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[Despatch Abstract.]

Mons: Haffkines' Anti-Plague inoculation

Commr to the Surgeon-General & the Sanitary Commr letters from the Govt of India, forwarding an account of the experiments made by Monsieur W. M. Haffkine with prophylactic and curative serum during an outbreak of plague in the Jail at Bombay & requesting the Surgeon-General to communicate this to all District Medical Officers & Surgeons of Districts in Madras.

6 P

BACK PAPERS.

No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Government {1897} of Madras.

LOCAL AND MUNICIPAL.

Recd. } 1897. *Enclosures*

Regd. } *Spare copies*

G.O., No. 367 M., 4th March 1897.

MARCH.

Monsieur Haffkine's Anti-Plague Inoculation.

Communicating to the Surgeon-General and the Sanitary Commissioner letters from the Government of India forwarding an account of the experiments made by Monsieur W. M. Haffkine with prophylactic and curative serum during an outbreak of plague in the jail at Bombay, and requesting the Surgeon-General to communicate this to all District Medical Officers and Surgeons of districts in Madras.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—the following papers:—

From the Secretary to the Government of India, Home Department, to the Secretary to the Government of Madras, Local and Municipal Department, dated 25th February 1897, No. 730-Sanitary.

I am directed to forward, for the information of His Excellency the Governor in Council, a copy of the letters marginally noted from Monsieur W. M. Haffkine giving an account of experiments made with prophylactic and curative serum during an outbreak of plague in the jail at Bombay.

Letters, dated 16th and 17th February 1897.

Enclosures.

From Monsieur W. M. HAFFKINE, to the Secretary to the Government of India, Home Department, dated Bombay, the 16th February 1897.

In view of the urgency of the case I have the honour to communicate the following information concerning the outbreak of plague in Her Majesty's House of Correction, Byculla, where a considerable portion of inmates had volunteered to undergo the prophylactic treatment, and where the first observations on the effect of this treatment have been collected.

Between the 23rd and 29th of January last nine cases of plague have occurred in the jail, of which five proved fatal, the population at the beginning of the outbreak numbering 345 souls.

The prophylactic treatment has been applied on the 30th January, 154 of a total 337 volunteering to be inoculated.

Occurrences on the day of the inoculation.—In the forenoon of the day of inoculation six new patients have been admitted to the hospital suffering from plague; of these three proved fatal.

The inoculations were applied in the afternoon. One of the inoculated, Kessu Umar Shankar, prisoner No. 672, had at the time of inoculation a painful gland in the left groin; two others, Abdool Karim, No. 1356, and Govind Pandoo, No. 1222, developed painful glands in the left axilla the same evening. These three cases have also proved fatal.

On the 1st day after inoculation there were—
Amongst 177 not inoculated prisoners 2 cases, of which 1 proved fatal.
Amongst 151 inoculated 1 case, who rapidly improved and recovered.
On the 2nd day after inoculation there were—
Amongst 172 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*
On the 3rd day after inoculation there were—
Amongst 173 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*
On the 5th day after inoculation there were—
Amongst 171 non-inoculated 1 case, which proved fatal.
Amongst 146 inoculated *nil.*
On the 6th day after inoculation there were—
Amongst 169 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*

On the 7th day after inoculation there were—
Amongst the 169 non-inoculated 5 cases, of which 1 proved fatal.
Amongst 146 inoculated 1 case, who is alive.
Since the 6th instant, no more cases have occurred in the jail.
The following is a tabulated form of the occurrences—

Date of occurrences.	Amongst the non-inoculated.	Amongst the inoculated.
23rd to 29th January 1897	9 cases, 5 fatal.	....
30th January 1897, the day of inoculation. Forenoon before inoculation.	6 cases, 3 fatal.	....
30th January 1897, the day of inoculation. Afternoon after inoculation.	....	3 cases, fatal.
1st day after inoculation, 31st January 1897	2 cases, 1 fatal.	1 case.
2nd " 1st February 1897	1 case, fatal.	....
3rd " 2nd " "	1 case, fatal.	....
5th " 4th " "	1 case, fatal.	....
6th " 5th " "	2 cases, 1 fatal.	....
7th " 6th " "	5 cases, 1 fatal.	1 case.
Total, after the day of inoculation	12 cases, 6 fatal in an average daily strength of 173 non-inoculated.	2 cases, in an average daily strength of 148 inoculated.

The experience gained by the observation in this jail tends to show—

1*st.*—That the injection of 3 ccm. of the prophylactic seems to be sufficient to effect the desired protection, no repetition of inoculation being necessary to arrest the disease during an existing epidemic.

2*nd.*—That the prophylactic is powerless to arrest the symptoms of plague already started, or which develop within a few hours, but there is the possibility of its influencing the disease in the incubation period, in individuals infected 3 or 4 days previously.

3*rd.*—That the time necessary for the plague prophylactic to produce the protective effect is shorter than in any preventive treatment known, this period being in the anti-cholera inoculation of 4 days, in vaccination against small-pox of 7 days, in the inoculations against anthrax of 12 days, in the inoculations against rabies of 15 days, and in the present treatment, apparently less than 1 day.

4*th.*—The question remains open as to how long will the inoculated persons remain proof against the disease, and, therefore, in order to ensure the probability of a more lasting effect, it is advisable to apply repeated inoculations, with doses higher than the above mentioned.

The above conclusions are temporary and refer only to the teaching of the particular outbreak in question. There remains fully the possibility of the future experience compelling us to modify the above conclusions, though the expectation is justifiable that the general bearing of the results as above detailed will remain unshaken.

A copy of this letter forwarded to the Municipal Commissioner for the City of Bombay.

From Monsieur W. M. HAFFKINE, to the Secretary to the Government of India, Home Department, dated Bombay, the 17th February 1897.

I have the honour to communicate the following information on the attempt at curative treatment, which has been made by means of the anti-toxine at present under preparation here at Siwree during the outbreak of plague in Byculla jail.

A patient, called Ganoo Baloo, admitted to the hospital since 3 days, has received one injection of anti-toxine, but died within 11 hours.

The following patients were selected for treatment immediately after their admission to the isolation shed, though after some time has elapsed since the onset of the disease :—

Admissions on the 30*th January* 1897.—Of six patients admitted in the morning, the two most serious, Jiva Virchand and Syed Jonas Ali, were selected for the anti-toxic injection, the four milder left to the ordinary treatment.

Of the four milder, three have died within 2, 4 and 6 days.

The two others specially treated have survived.

Admissions on the 31*st January* 1897.—Of the two cases admitted, the most serious one, Annah Vishroa, has been selected for the special injection ; the other milder has been left to the ordinary treatment.

The milder case ended fatally after three days' illness ; Annah Vishroa is alive.

Admissions on the 1*st February* 1897.—Of the five cases admitted, the two most serious, Kaloo Bhimsha and Keshao Umar, have been selected for the anti-toxic injections, the three milder left to ordinary treatment.

The two treated cases have ended fatally after 6 and 12 days' illness ; of the not treated specially, two died after 4 and 9 days.

II. Analysing the result in connection with the period elapsed between the onset of the attack and the beginning of the anti-toxic treatment, it appears that—

Out of the six patients treated, four have been taken for the special injections within 24 hours after attack, and two patients after 2 and 3 days' illness ; of the four patients admitted for treatment within 24 hours, three have survived and one lived for 12 days.

The two, admitted 3 and 2 days after attack, have died 11 hours and 4 days after beginning of treatment.

I believe, from the above results, that there is the possibility of the anti-toxic serum rendering service in the treatment of the disease.

At the present stage of the preparation, for producing any marked effect on the disease, the following restrictions impose themselves : it is necessary to start the treatment within the first 24 hours, and a large number of repeated injections are required.

The possibility remains that, with the further maturation of the fluid, its power will increase, so as to effect an influence on older cases, and when used in smaller doses.

No serum can as yet be issued for the use of the general public.

From R. NATHAN, Esq., Officiating Under Secretary to the Government of India, Home Department (Sanitary), to the Secretary to the Government of Madras, Local and Municipal Department, dated Calcutta, the 25th February 1897, No. 8 Sany.-734.

I am directed to forward, for the information of the Governor in Council, a copy of a letter and enclosures from Monsieur Haffkine, the Bacteriologist who has been deputed to Bombay to make investigations connected with the plague, on the subject of the possibility of protecting the population against the plague by small-pox vaccination. I am to request that effect may be given to Monsieur Haffkine's suggestion that the officers who certify cases and deaths of plague may be instructed to give information regarding the presence or otherwise, on the body of children and adults, of recent vaccination marks and marks from a natural attack of small-pox. I am further to request that any information collected in this manner may be communicated to the Government of India.

Enclosure.

From W. M. HAFFKINE, Esq., to the Secretary to the Government of India, Home Department.

I have the honour to forward copy of a telegram from the Secretary of State for India, No. 4297, dated the 2nd instant, referring to the possibility of protecting the population against the plague by small-pox vaccination.

The following data bearing on the question have been furnished by the recent outbreak of plague in Her Majesty's House of Correction, Byculla.

At the outbreak of plague, on the 23rd of January last, there were in jail 345 inmates amongst whom there were no unvaccinated individuals.

One hundred and sixty-four had been revaccinated in the same jail between 22 and 325 days before the outbreak, and these, as shown below, happened to suffer from the plague to a slight extent more than the non-revaccinated.

Of the revaccinated, 84 have taken vaccination successfully and happened also to suffer from the plague more than the 82 who did not take well, having been vaccinated previously as shown by good marks on the arms.

Eighty-three were not revaccinated in the jail, but are pitted from an attack of small-pox.

Ninety-eight were not revaccinated in the jail, but had been vaccinated previously.

The following is the list of inmates who were attacked by plague during the present outbreak, from 23rd January last up to 6th instant, with details as regards vaccination against small-pox :—

Number in the Jail Register.	Name.	Statement as regard vaccination.	Transferred from the observation ward to the Plague Hospital.	Result.
977	Biva Bagu	Not revaccinated lately ..	23rd January 1897 ..	Died on 27th January 1897.
1093	Rama Govind	Do. ..	26th January 1897 ..	Died on 30th January 1897.
1359	Narayan Dhondu	Revaccinated on 30th December 1896 successfully.	27th January 1897 ..	Do.
1349	Adamji Allibhoy	Not revaccinated lately ..	Do.	
1235	Katan Lakundas	Revaccinated on 24th October 1896 unsuccessfully.	Do.	
1094	Ramgulab Ram Pratab ..	Not revaccinated ; well pitted by small-pox.	Do.	
1247	Anton Salvador	Do.	Do.	
1272	Balkrishna Mahadu ..	Revaccinated on 12th November 1896 successfully.	Do. ..	Died on 30th January 1897.
1242	Ganoo Baloo	Revaccinated on 24th October 1896 successfully.	Do. ..	Died on 31st January 1897.
1336	Syed Jonas Ali	Revaccinated on 30th December 1896, modified result.	30th January 1897.	
1312	Vali Chand	Revaccinated on 12th November 1896 unsuccessfully.	Do. ..	Died on 3rd February 1897.
1276	Hoosain Muhamad ..	Revaccinated on 12th November 1896 successfully.	Do.	
1310	Bishram Jairam	Revaccinated on 12th November 1896, modified result.	Do. ..	Died on 5th February 1897.

Number in the Jail Register.	Name.	Statement as regard vaccination.	Transferred from the observation ward to the Plague Hospital.	Result.
1129	Ranji Joti Pawa	Not revaccinated lately ..	30th January 1897 ..	Died on 1st Feb. 1897.
1144	Jiva Virchand	Revaccinated on 28th August 1896 unsuccessfully.	Do.	
1224	Annah Vishroa	Revaccinated on 24th October 1896 successfully.	31st January 1897 ..	
1229	Genoo Tessu	Revaccinated on 24th October 1896 successfully.	Do.	Died on 4th Feb. 1897.
672	Kessu Umar Shankar ..	Not revaccinated lately ..	1st February 1897 ..	Died on 5th Feb. 1897.
1356	Abdool Karim Gulam Hoosen.	Not revaccinated; well pitted with small-pox marks.	Do.	Died on 8th Feb. 1897.
832	Rama Luxman	Not revaccinated lately ..	Do.	
1261	Kaloo Bhimsha	Revaccinated on 12th November 1896 successfully.	Do.	Died on 12th Feb. 1897
1222	Govind Pandoo	Revaccinated on 16th November 1896 unsuccessfully.	Do.	Died on 3rd Feb. 1897.
1252	Jeywan Gunesh	Not revaccinated; well pitted with small-pox.	2nd February 1897 ..	Died on 11th Feb. 1897
988	Mahamad Hoosen	Revaccinated on 4th March 1896 successfully.	4th February 1897 ..	Died on 8th February 1897.
1238	Babuji Sambhaji	Not revaccinated; well pitted with small-pox.	5th February 1897 ..	Died on 7th February 1897.
1136	Manji Bagwan	Not revaccinated; well pitted with small-pox.	Do.	
1297	Dhondu Sukhia, leper ..	Not revaccinated; well pitted with small-pox marks.	6th February 1897.	
1332	Kaloo Luxmon	Not revaccinated	Do.	
749	Ganji Dongerji	Not revaccinated lately ..	Do.	Died on 7th February 1897.
1267	Baloo Krishna	Revaccinated on 12th November 1896 unsuccessfully.	Do.	
1366	Shamrao Sittaram	Revaccinated on 30th December 1896 successfully.	Do.	
933	Munnoo Ibrahim	Revaccinated on 14th March 1896 successfully.	Do.	

(1) There were, therefore, 17 persons attacked, 9 fatally, to whom small-pox revaccination had been applied 28, 31, 38, 76, 77, 79, 79, 79, 81, 86, 95, 95, 99, 99, 155, 329, and 336 days before the plague attack, giving a percentage of attacks amongst the revaccinated of 10·4 per cent., and of deaths 5·5 per cent.

(2) There were 15 persons attacked, 8 fatally, to whom small-pox revaccination had not been applied lately, giving a slightly more favourable percentage of attacks, namely, 8·3 per cent., with also a slightly more favourable percentage of deaths, namely, 4·4 per cent.

(3) A comparison between the successfully and unsuccessfully revaccinated shows:—

11 attacks among 84 successfully revaccinated, with 3 deaths, giving a percentage of attacks 13·1 per cent. and of deaths 7·1 per cent.

6 attacks amongst the 82 unsuccessfully revaccinated with 3 deaths, giving a more favourable percentage of attacks 7·3 per cent. and a more favourable percentage of deaths 3·6 per cent.

(4) A comparison between the non-revaccinated who had not had small-pox and the non-vaccinated who had gone through an attack of small-pox shows—

Eight attacks amongst the 98 who had not had small-pox, with 5 deaths, giving a percentage of attacks 8·2, and of deaths 5·1 per cent.; and 7 attacks amongst 83 who has small-pox, with 3 deaths, giving a slightly less favourable percentage of attacks 8·4 per cent.; and a more favourable percentage of deaths 3·6.

It is obvious that no importance can be attributed to the small *differences* of the figures above, and the conclusion, for instance, that the application of revaccination, or particularly successful revaccination, predisposes to an attack of plague, or increases the mortality, or that an attack of natural small-pox increases the susceptibility to plague, or diminishes the mortality, would not be warranted, as—

1st, these differences in the figures are small; and

2ndly, in certain figures, they neutralise each other by a contradictory bearing.

But the marked *similarity* in the proportions of attacks and deaths in the different groups tends to show that an attack of small-pox, or vaccination against small-pox, stand no connection whatever with the susceptibility to the plague.

Notwithstanding this result, and in consideration of the communication from the Secretary of State for India, I have the honour to suggest that the officers appointed to certify cases and deaths of plague be instructed to answer, amongst other questions, one additional, concerning the presence or otherwise, on the body of children and adults, of recent vaccination marks and of marks from a natural attack of small-pox, by which measure, in the course of time, a larger material would be accumulated relating to the questions at issue.

II. With regard to the theoretical basis of the question, it has been found by Professor Klein in London, and afterwards confirmed and generalised by a series of observers, that the artificial introduction in certain ways of a virus of a given kind, and even of many neutral, not microbial products, had a temporary effect on the susceptibility of the organism to other virus, introduced in similar or modified ways; but in no instance did this effect extend over a very limited number of days, and no specific modification, with regard to the other views; was demonstrable in the organism as the result of the treatment.

Judging, therefore, from the information accumulated up to now, a campaign of artificial preventive treatment to be started amongst the plague-stricken inhabitants is to be made with a vaccine of no other disease except with that derived from the plague virus itself.

Telegram from the Secretary of State, London, to the Governor of Bombay, dated 2nd February 1897.

It has been suggested with some scientific support that recent vaccination confers some immunity against other germ diseases besides small-pox. Suggestion might be laid before your scientific experts for enquiry whether recently-vaccinated children enjoy any apparent immunity from plague and whether matter merits further verification.

Endorsement by the Private Secretary to His Excellency the Governor of Bombay, dated Malabar Point, the 3rd February 1897, No. 51.

Copy forwarded to the Municipal Commissioner for the City of Bombay.

Endorsement by the Municipal Commissioner for the City of Bombay, dated the 4th February 1897, No. 23345.

Forwarded with compliments to Professor Haffkine for favour of opinion.

ORDER—No. 367 M., dated 4th March 1897.

Communicated to the Surgeon-General and the Sanitary Commissioner.

2. The Surgeon-General is requested to communicate this to all District Medical Officers and the Surgeons of Districts in Madras.

(True Extract.)

G. S. FORBES,
Secretary to Government.

To the Surgeon-General.
„ Sanitary Commissioner.
Copy to all Presidents of District Boards.
„ „ Chairmen of Municipal Councils.
„ to the President, Municipal Commission, Madras.
„ „ Public Department.
„ „ Marine Department.
„ „ Revenue Department.

Exd. P. Seetharam

Government {1897} of Madras.

LOCAL AND MUNICIPAL.

Recd. } 1897. *Enclosures*
Regd. } *Spare copies*

G.O., No. 367, M. 4th March 1897.

MARCH.

Monsieur Haffkine's Anti-Plague Inoculation.

Communicating to the Surgeon-General and the Sanitary Commissioner letter from the Government of India forwarding an account of the experiments made by Monsieur W. M. Haffkine with prophylactic and curative serum during an outbreak of plague in the jail at Bombay, and requesting the Surgeon-General to communicate this to all District Medical Officers and Surgeons of districts in Madras.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

From the Secretary to the Government of India, Home Department, to the Secretary to the Government of Madras, Local and Municipal Department, dated 25th February 1897, No. 730-Sanitary.

I am directed to forward, for the information of His Excellency the Governor in Council, a copy of the letters marginally noted from Monsieur W. M. Haffkine giving an account of experiments made with prophylactic and curative serum during an outbreak of plague in the jail at Bombay.

ENCLOSURES.

From Monsieur W. M. HAFFKINE, to the Secretary to the Government of India, Home Department, dated Bombay, the 16th February 1897.

In view of the urgency of the case I have the honour to communicate the following information concerning the outbreak of plague in Her Majesty's House of Correction, Byculla, where a considerable portion of inmates had volunteered to undergo the prophylactic treatment, and where the first observations on the effect of this treatment have been collected.

Between the 23rd and 29th of January last nine cases of plague have occurred in the jail, of which five proved fatal, the population at the beginning of the outbreak numbering 345 souls.

The prophylactic treatment has been applied on the 30th January, 154 of a total 337 volunteering to be inoculated.

Occurrences on the day of the inoculation.—In the forenoon of the day of inoculation six new patients have been admitted to the hospital suffering from plague; of these three proved fatal.

The inoculations were applied in the afternoon. One of the inoculated, Kessu Umer Shankar, prisoner No. 672, had at the time of inoculation a painful gland in the left groin; two others, Abdool Karim, No. 1356, and Govind Pandoo, No. 1222, developed painful glands in the left axilla the same evening. These three cases have also proved fatal.

On the 1st day after inoculation there were—
Amongst 177 not inoculated prisoners 2 cases, of which 1 proved fatal.
Amongst 151 inoculated 1 case, who rapidly improved and recovered.
On the 2nd day after inoculation there were—
Amongst 172 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*
On the 3rd day after inoculation there were—
Amongst 173 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*
On the 5th day after inoculation there were—
Amongst 171 non-inoculated 1 case, which proved fatal.
Amongst 146 inoculated *nil.*
On the 6th day after inoculation there were—
Amongst 169 non-inoculated 1 case, which proved fatal.
Amongst the inoculated *nil.*

On the 7th day after inoculation there were—
Amongst the 169 non-inoculated 5 cases, of which 1 proved fatal.
Amongst 146 inoculated 1 case, who is alive.
Since the 6th instant, no more cases have occurred in the jail.
The following is a tabulated form of the occurrences—

Date of occurrences.	Amongst the non-inoculated.	Amongst the inoculated.
23rd to 29th January 1897	9 cases, 5 fatal.	....
30th January 1897, the day of inoculation. (Forenoon before inoculation.)	6 cases, 3 fatal.	....
30th January 1897, the day of inoculation. (Afternoon after inoculation.)	....	3 cases, fatal.
1st day after inoculation, 31st January 1897	2 cases, 1 fatal.	1 case.
2nd " 1st February 1897	1 case, fatal.	....
3rd " 2nd " "	1 case, fatal.	....
5th " 4th " "	1 case, fatal.	....
6th " 5th " "	2 cases, 1 fatal.	....
7th " 6th " "	5 cases, 1 fatal.	1 case.
Total, after the day of inoculation	12 cases, 6 fatal in an average daily strength of 173 non-inoculated.	2 cases, in an average daily strength of 148 inoculated.

The experience gained by the observation in this jail tends to show—

1*st.*—That the injection of 3 ccm. of the prophylactic seems to be sufficient to effect the desired protection, no repetition of inoculation being necessary to arrest the disease during an existing epidemic.

2*nd.*—That the prophylactic is powerless to arrest the symptoms of plague already started, or which develop within a few hours, but there is the possibility of its influencing the disease in the incubation period, in individuals infected 3 or 4 days previously.

3*rd.*—That the time necessary for the plague prophylactic to produce the protective effect is shorter than in any preventive treatment known, this period being in the anti-cholera inoculation of 4 days, in vaccination against small-pox of 7 days, in the inoculations against anthrax of 12 days, in the inoculations against rabies of 15 days, and in the present treatment, apparently less than 1 day.

4*th.*—The question remains open as to how long will the inoculated persons remain proof against the disease, and, therefore, in order to ensure the probability of a more lasting effect, it is advisable to apply repeated inoculations, with doses higher than the above mentioned.

The above conclusions are temporary and refer only to the teaching of the particular outbreak in question. There remains fully the possibility of the future experience compelling us to modify the above conclusions, though the expectation is justifiable that the general bearing of the results as above detailed will remain unshaken.

A copy of this letter forwarded to the Municipal Commissioners for the City of Bombay.

From Monsieur W. M. HAFFKINE, to the Secretary to the Government of India, Home Department, dated Bombay, the 17th February 1897.

I have the honour to communicate the following information on the attempt at curative treatment, which has been made by means of the anti-toxine at present under preparation here at Siwree during the outbreak of plague in Byculla jail.

A patient, called Ganoo Baloo, admitted to the hospital since 3 days, has received one injection of anti-toxine, but died within 11 hours.

The following patients were selected for treatment immediately after their admission to the isolation shed, though after some time has elapsed since the onset of the disease :—

Admissions on the 30th January 1897.—Of six patients admitted in the morning, the two most serious, Jiva Virchand and Syed Jonas Ali, were selected for the anti-toxic injection, the four milder left to the ordinary treatment.

Of the four milder, three have died within 2, 4 and 6 days.

The two others specially treated have servived.

Admissions on the 31st January 1897.—Of the two cases admitted, the most serious one, Anna Vishram, has been selected for the special injection; the other milder has been left to the ordinary treatment.

The milder case ended fatally after three days' illness; Anna Vishram is alive.

Admissions on the 1st February 1897.—Of the five cases admitted, the two most serious, Kaloo Bhimsha and Kessu Umar, have been selected for the anti-toxic injections, the three milder left to ordinary treatment.

The two treated cases have ended fatally after 6 and 13 days' illness; of the not treated specially, two died after 4 and 9 days.

Analysing the result in connection with the period elapsed between the onset of the attack and the beginning of the anti-toxic treatment, it appears that—

Out of the six patients treated, four have been taken for the special injections within 24 hours after attack, and two patients after 2 and 3 days' illness; of the four patients admitted for treatment within 24 hours, three have survived and one lived for 12 days.

The two, admitted 3 and 2 days after attack, have died 11 hours and 4 days after beginning of treatment.

I believe, from the above results, that there is the possibility of the anti-toxic serum rendering service in the treatment of the disease.

At the present stage of the preparation, for producing any marked effect on the disease, the following restrictions impose themselves: it is necessary to start the treatment within the first 24 hours, and a large number of repeated injections are required.

The possibility remains that, with the further maturation of the fluid, its power will increase, so as to affect an influence on older cases, and when used in smaller doses.

No serum can as yet be issued for the use of the general public.

From R. NATHAN, Esq., Officiating Under Secretary to the Government of India, Home Department (Sanitary), to the Secretary to the Government of Madras, Local and Municipal Department, dated Calcutta, the 25th February 1897, No. 8 Sany.-734.

I am directed to forward, for the information of the Governor in Council, a copy of a letter and enclosures from Monsieur Haffkine, the Bacteriologist who has been deputed to Bombay to make investigations connected with the plague, on the subject of the possibility of protecting the population against the plague by small-pox vaccination. I am to request that effect may be given to Monsieur Haffkine's suggestion that the officers who certify cases and deaths of plague may be instructed to give information regarding the presence or otherwise, on the body of children and adults, of recent vaccination marks and marks from a natural attack of small-pox. I am further to request that any information collected in this manner may be communicated to the Government of India.

Enclosure.

From W. M. HAFFKINE, Esq., to the Secretary to the Government of India, Home Department.

I have the honour to forward copy of a telegram from the Secretary of State for India, No. 4297, dated the 2nd instant, referring to the possibility of protecting the population against the plague by small-pox vaccination.

The following data bearing on the question have been furnished by the recent outbreak of plague in Her Majesty's House of Correction, Byculla.

At the outbreak of plague, on the 23rd of January last, there were in jail 345 inmates amongst whom there were no unvaccinated individuals.

One hundred and sixty-four had been revaccinated in the same jail between 22 and 325 days before the outbreak, and these, as shown below, happened to suffer from the plague to a slight extent more than the non-revaccinated.

Of the revaccinated, 84 have taken vaccination successfully and happened also to suffer from the plague more than the 82 who did not take well, having been vaccinated previously as shown by good marks on the arms.

Eighty-three were not revaccinated in the jail, but are pitted from an attack of small-pox.

Ninety-eight were not revaccinated in the jail, but had been vaccinated previously.

The following is the list of inmates who were attacked by plague during the present outbreak, from 23rd January last up to 6th instant, with details as regards vaccination against small-pox :—

Number in the Jail Register.	Name.	Statement as regard vaccination.	Transferred from the observation ward to the Plague Hospital.	Result.
977	Biva Bagu	Not revaccinated lately ..	23rd January 1897 ..	Died on 27th January 1897.
1093	Rama Govind	Do. ..	26th January 1897 ..	Died on 30th January 1897.
1359	Narayan Dhondu	Revaccinated on 30th December 1896 successfully.	27th January 1897 ..	Do.
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1235	Katan Lakundas	Revaccinated on 24th October 1896 unsuccessfully.	Do.	
1094	Ramgulab Ram Pratab ..	Not revaccinated; well pitted by small-pox.	Do.	
1247	Anton Salvador	Do.	Do.	
1272	Balkrishna Mahadu ..	Revaccinated on 12th November 1896 successfully.	Do. ..	Died on 30th January 1897.
1242	Ganoo Baloo	Revaccinated on 24th October 1896 successfully.	Do. ..	Died on 31st January 1897.
1336	Syed Jonas Ali	Revaccinated on 30th December 1896, modified result.	30th January 1897.	
1312	Vali Chand	Revaccinated on 12th November 1896 unsuccessfully.	Do. ..	Died on 3rd February 1897.
1276	Hoosain Muhamad ..	Revaccinated on 12th November 1896 successfully.	Do.	
1310	Bishram Jairam	Revaccinated on 12th November 1896, modified result.	Do. ..	Died on 5th February 1897.

Number in the Jail Register.	Name.	Statement as regard vaccination.	Transferred from the observation ward to the Plague Hospital.	Result.
1129	Ranji Joti Pawa	Not revaccinated lately ..	30th January 1897 ..	Died on 1st Feb. 1897.
1144	Jiva Virchand	Revaccinated on 28th August 1896 unsuccessfully.	Do.	
1224	Anna Vishram	Revaccinated on 24th October 1896 successfully.	31st January 1897 ..	
1229	Genoo Tessu	Revaccinated on 24th October 1896 successfully.	Do.	Died on 4th Feb. 1897.
672	Kessu Umar Shankar ..	Not revaccinated lately ..	1st February 1897 ..	Died on 5th Feb. 1897.
1356	Abdool Karim Gulam Hoosen.	Not revaccinated; well pitted with small-pox marks.	Do.	Died on 8th Feb. 1897.
832	Rama Luxman	Not revaccinated lately ..	Do.	
1261	Kaloo Bhimsha	Revaccinated on 12th November 1896 successfully.	Do.	Died on 12th Feb. 1897
1222	Govind Pandoo	Revaccinated on 16th November 1896 unsuccessfully.	Do.	Died on 3rd Feb. 1897.
1252	Jeywan Gunesh	Not revaccinated; well pitted with small-pox.	2nd February 1897 ..	Died on 11th Feb. 1897
988	Mahamad Hoosen	Revaccinated on 4th March 1896 successfully.	4th February 1897 ..	Died on 8th February 1897.
1238	Babuji Sambhaji	Not revaccinated; well pitted with small-pox.	5th February 1897 ..	Died on 7th February 1897.
1136	Manji Bagwan	Not revaccinated; well pitted with small-pox.	Do.	
1297	Dhondu Sukhia, leper ..	Not revaccinated; well pitted with small-pox marks.	6th February 1897.	
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1267	Baloo Krishna	Revaccinated on 12th November 1896 unsuccessfully.	Do.	
1366	Shamrao Sittaram	Revaccinated on 30th December 1896 successfully.	Do.	
933	Munnoo Ibrahim	Revaccinated on 14th March 1896 successfully.	Do.	

(1) There were, therefore, 17 persons attacked, 9 fatally, to whom small-pox revaccination had been applied 28, 31, 38, 76, 77, 79, 79, 79, 81, 86, 95, 95, 99, 99, 155, 329, and 336 days before the plague attack, giving a percentage of attacks amongst the revaccinated of 10·4 per cent., and of deaths 5·5 per cent.

(2) There were 15 persons attacked, 8 fatally, to whom small-pox revaccination had not been applied lately, giving a slightly more favourable percentage of attacks, namely, 8·3 per cent., with also a slightly more favourable percentage of deaths, namely, 4·4 per cent.

(3) A comparison between the successfully and unsuccessfully revaccinated shows:—

11 attacks among 84 successfully revaccinated, with 3 deaths, giving a percentage of attacks 13·1 per cent. and of deaths 7·1 per cent.

6 attacks amongst the 82 unsuccessfully revaccinated with 3 deaths, giving a more favourable percentage of attacks 7·3 per cent. and a more favourable percentage of deaths 3·6 per cent.

(4) A comparison between the non-revaccinated who had not had small-pox and the non-vaccinated who had gone through an attack of small-pox shows—

Eight attacks amongst the 98 who had not had small-pox, with 5 deaths, giving a percentage of attacks 8·2, and of deaths 5·1 per cent.; and 7 attacks amongst 83 who has small-pox, with 3 deaths, giving a slightly less favourable percentage of attacks 8·4 per cent.; and a more favourable percentage of deaths 3·6.

It is obvious that no importance can be attributed to the small *differences* of the figures above, and the conclusion, for instance, that the application of revaccination, or particularly successful revaccination, predisposes to an attack of plague, or increases the mortality, or that an attack of natural small-pox increases the susceptibility to plague, or diminishes the mortality, would not be warranted, as—

1st, these differences in the figures are small; and

2ndly, in certain figures, they neutralise each other by a contradictory bearing.

But the marked *similarity* in the proportions of attacks and deaths in the different groups tends to show that an attack of small-pox, or vaccination against small-pox, stand no connection whatever with the susceptibility to the plague.

Notwithstanding this result, and in consideration of the communication from the Secretary of State for India, I have the honour to suggest that the officers appointed to certify cases and deaths of plague be instructed to answer, amongst other questions, one additional, concerning the presence or otherwise, on the body of children and adults, of recent vaccination marks and of marks from a natural attack of small-pox, by which measure, in the course of time, a larger material would be accumulated relating to the questions at issue.

II. With regard to the theoretical basis of the question, it has been found by Professor Klein in London, and afterwards confirmed and generalised by a series of observers, that the artificial introduction in certain ways of a virus of a given kind, and even of many neutral, not microbial products, had a temporary effect on the susceptibility of the organism to other virus, introduced in similar or modified ways; but in no instance did this effect extend over a very limited number of days, and no specific modification, with regard to the other views; was demonstrable in the organism as the result of the treatment.

Judging, therefore, from the information accumulated up to now, a campaign of artificial preventive treatment to be started amongst the plague-stricken inhabitants is to be made with a vaccine of no other disease except with that derived from the plague virus itself.

Telegram from the Secretary of State, London, to the Governor of Bombay, dated 2nd February 1897.

It has been suggested with some scientific support that recent vaccination confers some immunity against other germ diseases besides small-pox. Suggestion might be laid before your scientific experts for enquiry whether recently-vaccinated children enjoy any apparent immunity from plague and whether matter merits further verification.

Endorsement by the Private Secretary to His Excellency the Governor of Bombay, dated Malabar Point, the 3rd February 1897, No. 51.

Copy forwarded to the Municipal Commissioner for the City of Bombay.

Endorsement by the Municipal Commissioner for the City of Bombay, dated the 4th February 1897, No. 23345.

Forwarded with compliments to Professor Haffkine for favour of opinion.

No. 367 M., 4TH MARCH 1897.

ORDER—No. 367 M., dated 4th March 1897.

Communicated to the Surgeon-General and the Sanitary Commissioner.

2. The Surgeon-General is requested to communicate this to all District Medical Officers and the Surgeons of Districts in Madras.

(True Extract.)

Secretary to Government.

To the Surgeon-General.
" Sanitary Commissioner.
Copy to all Presidents of District Boards.
" " Chairmen of Municipal Councils.
" to the President, Municipal Commission, Madras.
" " Public Department.
" " Marine Department.
" " Revenue Department.

Exd. P. Seetharam.

[L. & M. 1,000—25-8-96.]

Copy sent to the Press on the

Local & Munl. (1897) Department.

CURRENT No. 887/97

C. Nos 887 and 920M

Early

Order No. 367 M. of 4-3-97

Communicated to ~~all Local Boards and Municipal councils, the Municipal Commissioners of Madras~~, the Surgeon General and the Sanitary Commissioner

2. The Surgeon General is requested to communicate this to all District Medical Officers and the Surgeons of Districts in Madras

1/3/97

8/3/97

From The Government of India Home Department

No. 731

Dated 25-2-1897

Received 1-3-1897

Registered 1-3-1897

Enclosures 2

Spare copies

SUBJECT.

Forwarding for information copy of letters from Monsieur W. M. Haffkine giving an account of experiments made with prophylactic and curative serum during an outbreak of plague in the jail at Bombay.

To 1 Bull

Copies to All Presidents of Distnct Boards
" chairmen of munl. comms
+The President munl. comm. madras
" Surgeon General
" Sanitr. comr.
+Copy to the Public Department
+ Marine "
" " Revr. Department

Dispd of as Revs 6/8/97 Dispd 12/3/97

Issued with Desp No. 12/3/97

Dispatches - please attend to the instructions

Sent 4/3/97

BACK PAPERS.

G O.	No.	Department	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

...ony sent to Press. 5-3-97

LOCAL & MUNICIPAL DEPT.
No. 430 Date Rec'd 887/M

From R. Nathan, Esq:,
Offg. Under Secretary to the Govt. of India

To The Secretary to the Government of Madras
Local and Municipal Dept.

Calcutta the 25th February 1897.

SECRETARIAT TO GOVERNMENT
1 MAR 1897
LOCAL & MUNICIPAL DEPARTMENT

Home Department (Sanitary) Sir,

I am directed by the Board, for the infor... of His Excellency the Governor in Council, a co... the letters marginally noted from Monsieur M... Letters dated the 16th and 17th February 1897. Haffkine giving an account of experiments ... with prophylactic and curative serum during ... outbreak of plague in the Jail at Bombay.

I have the honour to be
Sir,
Your most obedient Servt.

R. Nathan

Offg: Under Secretary to the ... of India

Dated Bombay, the 16th February 1897.

From—Mons. W. M. HAFFKINE,

To—The Secretary to the Government of India, Home Department.

In view of the urgency of the case I have the honour to communicate the following information concerning the outbreak of plague in Her Majesty's House of Correction, Byculla, where a considerable portion of inmates had volunteered to undergo the prophylactic treatment, and where the first observations on the effect of this treatment have been collected.

Between the 23rd and 29th of January last, 9 cases of plague have occurred in the jail, of which 5 proved fatal, the population at the beginning of the outbreak numbering 345 souls.

The prophylactic treatment has been applied on the 30th January, 154 of a total 337 volunteering to be inoculated.

Occurrences on the day of inoculation.

In the forenoon of the day of inoculation 6 new patients have been admitted to the hospital suffering from plague; of these 3 proved fatal.

The inoculations were applied in the afternoon. One of the inoculated, Keshav Umar Shankar, prisoner No. 672, had at the time of inoculation a painful gland in the left groin; two others, Abdool Karim, No. 1356, and Govind Pandoo, No. 1222, developed painful glands in the left axilla the same evening. These three cases have also proved fatal.

On the 1st day after inoculation there were:

Amongst 177 not inoculated prisoners 2 cases, of which 1 proved fatal.
Amongst 151 inoculated 1 case, who rapidly improved and recovered.

On the 2nd day after inoculation there were:

Amongst 172 non-inoculated 1 case, which proved fatal.
Amongst the inoculated—*Nil.*

On the 3rd day after inoculation there were:

Amongst 173 non-inoculated 1 case, which proved fatal.
Amongst the inoculated—*Nil.*

On the 5th day after inoculation there were:

Amongst 171 non-inoculated 1 case, which proved fatal.
Amongst 146 inoculated—*Nil.*

On the 6th day after inoculation there were:

Amongst 169 non-inoculated 1 case, which proved fatal.
Amongst the inoculated—*Nil.*

On the 7th day after inoculation there were:

Amongst the 169 non-inoculated 5 cases, of which 1 proved fatal.
Amongst 146 inoculated 1 case, who is alive.
Since the 6th instant, no more cases have occurred in the jail.

The following is a tabulated form of the occurrences :—

Date of occurrences.	Amongst the non-inoculated.	Amongst the inoculated.
23rd to 29th January 1897 . .	9 cases, 5 fatal . .	...
30th January 1897, the day of inoculation. { Forenoon, before inoculation.	6 cases, 3 fatal . .	...
30th January 1897, the day of inoculation. { Afternoon, after inoculation.	...	3 cases, fatal.
1st day after inoculation, 31st January 1897.	2 cases, 1 fatal . .	1 case.
2nd day after inoculation, 1st February 1897.	1 case, fatal . . .	...
3rd day after inoculation, 2nd February 1897.	1 case, fatal . . .	...
5th day after inoculation, 4th February 1897.	1 case, fatal . . .	...
6th day after inoculation, 5th February 1897.	2 cases, 1 fatal . .	...
7th day after inoculation, 6th February 1897.	5 cases, 1 fatal . .	1 case.
Total, after the day of inoculation .	12 cases, 6 fatal . . in an average daily strength of 173 non-inoculated.	2 cases in an average daily strength of 148 inoculated.

The experience gained by the observation in this jail tends to show—

1st.—That the injection of 3 ccm. of the prophylactic seems to be sufficient to effect the desired protection, no repetition of inoculation being necessary to arrest the disease during an existing epidemic.

2nd.—That the prophylactic is powerless to arrest the symptoms of plague already started, or which develop within a few hours, but there is the possibility of its influencing the disease in the incubation period, in individuals infected 3 or 4 days previously.

3rd.—That the time necessary for the plague prophylactic to produce the protective effect is shorter than in any preventive treatment known, this period being in the anti-cholera inoculation of 4 days, in vaccination against small-pox of 7 days, in the inoculation against anthrax of 12 days, in the inoculations against rabies of 15 days, and in the present treatment, apparently less than one day.

4th.—The question remains open as to how long will the inoculated persons remain proof against the disease, and, therefore, in order to ensure the probability of a more lasting effect, it is advisable to apply repeated inoculations, with doses higher than the above mentioned.

The above conclusions are temporary and refer only to the teaching of the particular outbreak in question. There remains fully the possibility of the future experience compelling us to modify the above conclusions, though the expectation is justifiable that the general bearing of the results as above detailed will remain unshaken.

A copy of this letter forwarded to the Municipal Commissioner for the City of Bombay.

Dated Bombay, the 17th February 1897.

From—Mons. W. M. Haffkine,

To—The Secretary to the Government of India, Home Department.

I have the honour to communicate the following information on the attempt at curative treatment, which has been made by means of the anti-toxine at present under preparation here at Siwree, during the outbreak of plague in Byculla Jail.

A patient called Ganoo Balloo, admitted to the hospital since three days, has received one injection of anti-toxine, but died within 11 hours.

The following patients were selected for treatment immediately after their admission to the isolation shed, though after some time has elapsed since the onset of the disease :—

Admissions on the 30th January 1897.

Of six patients admitted in the morning, the two most serious, Jeeva Virchand and Syed Jonas Ali, were selected for the anti-toxic injection, the four milder left to the ordinary treatment.

Of the four milder, three have died within 2, 4 and 6 days.

The two others, specially treated, have survived.

Admissions on the 31st January 1897.

Of the two cases admitted, the most serious one, Anuah Vishroa, has been selected for the special injection, the other milder has been left to the ordinary treatment.

The milder case ended fatally after 3 days' illness; Anuah Vishroa is alive.

Admissions on the 1st February 1897.

Of the five cases admitted, the two most serious, Kaloo Bhimsha and Keshao Umar, have been selected for the anti-toxic injections, the three milder left to ordinary treatment.

The two treated cases have ended fatally after 6 and 12 days' illness; of the not treated specially, two died after 4 and 9 days.

II. Analysing the result in connection with the period elapsed between the onset of the attack and the beginning of the anti-toxic treatment, it appears that—

Out of the six patients treated, four have been taken for the special injections within 24 hours after attack,

and two patients, after 2 and 3 days' illness.

Of the four patients admitted for treatment within 24 hours, three have survived, and one lived for 12 days.

The two admitted 3 and 2 days after attack, have died 11 hours and 4 days after beginning of treatment.

I believe, from the above results, that there is the possibility of the anti-toxic serum rendering service in the treatment of the disease.

At the present stage of the preparation, for producing any marked effect on the disease, the following restrictions impose themselves: it is necessary to start the treatment within the first 24 hours, and a large number of repeated injections are required.

The possibility remains that, with the further maturation of the fluid, its power will increase, so as to effect an influence on older cases, and when used in smaller doses.

No serum can as yet be issued for the use of the general public.

L. & M.
1,000—28-10-96.

Local & Munl. (1897) Department.

CURRENT No. 920 M

Order

From The Government of India
Home Deptt.

No. 734

Dated 25-2-1897
Received 2-3-1897
Registered 2-3-1897
Enclosures
Spare copies 7

SUBJECT.

Forwarding for information copy of letter from M.Haffkine on the subject of the possibility of protecting the population against the plague by small-pox vaccination.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

LOCAL & MUNICIPAL DEPT.
CURRENT No. 9208

8 Sanj

No. 734.

FROM

R. NATHAN, ESQ.,
Offg. Under Secretary to the Government of India,

To

The Chief Secy to the Govt. of Madras.

Home Department.
Sanitary.

CHIEF SECRETARY'S OFFICE
MAR 1897
GOVERNMENT OF MADRAS

Calcutta, the 25th February 1897.

SIR,

I AM directed to forward, for the information of the Government in Council, a copy of a letter and enclosures from M. Haffkine, the Bacteriologist who has been deputed to Bombay to make investigations connected with the plague, on the subject of the possibility of protecting the population against the plague by small-pox vaccination. I am to request that effect may be given to M. Haffkine's suggestion that the officers who certify cases and deaths of plague may be instructed to give information regarding the presence or otherwise, on the body of children and adults, of recent vaccination marks and marks from a natural attack of small-pox. I am further to request that any information collected in this manner may be communicated to the Government of India.

I have the honour to be,

SIR,

Your most obedient Servant,

Nathan

Offg. Under Secretary to the Government of India.

From—W. M. HAFFKINE.

To—The Secretary to the Government of India, Home Department.

I have the honour to forward copy of a telegram from the Secretary of State for India, No. 4297, dated the 2nd instant, referring to the possibility of protecting the population against the plague by small-pox vaccination.

The following data bearing on the question have been furnished by the recent outbreak of plague in Her Majesty's House of Correction, Byculla.

At the outbreak of plague, on the 23rd of January last, there were in jail 345 inmates amongst whom there were no unvaccinated individuals.

One hundred and sixty-four had been revaccinated in the same jail between 22 and 325 days before the outbreak, and these, as shown below, happened to suffer from the plague to a slight extent more than the non-revaccinated.

Of the revaccinated, 84 have taken vaccination successfully and happened also to suffer from the plague more than the 82 who did not take well, having been vaccinated previously as shewn by good marks on the arms.

Eighty-three were not revaccinated in the jail, but are pitted from an attack of small-pox.

Ninety-eight were not revaccinated in the jail, but had been vaccinated previously.

The following is the list of inmates who were attacked by plague during the present outbreak, from 23rd January last up to 6th instant, with details as regards vaccination against small-pox: —

Number in the Jail Register.	Name.	Statement as regard vaccination.	Transferred from the observation ward to the Plague Hospital.	RESULT.
977	Biva Bagu . . .	Not revaccinated lately .	23rd January 1897 .	Died on 27th January 1897.
1093	Rama Govind . .	Ditto .	26th January 1897 .	Died on 30th January 1897.
1359	Narayan Dhondu . .	Revaccinated on 30th December 1896 successfully.	27th January 1897 .	Ditto.
1349	Adamji Allibhoy . .	Not revaccinated lately .	Ditto.	
1235	Katan Lakundas . .	Revaccinated on 24th October 1896 unsuccessfully.	Ditto.	
1094	Ramgulab Ram Pratab .	Not revaccinated; well pitted by small-pox.	Ditto.	
1247	Anton Salvador . .	Ditto .	Ditto.	
1272	Balkrishna Mahadu .	Revaccinated on 12th November 1896 successfully.	Ditto .	Died on 30th January 1897.
1242	Ganoo Baloo . . .	Revaccinated on 24th Octobera 1896 successfully.	Ditto .	Died on 31st January 1897.
1336	Syed Jonas Ali . .	Revaccinated on 30th December 1896, modified result.	30th January 1897.	
1312	Vali Chand . . .	Revaccinated on 12th November 1896 unsuccessfully.	Ditto .	Died on 3rd February 1897.
1276	Hoosain Muhamad .	Revaccinated on 12th November 1896 successfully.	Ditto.	
1310	Bishram Jairam . .	Revaccinated on 12th November 1896, modified result.	Ditto .	Died on 5th February 1897.

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1224	Anna Vishram . .	Revaccinated on 24th October 1896 successfully.	31th January 1897.	
1229	Genoo Tessu . .	Revaccinated on 24th October 1896 unsuccessfully.	Ditto . .	Died on 4th February 1897.
672	Kessu Umar Shankar .	Not revaccinated lately .	1st February 1897 . .	Died on 5th February 1897.
1356	Abdool Karim Gulam Hoosen.	Not revaccinated; well pitted with small-pox marks.	Ditto . .	Died on 8th February 1897.
832	Rama Luxman . .	Not revaccinated lately .	Ditto.	
1261	Kaloo Bhimsha . .	Revaccinated on 12th November 1896 successfully.	Ditto . .	Died on 12th February 1897.
1222	Govind Pandoo . .	Revaccinated on 16th November 1896 unsuccessfully.	Ditto . .	Died on 3rd February 1897.
1252	Jeywan Gunesh . .	Not revaccinated; well pitted with small-pox.	2nd February 1897. .	Died on 11th February 1897.
988	Mahamad Hoosen . .	Revaccinated on 4th March 1896 successfully.	4th February 1897 . .	Died on 8th February 1897.
1238	Babuji Sambhaji . .	Not revaccinated; well pitted with small-pox.	5th February 1897 . .	Died on 7th February 1897.
1136	Manji Bagwan . .	Not revaccinated; well pitted with small-pox.	Ditto.	
1297	Dhondu Sukhia, leper .	Not revaccinated; well pitted with small-pox marks.	6th February 1897.	
1332	Kaloo Luxmon . .	Not revaccinated . .	Ditto.	
749	Ganji Dongerji . .	Not revaccinated lately .	Ditto . .	Died on 7th February 1897.
1267	Baloo Krishna . .	Revaccinated on 12th November 1896 unsuccessfully.	Ditto.	
1366	Shamrao Sittaram . .	Revaccinated on 30th December 1896 successfully.	Ditto.	
933	Munnoo Ibrahim . .	Revaccinated on 14th March 1896 successfully.	Ditto.	

(1) There were, therefore, 17 persons attacked, 9 fatally, to whom small-pox revaccination had been applied 28, 31, 38, 76, 77, 79, 79, 79, 81, 86, 95, 95, 99, 99, 155, 329, and 336 days before the plague attack, giving a percentage of attacks amongst the revaccinated of 10·4 per cent., and of deaths 5·5 per cent.

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11 attacks among 84 successfully revaccinated, with 3 deaths, giving a percentage of attacks 13·1 per cent. and of deaths 7·1 per cent.

6 attacks amongst the 82 unsuccessfully revaccinated with 3 deaths, giving a more favorable percentage of attacks 7·3 per cent. and a more favorable percentage of deaths 3·6 per cent.

Order complete. 560

(4) A comparison between the non-revaccinated who had not had small-pox and the non-vaccinated who had gone through an attack of small-pox shows :—

8 attacks amongst the 98 who had not had small-pox, with 5 deaths, giving a percentage of attacks 8·2, and of deaths 5·1 per cent.; and 7 attacks amongst 83 who had small-pox, with 3 deaths, giving a slightly less favorable percentage of attacks 8·4 per cent.; and a more favourable percentage of deaths 3·6.

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Telegram dated 2nd February 1897.

From—Secretary of State, London.

To—The Governor of Bombay.

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No. 51, dated Malabar Point, the 3rd February 1897.

Endorsement by the Private Secretary to His Excellency the Governor of Bombay.

Copy forwarded to the Municipal Commissioner for the City of Bombay.

No. 23345, dated the 4th February 1897.

Endorsement by the Municipal Commissioner for the City of Bombay.

Forwarded with compliments to Professor Haffkine for favor of opinion.

opy sent to Press. 5-3-97

signature. 12-3-97

shed in print. 12-3-97
13-3-97

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10

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