

(1) Number of pages 12
(2) Date of repair 9.10.86
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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

PUBLIC WORKS DEPARTMENT

G.O. No. 4311.W.
B.P. No.

Press.
Mis.

Dated 8-11-1878

197.

28

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

8th November 1878, No. 4,311 W.

Buildings and Roads-
Military Works.

Read the following paper:—

No. 137. Circular from the Government of India, Public Works Department, (Military Works), dated Simla, 22nd October 1878, No. 91 P.W.

THE following is forwarded to the Local Governments and Administrations marginally noted, for information and guidance.
The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, and Punjab, in the Public Works Department.
The Chief Commissioners, Central Provinces, British Burmah, Mysore and Coorg, and Assam.
The Resident, Hyderabad.
The Agents of the Governor-General for Central India and Rajputana.
The Superintendent of Port Blair, and Chief Commissioner, Andaman and Nicobar Islands.
The Inspector-General of Military Works.

(By order,)

(Signed) C. POLLARD, Colonel, R.E.,
Dy. Secy. to the Govt. of India.

To the Secretary to the Government of Madras, Public Works Department.

From C. BERNARD, Esq., Officiating Secretary to the Government of India, Home Department, to the Officiating Agent to the Governor-General for the Rajputana States, dated Simla, 19th September 1878, No. 304.

I AM directed to acknowledge your letter* No. 1,196 S, dated the 31st May last, inquiring what officer is to be applied to when an analysis of potable water is required.

*To the Public Works Department.

2. In reply, I am to forward the accompanying copy of a letter† from the Military Department to the Quartermaster-General of the Army, and to say that, for analysis of ordinary water-supply, the rough process described in Dr. Cunningham's letters of October 1876 and February 1877 can be adequately carried out by the local Civil Surgeon. The attention of the officer entrusted with the duty should be drawn to the importance of investigating the physical surroundings of the source of supply, such as the gathering ground for a tank, or the circle of infiltration (which varies according to the strata or the consistency of the soil) in the case of a well. I am to add that if any large work of water-supply is contemplated, arrangements can be made by the Government of India to send, at the cost of the Local Government, a competent analyst to the spot.

No. 305.

Endorsed by the Home Department.

Copy forwarded to the Public Works and Foreign Departments.

From Colonel W. M. LEES, Officiating Secretary to the Government of India, Military Department, to the Quartermaster-General of the Army in India, dated Fort William, 19th September 1877, No. 341 (Sanitary—Potable Waters).

THE Government of India having had under consideration a scheme for the examination of the potable waters of military stations throughout India, I am directed to forward a copy of the correspondence noted in the margin, and to state, for the information of His Excellency the Commander-in-Chief, that, as financial considerations will not permit of this work being undertaken on a complete scale generally throughout the country, the Honorable the President in Council is pleased to direct that a "rough analysis" of the potable waters in cantonments be made periodically by one of the medical officers at each station, as suggested by the Sanitary Commissioner with the Government of India, and the result recorded in the cantonment annual sanitary report.

2. I am accordingly to request that His Excellency may be moved to issue the further necessary instructions for giving effect to this decision.

No. 343.

COPY of the above, and of the correspondence noted in the margin, forwarded to the Home Department for information, with reference to the memorandum thence, No. 161, dated the 27th August 1877.

From Sanitary Commissioner with the Government of India, No. 905, dated 23rd October 1876.
Military Department No. 1,006, dated 24th January 1877.
From Sanitary Commissioner with the Government of India, No. 59, dated 3rd February 1877.

From Surgeon-Major J. M. CUNNINGHAM, M.D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Military Department, dated Simla, 23rd October 1876, No. 905.

I HAVE the honor to return the enclosures of Military Department No. 826 S, (Sanitary—Reports and Returns), dated the 21st instant, being letter from the Bombay Government, with accompaniments, from the Surgeon-General and Quartermaster-General, relating to the remarks of the Army Sanitary Commission on the report of the Bombay Native Army for 1874.

2. The orders issued by His Excellency the Commander-in-Chief regarding the improvement of the lines of Native Regiments and their surroundings will, it is hoped, result in the removal of the insanitary conditions commented on by the Commissioner.

3. The letter of the Surgeon-General, copy of which is forwarded by the Bombay Government, is occupied with a history of water analysis in that Presidency, and with certain recommendations for conducting the inquiry on a more satisfactory basis. It is very evident that the analyses which have hitherto been made are of no value, or, as Dr. Thom expresses it, they have been "an utter waste of time, labor, and public money." This result has arisen, he explains, partly because the waters have not been analysed on the spot, and partly because the men by whom analyses have been made were not competent to undertake the work. Whether the latter explanation is correct or not, there can be little doubt that the results are open to all the objections urged against them by the Army Sanitary Commission.

4. All such useless labor should be stopped without delay, and if the analysis of water is to be continued, it should be done on a proper uniform plan. The Surgeon-General recommends that four intelligent Assistant Surgeons be appointed who should be not only itinerant analysts, but also assist the Sanitary Commissioner in all chemical and microscopic inquiries. No orders appear to have been issued by the Bombay Government either as to the stoppage of the present system or on Dr. Thom's other proposals.

5. I much fear that Assistant Surgeons could not be procured fit for the appointment proposed. Unless thoroughly qualified for these difficult duties, they would do more harm than good, and such peculiar qualifications can hardly be looked for in the Assistant Surgeon class. Moreover, I cannot agree with the Surgeon-General that the "Sanitation of the present day depends almost entirely on chemistry and the microscope." On the contrary, though inquiries involving such delicate and difficult investigations have great value in a scientific point of view, and may lead ultimately to decide advances in our knowledge of the causation and the best means of preventing disease, vast sanitary reforms, such as are specially needed in this country, can be made with little aid from either chemistry or the microscope.

6. I believe that in the present state of affairs, a rough analysis of water, made by an intelligent officer, who had at the same time an opportunity of inspecting and reporting on the local surroundings of the supply, would be sufficient, and in every way better fitted to secure practical results, than the system which has hitherto been in force.

From Captain E. H. H. COLLEN, Assistant Secretary to the Government of India, Military Department, to the Sanitary Commissioner with the Government of India, dated Fort William, 24th January 1877, No. 1,006 (Sanitary—Potable Waters).

WITH reference to paragraph 6 of your letter No. 905, dated the 23rd October 1876, I am directed to request that you will be so good as to indicate in further detail what kind of rough analysis of water should, in your opinion, be undertaken, and why it might not be useful for a medical officer in each station to do this work.

From Surgeon-Major J. M. CUNNINGHAM, M.D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Military Department, dated Calcutta, the 3rd February 1877, No. 59.

IN reply to Military Department No. 1,006 (Sanitary—Potable Waters), dated the 24th ultimo, I have the honor to state that the rough analysis referred in paragraph 6 of this office No. 905, dated the 23rd October, and which I suggested would be preferable to the system hitherto adopted in the Bombay Presidency, is the method generally laid down by Parkes and other authorities in their works on practical hygiene, and one which is well known to all medical officers who have been students at Netley.

2. It consists in the employment of one or two simple tests, especially Condry's fluid and solution of nitrate of silver. With these, added to such an examination of the hardness and other physical properties which may easily be made by any ordinary observer, a fair estimate may be obtained of the character of a water, and an opinion formed as to whether it is of good quality, suitable for drinking. Such a periodical examination might be made from time to time, with advantage, by one of the medical officers at each station, and the results recorded in the cantonment annual sanitary report.

3. For such an analysis no elaborate apparatus is required; nor is it desirable that it should be provided, for, besides involving considerable expense, such apparatus, when not in constant and careful use, rapidly deteriorates and gets out of order. Tubes and pipettes with a supply of the test solutions, renewed as may be needed, will suffice.

4. In employing this mode of examining water, it must be borne in mind that it is only a rough method and nothing more. Moreover, the Condry's fluid test must be used with considerable caution, and if the results it gives cast suspicion on the water, a specimen should be sent to a competent chemist before any decided verdict is passed. Of course there is no necessity for examining water which is manifestly open to pollution, still less for having the results of such examination pursued further. The rough analysis should in fact be employed as a means of ascertaining whether there is any reason, not to be seen in the surroundings, for suspecting the water. If, on the rough analysis, ground for such suspicion should appear, then the more complete examination should be made over to a chemist. The periodical rough analysis of water, imperfect as it is, will, however, serve a useful purpose in directing attention to the supply, and also in impressing on local authorities the great importance of exercising the most careful supervision over the wells and other sources from which water is drawn, and of taking such complete and constant precautions as will ensure them against contamination.

5. The complete analysis of water, I may remark, is one of the most difficult of chemical processes that can be undertaken, and I much fear that some of those analyses which were made in this Presidency of late years are not to be depended on. The recent researches of Drs. Lewis and Cunningham, on the Delhi waters in connection with Delhi sores, threw much doubt on the reports regarding this station, and the conclusions they have formed on this point have been confirmed by Professor Wood. A copy of their report on "Oriental Sore" is herewith forwarded with reference to their remarks at pages 24 to 26. Additional copies of this report will be submitted with this office annual sanitary report, of which it forms one of the appendices.

6. If a regular series of complete analyses of waters at military stations is desired, such as may be depended on both in a sanitary and practical point of view, the only way to obtain them is to bring from England one or two thoroughly educated chemists, to give them some little time for becoming acquainted with local peculiarities in India; and then send them to analyse waters at different stations and report on the water-supply in each, and this is the scheme which was recommended by the Sanitary Department in 1865, and not accepted by the Government. But, in the present state of the case, I believe that more practical benefit will result if the money which this would cost were expended on removing or remedying patent defects in the existing order of things.

7. For ordinary purposes, the rough analyses above proposed, aided by the professional chemist when suspicions are aroused, will, I believe, suffice. In any special case, Drs. Lewis and Cunningham might be sent to examine and report. Their remarks in the foot-note to page 25 of the "Oriental Sore" report show the importance of a thorough investigation in such matters, when any great project is in hand.

4 PUBLIC WORKS DEPARTMENT, 8TH NOVEMBER 1878, No. 4,311 W.

No. 138. ORDER THEREON, 8th November 1878, No. 4,311 W.

ORDERED to be recorded.

(True Extract.)

Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Military Department.

Exd. T. D. Ryan.
Spare Copies

BUILDINGS AND ROADS.
MILITARY WORKS.

Govt. of [1878] Madras.
PUBLIC WORKS

To

SUPERINTENDING ENGINEERS,

&c., &c., &c.

Dated November 8th.

Issued

Recd.

Encl.

G. O., 8th November 1878, No. 4311 W.

NOVEMBER.

Nos. 137-138.

Analysis of Potable Waters.—Circular from the Government of India regarding the procedure to be adopted in the — recorded.

Circular No. 91 P. W.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
MILITARY WORKS.

Simla, October 22, 1878.

The following is forwarded to the Local Governments and Adminis-

trations mar-
The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, ginally noted,
and Punjab, in the Public Works Department.
The Chief Commissioners, Central Provinces, British Burmah, Mysore and Coorg, and for information
Assam. and guidance.
The Resident, Hyderabad.
The Agents of the Governor General for Central India and Rajputana.
The Superintendent of Port Blair, and Chief Commissioner, Andaman and Nicobar Islands.
The Inspector General of Military Works.

By order,

Charles Bell

Col., R.E.,

Depy. Secy. to the Govt of India.

*To The Secy to the Govt of Madras.
P.W. Department.*

No. 304, dated Simla, 19th September 1878.

From—C. BERNARD, Esq., Offg. Secretary to the Govt. of India, Home Dept.,

To—The Offg. Agent to the Governor General for the Rajputana States.

I AM directed to acknowledge your letter* No. 11968., dated the 31st May last, enquiring what officer is to be applied to when an analysis of potable water is required.

* To the Public Works Department.

2. In reply, I am to forward the accompanying copy of a letter† from the Military Department to the Quartermaster General of the Army, and to say that, for analysis of ordinary water-supply, the rough process described in

† No. 341, dated 19th September 1877, and encl-
sures.

Dr. Cunningham's letters of October 1876 and February 1877 can be adequately carried out by the local Civil Surgeon. The attention of the officer entrusted with the duty should be drawn to the importance of investigating the physical surroundings of the source of supply, such as the gathering ground for a tank, or the circle of infiltration (which varies according to the strata or the consistency of the soil) in the case of a well. I am to add that if any large work of water-supply is contemplated, arrangements can be made by the Government of India to send, at the cost of the Local Government, a competent analyst to the spot.

No. 305.

Endorsed by the Home Department.

Copy forwarded to the Public Works and Foreign Departments.

No. 341 (Sanitary—Potable Waters), dated Fort William, 19th September 1877.

From—COLONEL W. M. LEES, Offg. Secy. to the Govt. of India, Military Dept.,

To—The Quartermaster General of the Army in India.

THE Government of India having had under consideration a scheme for the examination of the potable waters of military stations throughout India, I am directed to forward a copy of the correspondence noted in the margin, and to state, for the information of His Excellency the Commander-in-Chief, that, as financial considerations will not permit of this work being undertaken on a complete scale generally throughout the country, the Honorable the President in

From Sanitary Commissioner with the Government of India, No. 905, dated 23rd October 1876.

Military Department No. 1098 (Sanitary—Potable Waters), dated 24th January 1877.

From Sanitary Commissioner with the Government of India, No. 59, dated 2nd February 1877.

Council is pleased to direct that a "rough analysis" of the potable waters in cantonments be

made periodically by one of the medical officers at each station, as suggested by the Sanitary Commissioner with the Government of India, and the result recorded in the cantonment annual sanitary report.

2. I am accordingly to request that His Excellency may be moved to issue the further necessary instructions for giving effect to this decision.

No. 343.

From Sanitary Commissioner with the Government of India, No. 905, dated 23rd October 1876.
Military Department No. 1006, dated 24th January 1877.

From Sanitary Commissioner with the Government of India, No. 59, dated 3rd February 1877.

Copy of the above, and of the correspondence noted in the margin, forwarded to the Home Department for information, with reference to the memorandum thence, No. 161, dated the 27th August 1877.

No. 905, dated Simla, 23rd October 1876.

From—SURGEON-MAJOR J. M. CUNNINGHAM, M.D., Sany. Commr. with the Govt. of India,

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

I HAVE the honour to return the enclosures of Military Department No. 826S. (Sanitary—Reports and Returns), dated the 21st instant, being letter from the Bombay Government, with accompaniments, from the Surgeon General and Quartermaster General, relating to the remarks of the Army Sanitary Commission on the report of the Bombay Native Army for 1874.

2. The orders issued by His Excellency the Commander-in-Chief regarding the improvement of the lines of Native Regiments and their surroundings will, it is hoped, result in the removal of the insanitary conditions commented on by the Commissioner.

3. The letter of the Surgeon General, copy of which is forwarded by the Bombay Government, is occupied with a history of water analyses in that Presidency, and with certain recommendations for conducting the enquiry on a more satisfactory basis. It is very evident that the analyses which have hitherto been made are of no value, or, as Dr. Thom expresses it, they have been "an utter waste of time, labour and public money." This result has arisen, he explains, partly because the waters have not been analysed on the spot, and partly because the men by whom analyses have been made were not competent to undertake the work. Whether the latter explanation is correct or not, there can be little doubt that the results are open to all the objections urged against them by the Army Sanitary Commission.

4. All such useless labour should be stopped without delay, and if the analysis of water is to be continued, it should be done on a proper uniform plan. The Surgeon General recommends that four intelligent Assistant Surgeons be appointed: who should be not only itinerant analysts, but also assist the Sanitary Commissioner in all chemical and microscopic enquiries. No orders appear to have been issued by the Bombay Government, either as to the stoppage of the present system or on Dr. Thom's other proposals.

5. I much fear that Assistant Surgeons could not be procured fit for the appointment proposed. Unless thoroughly qualified for these difficult duties, they would do more harm than good, and such peculiar qualifications can hardly be looked for in the Assistant Surgeon class. Moreover, I cannot agree with the Surgeon General that the "Sanitation of the present day depends almost entirely on chemistry and the microscope." On the contrary, though enquiries involving such delicate and difficult investigations have great value in a scientific point of view, and may lead ultimately to decide advances in our knowledge of the causation and the best means of preventing disease, vast sanitary reforms, such as are specially needed in this country, can be made with little aid from either chemistry or the microscope.

6. I believe that in the present state of affairs, a rough analysis of water, made by an intelligent officer, who had at the same time an opportunity of inspecting and reporting on the local surroundings of the supply, would be sufficient, and in every way better fitted to secure practical results, than the system which has hitherto been in force.

No. 1006 (Sanitary—Potable Waters), dated Fort William, 24th January 1877.

From—CAPTAIN E. H. H. COLLEN, Asst. Secy. to the Govt. of India, Mily. Dept.,

To—The Sanitary Commissioner with the Government of India.

WITH reference to paragraph 6 of your letter No. 905, dated the 23rd October 1876, I am directed to request that you will be so good as to indicate in further detail what kind of rough analysis of water should, in your opinion, be undertaken, and why it might not be useful for a medical officer in each station to do this work.

No. 59, dated Calcutta, the 3rd February 1877.

From—SURGEON-MAJOR J. M. CUNNINGHAM, M.D., Sany. Commr. with the Govt. of India,

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

In reply to Military Department No. 1006 (Sanitary—Potable Waters), dated the 24th ultimo, I have the honor to state that the rough analysis referred to in paragraph 6 of this Office No. 905, dated the 23rd October, and which I suggested would be preferable to the system hitherto adopted in the Bombay Presidency, is the method generally laid down by Parkes and other authorities in their works on practical hygiene, and one which is well known to all medical officers who have been students at Netley.

2. It consists in the employment of one or two simple tests, especially Condry's fluid and solution of nitrate of silver. With these, added to such an examination of the hardness and other physical properties which may easily be made by any ordinary observer, a fair estimate may be obtained of the character of a water, and an opinion formed as to whether it is of good quality, suitable for drinking. Such a periodical examination might be made from time to time, with advantage, by one of the medical officers at each station, and the results recorded in the cantonment annual sanitary report.

3. For such an analysis, no elaborate apparatus is required; nor is it desirable that it should be provided, for, besides involving considerable expense, such apparatus, when not in constant and careful use, rapidly deteriorates and gets out of order. Tubes and pipettes with a supply of the test solutions, renewed as may be needed, will suffice.

4. In employing this mode of examining water, it must be borne in mind that it is only a rough method and nothing more. Moreover, the Condry's fluid test must be used with considerable caution, and if the results it gives cast suspicion on the water, a specimen should be sent to a competent chemist before any decided verdict is passed. Of course there is no necessity for examining water which is manifestly open to pollution, still less for having the results of such examination pursued further. The rough analysis should in fact be employed as a means of ascertaining whether there is any reason, not to be seen in the surroundings, for suspecting the water. If, on the rough analysis, ground for such suspicion should appear, then the more complete examination should be made over to a chemist. The periodical rough analysis of water, imperfect as it is, will, however, serve a useful purpose in directing attention to the supply, and also in impressing on local authorities the great importance of exercising the most careful supervision over the wells and other sources from which water is drawn, and of taking such complete and constant precautions as will ensure them against contamination.

5. The complete analysis of water, I may remark, is one of the most difficult of chemical processes that can be undertaken, and I much fear that some of those analyses which were made in this Presidency of late years are not to be depended on. The recent researches of Drs. Lewis and Cunningham, on the Delhi waters in connection with Delhi sores, throw much doubt on the reports regarding this station, and the conclusions they have formed on this point have been confirmed by Professor Wood. A copy of their report on "Oriental Sore" is herewith forwarded with reference to their remarks at pages 24 to 26. Additional copies of this report will be submitted with this office annual sanitary report, of which it forms one of the appendices.

6. If a regular series of complete analyses of waters at military stations is desired, such as may be depended on both in a sanitary and practical point of view, the only way to obtain them is to bring from England one or two thoroughly educated chemists, to give them some little time for becoming acquainted with local peculiarities in India; and then send them to analyze waters at different stations and report on the water-supply in each, and this is the scheme which was recommended by the Sanitary Department in 1865 and not accepted by the Government. But, in the present state of the case, I believe that more practical benefit will result if the money which this would cost were expended on removing or remedying patent defects in the existing order of things.

7. For ordinary purposes, the rough analyses above proposed, aided by the professional chemist when suspicions are aroused, will, I believe, suffice. In any special case, Drs. Lewis and Cunningham might be sent to examine and report. Their remarks in the foot-note to page 25 of the "Oriental Sore" report shew the importance of a thorough investigation in such matters, when any great project is in hand.

N^o 12623

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

MILITARY WORKS.

To

Circular No. 91 P. W.

Dated SIMLA, October 22, 1878.

Received

8th Nov.

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Trans: N^o 4311 Wd/8th Nov/80

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Procedure to be adopted in the analysis of pot-
able waters.

Staff 26-11-78-

Govt. C. B. Press, Simla, — No. 595, P. W. D. — 27-10-78 — 800.

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Govt. of (1878) Madrid.

PUBLIC WORKS.

To The Supg: Engrs.

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G. O. S. - Instr. 1878, No. 4311 M.

Nos. 370138

Analysis of potable
waters - Circular from
the Govt of Spain regarding
the procedure to be adopted
in the ———— records —

Entered in Reg.