular was issued, requesting all District Medical Officers to, as far as possible, endeavour to make a saturated solution according to the accompanying formula :—

Perchloride of mercury,	480 grains,
Chloride of ammonia,	480 grains,
Glycerine,	12 fluid oz.,
Rectified spirit,	8 fluid oz.,
Water,	5 pints,

making a solution of about 1-100.

An improved method of making this solution, which saved both the rectified spirit and the glycerine, was proposed by Dr. Maitland Gibson a few days later and circulated to Medical Officers. Dr. Gibson's formula is subjoined :—

1 Gallon	{	Perchloride of mercury, 10½ oz.
		Chloride ammonia, 7½ oz.
		Dissolve in 5½ pints of water.

Add 48 oz. of strong commercial hydrochloric acid.

These quantities are sufficient to make 64 gallons of 1-1000. Wooden buckets only must be used.

A memorandum on disinfectants was communicated to the Committee by Dr. Collis Barry, the Chemical Analyser to Government, who had made a series of experiments, especially on the proper use of perchloride of mercury.

Memoranda of Solutions.

The following are standard solutions :—

(1) Solution of hydrochloric, 1-1000.

Hg. Cl₂, ½ oz.,
Hcl., 1 oz.,

distributed with three gallons of water (1 bucket). The Hg. Cl₂ will dissolve the hydrochloric acid in the above proportions, if pure. If impure, there will be a sediment. It should be coloured with methylene blue, and stacked for daily use, labelled "Poison."

- (2) Solution of carbolic acid, 5 per cent.
Crude carbolic acid, 24 lbs. Water, 96 gallons.
- (3) Solution of pot. permanganatis, 1-60.
Pot. permanganatis, 16 lbs. Water, 96 gallons.
Adding 6½ lbs. Hcl. to increase efficacy.
- (4) Phenyle emulsion, 1-20.
Phenyle, 24 lbs. Water, 96 gallons.
- (5) Solution of formalin (commercial), 1-400.

Dr. Collis Barry strongly advocated the use of the last solution as cheaper than Hg. Cl., and non-poisonous. A solution, 1-1000 of formic aldehyde, being as powerful as 1-1000 of Hg. Cl., 1-400 of formalin would answer the same purpose, in his opinion, as well or even better, being free from danger. However, its action was considered uncertain so far as yet ascertained, and it has the disadvantage of being unstable. The efficacy of chloride of lime and sulphur as disinfectants are very slight.

In the months of October and November 1897, the Committee received intimation that some of the disinfectants were of inferior quality, and analysis of samples by Surgeon-Major Bannerman and the Chemical Analyser to Government were at once obtained. Frequent precautions were taken to prevent fraud in this way.

In some of the camps masonry tanks were erected for the disinfection of clothes, &c., by means of strong solution of the stronger disinfectants, but the method is cumbersome and unsatisfactory, and was supplanted as soon as possible by the steam sterilising apparatus.

The following notes on the preparation of solutions of Perchloride of Mercury were specially written for this report by Dr. Haydon, M.D., D.P.H.

It is now generally accepted that, for practical purposes, perchloride of mercury is the most powerful disinfectant known and that its efficacy is markedly increased by the addition of an acid, preferably hydrochloric acid.

The acid prevents the precipitation of the mercury, in the form of insoluble and practically innocuous albuminates from albuminous material so constantly present in polluted soils of dwellings and filthy rooms.

Owing to the somewhat difficult solubility of the mercury perchloride, it is desirable to issue this disinfectant ready dissolved, so that only the addition of a predetermined quantity of water is necessary.

For convenience of transport, therefore the preparation of highly concentrated solutions becomes of some importance.

In order to obtain these concentrated solutions, the addition of certain salts is necessary to increase the solubility of the mercury perchloride. The salts most commonly used for this purpose are common salt and ammonia chloride.

Hydrochloric acid also increases the solubility of the perchloride to a slight extent, but the primary use of the acid is to enhance the efficacy and not the solubility of the perchloride.

Common salt has the advantage of cheapness and of being generally obtainable, but, if possible, I prefer to use ammonium chloride as concentrated mercuric solutions prepared with common salt are precipitated on the addition of hydrochloric acid. This precipitate, however, is readily soluble in water, and if the precaution be taken of shaking up the contents and thoroughly rinsing out the bottles in which the strong solution is supplied, there is no objection to the use of common salt.

After numerous experiments I found the best results were obtained by adding one part in four of ammonium chloride or common salt to the mercuric perchloride.

The salts are to be ground up finely and thoroughly incorporated in a porcelain mortar, as this greatly lessens the time required for solution.

A measured volume of water equal in weight (3 for 3) to the weight of mercury salt is now added, and the whole gently warmed. Boiling is not necessary, the whole of the salts passing into solution at a temperature of 103° F.

The result is a cent per cent solution of mercury perchloride, which does not crystallize out on standing, at ordinary Indian temperatures at least.

It is important to remember that in the process of solution a considerable expansion takes place in the bulk of the fluid.

Thus though $2\frac{1}{2}$ pounds weight of the resulting fluid contains one pound weight of mercuric perchloride, it measures 22 fluid ounces if freshly prepared and warm, or 20 fluid ounces if the solution has been allowed to cool before measuring.

In practice I have been in the habit of measuring $5\frac{1}{2}$ oz. ($5\frac{1}{4}$ cool) into an ordinary wine bottle and filling up the bottle with concentrated commercial hydrochloric acid. The bottle then contains 4 oz. by weight of mercury perchloride, and 20 fluid oz. of hydrochloric acid, and its contents are sufficient to prepare 25 gallons of disinfecting fluid containing—

Mercuric perchloride, 1—1000.

Hydrochloric acid, 5—1000.

This proportion of acid has been found to give the best results.

If it is desired to prepare smaller quantities of disinfecting fluid, the contents of the bottle are thoroughly shaken up, and 1 oz. added for every gallon of disinfecting solution required.

For the preparation of the concentrated mercuric solution, any glazed porcelain or earthenware vessel may be used ; and this may be conveniently covered outside with clay and built into an ordinary clay fireplace. The contents may then be ladled out with a porcelain or wooden dipper. It cannot be too strongly or too frequently reiterated that no metal vessels, &c., are to be used in the preparation or application of this mercuric solution. Even enamelled iron vessels are rapidly corroded by mercuric solution of slight concentration.

APPENDIX No. 5.

Steam Disinfectors.

The ancient methods of disinfecting such articles as clothing and bedding by exposure to the sun or immersion in a solution of perchloride are somewhat crude and haphazard, and when large crowds are daily entering a camp, such methods require a large staff of attendants, and lead often to much confusion and loss.

Steps towards a thorough system of scientific disinfection by sterilisation by means of steam under pressure were, therefore, taken by the Committee, and for a commencement the equifex disinfecter belonging to the Port Health Department was obtained and installed at Wari Bunder Camp.

Another and a somewhat larger equifex disinfecter was then purchased from the P. & O. Company at a cost of £300, and was erected on the open ground to the west of the Modikhana Camp under a suitable permanent iron-framed building, 19ft. x 45ft., covered with corrugated iron sheets. It is described as "an equifex steam disinfecter under the Genishe and Heischer Patent, manufactured by Messrs. J. Deffris & Sons, London, size 7 ft. x 4 ft., complete, with an 8 H. P. vertical boiler and all necessary fittings."

The land on which it was erected is held on a monthly tenancy, and the shed has accordingly been constructed so as to allow of its removal elsewhere, if required, at a small cost.

In regular work the following establishment would be necessary :—

	Rs.	a.
1 Inspector on Rs. 75 per mensem	75	0
1 Third Class Certificated Engineer on Rs. 25 per month	25	0
1 Coalman and 2 coolies on Rs. 12 each per month	36	0
1 Ramoose on Rs. 11 per month	11	0
	Rs.	147 0
Coal, 5 cwt. per day, at Rs. 20 per ton	150	0
Water, 1,000 gallons per day, at annas 10 per 1,000 gals.	18	12
Stores and repairs, at Re. 1 per diem	30	0
	Rs.	198 12

The machine at Wari Bunder required the same establishment and stores, being of the same type and construction in all respects, except that it was mounted on wheels. A third disinfector was constructed to the orders of the Committee by a local firm, Messrs. Richardson & Cruddas, at a cost of Rs. 2,200, and was installed at the Nairalwadi Camp.

A fourth, *viz.*, an equifex horizontal disinfecting stove, of the Genishe and Heischer Patent, was placed at the disposal of the Committee by the Surgeon-General with the Government of Bombay, and was erected at the Byculla Camp, but was soon again removed to Karachi on the reappearance of Plague at that port.

As it was not possible to provide each of the remaining camps with a steam disinfector, the following arrangements were made for dealing with the kit of persons sent to camps in which no steriliser was at work :— The kit of each person was overhauled, and such articles of wearing apparel as would not take harm by being steamed in the steriliser, and all bedding, was packed into a numbered bag and securely tied and sealed with a small lead seal in the presence of the owner ; a token stamped with the same number as that on the bag was then given to the owner of the kit, and the bag was sent to the nearest disinfecting yard, disinfected and returned to the owner without being opened. This arrangement was viewed with great favour by the people who were satisfied that they would get their belongings returned to them intact. At the same time the ordinary camp establishments found the packing, lacing, and sealing somewhat elaborate, and the system was regularly carried out only in the Kennedy Seaface and Goculdas Camps under Major Ross.

**Disinfector's
action.**

The first condition of a good steriliser is that it should withdraw the air from the innermost recesses of bulky articles under treatment. The mere admission of compressed steam forces the air into these without withdrawing it, in consequence of which the steam is prevented from entering to any depth.

In the equifex, perfect steam permeation is effected by cutting off the steam supply to the inner chamber after the requisite pressure has been exercised for a short time, and then causing a certain reduction in pressure by the quick discharge of a portion of the contained steam. Hence, a sudden expansion and withdrawal of the compressed air in the inner folds of the articles, and its discharge into the atmosphere with the steam. After three or four repetitions, it is found that

the steam has penetrated everywhere. In the Lyon's machines the air is withdrawn prior to the admission of steam by the production of a vacuum.

Drying is effected by allowing the exhaust valve to remain open and turning steam into a ring between the inner and outer casings. This forms a steam jacket which evaporates all moisture contained in the treated articles—a process assisted by the admission of air from a valve at the bottom of the chamber, while a small ejector in the exhaust-pipe keeps up circulation.

The action of the machine constructed by Messrs. Richardson & Cruddas is somewhat different. Its working was tested by Mr. Hewett, the Assistant Executive Engineer, Municipal Workshops, who reported that the means taken to get rid of the contained air in the chamber and to secure a thorough penetration are as follows :—“ On the admission of steam from the outer to the inner casing, or, in other words, from the boiler to the disinfecting chamber, the pressure in the latter rises to 6lbs., corresponding to a temperature 230° F. When this pressure is attained, a safety valve in communication with the chamber and loaded to 6lbs. comes into action, and allows all surplus steam to blow off into the atmosphere. As the boiler continues to generate steam, a current of steam at the above pressure is continuously passing through the chamber. This action appears to secure thorough penetration of all articles, for on wrapping my handkerchief tightly up inside a blanket, and afterwards withdrawing it from the chamber before the drying operation was commenced, it was found to be quite damp and hot. In regard to the drying of the articles after treatment, I find that the apparatus is as quick, if not quicker, in action than the equifex disinfector. This is attributed to the fact that, although the steam pressure used is very much less than in the equifex apparatus, the heating surface is much greater, and the few clothes treated in my presence were found to be practically dry after five minutes treatment.”

The cost of working this disinfector is somewhat smaller than that for the equifex, and is estimated to be Rs. 200 per mensem. Its prime cost is about Rs. 2,000, something less than one-third the cost of an equifex.

APPENDIX No. 6.

Rats.

Whether rats bring Plague from infected into uninfected localities, or whether local rats are the first victims to existing local infection, has not been determined. It seems almost certain that, in some instances, rats suffering from Plague have moved in numbers to a fresh locality, and have brought Plague among the people there. In other instances the evidence seems to show that local rats sickened in consequence of the introduction of infection by human agency. In either case the certain and close connection between sick rats and Plague is beyond question; and the sequence is almost invariable that, unless disinfectants are freely used, Plague among rats is followed by Plague among men. It was the hope of the Committee to devise some organization by which rats could be killed in large numbers. High rewards, as much as one anna a rat, were offered, and the necessity of inducing people to kill rats was impressed on all Plague officials. The idea of bringing Wadars or other Deccan rat-catchers to work in Bombay was suggested, but had to be abandoned. The Wadars and other upcountry rat-catchers work in open fields driving the rats into the centre of the rat warrens, and there securing them in large numbers. The stone pavements in Bombay made the tools and the methods of the upcountry rat-catcher useless. Again it was thought that among British soldiers a certain number of skilled rat-catchers might be found. This attempt also failed. Finally, Bombay native rat-catchers were engaged, but with no satisfactory result. The only course that remained was to continue the existing practice of special care in obtaining news of sick rats, and in opening the drains, closing and disinfecting the rat-holes, and disinfecting the rooms and the surroundings of any house in which sick or dead rats were found.

Dr. Lewis Godinho, the District Medical Officer, gives the following details of his experience in C Ward, both during the first and during the recent epidemic:—"Sick rats are generally found in a locality from eight to twelve days before the first case of Plague occurs among men. Plague-stricken rats give out a musky odour and rapidly develop buboes. They move about listlessly in back gullies, sinks, and bathing-places. After two days they cease to be able to move. Local rats may sometimes be infected by imported Plague. As a rule, the rats seem to carry the Plague moving from south to north, and, less regularly, from east to west. In

the previous epidemic sick rats were found in houses at the south end of Khoja Street in Khara Talao. For a time all the houses infested by sick rats were on the same side of the street. They were next found on the other side of the same street, but always in houses further north than those they had left. In the present epidemic, towards the end of February (1898), sick rats were found in Dukar Gully in Phanaswadi. They made their appearance on the ground floor of the houses at the east end of the gully, and then rapidly travelled towards the west end, keeping to the rear gullies where water could be easily obtained. About a week after the appearance of sick rats, the inhabitants of Dukar Gully began to sicken and die of Plague. The first cases happened in houses where dead rats had been found. From Dukar Gully rats travelled west to Burrow's Lane. A listless rat was found on the 5th of March in No. 3, Burrow's Lane, and eight days later a servant boy, who is said to have killed and burned a rat, was attacked with Plague."

Dr. Hornabrook, M.B., M.R.C.S., has noted the following seven instances of the finding of dead rats in houses during the recent epidemic in C Ward :—

1. In No. 2, Kumbharwada Street, in the middle of February 1898, dead rats were found previous to Plague cases.
2. In No. 29, Kolbhatwadi, dead rats, in an advanced stage of decomposition, were found at the same time as a Plague case.
3. In No. 3, Kalbadevi Road, inhabited by Europeans, dead rats were found three to four days before a case of Plague occurred among the native servants.
4. On February 20th, 1898, in No. 273, Kalbadevi Road, 20 dead rats were found in one room. The house was disinfected and limewashed, and no Plague cases occurred.
5. In No. 39, First Marine Street, ten dead rats were found. The house was disinfected and limewashed, and no Plague cases occurred.
6. In No. 8, Phanagwadi Cross Lane, Room No. 1, dead rats were found. The house was disinfected and limewashed, and no Plague case occurred.
7. In Diva's Chawl, Trinity Street, dead and dying rats were found. A Plague case occurred in the same chawl a few days later.

Dr. Shroff, on 20th April 1898, reports that on Malabar Hill dead rats were found only in the servants' quarters of three bungalows close to the sea on Nepean Sea Road and Warden Road. In his opinion these diseased rats came from other infected districts, and travelled by night, as only in the morning were dead rats found. In rooms where dead rats were found, even though the rooms were carefully disinfected, the inmates were attacked with Plague.

The outbreak of Plague in Fort North was accompanied by the appearance of sick rats in Carwar Street, Mint Road, and the by-streets, and for some considerable time almost daily reports of dead and dying rats were received from various parts of the Fort.

The following is a list of places in which rats were found dead or dying for some three weeks in the winter in the Fort only :—

Elphinstone Circle.	47, Hornby Road (Oriental Buildings).
Customs House.	45 & 84, Hornby Road.
Dean Lane.	Hornby Road.
Hummum Street.	30 & 33, Frere Road.
Meadow Street.	Green Street.
Carwar Street.	Grant Road Buildings.
Goga Street.	37 & 67, Esplanade Road.
Mint Road.	Forbes Street.
17, Military Square.	Tamarind Lane.
7, Barber Lane.	Cawasji Patel Street.

APPENDIX No. 7.

Inoculation.

The attitude of the Committee as regards the prophylactic inoculation advocated by M. Haffkine, C.I.E., has been the subject of considerable criticism and condemnation in the public press.

The subject was thoroughly considered and discussed, and a resolution was finally adopted, excluding the measure as not being one of those that should be worked by the Committee.

It was considered that inoculation could not, as a means of suppressing the disease, take the place of segregation, disinfection of houses, and removal of persons from infected localities.

The Committee had all along been engaged with operations of an administrative nature in obedience to the principles laid down by Government for combating Plague, and neither they nor their officers had much opportunity of inquiring into the scientific aspect of this question or of putting it to that severe test of investigation and inquiry which its importance rendered necessary. In fact, beyond certain published records, the barest information has been obtained directly by the Committee, and latterly this experience has been limited to notes on a few cases in the Khojah Hospital, in which doubts were thrown upon the efficacy of inoculation. The cases were six in number, of which five were fatal; and the periods which had elapsed since inoculation varied from eight days to six months.

The notes and report were sent to M. Haffkine for the favour of scrutiny, and his reply was as follows :—

“It appears that three of the persons believed, by the Medical Officer in charge of the Mahomedbhai Ebrahim Hospital, to have been inoculated, have not been inoculated. These are Tejbai Mahomed, Umerbai Karamally and Shakahaibai Ahmed, who all succumbed to the Plague in the above hospital between the 5th and 16th January 1898.

“The information concerning the fourth patient, Halimabai Allibhoy, said to have been inoculated twice in Poona, and who afterwards passed through a rapidly subsiding attack of Plague in the above hospital, could not be verified for the present, as the documents concerning the Poona inoculations have been placed in charge of the Poona Plague Committee. The remaining three patients were actually inoculated;

“ one Gulam Hoosein Meherally on the 21st April, 8½ months before the
“ attack ; another Mahomed Visram, who died nine days after the inocu-
“ lation, is stated to have been already unwell at the time of inoculation,
“ and felt pain in the gland on that day ; and the third, Hoosein Allimiya,
“ whose disease took a favourable turn from the next day after admis-
“ sion, was inoculated ten days before.”

It is acknowledged by the Committee that the inoculations may be protective for a certain period—the duration of which is unknown—and M. Haffkine's figures seem to show that they are successful ; but it is impossible to make such prophylaxis compulsory, or to make it keep pace with the spread of Plague.

Under these circumstances, it did not seem desirable for the Committee to inaugurate and take part in the introduction of inoculations, which could only be properly done by the formation of a specially trained staff, separate from the general staff on which the Committee depended for the due performance of those duties, which, in the opinion of the Committee, were of paramount importance. When, soon afterwards, the Municipality took up the subject and opened stations for voluntary inoculations in different parts of the City, a question, which was bristling with doubts and difficulties, was solved in a way which undoubtedly produced the maximum of good and the minimum of friction.

APPENDIX No. 8.

NOTES ON SOME BACTERIOLOGICAL OBSERVATIONS MADE IN THE
GRANT ROAD LABORATORY

BY

Dr. L. G. HANSON, M.B., D.P.H.,

AND

Dr. F. M. GIBSON, M.B., B.Sc.

A series of experiments were made with the object of ascertaining, as far as possible, how the specific contagion of the disease passed from man to man, from rat to rat, or from rats to men; and, secondly, the relative degree of infectiousness in the dead as compared with the living.

While these experiments were in progress, some information was also gained on other points, hereafter enumerated.

Blood, excretions, and secretions were systematically examined, both from men and rats that had died of Plague. The presence of innumerable bacterial forms in such material, many of them bearing a strong resemblance, both microscopically and culturally, to the Plague organism, adds very largely to the difficulty of such an investigation, and renders it imperative, that no organism should be declared to be the Plague bacillus until it has been isolated, grown pure, and shown capable of *reproducing* the same disease:

The following methods were adopted to obtain the materials for examination:—

IN MEN DEAD OF PLAGUE.

Blood from the lungs and extremities was obtained by a sharp, pointed, sterile, capillary pipette, thrust through sterilised areas of the skin.

Urine, or, more properly speaking, fluid expressed from the urethra was drawn in small quantities by sterile pipettes from the urethra.

Faeces from rectum by a sterilised glass rod.

Sputum from fauces by swabs of sterile cotton wool.

Tears and sweat were not examined, but it is extremely improbable and contrary to all previous experience that a bacillus could be excreted in the latter.

IN BATS DEAD OF PLAGUE.

Blood was obtained from the snipped-off tip of the tail, the lungs and the spleen.

It may be here remarked that we never failed to obtain a pure cultivation of the germ from the extreme tip of the tail, and this can be so readily snipped off, squeezed and pressed on to a slide that it forms a very rapid and safe method for the diagnosis of Plague-stricken rats which are so frequently the forerunners of an outbreak.

Urine—Obtained by expressing the contents of the bladder “per urethram” after sterilising the outlet with a hot glass rod. This was found to be the most reliable method, as incisions through the bladder wall might permit the admission of Plague organisms from the blood.

Fæces—Obtained on a platinum loop after scorching a hole through the intestinal wall.

Sputum—By swabbing the fauces.

In the Blood—Plague bacilli were found in all cases *in men and rats* dead of Plague, but in the blood of rats they were, as a rule, far more abundant.

In Liquid drawn from Urethra—Plague bacilli were demonstrated both in *men and rats*.

In Fæces—They were found in rats, but not *up to the present* in men.

In Sputum—It was always found in Plague pneumonia cases, but in ordinary cases we have failed up to the present to isolate it. By Plague is *not* meant the secondary pneumonia which is so common a complication of the bubonic type, but a pneumonia which is the *first* and predominant feature of the disease.

The above experiments, although their number so far is too limited to justify a rigidly definite statement, go towards showing that most of the principal excretions are the means of transmitting the disease from the dead to the living, both as regards men and animals.

INFECTIOUSNESS OF THE LIVING.

This leads up to the question as to the length of time before death that these excretions become a source of danger.

In man this time is apparently very short. We have repeatedly failed to find the bacilli in the blood even three or four hours before death, from which it may be inferred with tolerable certainty that it is absent from the excretions also until a very short period before death.

(Plague pneumonia is a notable exception, the bacillus being present in the sputum at an early stage.)

In short, the organism seems to be confined to the bubo until shortly before death, and it is only then that it gains an entrance into the blood stream, and becomes rapidly and widely disseminated in the tissues and in the excretions, which one so constantly sees dribbling away on to the floors and bedding in moribund cases.

Hence, in the interests of the living, a strong argument can be deduced for the compulsory removal even of these moribund cases.

INFECTIOUSNESS OF CONVALESCENT CASE.

Examination of blood, and pus from buboes which had opened naturally or been incised, gave *negative* results, and it therefore seems unlikely that the organism can be present in the excretions of such cases.

VITALITY.

As to the vitality of the germ under laboratory conditions, it was found that cultures grown for 57 days in one tube, and then transplanted, flourished, and were capable of producing fatal Plague in rats, although the incubation period was much longer than for more recent growths.

INCUBATION PERIOD.

The usual period in rats was found to be from two to three days. In the above case the period was seven days. Rats kept in cages in which inoculated rats had just died of Plague did not develop the disease.

All attempts to isolate the organism from the floors of infected dwellings or soil gave negative result both by plate cultivation and inoculation.

Bacilli, closely resembling it both microscopically and in their growths, were found, but did not stand the final test.

Rats inoculated with polluted soil generally died, but not of Plague.

Examination of the organs reveals the fact that malignant oedema is usually the cause of death.

If, however, Plague bacilli have been purposely added to the soil used, the rat dies of a mixed infection; but the Plague bacilli can be readily isolated from the organs, because the bacillus of malignant oedema dies out at once in aerobic cultivations and leaves the Plague pure.

This method, therefore, of detecting the germ in the soil seems a promising one to pursue, provided always the real cause of death is scientifically ascertained.

Experiments are also in progress to find out the vitality of the germ in sterile and polluted soil respectively.

APPENDIX No. 9.

EXPLANATION OF MAPS AND CHART.

MAP No. 1.

Map No. 1 shows the sub-division of the Island into Wards and Sections, and in the marginal squares, the names of the officers in charge of the same.

The colouring on the plan of the wards, agrees with the marginal squares, and within the squares are given the names of the Sections, the population, and the number of houses in each Section.

A Plague Committee Hospital is shewn by a circle coloured yellow, with a number in the centre of it. On a reference to the index at the side of the map, the name of the Hospital referred to is given. The Committee's Health Camps are shewn by a red circle, with a number. A similar index at the side of the map gives the name of the Camp.

The small pink squares with numbers, indicate the position of the Private Hospitals, and the index at the side of the map gives the names and the Sections in which the Hospitals are situated.

MAP No. 2.

Explanation of Map.	Map No. 2 is an epidemic map of the disease, showing its course from September 1897 to the end of March 1898.
Primary Colours.	<p>The primary colours have been made use of in this plan in their regular order, as shown by the large coloured circles in the margin, month by month, and this has been continued after the 7th month by using the colours again and hachuring the circle.</p> <p>In the margin are also shown all the Census Sections of the city.</p>
Sections.	Each Section, as it became epidemic, was coloured with the colour distinguishing the month in which the disease arrived at the epidemic stage, and under each marginal Section heading is shown the number of cases taking place monthly in that Section, after the disease had become epidemic.
Epidemic.	In deciding on the epidemic state of a Section, great care was taken to carefully watch the distribution of the cases throughout the Section, and this was done in many instances by plotting on a plan the actual cases from house to house. It has often occurred in this city that Plague has raged in an epidemic form in small and confined areas, especially those inhabited by Kolis (fishermen), while beyond such areas it has only appeared in a sporadic form. In such cases the whole Section was not considered epidemic. Previous to, and after the epidemic period, cases appertaining to the month in which they occurred are shown by coloured circles placed in the Section, according to the monthly colour; the number of cases shown in the circles indicates the number occurring in that month.

A similar plan was prepared for the first epidemic and attached to the first Report of the Bombay Plague Committee.

On referring to that plan it will be seen that the epidemic area in 1896-97 is much smaller than in 1897-98.

It may also be noticed that the first Section to become epidemic was Dongri in January, a month later than in the previous epidemic, and the same will refer to all the other Sections.

Up to the end of March 1898, 24 Sections only out of 32 had become epidemic, pointing to the fact that the measures taken had the effect of keeping the disease within a much smaller area than in the epidemic of 1896-97, when 31 Sections were epidemic. Again, up to the date to which the chart is compiled, there has been no recrudescence in any Section, which was not the case in 1896-97. The following conclusions may probably be inferred from the readings of the chart as to the effect of the measures taken :—

- (1.) The epidemic area of the disease reduced in 1897-98 in comparison with 1896-97.
- (2.) No recrudescence in any of the Sections, such as occurred in 1896-97.

MAP No. 3.

MEMORANDUM on Mortality Chart from 1st June 1897 to 30th April 1898 by PLAYFORD REYNOLDS, Esq., C.E., Superintending Engineer, Bombay, P.W.D.

This chart is a continuation of that shown as Plan 3 attached to General Gatacre's Mortality Chart Plan No. 3 report, with the addition of arrow heads indicating wind directions, extracted from the daily meteorological reports as follows :—

Maximum and minimum temperatures	...	...	shown by thick black lines.
Population	...	...	„ a thin blue line.
Humidity	...	...	„ a green line.
Daily mortality	...	...	„ a thick red line.
Normal mortality, average of the 5 years previous to plague	...	...	shown by a thin red line.
Velocity of wind	...	...	„ purple line.
Wind directions...	...	...	„ arrow heads.
Clouds	...	...	„ a brown line.

The horizontal scale is six days to an inch; the vertical scale varies, as shown Scale. in the left hand margin.

The information in the chart has been obtained as follows :—

Information obtained.

Temperatures, humidity, wind velocities and clouds—from the records of the Colaba Observatory.

Wind directions—from the daily reports by the Meteorological Reporter, Western India.

Population—from the Managing Director of the Tramway Company, based on average tramway receipts for several years, checked with information published by the Bombay Chamber of Commerce. These returns, from independent sources confirmed by the Plague Committee's observations, may be taken as fairly correct.

Daily mortality—from cemetery returns of the Municipal Health Department.

Normal mortality—the average of the five years previous to the outbreak of the Plague from the returns in the *Government Gazette*.

The *red* figures at the top of the chart are the total deaths from all causes during each month, and the *red* figures below are the total deaths from Plague; deaths from cholera are shown in *black* figures under the Plague totals.

Plague deaths.

The total number of deaths from Plague has been arrived at in the following manner :—

The total weekly average number of deaths during the five years previous to the Plague has been deducted from the total deaths from all causes for the week, and the remainder taken as the number of deaths due to Plague, deaths from cholera being shown separately. But owing to the decrease of population, there must be added, in order to arrive at a true conception of the increased mortality, a figure bearing the same proportion to the recorded deaths as the calculated actual population bears to the normal population of 850,000. This calculation has been made, and the figure or number to be added is given in *red* figures above the numbers for *estimated* deaths from Plague by months, entered at the bottom of the chart.

Object of compilation of chart.

The object of the compilation of this chart was to establish the truth or otherwise of some of the theories freely advanced regarding the definite influence of temperature, humidity, wind and clouds on mortality. No more definite connection is evident from the records than was the case last year (see marginal quotation from last year's report), and most, if not all, of these theories must for the present be abandoned.

Northerly and easterly winds, which are always dry, seem generally to have had an unfavourable influence, often immediately so, on the mortality, *e.g.*, after October, *i.e.*, from November to near the end of March (when the humidity was only on four days above 80 and generally between 60 and 70 and while easterly winds prevailed) the mortality increased irregularly but more or less steadily; and in particular cases, *e.g.*, on 8th and 9th February and on the 2nd March, when high winds were accompanied by a fall in the humidity, there were immediate increases in the deaths as shown in the chart.

There has not, however, been a sufficiently consistent sequence to make any generalisation possible, and as a matter of fact, in order to give the elements a fair chance, all Plague measures should be abandoned, for it cannot be doubted that the measures that have been adopted have had the effect of diminishing the extent of the pest. The degree of sanitary efficiency is also a disturbing factor.

Advent of the rains.

The records of 1897 show that the advent of the rains may be looked to with the confidence that this year again the Plague death returns will be very low during the monsoon; and the returns for April make this assurance doubly sure.

APPENDIX NO. 10.

A List of Members of the Local Committees.

A WARD.

COLABA.

Mr. P. David. „ Munshi Fariduddin. „ G. M. Fernandez. „ Mahomed Sendole. „ Gopal Patel.		Mr. Harrichander Vishram. „ Sorabjee Machliwala. „ K. R. Cama, J. P. „ Merwanjee Colabawala. „ J. J. Mody, J. P.
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FORT.

Mr. M. M. Murzban. „ Bomanshaw Entee. Dr. J. J. Cursetjee. Mr. R. J. Tata. „ S. E. Warden. „ M. N. Daruwala. „ Kalidas. „ Damodar Gwardhandas. Dr. E. S. Nariman. „ B. N. Darabsetti. Mr. Hormusji D. Sha. „ N. N. Gazdar.		Dr. N. N. Katrak. Mr. Ardeshir N. Gazdar. „ B. P. Dhondi. „ B. B. Patell. Dr. D. N. Saher. Mr. D. D. Albless. „ E. W. Slater. „ F. R. Joshi. „ R. P. Karkaria. „ C. E. Howard. „ C. E. McDonald.
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B WARD.

KHOJA CASTE COMMITTEE.

The Hon. Mr. Fazulbhai Visram (Chairman). Mr. Fazulbhoy M. Chinoy (Secretary). „ F. O. Ganga. „ Abdoolla Hoossein. „ Remtoolla Khairaj. „ Joosub Peerbhoy. „ Habibbhoy Cassumbhoy. „ Mahomedbhoy Vally. „ Ibrahim Rahimtoolla. „ Gullamali Mahomed Sajan. „ Hoossein Joosub.		Mr. Dost Mahomed Allana. „ Kamaria Ismail Cassum. „ Moledena Laljee. „ Mahomed Jaffer Mukni. „ Joomabhoy Khan Mahomed. „ Joomabhoy Jan Mahomed. „ Jaffarbai Samjee. „ Dostmahomed Peerbhoy. „ Sheriff Dejee Kanjee. „ Cassam Dejee. „ Mukhi Cassum Mussa. „ Luhana Carjee.
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BENI ISRAIL COMMITTEE.

Mr. David Solomon. „ E. M. Ezekiel.		Mr. Ezekiel Shalome. „ Abraham Solomon.
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COMMITTEE FOR NORTH CHUKLA & SOUTH UMARKHADI.

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„ Shamrao Pandurang.	„ Balkrishna Bhawanishankar.

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„ Balkrishna Bhiwaji Nakwa.	„ Purushottam Bhai.
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„ Nagardas Vithal Patel.		„ Damjee Vella.
„ Narayan Ramaji.		„ Dhondu Lakshman.
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„ Ghelabhai Haridas.	Mr. T. J. Desai.
„ Kamrudin Amirudin	„ Babaji Gopal.
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„ Ardeshir H. Ghaswalla.	„ Abdool Ally M. H. Kazi.
Mr. Dinshaw Jijibhoj.	„ Shaffi C. Tyabji (Secretary).
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Mr. Fallonjee P. Cooper.	„ J. De Cunha.
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Mr. Narayen Trimbak Vaidya (Vice- Chairman.)	„ Devjee Odhavjee,
„ Atmaram Balkrishna Rele.	„ Bhimrao Atmaram.
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„ Harichandra Pandurang.	„ Narayen Shivshankarjee.
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Mr. D. G. Padhye (Secretary).	" B. L. Gharet.
" Mulraj Khatau.	Dr. H. N. Seervai.
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" R. N. Paramanand.	" Krishnarao Sakharan Masurkar.
Mr. Peter De Lima.	" Narhar Moreswar Shrotri.
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" Shamrao Vithal.	Mr. Narotam Morarjee.
" D. P. Kirloskar.	Prof. N. G. Welinkar.
" D. A. Idgunji.	Mr. B. H. Nazar.
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Dr. De Silva.	" Jahangirjee Dorabjee Nimuch- wala.
Mr. Mahadeo Rajaram Bodas.	" Ratanshaw K. Dadachanjee.
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D WARD (WEST).

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" Naranjee Dwarakadas.	" K. B. Sethna.
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" Ibrahim Nooroodin Ibrahim.	" Franjivandas Kaliandas.
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E WARD.

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„ Jaya Karadi Lingo.	„ P. F. Bhandara.
„ Manjee Rajujee.	„ Narsu Sayabu.
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„ Ramjan Babanbhai.	„ Ismail Mahmed Matta.

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„ Hakim Mahomed Dazami.	„ Shaik Oosman Kaffir.
„ Sudar Khuda Baksha.	„ Mahomed Ibrahim Makhbu.
„ Bala Bhaudin Khote.	„ Ibrahim Hafiz.

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„ Limbaji Bapoojee.	„ Jamsetjee C. Kharadi.

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„ Ramohandra Ashanna.	„ D. K. Desai.
„ P. C. Daroovala.	„ L. N. David.

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„ Abdool Rahiman Bakhshulla.	„ Chedan Yar Mahomed.
„ Karim Illahibuksha Sirdar.	

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„ Haji Ismail Badda.	„ Harrington.
„ Ibrahim Khan Mahomed.	

Section III.

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„ Dadajee B. Gaekwar.	Dr. Bisni.
„ Majanlal Fisram.	„ Pandurang Raoji Bhapkar.
„ Raghunath Keshav Bhawe.	

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„ Nowrojee D. Ditta.	„ Abdul Rahiman Shahluddeen.
„ Hormusjee N. Narielwala.	„ Darma Naojee Patal.

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„ H. Somekh.	„ P. R. Raghina.
„ Ardeshir F. Divitri.	„ Ashburner.

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„ R. Raghunath.	Dr. D. R. Wadia.
„ R. F. Badliwalla.	

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„ Narayen Abbaji.	„ Shaik Ismail.
„ R. Ragnath.	

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„ R. Hassoo.	

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„ R. Munshi.	„ J. M. Shrao.
„ B. Balaji.	„ E. Rodrigue.
„ N. Marphatia.	„ J. Tesara.

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„ I. F. Madan.	„ Setna.
„ Vasudeo Ramchandra Jaykar.	„ D. Framji.

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„ D. Bhimji.	„ Maulvi Haji Gulam Mahomed.
„ Adam Abba.	„ Abdulla Guard.
„ Isak Mussa.	„ Maneksha Dossabhai Vachha.
„ Dyal Mulji.	

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„ P. S. Laud.	„ Y. Sanzgiri.
„ G. T. Vaidya.	„ G. Trilokekar.
„ S. Laud.	„ D. M. Dalal.
„ S. Jewraj.	

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Mr. A. N. Dalvi.	„ K. Baboo Rao.
„ D. N. Vaidya.	„ Rao Bahdur Pitale.
„ R. S. Taki.	„ I. K. Paralkar.

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„ M. Ib. Dadu.	„ B. Samsuddin.
„ Devji Master.	

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„ Janardan Gopal.	„ M. Venayek.
„ Janardan Pandurang.	

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Dr. Tata.	„ D. M. Daboo.
Mr. C. H. Batliwalla.	„ J. Dorabji.
„ N. M. Marshall.	

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„ Fakurudin.	„ Mahomed Ibrahim Shaik Daood.
„ Shaik Madarulla.	

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„ M. A. Paskal.	„ G. Sivgur.

Section XIV.

Mrs. Drupatti Bai.	Mr. Maroti Appa.
Mr. Makun Pilaji.	„ Narayen Appa.

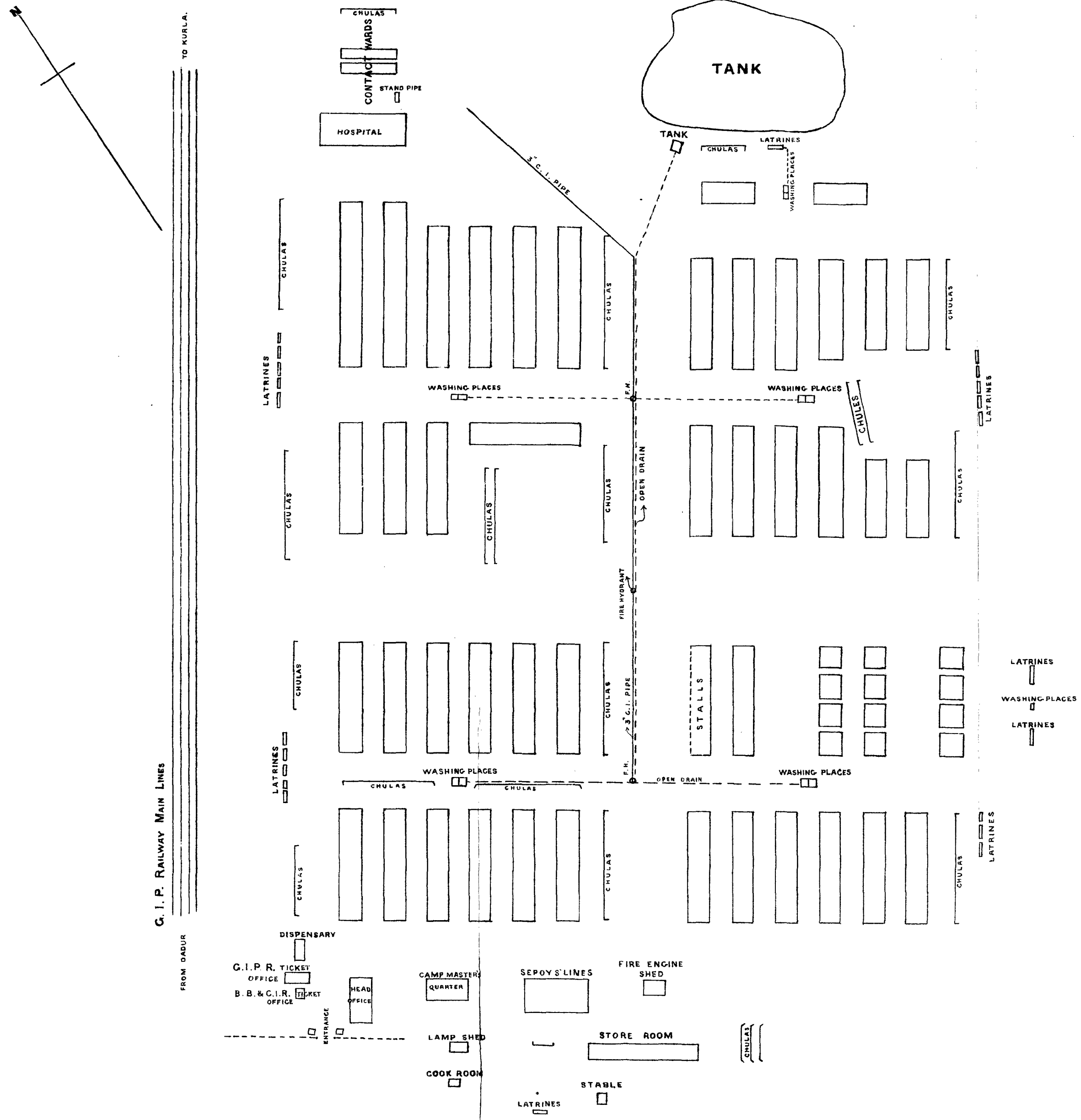
Section XV.

Mr. Dondi Rama.	Mr. Tukaram Vitooba.
„ Krishna Rajoo.	

DHARAVI CAMPE.

Mr. Shamrao Chintaman (Chairman).	Mr. Fakir Deo Kini.
„ Vitthaladas Ratanji Damania (Secretary).	„ Tukaram Abaji.
	„ Dinanath Purushottum.

PLAN SHEWING THE ARRANGEMENTS OF HUTS AT DADUR HEALTH CAMP



*J. Campbell
Chairman Plague Committee*

SCALE 80 FEET TO AN INCH