

MADRAS RECORD OFFICE.

Government of Madras.

Public DEPARTMENT.

G.O. No.	448	Press Mis.
Dated	12-4-	1870

Not to be folded or roughly handled

12th April 1870.

No. 108. Read the following letter from Surgeon W. R. CORNISH, F.R.C.S., Officiating Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 17th March 1870, No. 330.

I have the honour, with reference to Proceedings of Government, No. 282, of the 8th instant, to forward a return and diagram for the months of November and December, and January and February, of the observations made in this office, with the view of testing the theory of Professor Pattenkofer, regarding the relation between the level of subsoil water and the development of cholera. The observations and diagrams have been already published in the monthly Proceedings of the Sanitary Commissioner.

2. There has been so slight a prevalence of cholera in Madras during the months in question, that no deductions can be drawn, one way or the other, from the observed facts.

3. In regard to the general theory of Professor Pattenkofer, I may be permitted to state that there are certain local peculiarities of soil in the neighbourhood where the experiment is being tried, which, in my judgment, are likely to vitiate the results of the observations.

4. It is not very easy to understand from the Professor's own statement of his theory what he regards as "subsoil moisture." It is stated that "in any permeable soil it almost necessarily results that organic impurities are washed down through it, and accumulate in the subsoil water, or in other words, over the first impermeable layer." Now the first "impermeable layer" in the alluvial of Madras, in the situation in which the well has been sunk, happens, as it does in many other places, to be very near to the surface, and has been cut through to get at the spring level. At the present time, there is an open tank within sixty yards of the well, the level of the water in which is standing from eight to nine feet higher than the water in the well. It cannot get into the subsoil in fact, except by an extremely slow process, on account of the almost complete impermeability of the clay at the bottom of the tank.

5. The geological structure of the soil on which the town of Madras stands, renders it, in my opinion, a very unsuitable locality for conducting observations of the nature referred to. The whole area, at no very remote geological period, appears to have been a salt-water lagoon. At depths, varying from twelve to twenty feet, we come upon a dense bluish black clay; which, from the shells and plant remains imbedded therein, was apparently the bottom of the Marine lake. Gradually, the whole area must have got filled up, partly by deposits of sand from the sea and drifting winds, and partly by the detritus of surface rocks washed down by floods. These deposits are by no means even and regular in their appearance. In one place, sand predominates; in another, clay. The surface soil, in fact, consists of layers of clay and sand, by no means regular in their deposition or thickness. Long ridges of sandy deposits, with very little admixture of clay, extend parallel with the coast, and in these ridges, the rise and fall of subsoil water is doubtless much influenced by the local rainfall. But in very many parts of Madras, where the clay soils lie on the surface, the rainfall can only reach the subsoil at all, by indirect and circuitous channels, as by the leakage of tank bottoms, &c. I have frequently observed, after the heaviest monsoon

rains, soil, at the depth of two feet from the surface, to be quite hard and dry. In such situations, water will lie on the surface in shallow pools, not a drop of it permeating to the subsoil. It is gradually dried up by the heat of the sun's rays. As the tracts I speak of are very extensive, especially over the areas which include Nungumbakum, Egmore, Vepery, Choolay, &c., it will be seen how difficult a question the relation of subsoil water to cholera becomes, when we have to deal with situations where the surface soil is more or less impermeable to moisture falling from above or rising from below.

6. I have said that the spring level is, in such localities, affected only in a circuitous and round about way by rainfall. A recent and heavy fall of nearly two inches of rain on 1st March caused the tank, which is fed from a road-side drain and by surface drains, to rise about three feet above its former level; but the indicator placed in the well, fitted with Pattenkofer's apparatus, showed a rise of only three-tenths of an inch. The heavy rains of the north-east monsoon in November and December (total fall 13.2 inches) caused a rise of only 1'6.2" in the spring level. The rain in January of 6.55 inches caused a further rise of 4.7 inches. It should be stated that the present level of water in the well, in which the daily readings are taken, is not different from the mean level of the sea. In some parts of Madras, according to Captain Tulloch, who made borings in connexion with his proposed drainage works, the spring level is below sea level, and in others, about it.

7. My own view of Professor Pattenkofer's theory is that it relates essentially to the water which is carried down through the soil to the first impermeable stratum of clay, and not to the water which is found beneath this layer. In Madras, the situation of this layer is very varied. In one place, on the surface or a few inches below the surface, and at another place several feet of sandy porous soil may be passed through without coming upon a bed of clay. If there was any evenness in the deposition of the alternating beds of surface soil, it might be practicable to determine the variations in the depth of the subsoil moisture, which is said to have so marked an effect on the development of the germs of cholera; but there is no such order or regularity. In one compound, where the clay is superficial, water will lie on the surface for weeks, while in the adjoining grounds, the surface soil may be so porous as to absorb all the moisture falling upon it.

8. In my judgment, the experiments regarding this question would have fairer play, if they were carried out in the deltas of great rivers, where the soil is usually more homogeneous in structure than it is here, in an old lagoon bed which has silted up from the joint action of the sea, of the winds and of fresh water floods. At Dacca, for instance, it has been shown that the rise and fall of the water in the city wells is simultaneous with the rise and fall of the water in the river, half a mile distant. No such condition of soil exists in the neighbourhood in which these experiments are being conducted in Madras.

9. The observations will, should Government see fit, be continued until further orders. They give no trouble, and the results, such as they are, can be easily recorded.

No. 109. ORDER THEREON, 12th April 1870, No. 448.

The Government resolve to communicate the letter above recorded to the Government of India. Under the circumstances stated by Dr. Cornish there would seem to be no advantage in continuing the observations in so unfavourable a locality as Madras. Should funds become available the experiments will be tried as suggested in some more suitable place, such as the delta of the Godavery, where the soil is more homogeneous in structure than in Madras.

(True Extract.)

Chief Secretary.

To the Sanitary Commissioner.

„ Inspector-General of the Indian Medical Department.

Exd. J. Wright.

Govt. of Madras.

PUBLIC.

To

THE SANITARY COMMISSIONER,
Madras.

Dated April, 12th.

Recd.

Encl.

G. O., 12th April 1870, No. 448.

APRIL.
Nos. 108—110.

Directing that the report of the Sanitary Commissioner, and the returns received therewith, of the experiments made by him at Madras for testing Professor Patenhofer's theory, regarding the origin and propagation of cholera, be forwarded to the Government of India.

PUBLIC DEPARTMENT.

No. 449.

FROM

THE HON. R. S. ELLIS, C.B.,
Chief Secretary to the Government of Fort Saint George,

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,
HOME DEPARTMENT.

SIR,

In continuation of my letter, dated the 8th March last, No. 283, I am directed
to transmit a copy of the Proceedings* of this Govern-
ment on a report from the Sanitary Commissioner,
submitting the returns of the experiments made by him at Madras for testing
Professor Pattenkofer's theory, relative to the origin and propagation of cholera.

I have the honour to be,

Sir,

Your most obedient servant,

FORT SAINT GEORGE,
12th April 1870.

Chief Secretary.

Home 1870 Dept.

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From Government of

Fort St. George.

Dated 12th April 1870. No.

Enclosures

R.

Spare copies

D. No.

D.

Procs.

L. No. 449.

No.

Forwarding a report from the Sanitary Commissioner, and the returns received therewith, of the experiments made by him at Madras for testing Professor Pattenkofer's theory, relative to the origin and propagation of cholera.

Public
From
The Offg Sanitary Commr
for Madras
To
The Chief Secretary to Govt
Public Depart
Fort St George

Dated 17th } March 1870
Recd 14 }
Enclos 4.

No 431. 330.

Reports on the observations
made in this office with the
view of testing Professor Patton
Kofers theory of Cholera, and
remarks on the unsuitableness
of the present place of experiment

C. 1/4/70
R. S. 1/5/70

4.
No 448. 12 April 70

The Government are
to communicate the
letter above mentioned
to the Govt of India.
Under the circumstances
stated by Dr. Jomish
there would seem to
be no advantage in
continuing the observation,
in so unfavorable a
locality as Madras.

I.D.S.

J.P.
A.V.

Should funds be available
the ^{experiments} ~~observations~~ will
be made ~~in~~ as sug-
-gested in some more
suitable place, such
as the delta of the
Godavary, where the
soil is more homogeneous
in structure than in
Madras. W.R.

20
Professor. J. H. H. H.
Theory of Cholera

Govt. of (1870) Madras.

Public

To
The Sanitary Commr.,
Madras.

Dated April 12

Recd.

Encl.

G. O. 12 April 1870. No. 449.

Nos. 108-110.

and propagation of cholera,
be forwarded to the
Govt. of India.

Noting that the report
of the Sanitary Commr. & the
Returns received from
of the experiments made
by him at Madras for
testing Professor Pattenhofer's
theory, regarding the origin
and

desp 2/4 with
two Diagrams & two Registers.

Public Departt.

No. 449

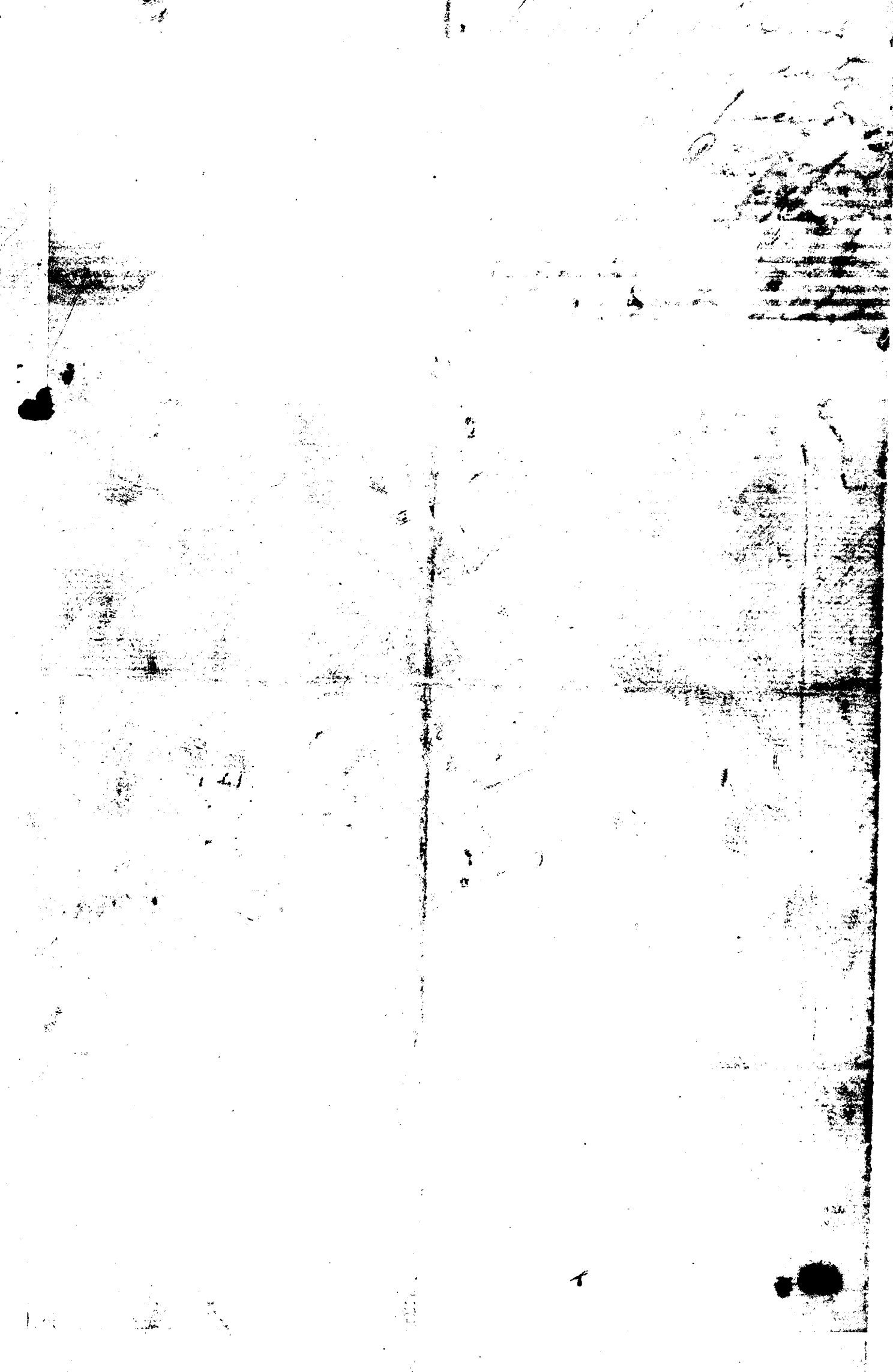
To
The Secretary to the Govt.
of India.
Home Departt.

Sir,

In continuation
of my letter dated
the 8th March last,
I am directed to
transmit a copy
of the Proceedings
of this Government
on a report from the
Sanitary Commission,
submitting the Return
of the experiments
made by him at
Madras for testing
Professor Pattenhofer's
theory, relative to the
origin and propa-
gation of cholera.

* No. 448 of 12 April 1870.

Forl. St. George
12 April 70.



Home 1870. Dept.

[Public]

From Government of

Fort St. George.

Dated April 2

1870

No.

Enclosures.

R.

spare copies.

D. No.

Progs.

D.

L. No. 449.

No.

Nos. 100-110.

~~7/12/1870~~

Forwarding Report ^{from} the
Sanitary Commission, and
the numerous notices received
of the experiments made
by him at Amoy for
testing Professor Pattison's
theory, relative to the origin
and propagation of
cholera.