

Govt. of (1883) Madras.

FINANCIAL

No 463 of 10 Feb/83

Communicated to
the Officers of the
Public Works Dept
for information—
to the effect that
the Government
have decided to
sink a well at
Madras.

Issued

Recd. 7/2/83

Encl.

G.O., 26th January 1883, No. 170.

L/2

Mt

3/2/83

Superintendent
Comm. Architect to Govt
Genl. Supt. P.W. Stores
Chief Eng. for Works
Comm. Eng. for Works
Chief Eng. P.W. D

JANUARY.

B.N. 463 of 10.2.83

Artesian Wells.

Communicating to the Presidents of all Municipalities the Sanitary Commissioner's Inspection Notes on the — at Pondicherry, and placing at his disposal Rs. 1,000 to sink a well at Madras.

With order

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

READ—the following paper :—

G.O., dated 26th January 1883, No. 190, Public.

Read—the following papers :—

From Deputy Surgeon-General M. C. FURNELL, M.D., F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 6th January 1883, No. 4.

I have the honor to forward some notes on the artesian wells of Pondicherry lately visited by me.

2. Since they were written, Davasigamany Modelliar, the man alluded to in paragraph 8, has called upon me here in Madras, and he informs me he has come here on purpose to bore a well for some native merchant in Ráyapuram.

3. I would venture to suggest that advantage be taken of his services and apparatus, whilst here, to construct a well in the People's Park or other convenient situation, not only for the use such a well may be to surrounding inhabitants, but as an incentive to other Municipalities.

ENCLOSURE.

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Pondicherry, 18th and 19th December 1882.

My object in visiting this French Settlement was to make myself acquainted with the artesian well water-supply, and to ascertain how far the inhabitants of this town had or had not escaped the epidemic of cholera which swept over Southern India during the end of 1881 and commencement of 1882. A full description of these wells (as far as they then existed) is given in various Government Orders marginally noted, but more especially that of 31st March 1881, No. 548, Revenue Department.

G.O.,	7th July 1879,	No. 1426,	Revenue Department.	
"	13th Sept. "	" 1878,	"	"
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“For domestic use, therefore, a water-supply by means of artesian wells would, if obtainable as cheaply as in the case of the well at Pondicherry, appear to be worthy of attention,” and he points out that a supply of 20 gallons per head per diem would cost in a population of 10,500 about 6½ pies per head per annum.

3. To a Sanitary Commissioner, the interest of such a water-supply lies, of course, mainly in its effects on the health of a community, and the freedom it may bring it from epidemics of cholera and Typhoid fever. The question of irrigation does not, except indirectly, concern him.

4. *Number of Wells in Pondicherry.*—There are now a number of artesian wells (14) scattered over the town of Pondicherry and its neighbourhood. In Mr. King's report, 20th May

1880, four or five are described. I saw four in one compound alone, that of the Savana Filature another in the Jardin D'Acclimatation, another in Colonel Sherman's garden and one in course of construction, and in many different parts of Pondicherry fountains with water laid on from these wells pour forth an ample supply of pure clear water for the use of the inhabitants.

5. *Different strata bored through in construction of these Wells.*—At Savana Filature I was shown by Mons. Louis Cornet, the Engineer, who spared no trouble to give me every information on the subject, a number of sectional diagrams of the borings. These were ingeniously constructed, showing the actual strata in position, not drawings of but the sand, laterite, argillaceous sand, &c., themselves *in situ*; and I was struck with the various and dissimilar strata of the different borings. Thus whilst in two or three the principal strata are alternate layers of gravel mixed with clay, lumps of black plastic clay, coarse blackish sand mixed with black clay, &c.; in one, viz., the well in Mr. Cornet's own compound in town (alluded to by Mr. King, paragraph 8, G.O., 20th May 1880, No. 569, Revenue Department, as then under construction), the strata were all more or less of hard, almost impenetrable, material thus described—quartz, argillaceous sand, coal, sable gros grains, quartenz, lignites, debris des roches primitives, minerais-de-fer lateritis gris ferrugineux, &c.

6. This well taxed Mr. Cornet's resources, perseverance and ingenuity to the utmost. It was commenced 16th August 1879 and brought to a successful issue only on 27th September 1880. There were 244 days and 10 nights' actual work, but the cost is only Rs 1,000. The boring was carried to a depth of 82 metres, equal to 338 feet: the result, however, is an abundant supply of good water. The Cuddalore boring was abandoned at a depth of 359 feet at a cost of Rs. 2,610. Why abandoned is not very evident, but according to Kinsly the borer, "owing to the absence of piping, the sides of the hole fell in and choked the passage." This was what I heard at Pondicherry. That in some borings more difficulties are met with than in others is very evident from a study of the wells at Pondicherry. The successful wells at Savana Filature cost I see each upwards of Rs. 2,000.

7. *Nature of Water.*—I have tasted the water at the different sources; it is warm, clear, with a distinctly ferruginous taste. It is used by the natives for cooking and drinking, and its slightly ferruginous taste comes to be liked after a short time. It is in high repute medicinally; skin affections are said to disappear under its use, and many natives of respectability come from English territories to drink the water for diabetes; indeed, lately at Madura I met a highly intelligent Brahmin gentleman who informed me he had been residing in Pondicherry for some time to drink these waters for an affection of the kidneys, and had derived much benefit therefrom.

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10. *Remarks.*—I have frequently remarked, but I cannot help again repeating it, that an improved water-supply is the great sanitary need of our Indian Municipal towns. Until the frightful water contamination which at present obtains is overcome, all our other efforts are almost nugatory. We have such large towns as Tanjore, Trichinopoly, Madura, Negapatam, Berhampore, and others with little or no clean water for domestic purposes. The greater number of people drink and cook with what in Europe would be called sewage. I am not exaggerating when I use the term sewage. Here, not in our territories, but close to us, is a city not so rich perhaps as any I have mentioned above, with an ample supply of good water available to the poorest, and which the people cannot defile. It may be said of Pondicherry as it is said of Rome, "its principal wealth lies in its magnificent water-supply." I think it would be well if the question were taken up again, and the Negapatam Municipality taking heart from the great success of artesian boring at Pondicherry, were to engage the services of some one practically acquainted with the process to construct an artesian well for it.

From Deputy Surgeon-General M. C. FURNELL, M.D. F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 11th January 1883, No. 39.

In continuation of my notes on the artesian wells of Pondicherry, I have the honor to forward copy of an analysis made of a sample I brought away with me by the Chemical Examiner to Government.

2. This analysis had not been forwarded to me before the report was sent in. It is very satisfactory.

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Total solids,	Grms. per litre	..	..	..	..	..	0.43
Volatile solids,	do. do.	..	..	..	..	..	0.12
Sodium chloride,	do. do.	..	..	..	..	..	0.047
Total hardness,	Clark's scale	..	..	..	..	..	9° 8
Permanent hardness	do. do.	..	..	..	..	..	2° 8
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Nitric acid	do. do. as ammonia	..	..	..	..	..	1.2

Remarks.—A good water.

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Communicated to the Revenue and Financial Departments.

(True Extract.)

C. G. MASTER,
Chief Secretary.

To the Revenue Department.
" Financial Department.
" Sanitary Commissioner.

ORDER—dated 26th January 1883, No. 170, Financial.

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To the Sanitary Commissioner.
" the Accountant-General.
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" all Presidents of Municipalities including Madras.

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Albumenoid ammonia,	do. do.	..	..	..	..	..	0.02
Nitric acid	do. do. as ammonia	..	..	..	..	..	1.2

Remarks.—A good water.

Order—dated 26th January 1883, No. 190, Public.

Communicated to the Revenue and Financial Departments.

(True Extract.)

C. G. MASTER,
Chief Secretary.

To the Revenue Department.
" Financial Department.
" Sanitary Commissioner.

ORDER—dated 26th January 1883, No. 170, Financial.

Communicated to the Presidents of all Municipalities.

2. The Government resolve to place the sum of Rs. 1,000 at the disposal of Dr. Furnell in view to the experiment of sinking an artesian well in some convenient locality in Madras being tried as suggested in his letter read above. The work should be done in communication with the Chief Engineer.

(True Extract.)

Chief Secretary.

To the Sanitary Commissioner.
" the Accountant-General.
" the Public Works Department.
" all Presidents of Municipalities including Madras.

Exd. A. Aubert.

Govt. of (1883) Madras.

FINANCIAL

Issued

Recd.

Encl.

G.O., 26th January 1883, No. 170.

No 463 Wdy 10/2/83

JANUARY.

Artesian Wells.

Communicating to the Presidents of all Municipalities the Sanitary Commissioner's Inspection Notes on the — at Pondicherry, and placing at his disposal Rs. 1,000 to sink a well at Madras.

P.W. Dept

Govt. of (1883) Madras.

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With order

No 463 Wdy 10/2/83

Communicated to
the officers of the Public
Works Dept for information.

/s/ J. J.
By W.

To.

The Supt Engineers

" Comr. Archt to Govt

" Genl Supt, P.W. Store

" Chief Engineer for Irrigation

" Comr. Engineer for Rep

" Chief Eng. P.W.D.

26TH JANUARY 1883, No. 170, FINANCIAL.

GOVERNMENT OF MADRAS.
FINANCIAL DEPARTMENT.

READ—the following paper :—

G.O., dated 26th January 1883, No. 190, Public.

Read—the following papers :—

From Deputy Surgeon-General M. C. FURNELL, M.D., F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 6th January 1883, No. 4.

I have the honor to forward some notes on the artesian wells of Pondicherry lately visited by me.

2. Since they were written, Davasigamany Modelliar, the man alluded to in paragraph 8, has called upon me here in Madras, and he informs me he has come here on purpose to bore a well for some native merchant in Ráyapuram.

3. I would venture to suggest that advantage be taken of his services and apparatus, whilst here, to construct a well in the People's Park or other convenient situation, not only for the use such a well may be to surrounding inhabitants, but as an incentive to other Municipalities.

ENCLOSURE.

Inspection Notes of the Sanitary Commissioner for Madras on Pondicherry.

Pondicherry, 18th and 19th December 1882.

My object in visiting this French Settlement was to make myself acquainted with the artesian well water-supply, and to ascertain how far the inhabitants of this town had or had not escaped the epidemic of cholera which swept over Southern India during the end of 1881 and commencement of 1882. A full description of these wells (as far as they then existed) is given in various Government Orders marginally noted,

G.O.,	7th July 1879,	No. 1426,	Revenue Department.
"	13th Sept. "	" 1878,	"
"	23rd Aug. 1880,	" 1605,	Financial "
"	20th May "	" 569,	Revenue "
"	31st Mar. 1881,	" 548,	"

but more especially that of 31st March 1881, No. 548, Revenue Department.

2. *Use for drinking, apart from Irrigation.*—Colonel Mullins, in his memorandum (G.O., 13th September 1879, No. 1878, Revenue Department), seems to have conclusively settled the question of their inutility as means of irrigation, but he remarks :—

"For domestic use, therefore, a water-supply by means of artesian wells would, if obtainable as cheaply as in the case of the well at Pondicherry, appear to be worthy of attention," and he points out that a supply of 20 gallons per head per diem would cost in a population of 10,500 about 6½ pies per head per annum.

3. To a Sanitary Commissioner, the interest of such a water-supply lies, of course, mainly in its effects on the health of a community, and the freedom it may bring it from epidemics of cholera and Typhoid fever. The question of irrigation does not, except indirectly, concern him.

4. *Number of Wells in Pondicherry.*—There are now a number of artesian wells (14) scattered over the town of Pondicherry and its neighbourhood. In Mr. King's report, 20th May

1880, four or five are described. I saw four in one compound alone, that of the Savana Filature another in the Jardin D'Acclimatation, another in Colonel Sherman's garden and one in course of construction, and in many different parts of Pondicherry fountains with water laid on from these wells pour forth an ample supply of pure clear water for the use of the inhabitants.

5. *Different strata bored through in construction of these Wells.*—At Savana Filature I was shown by Mons. Louis Cornet, the Engineer, who spared no trouble to give me every information on the subject, a number of sectional diagrams of the borings. These were ingeniously constructed, showing the actual strata in position, not drawings of but the sand, laterite, argillaceous sand, &c., themselves *in situ*; and I was struck with the various and dissimilar strata of the different borings. Thus whilst in two or three the principal strata are alternate layers of gravel mixed with clay, lumps of black plastic clay, coarse blackish sand mixed with black clay, &c.; in one, viz., the well in Mr. Cornet's own compound in town (alluded to by Mr. King, paragraph 8, G.O., 20th May 1880, No. 569, Revenue Department, as then under construction), the strata were all more or less of hard, almost impenetrable, material thus described—quartz, argillaceous sand, coal, sable gros grains, quartenz, lignites, debris des roches primitives, minerais-de-fer lateritis gris ferrugeneux, &c.

6. This well taxed Mr. Cornet's resources, perseverance and ingenuity to the utmost. It was commenced 16th August 1879 and brought to a successful issue only on 27th September 1880. There were 244 days and 10 nights' actual work, but the cost is only Rs. 1,000. The boring was carried to a depth of 82 metres, equal to 338 feet: the result, however, is an abundant supply of good water. The Cuddalore boring was abandoned at a depth of 359 feet at a cost of Rs. 2,610. Why abandoned is not very evident, but according to Kinsly the borer, "owing to the absence of piping, the sides of the hole fell in and choked the passage." This was what I heard at Pondicherry. That in some borings more difficulties are met with than in others is very evident from a study of the wells at Pondicherry. The successful wells at Savana Filature cost I see each upwards of Rs. 2,000.

7. *Nature of Water.*—I have tasted the water at the different sources; it is warm, clear, with a distinctly ferruginous taste. It is used by the natives for cooking and drinking, and its slightly ferruginous taste comes to be liked after a short time. It is in high repute medicinally; skin affections are said to disappear under its use, and many natives of respectability come from English territories to drink the water for diabetes; indeed, lately at Madura I met a highly intelligent Brahmin gentleman who informed me he had been residing in Pondicherry for some time to drink these waters for an affection of the kidneys, and had derived much benefit therefrom.

8. *Cost of Wells.*—The wells at the Savana Filature cost, as remarked above, about Rs. 2,000 each. Colonel Sherman tells me his well cost him about Rs. 500; that a native in Pondicherry is very willing to undertake sinking wells on a salary of Rs. 150 for himself per month, finding the machinery, but of course not paying the coolies, the pay of which must be defrayed by the person employing him. I saw yesterday evening, 19th December, a well in course of being sunk at Villanour, and I am quite at a loss to understand how the Negapatam Municipality can talk of a preliminary expense of Rs. 7,500 for the purchase of instruments (G.O., No. 1605, 23rd August 1880, Financial Department). Judging from what I saw there, and at Mr. Cornet's, I should say 200 to 300 rupees would cover the cost of the machinery easily. But any difficulty on this head seems set aside by the fact that Davasigamany Modelliar, the native alluded to, if employed, will bring his own boring instruments.

9. *Pondicherry during late Cholera Epidemic.*—I visited the General Hospital at Pondicherry to make inquiries about the late cholera epidemic, naturally thinking I should there find official records on the subject. The Medecin-en-Chef, Dr. Quetand, had not heard of any cases of cholera. The native doctor of whom he enquired had heard of a few in the outlying districts, but there had been none in the town. A few cases had been imported into Villanour, an outlying suburb, but it had not spread. "You see, Monsieur, we have such good water" was his remark.

10. *Remarks.*—I have frequently remarked, but I cannot help again repeating it, that an improved water-supply is the great sanitary need of our Indian Municipal towns. Until the frightful water contamination which at present obtains is overcome, all our other efforts are almost nugatory. We have such large towns as Tanjore, Trichinopoly, Madura, Negapatam, Berhampore, and others with little or no clean water for domestic purposes. The greater number of people drink and cook with what in Europe would be called sewage. I am not exaggerating when I use the term sewage. Here, not in our territories, but close to us, is a city not so rich perhaps as any I have mentioned above, with an ample supply of good water available to the poorest, and which the people cannot defile. It may be said of Pondicherry as it is said of Rome, "its principal wealth lies in its magnificent water-supply." I think it would be well if the question were taken up again, and the Negapatam Municipality taking heart from the great success of artesian boring at Pondicherry, were to engage the services of some one practically acquainted with the process to construct an artesian well for it.

From Deputy Surgeon-General M. C. FURNELL, M.D. F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 11th January 1883, No. 39.

In continuation of my notes on the artesian wells of Pondicherry, I have the honor to forward copy of an analysis made of a sample I brought away with me by the Chemical Examiner to Government.

2. This analysis had not been forwarded to me before the report was sent in. It is very satisfactory.

ENCLOSURE.

							Water taken from an Artesian Well.
Total solids,	Grms. per litre	..	..	..	..	..	0.43
Volatile solids,	do. do.	..	..	..	..	..	0.12
Sodium chloride,	do. do.	..	..	..	..	..	0.047
Total hardness,	Clark's scale	..	..	..	..	..	9° 8
Permanent hardness	do. do.	..	..	..	..	..	2° 8
Free ammonia,	Mlgrms. per litre	..	..	..	..	..	Nil.
Albumenoid ammonia,	do. do.	..	..	..	..	..	0.02
Nitric acid	do. do. as ammonia	..	..	..	..	..	1.2

Remarks.—A good water.

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" Financial Department.
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Exd. A. Aubert.