

BOMBAY MUNICIPAL CORPORATION.

PAPERS

REGARDING CERTAIN REMARKS

OF

MR. BALDWIN LATHAM

ON THE

BOMBAY DRAINAGE SYSTEM.

BOMBAY
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intercepted or kept back by screens or otherwise from the pumps gradually, but surely, accumulate and become more or less offensive, and consequently these filthy unsanitary accumulations have to be periodically removed by costly disgusting manual labour. Whereas, as I have already stated, the Ejectors receive every thing, liquids and solids alike, and eject both in combination to their final or other destination with as great a certainty as if the liquids ejected were clean filtered water and not crude sewage.

83. For these and other reasons, Mr. Ault and myself, I assure you, so far from being ashamed of what has been done in India and Burma already on the Shone System, are, on the contrary, exceedingly proud, and if your council will but act wisely by taking no heed of *Mr. Latham's untenable attacks on the system*, and if they will also, as I believe they will, have patience to await the proper completion of the Colaba and the other works proposed and in progress on the system in Bombay, we are absolutely confident that they also, as a Municipality, and you as their Special Drainage Engineer, will be more than satisfied with the final results.

84. Having traversed the chief charges made by Mr. Latham and brought to the special notice of the people of India through the medium of the Bombay Municipality, whose transactions are reported in the *Times of India*, and I presume in other important and widely circulated newspapers, it only remains for me to ask the Municipal Commissioner of Bombay, through you, to do me and my partner, Mr. Ault, the honor and justice to treat my letter in the same way as he treated Mr. Latham's letter to the President of the Ahmedabad Municipality, *i.e.*, to print it and circulate it amongst the members of your Municipality.—I am, &c.,

ISAAC SHONE.

JAMES W. SMITH, Esq., M.I.C.E.,
Special Drainage Engineer,
Bombay Municipality.

Appendix I.

Copy.

WESTMINSTER CHAMBERS, 13, VICTORIA STREET,
WESTMINSTER, S.W., 23rd August 1895.

To THE PRESIDENT, Rangoon Municipality.

DEAR SIR,—I am very much indebted to you for having forwarded me the report of the Medical Officer of Rangoon for the year 1893. I regret that I have not had any time to look through it until recently when my attention has been directed to the subject of the

sanitation of Rangoon, and in going through it I find that some error has evidently crept into it; for instance, in table 12, as I was very desirous of knowing what was the relative state of health of the different districts, in adding up the total of the columns for 1888, 1890 and 1891 I found that the number of deaths at the foot of the column does not agree with those inserted in the column itself. Evidently there is some discrepancy especially as it would appear that for the district called Tamway there must be some misprint or error.

In looking into all the figures which refer to Rangoon, I am very much impressed with the extraordinary change which appears to have taken place in the health of the district since the Shone system has been in operation;—and that if the five years before, from 1885 to 1889, are compared with the five years subsequently, 1898 to 1894, there appears to be a most extraordinary increase in the death-rate, such increase, however, not occurring in any of the towns of Lower Burma or in Burma itself, showing that, in spite of the lavish expenditure on the Shone System introduced into this district, it has been anything but of a beneficial character.

I am quite aware of the statement which has been made with regard to the improvement since 1898 in this district, but unfortunately a district in which a new system has been introduced cannot be compared with itself. If compared with itself it must be with some period of years when not under the influence of the special system in operation.

If the population of the districts are properly interpolated according to the late Dr. Farr's method, as adopted by the Registrar General of England, and in other cases, it would be at once seen that in the five years before the Shone System came into operation in Rangoon, compared with the five years subsequently, there has been an increase in the death-rate of nearly 10 per thousand in the latter five years which of course I attribute, as I have pointed out, to the pernicious effects of the Shone System in diffusing foul air into the district in which it is in operation.

The same thing has occurred in the only other districts in England in which the Shone System has been entirely adopted, namely at Honley-on-Thames, that is comparing the years subsequent to its adoption with the years previous there has been also an increase in the death-rate of the district.

You cannot bring air under high pressure into contact with sewage without liberating into the atmosphere an enormous amount of sewage or fecalized air which is most detrimental to health, of all forms of pollution, and a very slight test made by charging the sewage with some chemical compound easily detected in the air, such as lithia, and then testing the air escaping from the ejectors by spectrum analysis will show at once how the sewage air is diffused into the atmosphere by the Shone Ejectors and this sewage air escapes in very considerably larger volumes than the sewage it-

self which is removed from the district, and this sewage air, distributed at numerous points throughout your district is scattered by the winds of heaven in various directions to exert its pernicious effects upon the health of the population. Moreover, the combination of air for raising water in which the same pipes are used which may be directly in connection with these foul ejectors is not a system to be commended when it appears that the ejectors at times are not under pressure, so that there is a means of getting direct access of sewage air to the water-supply.

What I really wanted was, not the reports of the Medical Officer of Health, a single copy of which has been forwarded to me, but the annual Reports of the Municipality itself which give quite sufficient information upon the question of the health of Rangoon, and also the statistics which are not contained in the Medical Officer of Health's report, but I should very much like to know which are the districts in which it is alleged that the actual Shone System is in operation as the tables I, VII and XII do not show which districts are in the town proper and have the Shone System or which have got a pipe water-supply, all of which are points of very considerable importance.

Of course from a study of the various reports I personally know that certain districts are within the suburbs, but as to what are the districts which the Municipality themselves take into consideration no information is given, although they make statements in the reports as to relative differences in the health of the districts.

If you wish to know the actual state of health for Rangoon at any time, it may be readily found from a method which I introduced some years ago, of proportional mortality, which is very fully described in the *Times of India* of the 11th May of the present year. For example the population of Rangoon in the census year of 1891, in the middle of the year if properly interpolated is 181,862 which would give a death-rate of 36.78 per thousand in that year. Now if the births are divided by the deaths in any year and the result is multiplied by 93.62 and taken from the tabular number applicable to Rangoon of 73.55 it will give the proportional death-rate in any year, that is, the death rate proportional to the death-rate in 1891. With 6,950 deaths in 1894 and 3,102 births, the proportion of births to deaths is .4463 and the proportional mortality is therefore 31.76 per thousand, which is a less death-rate than if we assumed the population since 1891, as increasing in the same ratio as it had previously to 1891 and which shows that in all probability the population has increased faster than it had done previously to 1891 and the district is certainly healthier than it was in that particular year 1891, as the proportion of births to deaths is larger and the health of a district might just as well be ascertained from the proportion of births to deaths as in any other way.

The only report of the Municipality of Rangoon, which is in my possession is that for the year 1889-90. I should very much like to see the subsequent reports, but I have had access to the various

reports made by the Municipal Commissioner of Burma and other documents which are in this country at the India office.

Yours faithfully,
(Sd.) BALDWIN LATHAM.

To the President,
Rangoon Municipality.

Appendix II.

Copy.

13, VICTORIA STREET,
WESTMINSTER, S.W., 15th September 1896.

TO THE SECRETARY, Rangoon Municipality.

SIR,—It has been my intention to reply to your letter of 22nd January 1896, but before doing so I wished to see the Sanitary Administration Report for Burma for the year 1895, which I regret to say has not up to the present time come to hand at the India Office.

It is stated in Clause 5 of your letter that correct information could easily be obtained from your office. May I ask you therefore, if the information is obtainable, to give me the correct figures which I asked for in my letter of the 23rd August 1895, and also will you kindly give me the figures of the population and the actual number of deaths upon which you say the statistics from 1890 to 1895 given in your letter are based and at the same time the similar figures in reference to the death-rate in the suburbs of Rangoon mentioned in your letter? Will you also supply me with the most recent copy of your Medical Officer of Health's Report and also with copies of the Reports of the Municipality, since the years 1889-90? I shall also feel obliged if you will inform me on what date the Shone System ceased to be used for the purposes of raising the high pressure water in Rangoon. If there is any charge for the documents asked for, I shall be happy to pay the cost of same.

You shall receive a full reply to your letter and also some remarks on other figures which have been circulated by your Municipality with reference to the working of the Shone System.

In conclusion I desire to say that I have no interest or object whatever in endeavouring to injure Rangoon or any other place by any statements I may make, but I am solely desirous of encouraging all real sanitary works while exposing humbug wherever it is found, and if on full investigation it can be shown that Shone System adopted in Rangoon is a sanitary economical and proper system, I should certainly not oppose its extension in that City or any other place, but until this is shown not by mere assertion as set out in your letter but upon all the facts being fully investigated I shall hold that the system is both insanitary and not economical.

Yours faithfully,
(Sd.) BALDWIN LATHAM.

Appendix III.

Extracts from Allbut's "System of Medicine on Plague by J. F. Payne, pages 917—939, Vol. 1".

The Bacillus of Plague.—Great interest attaches to the recent discovery, in Hong Kong, by Kitasato, confirmed by Yersin, of a micro-organism which seems to fulfil all the conditions required by the problem, and is probably the specific cause of the disease *Ecogenic Existence of the Bacillus.*

Yersin was able to cultivate and isolate a bacillus from earth of an infected house, four to five centimetres below the surface, which precisely resembled that from buboes but was not virulent. Kitasato found in one instance that dust from an infected house communicated plague by inoculation. Yersin found that flies die from the disease, their bodies containing the bacillus; and by inoculation of material contaminated with a dead fly he conveyed plague to animals. The conclusion is that the bacillus has been discovered capable of parasitic existence in men and animals, capable of ecogenic life, showing spontaneous variability in virulence and thus fulfilling all the conditions necessary to explain the observed phenomena of plague.

Endemic Plague.

Mountain districts are perhaps the most persistent foci of plague now known.

Endemic Plague as a soil disease.

In all the places where plague is endemic, there is reason to believe that the virus resides permanently in the soil, and that human beings acquire it thence by certain channels of communication. Plague is therefore partially, though not wholly, a miasmatic or soil disease. It differs from malarial disease in that it exists only in the soil of inhabited places, and has never been acquired from mere telluric conditions. Since the living virus is a bacillus which exists in the affected subjects, it will pass from them back into the soil, and a mutual relation be thus established. The soil theory of plague is a popular belief in some parts of the world. It was dimly perceived by many older writers (by Bognhurst in the seventeenth century); but was obscured by other less tenable hypotheses of infection of the air and epidemic constitutions. It was clearly recognized by Dr. C. R. Francis as the explanation of the Indian plague of Kumaon in 1853. It was suggested as possible by Liebermesster in the article on plague in Ziemsson's Cyclopædia of Medicine and adopted, subject to further evidence, by myself in the Encyclopædia Britannica and elsewhere; but it was first definitely formulated, with the aid of Petten Kofor's theory of soil water, by Dr. Croighton in his History of Epidemic Diseases. It is apparently not held by most epidemiologists.

The arguments in favour of this view are somewhat as follow :—

(1) The remarkably limited geographical distribution of plague, so widely different from that of diseases caused by a floating or purely personal contagion, is hardly consistent with any other hypothesis.

(2) In localities where the disease is permanently established, animals living under ground are often affected in a peculiar way. Usually before the outbreak of an epidemic such animals, especially rats, perish in large numbers. They come out of their holes evidently very ill, and die, or are found dead underground; so that this phenomenon is considered by the people in India and China, where it has been chiefly observed as the sign of a coming epidemic. Recent observation in China has shown that the rats suffer not merely from poisoning, but from true bubonic plague. They have buboes, and their organs contain immense numbers of the plague bacilli. It cannot, therefore, be doubted that the virus exists underground before it affects human beings. In some countries other animals are said to be affected, but this is less certain. (In the older European epidemics it seems doubtful whether this death of rats was actually observed. The old books contain general statements of the same kind regarding animals which live in the ground, but they have the appearance of being traditional, and borrowed from the Arabian writers, especially from Avianna, who is very copious on this point).

(3) Within an endemic area of plague the disease often occurs year after year, or in successive epidemics, precisely in the same spots, even in the same houses, and springs up simultaneously in several independent foci. In London in 1665 it was said the disease "fell upon several spots of the city and suburbs like rain."

(4) Of places apparently under the same conditions, and in free communication with one another, one is repeatedly affected, the other never. Dr. Francis observed in India two villages on the same mountain, with the same aspect, scarcely 500 yards apart, of which, at every visitation of plague, one always escaped, the other suffered. In old days again, it was observed in Egypt that Alexandria might have terrible epidemic, while Cairo entirely escaped; in another epidemic the converse relation might obtain, and this in spite of unchecked communication.

(5) In cities where a notable part of the population lives on the water in boats and barges, it has more than once been noted that such persons have entirely escaped the plague. It was so in London in 1665, and recently in Canton, where 250,000 people live and sleep on the water, this part of the population enjoyed almost complete immunity.

(6) It has often been observed that while those who live on the ground floor of a house are seized with plague, the inhabitants of the

upper stories may entirely escape; so that it used to be said, "Plague does not go upstairs." This has been signally confirmed in the late epidemic of Canton.

(7) In a general way, the beneficial effects of local sanitary measures, as compared with mere prevention of contagion tell in the same direction; but the bearings of these facts can only be thus briefly indicated.

It would appear from the above reasons that the endemic prevalence of plague is comparable to that of Cholera or Typhoid, and governed by somewhat similar laws; though in other respects it differs very much from those diseases. In the double infection of the soil and the organism it resembles anthrax. Along with infection of the soil, there appears to be a passage of the virus in some form into the air, so that it has always been believed that the disease may be acquired by inhalation, like typhus. Scientific explanation of this method of receiving the virus is however still wanting.

Plague as a Communicable Disease.

Transmission of plague from one place to another not previously infected must also be regarded as well established; though doubtless, this has often been wrongly assigned as the cause of purely local outbreaks. That this is possible by means of infected ships is clearly proved by the records of the Quarantine at Marseilles (quoted by Prus), when in several instances the infection was, so to speak, caught on the sieve, that is to say, the infected ships gave rise to cases of plague within the quarantine station, of which some were fatal. The like possibility on land has often been established, though doubted by the extreme school of anti-contagionists. For instance, in the London Plague of 1665, towns and villages in communication with London became affected, though they were previously healthy, and had not suffered from plague for many years, if ever. The infection is doubtless generally conveyed by persons either affected with the disease or in the stage of incubation. Such persons convert the house they occupy into a focus of infection, till possibly the virus passes into the soil, and a severe epidemic may result. Conveyance by means of infected objects is doubtless possible, but probably much rarer. With regard, however, to this mode of transmission, it should be observed that, according to old and sound tradition, the plague does not spread when it is sporadic, but only when it is in an epidemic form. Furthermore, its diffusibility varies as much as its contagiousity in the narrower sense, being very marked in great epidemics, very slight or self-limited in others. Many epidemics have burnt themselves out on the spot, or travelled but a few miles; others have spread over whole continents. Generally successive epidemics, if unchecked cover each time a somewhat wider area.

The rate of extension is also variable, but is generally slow. Plague has taken weeks or months to pass from one side of a city to

another; it creeps along from point to point, so as to be compared by some to a drop of oil on paper.

Such gradual extension suggests the slow progress of a virus in the soil itself, and probably that is in some places the explanation; but, obviously, only transmission through short distances can be thus accounted for.

Transmission by the air cannot be said to be impossible and was once much dreaded, but while this may be possible through distances measured by yards, it can hardly be so through distances measured by miles.