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2. Date 3-2-37
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M.E.O. 1-82,400-22-11-80

MADRAS RECORD OFFICE.

Government of Madras.

Public DEPARTMENT.

G.O. No. 1627	Press ~~Mis.~~
Dated 30-11-	1869

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Department,
30th November 1869.*

No. 174. Read the following letter from the Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 25th October 1869, No. 3138.

I have the honour to submit, for the consideration of Government, a few remarks upon the water supply at Ootacamund, now in course of provision.

2. The water of these Hills, as procured from sources of supply, at elevations above the risk of contamination, and whether derived from perennial springs or from artificial impounding reservoirs, has been pronounced by Mr. Broughton, after chemical analysis, to be remarkably pure.

3. But there is abundant experience to show that, in order to maintain this condition of purity, it is necessary to adopt the principles of storage and distribution recognised in Europe.

"The practical solution in fact of the question of water supply in India is," as has been remarked by the Army Sanitary Commission in their Memorandum transmitted by the Right Honourable the Secretary of State with his Despatch, No. 12, (Sanitary,) dated the 24th June of the current year, "the same as in London."

4. The leading principles applicable to the conditions of supply to be adopted at Ootacamund may be stated as follow :—

1st.—That the sides and slopes of the impounding reservoirs should be most strictly conserved and especially kept free from cultivation requiring manure.

2nd.—That the water after filtration should be passed into covered reservoirs, and thence be distributed by pipes or closed conduits with the object of excluding it from light and air, during the whole course of its circulation after filtration.

5. The proposed scheme makes no provision for security against deterioration, and it requires little prescience to predict that before the water reaches the consumers, it will, in its flow along lines of open channels, be so contaminated by *inorganic* matters dissolved out of the soil, and *organic* matters communicated to it by the numerous methods of contamination associated with the habits of the natives of this country with which the Government are so well-acquainted, as to be quite unfitted for domestic purposes.

6. At Simla this has proved to be the case. Water, which at its source was of the purest quality, was found ere it reached the consumers, to have become most impure, and to be the actual means of diffusion of sickness. There can be little doubt that the same results will follow at Ootacamund, if the same system of supply by open channels is followed.

7. The Government, I am aware, have given full consideration to the importance of this subject, but while fully recognising the correctness of the principles of storage and distribution by pipes or closed conduits advised, are deterred by the additional expense attendant upon the system.

8. I would respectfully submit, however, that all money expended in giving the inhabitants of this favoured sanitarium a water supply upon the system of open channels, and without most rigid conservancy of the gathering grounds and filtration, will prove to be money wasted. The supply will by slow, but sure degrees be so contaminated as to be unfit for domestic use.

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30th November 1869.

9. Should filtration and the method of distribution of the *entire* supply by pipes be impracticable on financial grounds, it is most desirable that at least a portion of the supply, sufficient for domestic use, should after filtration be brought from the impounding reservoirs by pipes, and conducted into fountains or reservoirs, placed in convenient localities throughout the station.

10. These reservoirs or fountains need not be numerous; but it is certainly most advisable that the community should have it in their power to procure a pure water for drinking and culinary purposes, and a comparatively small number of the suggested fountains would place it in the power of every one to command pure water for domestic use.

11. It would be for the Municipality, in communication with the Executive Engineer, to determine the number, site, and construction of these fountains.

12. The material of which they should be constructed requires consideration. Mr. Broughton recently had a practical illustration of the necessity for attending to this point. For the convenience of his laboratory he led a stream of water, (possessing such purity that he was able to substitute it in all chemical processes, for distilled water) into a cistern constructed of ordinary brick and mortar. He found, however, that the water dissolved out so much of the lime salts that it was no longer fitted for use in his laboratory.

13. The fountains should, therefore, I think, be of iron; not that a little impregnation of the water by carbonate of lime would, in a sanitary point of view, be of much importance. In an economic sense it has more significance; still it is desirable to maintain, to the fullest possible extent, the original purity of the water.

These fountains might be provided with a number of "careless" cocks to prevent wastage.

14. But the details of the scheme which I have ventured to shadow forth for the favourable consideration of Government, would have to be considered by the Executive Engineer in communication with the Municipal Commission.

15. The cost of the scheme will not, I trust, be found so great as to militate against its entertainment. In the face of the impossibility—owing to the great expense of bringing the *whole* supply by iron pipes—it offers a solution of the difficulty of the question of providing a limited pure supply under conditions that exclude all possible sources of pollution.

16. I had the advantage of an interview with Colonel Farewell on the subject. He was pleased to express his approval of the scheme, and indeed appeared to accept it as quite practicable, and—as a measure calculated to meet the wants of the station—deserving of every consideration.

17. The main pipes I understood him to say might be of glazed earthenware as they would not be subjected to much pressure. The distribution pipes to the fountains would have to be of iron.

18. By the term "fountains," I do not mean any kind of reservoir into which vessels can be dipped at the risk of contamination of the supply. They might consist of iron reservoirs somewhat resembling the "pillar posts" recently erected in the station, with four "careless" cocks, from which at all times a pure supply

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30th November 1869.

could be drawn under conditions that would put it out of the power of any one to contaminate it.

19. I think it also necessary to add a caution regarding the conservancy of the impounding reservoirs near Major Morgan's property, and which is destined to supply the northern side of the station. The sides and slopes of part of the gathering grounds of that reservoir are under cultivation, and the land is heavily manured. The possibility, indeed the certainty, of the supply being thus contaminated at its fountain head must not be lost sight of. No precaution in fact should be omitted that may tend to maintain the purity of the supply, and heavy manuring of any portion of the gathering grounds will communicate impurities of the most dangerous nature.

20. The measures, then, I think it necessary on sanitary grounds to press upon the consideration of Government before further progress is made in the works now under execution, are—

1st.—That any further extension of cultivation upon the sides and slopes of the lands constituting the gathering grounds of the reservoir be prevented, and the grounds themselves strictly conserved;

2nd.—That a filter or filters be made for filtration of a limited supply of water for drinking and culinary purposes; that from these filters the water be made to pass into a closed reservoir or reservoirs (clear water tank); and

3rd.—Thence be distributed by pipes to fountains placed at sites to be determined by the Municipal Commission and Executive Engineer.

No. 175. ORDER THEREON, 30th November 1869, No. 1627.

In the foregoing letter the Sanitary Commissioner remarks on the water supply at Ootacamund, and offers suggestions for securing for the residents at that station a moderate supply of pure drinking water.

2. The Sanitary Commissioner's suggestions, briefly stated, are—that any further extension of cultivation upon the sides and slopes of the reservoir should be prevented and the grounds strictly conserved; and that, as the supply to each house of pure water would entail a very great expense, fountains should be erected at convenient spots in the station, so that the residents would be able to obtain water which has been stored in covered reservoirs—filtered—and led in earthenware, and where necessary, in iron pipes to the fountains.

3. His Excellency the Governor in Council approves of the Sanitary Commissioner's suggestions, and directs that a copy of his letter be furnished, through the Public Works Department, to Colonel Farewell, the Executive Engineer, with a view to his preparing, in communication with the Municipal Commissioners, plans and estimates for the proposed scheme.

4. It will also be suggested to Colonel Farewell, for inquiry, whether it may not be possible to find suitable clays on the Neilgherry Hills, and to manufacture earthenware pipes at Ootacamund itself.

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30th November 1869.

5. The Commissioner of the Neilgherries will be requested to abstain from granting any portion of the lands in the vicinity of the reservoir for cultivation and to arrange for the grounds being strictly conserved.

(True Extract.)

R. S. ELLIS,
Chief Secretary

To the Public Works Department.

„ Sanitary Commissioner.

„ Commissioner of the Neilgherry Hills.

„ Revenue Department.

Madras, 25th October 1869.

From

To

The Sanitary Commissioner for Madras,
The Chief Secretary to Government,
Public Department,
Fort Saint George.

SIR,

I have the honor to submit for the consideration of Government a few remarks upon the water supply at Cotacaimund, now in course of provision.

Enclosures.

2. The water of these Hills, as procured from sources of supply, at elevations above the risk of contamination, and whether derived from natural springs or from artificial reservoirs, has been pronounced by Mr. Throughton, after chemical analysis, to be remarkably pure.

3. But there is abundant experience to show that in order to maintain this condition of purity, it is necessary to adopt the principles of storage and distribution recognised in Europe.

The practical solution in fact of the question of water supply in India is-

Govt. of 1869, Madras.

PUBLIC.

To

THE PUBLIC WORKS DEPARTMENT,
&c., &c., &c.

Dated November, 30th.

Recd.

Encl.

G. O., 30th November 1869, No. 1627.

NOVEMBER.

Nos. 174-175.

Passing orders on a letter from the Sanitary Commissioner regarding the water supply of Cotacaimund.

as has been remarked by the Sanitary Commission in their memorandum transmitted by the Right Honble. the Secretary of State with his Despatch, N^o 12. (Sanitary) dated the 24th June of the current year - "the same as in London."

4. The leading principles applicable to the conditions of supply to be adopted at Cotacacumund, may be stated, as follows:-

(1st). That the sides and slopes of the impounding reservoirs should be most strictly conserved, and especially kept free from cultivation requiring manure.

(2nd). That the water after filtration should be passed into covered reservoirs, and thence be distributed by pipes or closed conduits with the object of excluding it from light and air, during the whole course of its percolation after filtration.

5. The proposed scheme involves no provision for security against deterioration, and it requires little foresight to predict that before the water reaches the consumers, it will, in its flow along series of open channels, be so contaminated by microscopic matters dissolved out of the soil, and organic matters communicated to it by the numerous methods of contamination associated with the habits of the natives

of this country with which the Government are so well acquainted, as to be quite unfitted for domestic purposes. 98^b

6. It further has proved to be the case. Water, which at its source was of the purest quality, was found, ere it reached the consumers, to have become most impure, and to be the actual means of diffusion of sickness. There can be little doubt that the same results will follow at Cotacacumund, if the same system of supply by open channels is followed.

7. The Government, I am aware, have given full consideration to the importance of this subject, but while fully recognising the correctness of the principles of storage and distribution by pipes or closed conduits, are deterred by the additional expense attendant upon the system.

8. I would respectfully submit, however, that all money expended in giving the inhabitants of this favored Sanitarium a water supply upon the system of open channels and without most rigid conservancy of the gathering grounds and filtration, will prove to be money wasted.

The supply will, by slow, but sure degrees be so contaminated as to be unfit for domestic use.

9. Should, filtration and the method of distribution of the entire supply by pipes, be impracticable on financial grounds, it is most desirable that at least, a portion of the supply, sufficient for domestic uses, should, after filtration, be brought from the impounding reservoirs by pipes, and conducted into fountains or reservoirs, placed in convenient localities throughout the station.

10. These reservoirs or fountains need not be numerous; but it is certainly most advisable that the community should have at its power to procure or purchase water for drinking and culinary purposes, and for comparatively small numbers of these suggested fountains would place it in the power of every one to secure as pure water for domestic uses.

11. It would be for the Municipality in communication with the Executive Council, to determine the number, sites and construction of these fountains.

12. The material of which they should be constructed requires consideration. 11/2
Upon a recent visit to the practical illustration of the necessity for attention to this point. For the convenience of this laboratory he led us streams of water, possessing such purity that he

11 3
was able to substitute it in all chemical processes, for distilled water into a cistern constructed of ordinary bricks and mortar. He found, however, that the water dissolved out so much of the lime salts that it was no longer fitted for use in his laboratory.

13. The fountains should, therefore, I think, be of iron; not that a little impregnation of the water by carbonates of lime, would, in a sanitary point of view, be of much importance. In an economic sense it has more significance; still it is desirable to maintain to the fullest possible extent the original purity of the water.

These fountains might be provided with a number of "careless" cocks to prevent wastage.

14. But the details of the scheme which I have ventured to shadow forth for the favorable consideration of Government, would have to be considered by the Executive Engineer in communication with the Municipal Commission.

15. The cost of the scheme will not, I trust, be found so great as to militate against its entertainment. In the face of the impossibility - owing to the great expense, of bringing the whole supply by iron pipes, it offers a solution of the difficulty of the

questions of providing a limited pure supply under conditions that exclude all possible sources of pollution.

15. I have the advantage of an interview with Colonel Farewell on the subject. He was pleased to express his approval of the scheme and indeed appeared to accept it, as quite practicable and - as measures, calculated to meet the wants of the station - deserving of every consideration.

17. The main pipes I understood him to say might be of glazed earthen ware so they would not be subjected to much pressure. The distribution pipes to the fountains would have to be of iron.

18. By the term "fountains," I do not mean any kind of reservoir into which water can be dipped at the risk of contamination of the supply. They might consist of iron reservoirs somewhat resembling the "pillar fountains" recently erected in the station, with 4 "cascades" or "jets," from which at all times a pure supply could be drawn under conditions that would put it out of the power of any one to contaminate it.

19. I think it also necessary to add precautions regarding the conservancy of the impounding reservoirs near Major Morgan's

property and which is destined to supply the northern side of the station. The sides and slopes of part of the gathering ground of that reservoir are under cultivation, and the land is heavily manured. The possibility, indeed the certainty, of the supply being thus contaminated at its fountain head must not be lost sight of. No precaution in fact should be omitted, that may tend to maintain the purity of the supply, and heavy manuring of any portion of the gathering ground will communicate impurities of the most dangerous nature.

20. The measures then, I think, it necessary on sanitary grounds to press upon the consideration of Government before further progress is made in the works now under execution are:-

(1st) That any further extension of cultivation upon the sides and slopes of the lands constituting the gathering grounds of the reservoir be prevented and the grounds themselves strictly conserved.

(2nd) That a filter or filters be made for filtration of a limited supply of water for drinking and culinary purposes; that from these filters the water be made to pass into a closed reservoir or reservoirs (clear

near water tank/pond
(3rd) Thence be distributed by pipes to
fountains placed at sites to be determined
by the Municipal Commissioners and Executive
Engineer.

I have the honor to be,

Sir,

Your most Obedt Servant

A. Maunick
Sanitary Commissioner
for Madras.

Memorandum

In this letter D. Rankin
 Unsubstantiated makes
 suggestions for securing
 for the station of Otago
 a moderate supply of
 pure drinking water.

His suggestion is that
 as the supply to each house
 of pure water would entail
 a very great expense
 should be erected at con-
 -venient spots in the station

I am in
 the minor station in
 the name.

I am sure that the
 cost of carrying out D.
 Rankin's proposals
 will not be an insuperable
 defect? - as a contribution
 towards their success I
 would at once suggest the Govt.
 to abstain from paying
 for cultivation any part
 of the land in the
 close vicinity of the station

From ~~Feb: 1869~~ ~~Sept:~~
Nov. 29 - Nov 1869
The Sanitary Comm.
for Madras

To The Chief Secy: to Govt.
Public Dept.
Fort Saint George
Sept 1869

Dated 25th

Sept 26 { Oct 1869

N 2376 N 3138.

Submits remarks upon
the water supply at
Ootacamund, now in
course of provision.

7 N 27 27 -

so that ^{these} the residents
would ~~be able to draw~~
~~water from the~~ ^{draw} water
which has been stored
in covered reservoirs -
filtered, & led
in earthenware & then
carrying iron pipes -
to the fountains.

These suggestions may
be submitted to the
Public Works
Department to Col. Fennell
with a view of that officer
communication with

where it is determined
to construct the
reservoir.

with the Municipal Com^{ee}
preparing plans and
estimates for the proposed
scheme.

It is certain that unless
the protection suggested
by Mr. Ranking is provided
water led by open channels
will reach the consumer
in a polluted condition
and the ~~water supply~~
water supply will be as
bad as that at Simla
I am not aware if clays
suitable for earthenware

any further extension of
cultivation upon the
sides

5
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Public Department.
AS GOVERNMENT.
Read the following letter from the
Sanitary Commissioner
for Madras.
(M.E. 25th Oct 1869 No 3138)
on 30 Nov/69 Dec 1869.
In the foregoing
letter the Sanitary Comm.
missioner remarks on the
water supply at Ottac.
mund, and offers sugges-
tions for securing for the
residents at that station
a moderate supply of
drinking water.
The Sanitary
Commissioner's suggestions
briefly stated, are that
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212
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necessary, in iron pipes
to the fountains.

3. His Excellency the
Governor in Council
approves of the Sanitary
Commissioner's suggestions,
and directs that a
copy of his letter be fur-
nished, through the Public

Works Department, to Col.
Farewell, the Executive
Engineer, with a view
to his preparing in com-
munication with the Munici-
pal Commissioners, plans
and estimates for the
proposed scheme -

4. It will also be sug-
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for inquiry, whether it
may not be possible to
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