GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 1st May 1886, No. 411 M., Financial.

Abstract.—Referring to the Public Works Department, for inquiry and report, paragraph 9 of the Sanitary Commissioner's letter reporting on the project of water-supply in Dindigul, and stating that, if the proposal made therein be not found feasible, the Municipal Council will be asked to report on the scheme of bringing water from Koduvanar.

G.O., dated 22nd November 1886, No. 1172 M., Financial.

Abstract.—Awaiting the result of the experiment now being made of the Dindigul water-supply project, and directing the Sanitary Commissioner to furnish the Superintending Engineer, VI Circle, with the report required in paragraph 7 of his letter.

G.O., dated 12th January 1887, No. 27 M., Local and Municipal.

Abstract.—Recording, pending report on the result of the experiment of the Dindigul water-supply scheme, letter from the Sanitary Commissioner furnishing the information required by the Superintending Engineer, VI Circle.

Read—also the following papers :—

From H. M. WINTERBOTHAM, Esq., Divisional Officer in charge of the office of Chairman, Dindigul Town Council, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 29th October 1887, No. 119.

I have the honor to report the result of the experiment sanctioned in G.O., Mis. No. 1126 M., dated 10th November 1886.

2. I took charge at Dindigul on 29th September, and found that a large centrifugal pump and engine had been procured from Negapatam. With the piping supplied, I found it impracticable to get nearer the bottom of the well than $2\frac{1}{2}$ feet. The bottom of the well is not level, being considerably deeper in the middle than at the sides. The water in the well (measuring at the side) stood at 13 feet 9 inches.

3. The pump emptied the well down to $2\frac{1}{2}$ feet from the bottom in less than an hour; and it then became apparent that water was pouring freely into the well through cracks in the stones on all four sides, evidently by percolation from the adjoining tank.

4. Mr. Crole (paragraphs 8 and 11 of his letter printed at pages 2 and 3 of G.O., 1st May 1886, No. 411 M., Financial) believed the pumping-shaft to be hermetically sealed by a case "of solid masonry pointed with Portland cement;" but it appears that cement was only applied for about 2 feet below the usual water-level, that being the greatest depth to which the pulsometer then in use could sink the water.

5. The free percolation of the filthy tank water into the well vitiates the whole experiment both as to quantity and quality. However, as the pump had been procured and fitted up at a great expense, and with much trouble, I caused the well to be

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5. The free percolation of the filthy tank water into the well vitiates the whole experiment both as to quantity and quality. However, as the pump had been procured and fitted up at a great expense, and with much trouble, I caused the well to be

pumped out to 2½ feet from the bottom on ten consecutive days excluding Sundays, and then took two samples of the water in the manner indicated by Mr. Crighton, and submitted them for analysis to the Chemical Examiner.

6. The time that the well took to refill was carefully noted, and the following was found to be the rate per foot, beginning at 2½ feet from the bottom as zero :—

From 0 to 1 foot.	35·4 minutes.
„ 1 to 2 feet.	36·6 „
„ 2 to 3 „	42·6 „
„ 3 to 4 „	48·8 „
„ 4 to 5 „	51·8 „
„ 5 to 6 „	64·0 „
„ 6 to 7 „	93·0 „
„ 7 to 8 „	102·2 „
„ 8 to 9 „	139·0 „
„ 9 to 10 „	205·0 „
10 feet	818·4 minutes.

Each foot in depth represents, as near as may be, 3,620 gallons. Thus, at 2½ feet from the present bottom the well fills at the rate of about 6,200 gallons an hour, the rate gradually decreasing as the water approaches the top. To rise 10 feet (36,200 gallons) takes 13 hours 38 minutes ; 4½ inches of rain fell during the week prior to the day on which pumping began.

7. Pending receipt of the Chemical Examiner's report, it was resolved to endeavor to pump out the well and tank simultaneously, so as to get rid of the disturbing influence of the latter. For this end, a pulsometer was obtained from Madura (by the kind offices of the Collector and the Secretary, Agricultural Farm, Madura), but on setting the pulsometer to pump the well, it was found to be incapable of discharging more than 5,125 gallons an hour, and at a depth of 6 feet from the bottom the water comes into the well faster than the pulsometer could empty it. Also the iron pipes supplied with the centrifugal pump could not be adjusted so as to reach the bottom of the tank, and no additional piping is locally procurable. The Chemical Examiner's report on the water was also discouraging ; and at a meeting of the Town Council this morning it was resolved, for want of the proper appliances, to abandon the project of pumping out the well and tank simultaneously and to return the centrifugal pump to Negapatam.

8. The Chemical Examiner's report on the two samples submitted to him is given below. Sample No. I was drawn from the surface of the well when full. Sample No. II was taken from the water gushing from the pump 3 minutes after pumping began, and thus represents the water 2½ feet from the bottom of the well when full :—

	Sample No. I.	Sample No. II.
Total solids, grms. per litre	1·560	1·680
Volatile solids, do.	0·510	0·670
Chlorine, do.	0·402	0·420
Total hardness, Clark's scale	66°·500	66°·500
Permanent hardness, Clark's scale	28°·000	43°·750
Free ammonia, mlgrms. per litre	trace.	trace.
Albumenoid ammonia, mlgrms. per litre	0·040	0·080
Nitric acid, mlgrms. per litre (as ammonia)	12·000	12·000
Apparent quality of the water as inferred from the results obtained on examination	Bad.	Bad.

Each sample contains much lime magnesia with traces of sulphuric acid, no deposit.

9. It is interesting for purposes of comparison to give here the results of former analyses of the same well-water. I do not know whether a chemist can account for what seem to be somewhat extraordinary variations.

	Water taken from the Well, July 1884.	Water taken from the Well, 15th September 1885.	Water taken from the Well, 22nd September 1885.
	No. 2 (*Vide* G.O., No. 411 M., Financial, dated 1st May 1886).	Sample No. II.	Sample No. I.
Total solids, grms. per litre	0·92	1·73	1·460
Volatile solids, do.	0·25	0·65	0·440
Chlorine, do.	0·018	0·426	0·369
Total hardness, Clark's scale	21°·7	35°·0	25°·9
Permanent hardness, Clark's scale	0°·28	15°·4	14°·7
Free ammonia, mlgrms. per litre	0·28	0·24	0·24
Albumenoid ammonia, mlgrms. per litre	0·12	0·16	0·12
Nitric acid, mlgrms. per litre (as ammonia)	11·25	45·0	45·0
Apparent quality of the water as inferred from the results obtained on examination	Suspicious.*	Bad.†	Bad.‡

* If carefully guarded from dangerous organic contamination, may be usable ; but in their present state, they cannot be regarded as safe for drinking without boiling.

† *Microscopic Examination.*—Some yellowish white flocculent sediment consisting of organic debris including remains of insects and living extomostraca (*Cyclops*).

‡ *Microscopic Examination.*—Slight deposit of sharp sand mixed with decaying vegetable matters and containing infusoria, dictorus and other organisms.

10. However much the water may fall below the ideal standard of excellence, it is clear and palatable, and would, I imagine, compare favorably with what is usually drunk in most parts of the presidency. It is certainly now contaminated by the adjoining stagnant water, which might be got rid of ; and it is also to be remembered that the Chemical Examiner's report is equally unfavorable as regards all the other available sources of supply.

11. I think the quality of the water can never be fairly tested until the tank has either been thoroughly cleared out, or (better) filled in in the manner contemplated in paragraph 17 of Mr. Crole's letter (page 4, G.O., 1st May 1886, No. 411 M., Financial), and when this is done, I think the quality of the water cannot but greatly improve. It is, no doubt, quite practicable to put in a layer of clay, 15 or 20 feet wide, between the well and the tank, which would effectually stop percolation. Until this is done, it seems useless to expect any improvement in the quality of well-water.

Forwarded.

(Signed) H. M. WINTERBOTHAM,
Sub-Collector.

No. 431.

Submitted.

2. The result is most discouraging. I agree with Mr. Winterbotham that if we submitted the water usually drunk by the masses in this country to a chemical test, the result would be even more unsatisfactory than in the present instance. The worst of it is that no one can find a better supply. Must then Dindigul go without water ? The Sippanuthee water can at least be used for cooking and cleaning purposes.

MADURA,
7th November 1887.

(Signed) E. TURNER,
Collector.

From the Rev. Dr. E. CHESTER, Dindigul, dated 2nd November 1887.

From the President, Sarvajana Sabha, dated Dindigul, 19th November 1887.

ABSTRACT.—Submitting memorials from the members of the above Sabha praying that Sippanuthee water scheme may be sanctioned.

From the Private Secretary to the Right Honorable the Governor, dated 25th November 1887.

Abstract.—Transfers a petition from the Dindigul Sarvajana Sabha regarding the scarcity of water in the town.

Order—dated 3rd February 1888, No. 107 M., Local and Municipal.

The above papers relate to the scheme proposed by Mr. Crole, late Collector of Madura, for supplying the town of Dindigul with good drinking water. During the 11 years previous to 1885, several schemes were brought forward for this object, but they were dropped one after another on account of their impracticability or prohibitive cost. At length Mr. Crole, in consultation with Mr. Crighton of the South Indian Railway, devised a scheme which consisted in sinking a well in the bed of the abandoned Sippanuthee tank and pumping water therefrom into a reservoir from which the water was to be distributed through the town by small house service pipes. A local Water Project Committee was formed which took up this scheme and spent about Rs. 7,500 on it, making available, according to Mr. Crole, some 30,000 or 40,000 gallons of water for daily consumption. The Municipal Council subsequently took up the scheme in November 1884, and in March 1885 they requested the sanction of Government for the whole project, which was estimated to cost Rs. 31,551.

2. With regard to the quantity of water available in the well, there was no accurate information, and as to the quality, the Chemical Examiner who analysed two specimens in July 1884 pronounced one "bad" and the other "suspicious."

3. The Public Works Department, to whom the scheme was referred for scrutiny, found it incomplete, and it was returned to the Municpal Council for reconsideration. A fresh analysis of the water was also ordered to be made and the Sanitary Commissioner's remarks obtained thereon.

G.O., No. 225 M., dated 26th June 1885.

4. The Sanitary Commissioner, Dr. Bidie, reported that the result of the second analysis, made in September 1885, was more discouraging than the first, and that the water was hopelessly bad. He, however, thought that, as there was a large supply of ground water in the locality, it was desirable to ascertain whether the current could not be tapped in some other spot where a purer supply might be obtained. At the same time he suggested that a wholesome supply might be obtained from the Koduvanar river.

G.O., No. 411 M., dated 1st May 1886.

5. The matter was then referred to the Superintending Engineer, who reported that he saw little chance of better water than that from the Sippanuthee well being obtained anywhere in the town, and that the proposal to bring water from the Koduvanar must be abandoned as impracticable on account of the great outlay it would involve. He suggested, however, that, before incurring the expense of searching for the under-ground current outside the town, the Sippanuthee water should be once more analysed after the well had been pumped out for ten successive days so as to get rid of local impurities.

G.O., No. 1172 M., dated 22nd November 1886.

6. This experiment has been carried out and the Sanitary Commissioner has again pronounced the water to be bad. The results of the experiment were, however, vitiated by water freely percolating into the well on all sides from the adjoining tank.

7. The late Chairman of the Municipal Council, Mr. Winterbotham, states that the water of the Sippanuthee well is clear and palatable, and that it will compare favorably with what is usualy drunk in other parts of the presidency. Mr. Winterbotham was, however, new to the place, and it is observed that prior to the inception of Mr. Crole's scheme this water appears to have been looked on by the people with much distrust. Dr. Bidie upon personal inquiry in 1886 found that it had never at any time been used for drinking purposes, and similar evidence is afforded by the Rev. Dr. Chester who has resided in the town for over 20 years. The Government

also understand that the bulk of the people have not shown any particular interest in the scheme.

8. His Excellency in Council does not, of course, look for ideally perfect water, but the water in question is far worse than imperfect, the highest chemical and sanitary authorities available being of opinion that it gives a degree of impurity, both organic and inorganic, beyond the line of safety. The mere fact that the use of the water was not immediately followed by an outbreak of sickness proves nothing, and it is stated by the present Sanitary Commissioner that a combination of impurities such as has been found therein cannot but be injurious to health. In these circumstances, His Excellency in Council must decline to sanction the scheme at present before him.

9. The Municipal Council should now proceed, without delay, to investigate some other scheme by which reliable drinking water may be obtained at a cost that shall not be prohibitive, and in this connection the following suggestions are thrown out for their guidance :—

(1) If, as is believed by many, the Sippanuthee spring is fed under-ground from the Sirumalays, the stream might be tapped before it reaches the polluted ground near the rock.

(2) Further prospecting for water might well be made beyond Nagalanaickenpatti, about a mile from Sippanuthee, where, it is understood, there are wells which never run dry.

The results of these or of such other experiments as the Council may think fit to make should be reported in due course.

10. With reference to the Collector's suggestion that the Sippanuthee water might be used as a subsidiary supply for washing and cooking purposes, it is observed that the first requirement of the town is pure drinking water, and that experience shows that if unwholesome water is supplied, it is impossible to prevent its being used for drinking purposes also.

(True Extract.)

W. S. MEYER,
Asst. Secy. to Govt.

To the Chairman, Municipal Council, Dindigul,
through the Collector of Madura
„ Sanitary Commissioner for Madras.
„ Public Works Department.

Exd. E. Fernandez.

Rw 643 w of 23d Feby/88

Comd: to the Supdtg. Engr:

VI Circle

(B) A.R.M.

Govt. of {1888} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. *Encl.*

G.O., 3rd February 1888, No. 107 M.

No 643 w of 23d February/88

FEBRUARY.

Water Supply Project.

Declining, for reasons stated, to sanction the — at Dindigul, and making certain suggestions for the guidance of the Municipal Council for obtaining reliable drinking water at a moderate cost.

S.E. II C.

1st May 1886, No. 411 M., Financial.

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

Read—again the following papers:—

G.O., dated 22nd June 1885, Mis. No. 217 M., Financial.

Abstract.—Recording certain papers from the Collector of Madura requesting early sanction to the water-project scheme in Dindigul, submitted with the Collector's letter, dated 31st March 1885, No. 31.

G.O., dated 26th June 1885, Mis. No. 225 M., Financial.

Read—the following papers:—

From C. S. CROLE, Esq., President, Municipal Commission, Madura, to the Chief Secretary to Government, dated Dindigul, 31st March 1885, No. 31.

I have the honor to submit, for the sanction of Government, an application from the Municipal Commissioners of Dindigul for leave to raise a loan of Rs. 16,000 for the purpose of completing the works designed for the supply of water to that town.

2. Government is aware that the subject has already been before them in its initial stages, and that the project has elicited a considerable amount of controversial criticism. This is, perhaps, matter for some satisfaction, for everything that can be said *pro* and *con* is already in its possession, and a final decision is possible without the delay which would be prudent in the case of a scheme which had not already passed through that preliminary ordeal.

3. The question *qua* the Government stands thus. There are two orders to be satisfied. They run as follows:—

* * * "The Government do not feel called upon to pronounce any opinion on the matter, which should be determined after taking the best professional advice available" * * * * (G.O., 8th October 1884, Mis. No. 2393, Financial).

"The papers promised in paragraph 4" (of the President's letter) "will be awaited" (G.O., 6th November 1884, Mis. No. 2365, Financial).

4. These last are now submitted.

5. In regard to professional opinion, touching a scheme to supply a town with water by pumping out of the bowels of the earth, the experts concerned are:

(1) The projector or water-supply engineer.
(2) The geologist.
(3) The chemical analyst.
(4) The mechanical engineer.

As things stand now in the south of India, rôles Nos. 1 and 2 have to be taken by the Collector. At all events, this has been my experience in Madura and Dindigul, for both of which towns I have had to prepare schemes of water-supply.

6. The cardinal doctrine of Indian water-supply, as it appears to me, is to look for a pure uncontaminated source in the waters under the earth, before seeking to face the heavy expense of first cost and subsequent upkeep, the sanitary risks, and the many uncertainties attending every project which depends on storage of rainfall in

any form. In the case of both Madura and Dindigul, I have been so fortunate as to discover inexhaustible subterranean supplies, and have gladly placed such geological knowledge as I possess at the disposal of the local bodies concerned. The experiments, which have been at work in both places, have been submitted to public criticism for several months past. No rival scheme has been started. The townspeople freely use the water in both places. The supply has been proved to be practically inexhaustible. So much for quantity.

7. Next as to quality. The following table shows the result of the examination made by the Chemical Examiner to Government of all the possible waters available for drinking purposes in Dindigul :—

—	Sippanuthee centre and west centre well.	Well in south-west corner of do.	Devaraja Aiyar's well.	Gopala Samudrum.	Dindigul rock.	Betel garden well.	Weekly market well, Nagalnayakkenpatty.
	1	2	3	4	5	6	7
Total solids, grammes per litre ..	1 ·13	0 ·92	0 ·8	0 ·9	0 ·18	1 ·06	0 ·8
Volatile solids, grammes per litre..	0 ·24	0 ·25	0 ·44	0 ·51	0 ·07	0 ·49	0 ·35
Chlorine, grammes per litre ..	0 ·269	0 ·018	0 ·092	0 ·114	0 ·021	0 ·192	0 ·106
Total hardness, Clark's scale ..	23°·1	21°·7	20°·3	22°·4	4°·9	24°·5	21°·0
Permanent hardness, Clark's scale.	2°·45	0°·28	9°·45	10°·8	1°·4	9°·45	8°·4
Free ammonia, milligrammes per litre.	0 ·48	0 ·28	0 ·009	0 ·016	0 ·48	0 ·008	0 ·24
Albuminoid ammonia, milligrammes per litre.	0 ·16	0 ·12	0 ·12	0 ·16 *	0 ·56	0 ·16	2 ·4
Nitric acid, milligrammes per litre .	10 ·5	11 ·25	15 ·0	18 ·0	7 ·5	12 ·0	39 ·0
Apparent quality of the water, as inferred from the results obtained on examination.	Bad.	Suspicious.	Bad.	Bad.	Suspicious.	Bad.	Bad.

Remarks.—Nos. 3, 4 and 6 are hopelessly bad on account of mineral impurity (culnic sulphats *). The other waters in order of purity, 5, 2 and 1, if carefully guarded from dangerous organic contamination, may be usable, but, in their present state, they cannot be regarded as safe for drinking without boiling.

* *Sic.*

8. Plainly put, this means that the water now proposed to be used was, even before the well was carried down to its present depth and hermetically protected against any water which did not come from a depth of over 30 feet below the surrounding ground, at least as good as the hitherto supposed unapproachably-pure rock fort water, and better than the other waters in use in the municipality. The Sanitary Commissioner has practically tested it, and agrees that it is the best available. For my own part, I believe that it is the best and the only water to be got. The people are at this moment using it largely. They have put down their money to get it. They cry for more of it, and I do not see what better test can be applied to a new source of supply.

9. I shall briefly then summarise the history of the subject up to date.

10. The town of Dindigul stands high, and has, in the past, suffered much from want of a sufficient supply of water. Several schemes have been put forth during the last eleven years to remedy the defect. They have all been dropped one after the other, because of their acknowledged impracticability or prohibitive cost. In July 1882, His Excellency the Governor was addressed on the subject when he visited the place. The result of this was the formation of a Water-project Committee, composed of private residents, and the floating of the scheme now submitted for sanction. At first, the committee in question seems to have got on tolerably well with the then municipal commissioners. Subsequently, however, owing to the delays which took place in the removal of, what was admitted on all sides to be, a crying evil, the committee broke away from the municipal commission, and the result is that they introduced, by private subscription, a pioneer scheme, by which at this present moment, some 30,000 or 40,000 gallons of water are being pumped into the town every day. The municipality, by resolution, took over the works from the committee on the 22nd November 1884, and is now working it very successfully. Frequent

applications are received from private parties to lead pipes into their streets, and even into their houses, at their own cost. Many of these must, of course, be refused pending the introduction of the scheme now submitted, as the existing pipe branching from the main will not carry the quantity of water required. In July of the year last mentioned, the result of an election, which took place for the first time in Dindigul, had again placed the municipality in accord with the committee of the rate-payers on the water question.

11. Now, I have to observe again in regard to this point, that the analysis of the Sippanuthee well, recently excavated by the Water-project Committee, was taken at a time when the elaborate precautions now existing to ensure purity were imperfect. But I accept it. Every drop of the water now being pumped into Dindigul is drawn from an impermeable stratum, 40 feet below the mean level of the town. The sides of the pumping shaft are encased in solid masonry, pointed with Portland cement. The very taste of the water is improving in popular estimation from day to day, owing probably to continued pumping having removed some of the redundant mineral constituents. Surgeon-General Furnell, a scientist whose speciality is water-supply, when Sanitary Commissioner, visited the town (in November last), and fully confirmed the opinion of the analyst. I have reason to believe that he has most strongly recommended the scheme to the support of Government.

12. Quantity and quality being thus disposed of, I turn to the question of cost. The total sum required will be Rs. 31,551. This gives a ratio of Rs. 2·19 per head of population (14,182, census of 1881). It is estimated that, excluding municipal expenditure for ameliorating the existing cruelly deficient and impure supply from surface drainage, tanks and wells, the cost to the town in private water establishments, loss of service and so on, amounts to no less than Rs. 20,000, or Rs. $1\frac{3}{8}$ per head *in a single year*. The burden removed from the town by the introduction of the present scheme will thus be enormous.

13. I shall now describe the works proposed. They are of a most simple character. The details have been designed by Mr. C. E. Crighton, Locomotive Superintendent, South Indian Railway. For the working out of the scheme is one almost entirely for the mechanical engineer. In making the above statement, I am nearly repeating the opinion of Colonel H. R. Mead, R.E., Superintending Engineer of the VI Circle, under whose advice I originally called in the aid of Mr. Crighton.

14. The works consist of three parts :—

1*st. The Source of Supply.*—The town of Dindigul lies, roughly, midway between the Sirumalai Mountains, average height 3,000 feet, and the river Kodavanár. The fall is very great, and the underlying gneiss is covered by a stratum of shaley kunkur of considerable thickness, beneath which it was reasonable to look for a copious water sheet. After much toilsome search, I struck upon a comparatively thin skin of kunkur, mixed with the shells of fresh water molluces, and below that, soft sandstone with mica. This was in the bed of an abandoned stone-built tank, situated near the foot of the Fort Rock, to the south-west of the town. The surface is some 25 feet below the general level of the ground on which the houses are built.

15. A well measuring 21 × 17 and 19 feet deep has been sunk here, and built after the manner described in the foregoing part of this letter. It appears to be little affected by the season. The water in it stands always about 18 feet, and the result of pumping an average of about 40,000 gallons during 12 to 14 hours daily has hitherto been to reduce the water in the well 8 inches a day, the original level being recovered next morning ; so that, as far as has yet been seen, this single well promises to prove ample for the supply of the whole town. Experience, of course, can alone settle this point ; but should another well become necessary, another, the excavation of which was stopped by the inflow of water, can be sunk.

16. It is proposed to purchase two pumping engines, capable of raising 10,000 gallons per hour each, at a cost of Rs. 7,900.

They are duplicated in order to provide against breaks down and repairs. The town has at present a steam pulsometer at work, which has been lent by the Madura Municipality. It is proposed to supplement it by another of somewhat larger capacity, till the new engines come out from England. Even with the pump, which has been at work under the Water-project Committee for several months, a very large supply of water can be raised. Taking the population under supply for the present as 11,000, the pulsometer working for 18 hours would give a supply of 66,000 gallons, or 6 gallons a head, which is ample to commence with:—

$$3{,}800 \times 18 = 68{,}400 \text{ gallons.}$$

17. It is proposed, further, to acquire $16\frac{1}{4}$ acres round the Sippanuthee tank in which the well is now situated, so as to obtain sanitary and conservancy control over it. It is in contemplation also to fill in the tank by levelling in the excavated soil, so as to prevent the storage of any water in it for the future. The purchase of the land, which will, as is always the case in the Madura district, require to be carried out under the powers given by the Land Acquisition Act, will cost about Rs. 2,000, and the filling in of the tank, the levelling of the surrounding ground and fencing is estimated at about Rs. 1,000. These items of expenditure are vital to the scheme, and cannot be deferred, as it would be unsafe to omit any precaution to secure and preserve the purity of the water.

18. *2nd. The Storage Reservoir.*—A service tank capable of holding 200,000 gallons, or one-and-a-half full day's supply at 10 gallons per head of 13,000 people under eventual supply, is to be constructed. This is to be partly cut out of solid rock on a small spur of disintegrating gneiss, standing at the corner of Arisikara street. The stone thus obtained is to be used for the walls. See plan enclosed. It will be 45 feet above the roadway, and will give a head varying from 54·97 to 68·6 feet over the different portions of the town. The local stone-cutters are adepts at this class of work, which they perform, thanks to the tractable nature of the rock, with great cheapness. The cost is estimated at Rs. 2,965.

19. Another reservoir should eventually be constructed near the one now estimated for, so that it may be possible to store three days' supply, and also to provide for cleansing. The design and position of these reservoirs are, it is believed, unique. They will be very cheap, and insure the town practically against failure of supply.

3rd. The Pipes, &c.—The water is to be pumped through a six-inch main into the reservoir. The total height from mean water-level to reservoir is 84·38 feet, and the distance 2,080 feet. The engines will have a forcing power of 250 feet. The diameter of the main is, therefore, more than ample.

20. It has been decided by Mr. Crighton to employ only two diameters of pipes (cast iron) for street service—six inches for the main and three inches elsewhere. It is not economical to have smaller pipes than three inches, as they would require to be of wrought iron, which is very expensive. Smaller sizes are, it is believed, never used in England for this reason also that they are liable to choke. The taps are to be plain bends, with as many cocks as may be required for each particular locality.

21. It is to be remembered that the present is not a paper scheme, proposed for acceptance on a confused maze of figures. We have to do with completing and perfecting a system of water-supply already in practical working. The Water-project Committee has actually introduced the proposed system of water-supply into a certain portion of Dindigul. It has spent Rs. 7,500 out of the moneys privately raised, in such a manner that, while the town has obtained the boon of good water, the operations of the committee have been undertaken in such a way as to fit in with the larger scheme now submitted for sanction. Very little will require to be done over again. The supply given by the committee is indicated on the enclosed map by a blue line. It will be observed that it almost coincides with Mr. Crighton's line of pipes, laid down in red. In some respects, it may be considered to be an improvement, as it tends to make the supply circulating, which is a substantial advantage.

This being so, the estimate submitted herewith, amounting to Rs. 31,551, is subject to a deduction of Rs. 15,000.

22. In this connection, I have the honor to support the prayers of the commissioners that Government should make a grant for the execution of the project equal to the sum voluntarily raised by the inhabitants. I submit that it is very expedient to mark the approval of Government of these enterprises in self-help for public purposes. Moreover, Dindigul is a station of many public offices. It is the headquarters of a Sub-Collector, a munsif's court, a tahsildar's office, and several others. As Government is aware, it is also an important station on the line of railway, and the starting point for the new State Railway, which is to connect Dindigul with Pálghat. In every way it is a town whose importance and size is likely to increase. The water-supply, while it will tend thus to develop the town, seems also to be a matter in which the Government has duties to fulfil. I therefore recommend most strongly that, for this reason, as well as to encourage public spirit elsewhere, Government be pleased to make a grant-in-aid of Rs. 7,500.

23. Sanction to raise the balance, viz., Rs. 16,000, by loan, bearing interest at 5 per cent. and repayable in thirty years, is now solicited by the commissioners on the assumption that Government will contribute. Failing that, they request permission to raise the whole, Rs. 24,000. A draft of the prescribed statement, for publication in the Gazette, is enclosed.

24. The total cost to the Municipality of Dindigul by the carrying out of the water project will be Rs. 24,000, and the incidence $1\frac{1}{16}$ rupee per head, or Rs. 16,000 and $1\frac{3}{5}$ rupee per head of population, according as the Government grant is calculated or omitted. The Government will be able to judge regarding the lightness of the burden thus imposed by comparing these figures with the cost elsewhere. It has been calculated that the chronic water difficulty has, as stated above, been hitherto equivalent to an annual tax of at least Rs. 20,000 on the inhabitants of Dindigul.

25. The working of the scheme will cost about Rs. 1,688 per annum, as detailed below:—

	Rs.
Firewood, 180 tons, at Rs. $4\frac{1}{2}$ per ton	810
Driver's and fireman's pay, at Rs. $31\frac{1}{2}$ per mensem	378
Repairs and contingencies	500
Total ..	1,688

26. Part of this will be met out of savings under annual expenditure, say, Rs. 500, for clearing the inferior tanks upon which the town has till now depended for water, and out of the annual unexpended balance, Rs. 1,000, which is available. The balance (Rs. 188) will be met from the water-tax provided for under the new Act. This is calculated to produce a maximum of Rs. 1,800 per annum for the present.

27. The water assets available, without the slightest squeezing, amount thus to an annual income of Rs. 3,300 against a provision of Rs. 1,688 for current expenditure. The balance is more than sufficient to provide for the loan, even during the first year, in which occur the highest payments, thus:—

	Rs.
Interest on Rs. 16,000, at 5 per cent.	800
One-thirtieth payment to sinking fund, say	550
Total ..	1,350

against Rs. 1,612, the available balance.

28. The small tax required will be gladly paid, for the townspeople will be considerably richer under the new scheme, as shown above.

29. Since Colonel Mead's remarks (Enclosure 14) were written, the estimate has been thrown as much into Public Works Department form as the nature of such a project permitted.

30. As to Colonel Mead's other remarks, they are satisfactorily explained by Mr. Crighton in his letter, dated 5th January 1885 (Enclosure 15).

31. The proposed works are intended to be carried out by the District Mechanical Engineer, lately sanctioned as a joint charge by the Local Fund Board and the Municipalities of Madura and Dindigul, through the agency of the municipal staff. Several of the commissioners have already distinguished themselves in supervision, and we have the very great advantage in Dindigul of an ingenious native workman, Sangaralinga Asari, who is thoroughly competent to deal with machinery, and whose name is probably known to Government. The works will therefore be carried out with great economy, and we are always sure of Mr. Crighton's advice in the case of any unexpected difficulty.

32. I have to submit to Government that the successful manner in which the Water-project Committee, whose labors the municipality has now taken over, has conducted its pioneer enterprise, reflects great credit on the public spirit of the inhabitants; and I have the honor to bring to their notice, in this connection, the name of Mr. Ethupathi Row, a private Brahmin gentleman, who has acted as Secretary of the committee, and who has devoted nearly all his time, for many months, to its business.

33. This report would not be complete unless, also, I brought to the signal notice of Government the services of Mr. C. E. Crighton, Locomotive Superintendent of the South Indian Railway. He has given me his gratuitous services in working out both the Madura and Dindigul schemes, the former a very laborious task. It will also be submitted very shortly. It may be said, with small danger of exaggeration, that had it not been for the sympathetic spirit in which he has placed his special knowledge at the disposal of these towns, without an idea of fee or reward, the long-standing puzzle of water-supply for Indian towns would still have remained an unsolved enigma In place of this, I claim that it has been solved, and I would strongly recommend that Government mark its sense of the services rendered by Mr. Crighton in an emphatic and appropriate manner.

34. In addition to the papers in the accompanying list, I beg to enclose two addresses delivered by me at different stages of the working out of this water project, the history and discussion of which they illustrate in detail. They have already appeared in some of the Madras papers.

No. 26.

Referred to the Chief Engineer and Secretary to Government, Public Works Department, for remarks.

(By Order.)

Madras,
29*th April* 1885.

(Signed) M. HAMMICK,
Ag. Under Secy. to Govt.

No. 903 C.

Forwarded to the Superintending Engineer, VI Circle, for scrutiny of the estimates and favor of early opinion on the details of the project.

(By Order.)

Chepak,
12*th May* 1885.

(Signed) C. BOWEN, Major, R.E.,
Under Secy. to Govt., P.W.D.

From Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Kodaikánal, 23rd May 1885, No. 38 C—M.D.

With reference to your endorsement, No. 903 C., dated 12th May 1885, I have the honor to return the papers and to point out that I have already in my note, No. 563 M.D., dated 2nd January 1885, given my general opinion of the project.

2. The two important points first to be considered are—

1*st*.—Quality of the water.
2*nd*.—Is the supply likely to be sufficient?

With regard to the first point, quality, Mr. Crole, in paragraphs 7 and 8 of his letter, states that the Chemical Examiner gave his opinion that it is bad; but Mr. Crole says that he has reason to believe that it is now of better quality and that it will improve, also that it is the best water procurable in or near Dindigul; he further states that the Sanitary Commissioner has practically tested it and agrees that it is the best water available. I think it would be as well for Government to call on the Sanitary Commissioner for a special report on the quality of the water, if this has not been done already.

3. With regard to the second point, sufficiency of supply, it is proposed to draw off 120,000 gallons per day, or 8 gallons per head of population. There is nothing to show that this water is available; the mere statement that 40,000 gallons were pumped up in 12 to 14 hours daily for a time (not stated) is not, in my opinion, sufficient. There is nothing in the papers to show what time of the year this was done, for how many days, or how the water was measured. I consider that definite information on these points should be recorded. My own opinion is that Mr. Crole's estimate of the quantity of water that has been raised by the pulsometer that has been for some time at work, is far in excess of the actual.

4. It is useless for me to further point out that the project is not complete, and has not been worked out properly. Mr. Crighton's remark that the engines could lift the required supply 250 feet, if necessary, but that only 70 or 80 feet have to be lifted, to me shows that the whole scheme has not been properly considered. I cannot agree that "the most important thing is to get pipes laid and the water-supply introduced as soon as possible, so that the public benefit may be secured and further improvements made from time to time." I consider that before this is done, a complete scheme should be worked out in proper detail; this, of course, will cost money, as it necessitates the employment of a man competent for the work, but I think experience has shown in India and elsewhere this procedure is, as a rule, the cheapest.

5. Mr. Crole estimates the cost of working the engines &c. at Rs. 1,688 a year. I consider this estimate far too low; and have to point out that nothing is allowed for wear and tear or maintenance.

6. Mr. Crole has done much towards the water-supply of Dindigul and Madura, and, in my opinion, he is working on the right track, and, if properly advised, his schemes will succeed; his letter, however, shows that much more than he considers necessary is required for a sound good water project for the supply of a town.

Note by the Chief Engineer.

In his letter, No. 38-C—M.D., dated 23rd May 1885, reporting on the water-supply scheme for the town of Dindigul, the Superintending Engineer, VI Circle, deals first with the important points of quality and quantity of the water in the source whence it is proposed to supply the town of Dindigul; and he rightly remarks that further and more definite information on those points is necessary before the expenditure of a large sum can be recommended.

2. With respect to *quality*, the adjective used by the Chemical Examiner to Government in describing the water in the "Sippanuthee" wells is "*bad*;" and he adds, "if carefully guarded from dangerous organic contamination, they may be usable, but in their present state they cannot be regarded as safe for drinking without boiling." Mr. Crole states that the conditions affecting the wells have been improved since that analysis was made, but I strongly advise that a second analysis under those improved conditions be made, and the opinion of the Sanitary Commissioner obtained thereon, before sanction is accorded to the scheme.

3. With respect to *quantity*, there appears to be nothing on record except Mr. Crole's statement that he has discovered "inexhaustible subterranean supplies;" and the opinion expressed by Mr. Crighton that there "will be ample quantity for the town supply during the dry years." I concur in Colonel Mead's opinion that more definite and accurate information on this important point is necessary.

4. With respect to the general details of the scheme, I entirely concur in Colonel Mead's remark that the project is at present incomplete. Until it is thoroughly worked out in all details, and the data accurately tested and recorded, it is impossible to form an opinion upon its merits, or upon the probable cost.

5. It is to be hoped that further investigation of the project will bear out all that Mr. Crole expects from it; but in its present shape it is impossible to recommend it for sanction, or for the grant of a large contribution from Provincial funds in aid of the cost.

* * * * *

Ootacamund, 2*nd June* 1885. (Signed) J. SHAW-STEWART, Col., R.E., *Chief Engineer, P.W.D.*

No. 180-E.

Transferred to the Financial Department with advertence to its endorsement No. 26, dated 29th April 1885; the original papers received with which are herewith returned.

Ootacamund, 3*rd June* 1885. (Signed) J. SHAW-STEWART, Col., R.E., *Secretary to Govt., P.W.D.*

To the Financial Department, with 22 enclosures.

Order—dated 26th June 1885, Mis. No. 225 M., Financial.

The papers read above, with their enclosures, will be forwarded to the Collector of Madura who will communicate the substance of the Chief Engineer's note to the Chairman, Municipal Council, Dindigul, in view to the scheme being reconsidered with reference to the remarks of the Superintending Engineer and the Chief Engineer. A fresh analysis of the water should be made, and the Sanitary Commissioner's opinion obtained on its quality.

(True Extract.)

(Signed) E. F. WEBSTER, *Chief Secretary.*

To the Collector of Madura, with papers in original.

G.O., dated 30th December 1885, Mis. No. 982 M., Financial.

Read—the following papers:—

From G. STOKES, Esq., Chairman, Municipal Council, Dindigul, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 27th October 1885, No. 118.

Referring to G.O., dated 26th June 1885, Mis. No. 225 M., I have the honor to submit for instructions copy of a resolution passed by this council at a meeting held on the 19th instant in connection with the water-supply scheme of Dindigul. Copies of analysis of two samples of water of the Sippanuthee well obtained through the Sanitary Commissioner for Madras are herewith submitted, in original, for the information of Government, together with a copy of the Superintending Engineer's letter containing suggestions on the test of the quantity of water alluded to in the resolution of the council.

Enclosures.

Extract from the Proceedings of the Municipal Council, Dindigul, passed at a meeting held 19th October 1885.

* * * * *

VI. Read docket No. 922, dated 6th instant, from the Sanitary Commissioner for Madras, forwarding copy of analysis of the two samples of Sippanuthee well water sent from Dindigul.

The reference to the chairman of the municipality involves two questions—

1*st.*—The quality of the Sippanuthee water.

2*nd.*—Its quantity or the available supply.

The present analysis answers the first question. The water is certified bad and contaminated by organic and other remains. For testing the second, the Superintending Engineer proposes a test which is excessively difficult to carry out and without much more careful observation and record than the resources of the municipality can supply is likely to be deceptive. Before going to the expense of making the experiments suggested and having regard to the quality of the water, the council resolve to ask whether some simpler test than that laid down will not be satisfactory to Government. The supply of water to Dindigul is a matter of great importance to the town, and the supply of the Sippanuthee water is regarded as a very great boon by the townspeople. The council think that efforts should be made to bring from wells in the Kodavanar river water to the town by pumping, should it be decided that the Sippanuthee water ought not to be introduced. The present connection of the municipal council with the water-supply scheme is simply that the council has undertaken to pay the working expenses of the engine at present employed in pumping.

(Signed) G. STOKES, *Chairman.*

—	Sippanuthee well water, sample No. 1.	Microscopic examination.
Total solids, grammes per litre	1·73	Some yellowish white flocculent sediment consisting of organic *debris*, including remains of insects and living Entomostraca (*Cyclops*).
Volatile solids, do. do.	0·65	
Chlorine, do. do.	0·426	
Total hardness, Clark's scale	35°·0	
Permanent hardness, Clark's scale	15°·4	
Free ammonia, millegrammes per litre	0·24	
Albumenoid ammonia, do. do.	0·16	
Nitric acid do. do. (as ammonia).	45·0	
Apparent quality of the water as inferred from the results obtained on examination	Bad.	

—	Sippanuthee well water, sample No. 2.	Microscopic examination.
Total solids, grammes per litre	1·460	Slight deposit of sharp sand mixed with decaying vegetable matters and containing infusoria, diatoms, and other organisms.
Volatile solids do. do.	0·440	
Chlorine do. do.	0·369	
Total hardness, Clark's scale	25°·9	
Permanent hardness, Clark's scale	14°·7	
Free ammonia, millegrammes per litre	0·24	
Albumenoid ammonia do. do.	0·12	
Nitric acid do. do. (as ammonia)	45·0	
Apparent quality of the water as inferred from the results obtained on examination	Bad.	

From Colonel H. R. MEAD, R.E., Superintending Engineer, VI Circle, to the Chairman of the Municipal Council, Dindigul, dated Kodaikánal, 16th September 1885, No. 323 M.D.

With reference to your letter, No. 92, dated 8th September, I have the honor to inform you that in my opinion the best course to be adopted for testing the quantity of water in Sippanuthee well is as follows:—

When the wells and springs in the town and neighbourhood are at their lowest, by means of steam or other appliance to pump water from the well, keeping a careful record of the depth of water in the well. The water pumped out to be carefully gauged or measured (the best way of doing this will be to press it over a gauge-board of suitable length). It would probably be best to pump for eight hours a day a quantity of water from the well equivalent to double what is calculated as a full supply for the town and to do this for at least twenty-one days. Should this prove satisfactory and the level of the water in the well be not materially lowered (the record of the depth in the well will show if this is the case), it will be as well if there are appliances to do it for the well to be pumped out as low as practicable the quantity of water taken out being gauged and then for the pumping to be stopped and the rate at which the water again entered the well to be noted. This might be done three or four times, so that it may be seen if this rate materially decreased.

2. The above, I think, will show us fairly what supply could be hoped for; but of course any other series of carefully-conducted experiments would do as well. I believe that the Dindigul Municipality have for a considerable period pumping water from the well and if then a careful record of the results as regards quantity of water pumped out and depth of water in the well has been kept, there is no reason why, if properly reported, it should not be sufficient proof to Government and others that the supply is sufficient for the requirements.

Submitted.

2. The Collector's views have already been laid before Government in detail.

(Signed) C. S. CROLE,
Collector.

MADURA,
29*th October* 1885.

Telegram from the Secretary, Water-project Committee, Dindigul, dated 7th November 1885.

ABSTRACT.—Requesting to postpone disposal of the question regarding the Dindigul water-supply.

From the Collector of Madura, dated 26th November 1885, No. 6.

ABSTRACT.—Forwarding the original papers called for in the official memorandum No. 478, of 19th November 1885.

From the Secretary, Water-project Committee, Dindigul, dated 2nd December 1885.

ABSTRACT.—Regarding the water project of Dindigul.

Order—dated 30th December 1885, Mis. No. 982 M., Financial.

The file * of papers relating to the Dindigul water-supply will be communicated to the Sanitary Commissioner for opinion and eventual return.

1. *G.O., dated 26th June 1885, Mis. No. 225 M.
2. Letter from the Chairman, Municipal Council, Dindigul, dated 27th October 1885, No. 118.
3. Letter from the Secretary, Water-project Committee, Dindigul, dated 2nd December 1885.

2. The Dindigul Municipal Proceedings, dated 19th October 1885, show that the Municipal Board has been in communication with the Sanitary Commissioner, but no *opinion* of his is quoted. The Government are not aware whether

the Kodavanar water has been analysed. No reference to it by that name is found in the table in Mr. Crole's letter, dated 31st March 1885, No. 31, paragraph 7, though that table is said to include "all the possible waters available for drinking purposes in Dindigul."

3. Information should be afforded on this point and if the waters analysed do not include that of the Kodavanar, a specimen thereof should be analysed now and the opinion of the Sanitary Commissioner thereon be obtained.

(True Extract.)

(Signed) W. WILSON,
Acting Chief Secretary.

To the Sanitary Commissioner for Madras, with a file of papers, in original, to be returned.

" Collector of Madura.

READ—also the following paper:—

From Deputy Surgeon-General G. BIDIE, M.B., C.I.E., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 1st April 1886, No. 497.

In returning the papers regarding the Dindigul water-supply, referred to me under G.O., Mis. No. 982 M., of 30th December 1885, I have the honor, after a personal inspection of the town, to submit the following remarks to the Right Honorable the Governor in Council.

2. Dindigul has hitherto been very badly off for potable water, and naturally the inhabitants have gladly welcomed the recent attempt which has been made to increase the supply by pumping from a well and delivery through iron pipes within the limits of the town.

3. In an undertaking of this kind the more important considerations from a sanitary point of view are—

1*st*.—Whether the water is wholesome, and
2*nd*.—Whether it can be got in sufficient quantity.

4. In the present instance the site selected for the source of supply is the bed of an old tank of very small size situated at Sippanuthee to the south-west of the town, and near the base of the rock on which the fort stands. The tank in question is considerably below the level of the town and although at some distance from it is in the line of natural drainage, and its water, so far as could be ascertained, has never at any time been used for drinking purposes, but only for washing clothing and such like purposes.

5. The well intended to supply the town with water has been sunk in the bed of the little tank, and from an examination of the excavated earth it would appear that the whole neighbourhood was originally the bed of a lake or swamp. The upper strata of the earth in the adjoining gardens apparently consist chiefly of thick deposits of *shell-marl*, containing shells which belong to such aquatic genera as *Melania*, *Paludina*, and *Unio*. The well is 19 feet deep and, after passing through the marl, soft sandstone is said to have been encountered resting on gneiss. Here the ground water is stated to have been reached and to yield a supply to pumping of about "40,000 gallons during 12 to 14 hours daily."

6. The probability of finding water in considerable quantity in such a locality as the bed of a former lake would, of course, be great, but unfortunately in this case the prospect of getting potable water is not equally favorable.

7. In paragraph 7 of Mr. Crole's letter, No. 31, of 31st March 1885, a table is given showing, amongst others, the results of the analyses of water from Sippanuthee well to be as shown below, and from these it appears that the water was then "bad" and "suspicious":—

—	Sippanuthee centre and west-centre well.	Well in south-west corner of do.	Remarks.
Total solids, grammes per litre	1·13	0·92	If carefully guarded from dangerous organic contamination may be usable, but in their present state they cannot be regarded as safe for drinking without boiling.
Volatile solids do. do.	0·24	0·25	
Chlorine do. do.	0·269	0·018	
Total hardness Clark's scale	23°·1	21°·7	
Permanent hardness, do.	2°·45	0°·7	
Free ammonia, millegrammes per litre	0·48	0·28	
Albumenoid ammonia do. do.	0·16	0·12	
Nitric acid, millegrammes per litre	10·5	11·25	
Apparent quality of the water as inferred from the results obtained from examination	Bad.	Suspicious.	

Subsequently to the time at which these specimens were taken, improvements were said to have been made on the main well from which the water is pumped with the object of excluding all water coming from the upper strata of the site, and restricting the influx to the ground water flowing on the surface of the gneiss.

8. Accordingly fresh samples were sent to the Chemical Examiner in September and October 1885 and his reports, as given below, show, I am sorry to say, no improvement in the quality of the water. In short, these latter analyses give a degree of impurity—organic and inorganic—beyond the line of safety and with no hope of amendment:—

—	Sippanuthee well water, sample No. 1 (*a*).	Sippanuthee well water, sample No. 2 (*b*).	Microscopic examination.
Total solids, grammes per litre	1·73	1·460	(*a*) Some yellowish white flocculent sediment consisting of organic *debris*, including remains of insects and living Entomostraca (*Cyclops*).—22*nd September* 1885.
Volatile solids, do. do.	0·65	0·440	
Chlorine do. do.	0·426	0·369	
Total hardness, Clark's scale	35°·0	25°·9	
Permanent hardness do	15°·4	14°·7	
Free ammonia, millegrammes per litre	0·24	0·24	(*b*) Slight deposit of sharp sand mixed with decaying vegetable matters and containing infusoria, diatoms, and other organisms.—1*st October* 1885.
Albumenoid ammonia do. do.	0·16	0·12	
Nitric acid do. do. (as ammonia) ..	45·0	45·0	
Apparent quality of the water as inferred from the results obtained on examination	Bad.	Bad.	

9. As there is, however, evidently a large supply of ground water in this locality, it might be desirable to ascertain whether the current could not be tapped in some other spot out of the area of the marl deposits, where possibly a fluid of greater purity might be obtained. This is of course a question for the Engineer. There is just a suspicion that the water at the site of the present well may be polluted by the percolation of town sewage, and that the lake or marsh which formerly existed there may, in past times, have been the receptacle for years of foul drainage from the fort and attached buildings.

10. The entire table of analyses of Dindigul waters, as given in paragraph 7 of Mr. Crole's letter, is here recorded for ready reference, but in no case are the quality of the water and quantity yielded, so far as known to me, such as to enable me to recommend any one as a source from which the wants of the community could be met—

—	Sippanuthee centre and west-centre well.	Well in south-west corner of do.	Devarsja Aiyar's well.	Gopala-samudrum.	Dindigul rock.	Betel garden well.	Weekly market well, Nagalnagak-kempatty.
	1	2	3	4	5	6	7
Total solids, grammes per litre ..	1·13	0·92	0·8	0·9	0·18	1·06	0·8
Volatile solids do. do.	0·24	0·25	0·44	0·51	0·07	0·49	0·35
Chlorine do. do.	0·269	0·018	0·092	0·114	0·021	0·192	0·106
Total hardness, Clark's scale	23°·1	21°·7	20°·3	22°·4	4°·9	24°·5	21°·0
Permanent hardness do.	2°·45	0°·7	9°·45	10°·8	1°·4	9°·45	8°·4
Free ammonia, millegrammes per litre ..	0·48	0·28	0·009	0·016	0·48	0·008	0·24
Albumenoid ammonia, millegrammes per litre	0·16	0·12	0·12	0·16	0·56	0·16	2·4
Nitric acid, millegrammes per litre ..	10·5	11·25	15·0	18·0	7·5	12·0	30·0
Apparent quality of the water as inferred from the results obtained on examination	Bad.	Suspicious.	Bad.	Bad.	Suspicious.	Bad.	Bad.

Remarks.—Nos. 3, 4 and 6 are hopelessly bad on account of mineral impurity (culnic sulphats). The other waters it order of purity, 5, 2, and 1; if carefully guarded from dangerous organic contamination may be usable, but in their present state they cannot be regarded as safe for drinking without boiling.

11. With reference to paragraph 3 of the order under reply, a recent analysis of the Kodavanar river water is subjoined, and there seems no doubt that with the usual precautions of subsidence and filtration a good wholesome water can be got from this source—

—	Kodavanar river water.	Microscopic examination.	Remarks.
Total solids, grammes per litre	0·43	Some yellowish deposit of organic *debris* and sand.	This would be a good water if the suspended organic matter were removed by filtration or other means.
Volatile solids do. do.	0·15		
Chlorine do. do.	0·0213		
Total hardness, Clark's scale	11°·9		
Permanent hardness do.	1°·75		
Free ammonia, millegrammes per litre	0·08		
Albumenoid ammonia do. do.	0·12		
Nitric acid do. do. (as ammonia).	12·0		
Apparent quality of the water as inferred from the results obtained on examination	Suspicious.		

Order—dated 1st May 1886, No. 411 M., Financial.

Paragraph 9 of the Sanitary Commissioner's letter read above will be referred to the Public Works Department for inquiry and remark. If the proposal therein made is not found to be feasible, the Municipal Council will be asked to consider whether a scheme to bring in water from the Kodavanar river might not be worked out and adopted.

(True Extract.)

for Chief Secretary.

To the Public Works Department.
„ Chairman, Municipal Council, Dindigul, through the Collector of Madura.
„ Sanitary Commissioner for Madras.

Exd. A. Raitt.

B No 1325 W of 27th May/86

Communicated to the Superintending Engr. VI Circle, for investigation and report with reference to para 9 of the Sanitary Commissioner's letter

12-7-86

9.7.86

12.7.86

+ To be substituted for the order previously issued & subsequently recalled.

S.E. VI Circle

15/7/86

O.S. 5/7/7.

9.7.86 R 14.7.86

(19)

P.W.C. No. ~~331~~ 3826

Govt. of {1886} Madras.

FINANCIAL.

S.S.C

Issued

Recd. 8-7-86 Encl.

G.O., 1st May 1886, No. 411 M

MAY.

Water-supply.

Referring to the Public Works Department, for inquiry and report, paragraph 9 of the Sanitary Commissioner's letter reporting on the project of — in Dindigul, and stating that, if the proposal made therein be not found feasible, the Municipal Council will be asked to report on the scheme of bringing water from Kodavanar.

2 Copies to S.S.

OFFICE OF THE SUPERINTENDING ENGINEER,

6TH CIRCLE.

Kurnvanuth 2d Septr/1886.

D 6/9.

No. 223 MD.

From

The Superintending Engineer,

6th Circle.

To

The Chief Engineer

P.W.D.

Sir,

ENCLOSURE.

With reference to your No. 1325/1 W of 27: Ultimo, I have the honor to state that it will not be possible for me to report upon the Dindigul water supply for some weeks to come.

2. The matter has been somewhat complicated by the alteration in the wording of G.O. No. 411. M. (Financial Department) of 1st May 1886.

3. On receipt of the original order the Collector forwarded to me a letter

B. No 1325 W. 27. 5. 86.

B/ B. No 2337 W a/ 15 Septr/86

Communicated to the Financial Department with reference to G. O. No. 411 M. Financial dated 1st May 1886.

9/9/86

10/9/86

Financial Dept.
Suptg. Engr. VI circle

15/9/86

OLS 48/9

16/9

O. 9. 9. 86. R. 13. 9. 86
O. 4. 7. 86 R. 14. 7. 86

P. W. D. 6TH CIRCLE.

(6)

From

The Superintending Engineer,

6th Circle.

To

The Chief Engineer P. W. D

No. 223. Md

Dated 2nd
Despd 6th } Septber 1886
Received 8

Enclosure.

B. No 2337 W a/ 15-9-86.

Dindigul Water Supply.

Reports on the—

With order

2 Copies to

Financial Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

G. O. Public Works Department, dated 15th September 1886 No. 2337 W regarding Dindigul Water supply

Order thereon dated 24th September 1886 No. 943 M. Financial

Communicated to the Chairman Municipal Council Dindigul. The reference of the Superintending Engineer to an alteration in the wording of G. O. 1st May 1886 No. 411 M is not understood no such alteration having taken place.

(True Extract)

Under Secretary.

To

The Chairman Munl. Council Dindigul
thro' the Collector of Madura.
" Public Works Department.

1325 w 27-5-86.
386 D 12-7-86.
321-2 D 30-6-86.
180 E 3.6.85.
257 E. 22.6.85.
903 C. 12.5.85
2337 w 15-9-86

B. No. 2579 W d/ 1st Oct/86.

[6]

Govt. of (188) Madras.

P.W.C. No. 7663

Comd. to the Supg. Engineer, VI C, with reference to G. O. No. 2337 W d/ 15th September 1886.

2. The remark in para 2 of the S. E's No. 223, M.D. d/ 2.9.86 that "the matter has been somewhat complicated by the alteration in the wording of G.O. No. 411 M of 18th May 1886" should be explained.

3. The report called for in G.O. No 1325 W d/ 27-5-86 is awaited.

[signature]
30/9/86

S. E. VI Circle
Fimb. Dept.

To

The Public Works Deptt.

Recd: 28.9.86

Proceedings, dated 24th September 1886.
No. 943 M(mis).

Subject.

B. No. 2579 W d/ 1-10-86.

Regarding Dindigul Water supply.

With order

Financial Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

letter from the Chairman, Municipal Council, Dindigul, d/ 1st November 1886 No. 114.

In submitting herewith Copy of a Resolution passed by the Municipal Council this day, I have the honor to state that the Collector of Madura, the Superintending Engineer, 6th Circle, and Mr. Crighton, Locomotive Superintendent S.I.R., having inspected the Suppanuthu tank on the morning of the 29th Ultimo, considered that as soon as possible a thoroughly satisfactory test of the quantity and quality of the Suppanuthu water should be carried out. The estimated Cost of carrying out this test was something under Rs. 800. The Superintending Engineer was of opinion that he would be able to lend an Engine for pumping out the well and Mr. Crighton promised to see to all the work at the Spring being properly carried out.

But instead of Rs. 800 required, the Municipality only have an available balance of Rs. 300; for the remaining Rs. 500, they request that the early sanction of Government may be obtained to utilizing Rs. 500 out of the Reserve of Rs. 1970. This course they are of opinion will save four months time and if the scheme is decided on will enable the town to have the water during the ensuing hot weather.

The Collector has been requested by the Municipal Council to endorse his views on this letter as he has recently visited the works.

Endorsement on the above.

No. 402.

Submitted for the favor of early sanction.

2. The undersigned was present when the officiating Superintending Engineer Mr. Martin examined the Sippiyanith well on the 29th Ultimo in pursuance of the direction contained in G.O. dated 1st May 1886, No. 411 M Financial. Mr. Mounsey, the Chairman of the Dindigul Municipal Council & acting Sub Collector was present on the spot and so were Mr. Crighton of the South Indian Railway and the members of the water project Committee, Dindigul.

2. After considerable deliberation, it was resolved that the best that could be done under the circumstances was to subject the water of the well to a thoroughly satisfactory test, both as to the quantity and quality, by pumping out the water for a continuous period of about 10 days and then sending a sample of the pure spring water for analysis to the Chemical Examiner.

4. The maximum cost of the experiment is estimated at Rs. 800 and it is very desirable that it should be conducted as early as possible.

Madura Collector's Office,
3d November 1886

(Sd.) E. Turner
Collector

Order thereon, 10th November 1886 No. 1126 M (Mis.)

Sanctioned.

To the Chairman, Mpl. Council, Dindigul,
thro' the Collector of Madura.
" Public Works Department.

(True Extract)
W. Meyer
Asst. Secretary.

P.W.C. No. 8813

No. 3014 W of 15th Nov/86

B

Communicated to the S. E. VI circle with advertence to his letter No. 350 M. D. dated 1st November 1886.

Communicated to the S. E. VI circle with advertence to his letter No. 350 M.D. dated 1st November 1886.

Govt. of (188) Madras.

To

The Public Works Depth.

2945 W 9-11-86

12 NOV 86
SECRETARY TO GOVERNMENT
DEPARTMENT MADRAS

No. 3014 W of 15th Nov/86

Rq 12.11.86

Proceedings, dated 10th November 1886
No. 1126 M (mis).

Subject.

Sanctioning transfer of funds for effecting a satisfactory test of the Suppanuthu water in Dindigul

2945 W 9.11.86.
2579 W 1.10.86.
2337 W 15.9.86.
1325 W 25.5.86
321. 2 D 30.6.86
257 E 22.6.85
180 E 3.6.85
903 C 12.5.85

S. E. VI circle.

S. E. VI circle

Despd 15/11/86

With order

22nd November 1886, No. 1172 M., Financial.

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

Read—the following paper :—

G.O., dated 9th November 1886, No. 2945 W., Public Works.

Read—the following letter from the Superintending Engineer, VI Circle, dated 1st November 1886, No. 350-M.D. :—

Adverting to G.O., No. 1325 W., dated 25th May 1886, regarding water-supply in Dindigul, I have the honor to report as follows.

2. On the 28th ultimo, I met by appointment, at Dindigul, the Collector and Mr. Crighton; the Sub-Collector and Tahsildar, Saravanamuthu Pillai, who was Tahsildar of Dindigul from the time the water-works were commenced until recently, were also present.

3. The well from which it is proposed to supply the town is situated at south-east* corner of Sippanuthu tank. The tank is an ordinary village tank. The sides are revetted with stone, except at a few places where the revetment has fallen down. The sides measure 192 feet by 127 feet, and the deep bed is about 14 feet below the average level of the adjoining land. At the time of inspection, the bed of the tank was covered with water except near the well, where the bed has been raised by the spoil taken from the well. The depth of water in the centre of the tank was about 5 feet. It is said that Mr. Crole had the whole tank cleared out as far as practicable by coolies. The tahsildar and several other persons stated that the tank never goes dry, and that during the famine years of 1877-78 it was well supplied and was the chief source of supply for the town, because during that time several of the other wells went dry. The tank is situated at the southern side of the town, where all the wells show that water is much nearer the surface than at the northern end. The natural slope of the country, and the comparative nearness of the Sirumalai mountains, point to this conclusion also. So I am inclined to think the tank is well supplied at all times.

* Described in Mr. Crole's report south-west, which is incorrect.

4. Now turning to the well, it is situated at the south-east corner of tank as noticed already. At the time of inspection, the water in it was 14′ 9″ deep, or the surface was about the same level as the surface of the water outside in the tank. Mr. Crole in his report states that the well is 19 feet deep, but this is not the case unless he refers to the top of the parapet, which, at the time of inspection, was 4′ 6″ above surface of water in well. Mr. Crole, in paragraph 11 of his report, states that the well is lined with masonry pointed with Portland cement, but only the top of the lining was visible at time of inspection owing to the well being full. As the well is situated in a tank which all available evidence goes to show never becomes dry, I think it is highly probable the well will give at all times an ample supply to the town, unless the population increases very much beyond the present number. It is rather unfortunate that Mr. Crole, in paragraphs 6 and 11, used the expressions "pure, uncontaminated source in the waters under the earth;" again, "I have been so fortunate as to discover inexhaustible subterranean supplies;" and again, "after much toilsome search, I struck upon a comparatively thin skin of kunker." These expressions are apt to lead one to suppose that Mr. Crole found water in a locality where very few would expect to find it, and, therefore, it is possible the supply is limited. As a matter of fact, however, Mr. Crole found water where any man with ordinary capacity would naturally look for it, because all the surrounding existing circumstances point

No. 3014 W. of 15th Nov/86

P.W.C. No. 8813

Govt. of [188] Madras.

B

To

The Public Works Dept

o/ 2945 W 9-11-86

SECRETARY TO GOVERNMENT
12 NOV 86
DEPARTMENT MADRAS

No. 3014 W. of 15th Nov/86

Rq 12.11.86

Communicated

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to the S. E. VI circle,

to the S. E. VI circle,

with advertence to

with advertence to

his letter No. 350 M.D.

his letter No. 350 M.D.

dated 1st November

dated 1st November

1886

1886.

13.11.86.

13/11/86

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Proceedings, dated 10th November 1886
No. 1126 M (mis).

Subject.

Sanctioning transfer of funds for effecting a satisfactory test of the Suppanuthu water in Dindigul

S. E. VI circle.

S. E. VI circle

Despd

15/11/86

With order

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22nd November 1886, No. 1172 M., Financial.

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strongly to a good supply being available. Not only is the tank itself well supplied, but there are at least three wells not a 100 yards off, which show that there is plenty of water comparatively near the surface, while beyond this limit there are several other wells not far off.

5. Referring to the unfavorable results of the analysis of the samples of water taken from Mr. Crole's well, Mr. Crighton has already reported to the Collector that he considers the water available has not been properly tested yet, because the well has never been pumped dry on account of the pulsometer hitherto used not being sufficiently powerful. It seems that at first the lining of the well was not raised high enough to prevent the tank water submerging the well when the water in the tank rose rather high, and that the first set of samples was taken while the well was in this state. Subsequently, a parapet was built all round on the top of the lining, so now water from the tank cannot enter except by percolation, if this is possible. But the well was not pumped dry before the parapet was built nor since, and, consequently, the second set of samples was taken when the circumstances were practically the same as when the first set was taken. For this reason, Mr. Crighton considers the best water available has not been obtained yet. The Collector agrees with him and I concur, and I may add the late Superintending Engineer considered it would be advisable to pump the well dry. Mr. Crighton suggests the well should be pumped as follows :—Pump the water until the depth on floor is nine inches, which is the least depth that will suit the pulsometer; then allow water to rise 10 feet; then pump it out until depth is reduced to nine inches; let it rise again 10 feet and then pump again, and so on for ten days. At the end of this time, take samples when the water is nine inches deep and after it rises to full height, that is, the height it will rise to if pumping is stopped altogether. If this experiment is carried out properly, the water at the end of ten days ought to be free from local impurities at all events, and the then quality will, I think, represent very fairly the true working quality of the water.

6. The present is a favorable time to carry out Mr. Crighton's suggestion, for we have, at the Vaigai bridge works, a powerful pulsometer, which is not required at present, nor is it likely to be wanted for some time. Mr. Crighton said this pulsometer will pump the well dry easily, while the Collector said he would be able to get, either from the municipality or from the people, Rs. 800, the amount of the estimated cost of carrying out the experiment. Under the circumstances we agreed to start the work as soon as funds are provided, the Collector and Mr. Crighton agreeing to be responsible for the working and safety of the pulsometer; while the Sub-Collector agreed to look after the pumping and see that it is done as described above. This experiment will give also data for determining whether the well is likely to be able to supply the town, for if we know the length of time it takes to pump water out until the depth is reduced to nine inches, and the time the water takes to rise ten feet, we will be able to calculate the rate of inflow to the well and quantity of water taken out.

7. With reference to paragraph 9 of the Sanitary Commissioner's report, pending the result of the experiment about to be made, it is not necessary nor desirable to suggest anything that would involve expense, but I may state now that I am not hopeful better water than the water of Mr. Crole's well will be found within a reasonable distance of the town, because the stratum which the Sanitary Commissioner calls "marl deposits," and Mr. Crole "shaley kunker," seems to me to run under the whole town and to extend beyond it on all sides. I inspected several wells in and round the town, also two wells at Nagalnaickenpatti, which is about a mile off, and I noticed that in all cases the stratum under the surface soil is apparently similar to what is usually described as shaley kunker, and apparently the water flows from this stratum. The kunker may, of course, differ in quality in different places about the town, but I think there is a good deal of lime in it everywhere. In fact, about 200 yards to the south of Mr. Crole's well, there are lime-kilns in which the kunker, which is picked up there, is burnt for lime. The Sanitary Commissioner has not stated in his report to what extent in his opinion the impurities exhibited in the results of the analysis are derived from the "marl deposits;" but in the absence of a better opinion to the contrary, I cannot help thinking it is impossible to get, in or near the town, water which will come up to the standard the Sanitary Commissioner considers necessary for potable water.

However, if it is only a question of finding another source of supply away from Sippamuthu's tank, my opinion is that, if a well is sunk anywhere to the south of the tank or in the direction of the road to Kannivadi, water will be found. But before going to any expense in this direction, I think the Sanitary Commissioner should be asked to report to what extent he considers the impurites shown in the results of the analyses are derived from the "marl deposits."

8. With reference to the scheme to bring a supply from the Kodavanar river, I inspected the river at the site selected. This place seems to be the nearest point to the town; it is where a bandy track leading to Kannivadi crosses the river. The municipal overseer, K. Arasa Pillai, informed me he measured, for Mr. Crole, the distance from the town to the river, and made the length $4\frac{1}{8}$ miles. A six-inch diameter pipe is the smallest it would be advisable to lay. Mr Crighton's estimate for a pipe of this size delivered in the town is Rs. 1-12-0 per foot run. To this should be added the cost of carting to site, leading, and laying, which would probably bring the cost up to Rs. 2 per foot run. Four and one-eighth miles are equal to 21,780 feet. So the cost for laying a six-inch pipe would amount to $21,780 \times 2 =$ Rs. 43,560—a sum which is beyond the means of the people or municipality. Moreover, from levels furnished by Mr. Target, Executive Engineer, to the Chairman, Municipal Council, it seems the bed of the river is 93·59 feet below the parapet of Mr. Crole's well, while some levels which I have had taken show the height from the parapet to the rock selected by Messrs. Crole and Crighton for a site for a service reservoir is 80·47 feet, which makes the reservoir site 174 above the bed of the river. To pump water to a height of 174 and drive it $4\frac{1}{8}$ miles would, of course, require a powerful pump and considerable expense in the way of fuel. Again, it may be asked whether water might not be brought from the river in either an ordinary earthen channel or in a masonry one. This cannot be done, for the country from the town to the river falls or slopes towards the river. Besides, the bed of the river is a considerable depth below the adjacent ground, and therefore a supply could not be obtained unless the water is raised by some artificial means. Taking all these circumstances into consideration, I think the conclusion is that the scheme to bring water from the Kodavanar may be abandoned, for it is impracticable on account of the great outlay it would involve.

9. In conclusion, I may refer to a subject brought out during my inquiry which is, to say the least, peculiar. It is this, that according to local opinion, the water in Gopalasamudram tank (sample No. 4, paragraph 7, Mr. Crole's report) is the best in the town, and the next best is the Dindigul rock water In fact, most of the better classes take water for drinking from these tanks, but pariahs and other low-caste people are not allowed to draw water from them. On the other hand, the Chemical Examiner has reported the water of the former is hopelessly bad and the water of the latter suspicious. Gopalasamudram tank is said to be rain-fed; it certainly receives a good deal of rain water, for when I inspected it, the water was discolored and muddy; the Dindigul rock tank is, as far as I could ascertain, fed entirely from the rain water which flows off the rock and old fortifications. Another peculiarity in connection with this subject is, that from all the information I have been able to get, including vital statistics, Dindigul appears to be a very healthy town, and I could not discover that the people suffer from any local or peculiar disease derived from drinking water which, judging from the results of the analyses, must be bad; while, as regards Mr. Crole's well, water from it has been supplied continuously (I believe) to parts of the town for the last two years, and as yet there appear to be no evil results.

Order—dated 9th November 1886, No. 2945 W., Public Works.

Communicated to the Financial Department in continuation of G.O., No. 2337-W, dated 15th September 1886.

(True Extract.)

(Signed) W. L. C. BADDELEY, Captain, R.E.,
Under Secy. to Govt., P.W.D.

To the Financial Department.
„ Superintending Engineer, VI Circle.

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However, if it is only a question of finding another source of supply away from Sippamuthu's tank, my opinion is that, if a well is sunk anywhere to the south of the tank or in the direction of the road to Kannivadi, water will be found. But before going to any expense in this direction, I think the Sanitary Commissioner should be asked to report to what extent he considers the impurites shown in the results of the analyses are derived from the "marl deposits."

8. With reference to the scheme to bring a supply from the Kodavanar river, I inspected the river at the site selected. This place seems to be the nearest point to the town ; it is where a bandy track leading to Kannivadi crosses the river. The municipal overseer, K. Arasa Pillai, informed me he measured, for Mr. Crole, the distance from the town to the river, and made the length $4\frac{1}{8}$ miles. A six-inch diameter pipe is the smallest it would be advisable to lay. Mr Crighton's estimate for a pipe of this size delivered in the town is Rs. 1-12-0 per foot run. To this should be added the cost of carting to site, leading, and laying, which would probably bring the cost up to Rs. 2 per foot run. Four and one-eighth miles are equal to 21,780 feet. So the cost for laying a six-inch pipe would amount to $21,780 \times 2 =$ Rs. 43,560—a sum which is beyond the means of the people or municipality. Moreover, from levels furnished by Mr. Target, Executive Engineer, to the Chairman, Municipal Council, it seems the bed of the river is 93·59 feet below the parapet of Mr. Crole's well, while some levels which I have had taken show the height from the parapet to the rock selected by Messrs. Crole and Crighton for a site for a service reservoir is 80·47 feet, which makes the reservoir site 174 above the bed of the river. To pump water to a height of 174 and drive it $4\frac{1}{8}$ miles would, of course, require a powerful pump and considerable expense in the way of fuel. Again, it may be asked whether water might not be brought from the river in either an ordinary earthen channel or in a masonry one. This cannot be done, for the country from the town to the river falls or slopes towards the river. Besides, the bed of the river is a considerable depth below the adjacent ground, and therefore a supply could not be obtained unless the water is raised by some artificial means. Taking all these circumstances into consideration, I think the conclusion is that the scheme to bring water from the Kodavanar may be abandoned, for it is impracticable on account of the great outlay it would involve.

9. In conclusion, I may refer to a subject brought out during my inquiry which is, to say the least, peculiar. It is this, that according to local opinion, the water in Gopalasamudram tank (sample No. 4, paragraph 7, Mr. Crole's report) is the best in the town, and the next best is the Dindigul rock water In fact, most of the better classes take water for drinking from these tanks, but pariahs and other low-caste people are not allowed to draw water from them. On the other hand, the Chemical Examiner has reported the water of the former is hopelessly bad and the water of the latter suspicious. Gopalasamudram tank is said to be rain-fed ; it certainly receives a good deal of rain water, for when I inspected it, the water was discolored and muddy ; the Dindigul rock tank is, as far as I could ascertain, fed entirely from the rain water which flows off the rock and old fortifications. Another peculiarity in connection with this subject is, that from all the information I have been able to get, including vital statistics, Dindigul appears to be a very healthy town, and I could not discover that the people suffer from any local or peculiar disease derived from drinking water which, judging from the results of the analyses, must be bad ; while, as regards Mr. Crole's well, water from it has been supplied continuously (I believe) to parts of the town for the last two years, and as yet there appear to be no evil results.

Order—dated 9th November 1886, No. 2945 W., Public Works.

Communicated to the Financial Department in continuation of G.O., No. 2337-W, dated 15th September 1886.

(True Extract.)

(Signed) W. L. C. BADDELEY, Captain, R.E.,
Under Secy. to Govt., P.W.D.

To the Financial Department.
„ Superintending Engineer, VI Circle.

ORDER—dated 22nd November 1886, No. 1172 M., Financial.

The result of the experiment now being made, for which an allotment of funds was sanctioned in G.O., 10th November 1886, Mis. No. 1126 M., will be awaited. Meanwhile, the Sanitary Commissioner will submit the report referred to in paragraph 7 of the Superintending Engineer's letter.

(True Extract.)

for Ag. Chief Secretary.

To the Public Works Department.
„ Chairman, Municipal Council, Dindigul,
through the Collector of Madura.
„ Sanitary Commissioner for Madras.

Exd. A. Raitt.

8 8 C

No. 3225 W. of 6th December 1886.

F.W.C. No. 9461

Communicated to the Supdg. Engineer VI circle, with reference to G.O.s No. 2945 W. dated 9th Novr. 86, and No. 3014 W. dated 15th Novr. 86.

3.12.86

Govt. 2/12/86.

3014 W. 15.11.86.
2945 W. 9.11.86.
2547 W. 1.10.86.
2337 W. 15.9.86
1325 W. 27.5.86.
321.2 Dl. 30.6.86.
2547 E. 22.6.85
180 Rv. 3.6.85
903 C. 12.5.85

S. Ev. VI circle Dft. 7.12.86
S. E. VI. C.

Enc 9/12

Govt. of {1886} Madras.

FINANCIAL.

Issued

Recd. 3.12.86 Encl.

G.O., 22nd Nov. 1886, No. 1172 M.

No. 3225 W. of 6th December 1886

NOVEMBER.

Water-supply.

Awaiting the result of the experiment now being made of the Dindigul — project, and directing the Sanitary Commissioner to furnish the Superintending Engineer, VI Circle, with the report required in paragraph 7 of his letter.

2 Copies forwarded with Order

Local & Municipal ~~Financial~~ Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

letter from the Offg: Sanitary Commissioner for Madras, dated 17th December 1886 No. 1785:-

I have the honor, with reference to G.O. No. 1172 Mc. Financial, to forward the enclosed letter from the Chemical Examiner, from which it will be seen that, in his opinion, there are clear indications of numerous impurities other than marl deposits in the surroundings about the Sippanimuthoo well. The ground water in such a locality must consequently be subject to dangerous pollution by percolation of rain, and to such an extent as to render it undrinkable and prejudicial to health.

The water in the Sippanimuthoo well would naturally likewise receive insets of this pollution by percolations of rain and from the tank in which it is situated, notwithstanding its protection by a masonry tube lined with Portland cement. I consider it

it therefore advisable that it should be abandoned as a source of drinking supply.

I may here remark, with reference to the concluding portion of the VI Circle Superintending Engineer's letter, that it is most fallacious to form a general opinion of the state of health of a people using certain waters without a careful enquiry and collection of facts. Professor Simons in one of his admirable reports observes that "we cannot expect to find the effect of impure water always sudden and evident; its results are indeed often gradual and may elude ordinary observation and yet be not the less real and appreciable by a close enquiry. In fact it is only when striking and violent effects are produced that public attention is arrested; the minor and very insidious, but not the less certain, evils are borne with the indifference and apathy of custom". A combination of impurities and especially the co-existence of organic matter and calcium sulphate must be hurtful and injurious to health.

At-

At least the analyses of waters which have decidedly produced ill-effects on the health state of a people using such waters often showed that the impurities have been numerous.

Order thereon dated 12th January 1887 No 27 He (this)

Recorded pending report on the result of the experiment referred to in G.O. dated 22nd November 1886 No 1172 He.

(True Extract)

W. Blue
Asst Secretary.

To

The Sanitary Commr for Madras.

" Public Works Department

" Chairman Municipal Council, Madras

thro' the Collector of Madura.

No. 183 W d/ 21 Jany /87

B

P.W.C. No. 338

Govt. of (188) Madras.

Comd. to the Supg. Engr., VI circle, in contn. of G.O. No. 3225 W. dated 6th Decr 1886.

19.1.87

19.1.87

To

The Public Works Deptt.

Ry 18.1.87

Proceedings, dated 12th January 1887
No. 27 M (mis).

Subject.

B. No. 183 W d/ 21-1-87

Recording, with remark, the information regarding the Seppanuthee well.

3225 W 6.12.86.
3014 W 15.11.86.
2945 W 9.11.86.
2579 W 1.10.86
2337 W 15.9.86.
1325 W 27.5.86
321-2 D 30.6.86
257 G 22.6.85
180 G 3.6.85
903 C 12.5.85

Supg. Engr. VI Circle

21/1/87

With order

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—the following paper :—

From C. H. MOUNSEY, Esq., Chairman, Municipal Council, Dindigul, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 27th May 1887, No. 22.

I have the honor to submit the annual report of the Dindigul Municipality for the year 1886-87, with the usual prescribed statements.

2. The total receipts of the municipality during the year, including the opening balance, amount to Rs. 21,249-3-9 and the charges to Rs. 14,925-2-1, leaving a balance of Rs. 6,324-1-8 at the close of the year. This is Rs. 4,854-1-8 in excess of the estimate, owing especially to the larger opening balance, *plus* the unspent allotments under Grants I and II as will be seen in the succinct explanations given in the comparative statement and in paragraphs 16, 17, and 18 below.

Receipts.

3. *Statement I—House-tax.*—The total amount collected under this head, as compared with that of previous year, shows a deficit of Rs. 243-10-7, which is attributable to a new man having been employed during the year under report on

	RS.	A.	P.
1885-86	3,410	4	1
1886-87	3,166	9	6

a reduced rate of commission, viz., 2 instead of 5 per cent. on the actual amount of taxes collected; and yet it will be observed that the collection under this head forms 88 per cent. on the total demand. Statement IV shows that out of a current demand of Rs. 3,543-8-0, Rs. 3,123-11-0 have been collected, Annas 6 written off, and the balance left uncollected is Rs. 419-7-0, which has almost all been since collected. Under arrears, the total demand was Rs. 49-8-0, of which Rs. 42-14-6 have been collected (two by prosecution realizing after judgment Rs. 5-7-0), Rs. 4-1-6 written off, and the remainder Rs. 2-8-0 is still due by two persons whose inquiry is pending before the Bench Magistrates. Thus it will be seen from the appendix to statement IV-B that only four prosecutions were instituted for arrears of house-tax during the year under review; 424 warrants for the recovery of Rs. 502-8-0 were issued during 1886-87 against 243 for Rs. 338-11-0 in the previous year. But the amount collected by such process during the current year was only Rs. 109-9-0 for 70 warrants against Rs. 305-7-0 for 214 warrants last year. In no case was property distrained or sold during the year under report. There is a gradual increase in the number of buildings in the town, and a corresponding increase in the assessment under this head. A general revision of the measurement of all houses is now being made with a view to bring to taxation during 1887-88 all the new buildings and extended houses not always easily known and which are supposed to have escaped liability to the tax. It is more than five years since a general revision was effected in accordance with the instructions of Government conveyed in their order, dated 9th November 1880, No. 2091, Financial.

No. 183 W d/ 21 Jany /87

B

Comd. to the Supg Engr, VI Circle, in contn of G.O. No: 3225. W. dated 6th Decr 1886.

19.1.87

19/1/87

3225 W 6.12.86.
3014 W 15.11.86.
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903 C 12.5.85

Supg Engr. VI Circle.

21/1/87

P.W.C. No 338

Govt. of (188) Madras.

To

The Public Works Deptt.

R 18.1.87

Proceedings, dated 12th January 1887
No. 27 M (mis).

Subject.

B. No 183 W d/ 21-1-87

Recording, with remark, the information regarding the Seppamuthee well.

8TH JULY 1887, No. 644 M., LOCAL AND MUNICIPAL.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper :—

From C. H. MOUNSEY, Esq., Chairman, Municipal Council, Dindigul, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 27th May 1887, No. 22.

I have the honor to submit the annual report of the Dindigul Municipality for the year 1886-87, with the usual prescribed statements.

2. The total receipts of the municipality during the year, including the opening balance, amount to Rs. 21,249-3-9 and the charges to Rs. 14,925-2-1, leaving a balance of Rs. 6,324-1-8 at the close of the year. This is Rs. 4,854-1-8 in excess of the estimate, owing especially to the larger opening balance, *plus* the unspent allotments under Grants I and II as will be seen in the succinct explanations given in the comparative statement and in paragraphs 16, 17, and 18 below.

RECEIPTS.

3. *Statement I—House-tax.*—The total amount collected under this head, as compared with that of previous year, shows a deficit of Rs. 243-10-7, which is attributable to a new man having been employed during the year under report on a reduced rate of commission, viz., 2 instead of 5 per cent. on the actual amount of taxes collected; and yet it will be observed that the collection under this head forms 88 per cent. on the total demand.

	RS.	A.	P.
1885-86	3,410	4	1
1886-87	3,166	9	6

Statement IV shows that out of a current demand of Rs. 3,543-8-0, Rs. 3,123-11-0 have been collected, Annas 6 written off, and the balance left uncollected is Rs. 419-7-0, which has almost all been since collected. Under arrears, the total demand was Rs. 49-8-0, of which Rs. 42-14-6 have been collected (two by prosecution realizing after judgment Rs. 5-7-0), Rs. 4-1-6 written off, and the remainder Rs. 2-8-0 is still due by two persons whose inquiry is pending before the Bench Magistrates. Thus it will be seen from the appendix to statement IV-B that only four prosecutions were instituted for arrears of house-tax during the year under review; 424 warrants for the recovery of Rs. 502-8-0 were issued during 1886-87 against 243 for Rs. 338-11-0 in the previous year. But the amount collected by such process during the current year was only Rs. 109-9-0 for 70 warrants against Rs. 305-7-0 for 214 warrants last year. In no case was property distrained or sold during the year under report. There is a gradual increase in the number of buildings in the town, and a corresponding increase in the assessment under this head. A general revision of the measurement of all houses is now being made with a view to bring to taxation during 1887-88 all the new buildings and extended houses not always easily known and which are supposed to have escaped liability to the tax. It is more than five years since a general revision was effected in accordance with the instructions of Government conveyed in their order, dated 9th November 1880, No. 2091, Financial.

A classified statement of houses ordered in paragraph 9 of G.O., 31st March 1887, Nos. 304-305 M., Local and Municipal, has been appended to the annual statements herewith submitted.

4. *Land-tax.*—The difference between these items, as per margin, can be attributed to the same cause shown above regarding the bill-collector. In statement IV it will be observed that a sum of Rs. 17-4-0 has been left uncollected out of the current demand of Rs. 45-11-0. Twenty-seven warrants for Rs. 21-15-0 were issued as against 17 warrants for Rs. 27-10-0 during 1885-86. The total of Rs. 1-8-9 under arrears was written off as irrecoverable.

	Rs.	A.	P.
1885-86	46	10	6
1886-87	28	7	0

5. *Taxes on Vehicles and Animals.*—Comparing the two items in the margin, the large increase of Rs. 96-12-0 in the year under review is due entirely to the unexpected increase in the number of animals registered, for some of which taxes are still due, although bills have been served in the usual course under the Act. They are shown under arrears and current in statement IV aggregating Rs. 60-8-0. From the appendix to statement IV, it will be observed that 50 warrants for the recovery of Rs. 37-12-0 have been issued against 30 for Rs. 59-8-0 in the previous year, and there were nine prosecutions against three in 1885-86. It is a matter for regret that coercive measures and magisterial proceedings, as shown under this and the foregoing heads, have had to be more freely resorted to this year. But in no instance was property distrained or sold.

	Rs.	A.	P.
1885-86	906	8	0
1886-87	1,003	4	0

6. *Registration of Carts.*—The enormous increase exhibited in the number of carts registered during 1886-87 arises from the same cause as the corresponding increase in the number of bullocks.

	Rs.	A.	P.
1885-86	592	4	0
1886-87	643	0	0

7. *Tolls.*—This item fetched Rs. 95 more than last year. The statement appended to the annual statements shows in detail the payment of contribution to the Madura District Board on this account.

	Rs.	A.	P.
1885-86	6,510	0	0
1886-87	6,605	0	0

8. *Licenses.*—Oil-mills, lime-kilns, bricks and pottery kilns, places for storing hides, &c., and some others mentioned in section 188 of the Municipal Act have been for the first time assessed during the year under report, according to the scale of fees arranged by the council upon the maximum rates sanctioned in G.O., dated 3rd June 1870, No. 705, Public. Hence an increase of Rs. 88 over that of last year. There still remains a balance of Rs. 61 to be recovered under this head as will be seen from the demand, collection and balance statement. But most of these, imposed for the first time, have been collected. Appendix to statement IV-B gives the particulars in this regard.

	Rs.	A.	P.
1885-86	44	0	0
1886-87	132	0	0

9. *Contribution from Provincial Funds.*—As the municipal expenditure on education fell far below 15 per cent. of the total income of the municipality excluding the opening balance and contributions, &c., no contribution was drawn during the year under review from Provincial Funds for payment of results grants, &c., although Rs. 1,000 was provided in the budget under this head. But, on the contrary, the surplus of the Provincial contribution of 1885-86, viz., Rs. 159, was refunded to Government during 1886-87 at the instance of the Director of Public Instruction, Madras.

	Rs.	A.	P.
1885-86	1,086	0	0
1886-87	*Nil.*		

10. *Realization under Special Acts.*—The difference is the inclusion of license-tax commission and penalties in the amount for 1885-86, but the Surplus Pound Fund is Rs. 10-12-0 more than the actuals of previous year.

	Rs.	A.	P.
1885-86	84	11	0
1886-87	27	3	0

11. *Municipal Fines.*—The short receipts under this head, as compared with those of the previous year, are accounted for by the fact that most of the warrants have not been executed, and some of the prosecutions not been disposed of during the year under report.

	Rs.	A.	P.
1885-86	198	0	8
1886-87	162	5	0

12. *Income from Markets.*—The considerable increase of Rs. 838-8-6 over last year is probably due to the increase of trade of the town as also exhibited in the increased amount of carts and cattle registration. The details of items under this head for 1886-87 are given below:—

	Rs.	A.	P.
1885-86	4,873	3	6
1886-87	5,711	12	0

	Rs.	A.	P.
Weekly market	3,010	0	0
Daily market, including slaughter-house	2,015	0	0
Beef market, including cattle slaughter-house	255	0	0
Rents obtained from Mosque lane bazaar sheds	431	12	0

As stated in last year's report, the mosque lane bazaars are still kept under the direct management of the council, and are under the efficient supervision of Mr. Pichaimoitheen Rowtar, councillor, who is in charge of the market administration in general, and who spares no pains in looking after the proper working of these markets. The fees collected at weekly market ranges from 1 pie to 1 anna, the rate sanctioned in G.O., 22nd April 1875, No. 906, Financial, and the contractor is allowed to collect fees according to the scale prescribed by the council; in the sheep and cattle slaughter-houses not exceeding 1 anna minimum being fixed by the council. As for mutton stalls and others where monthly rent could be obtained, no limit is fixed. The contractors, as well as the council in the case of mosque lane bazaars, are allowed to leave them to open competition.

13. *Rent of other Buildings, &c.*—The falling off of Rs. 31-4-0 during the year under review as noticed in the margin is due comparatively to the smaller receipts derived from grass rent of the parade ground. Rent of travellers' bungalow, pandal fees, and grass rent are the only items comprising this head.

	Rs.	A.	P.
1885-86	272	4	0
1886-87	241	0	0

14. The sum of Rs. 133-13-6 from chattram endowment for water-supply was received from the Treasury Deputy Collector of Madura a single day late to be credited in the accounts of 1886-87, and hence brought to the accounts of 1887-88 on the 1st day of April 1887, which would obviously swell the receipts of that year under this head when the same is drawn for the current official year also.

15. *Miscellaneous.*—The figure of 1885-86 consists of a sum of Rs. 150-0-3 on account of a certain refund, while that of 1886-87 does not, but the land referred to in paragraph 15 of the last year's report has been sold during the year under review, which, together with the interest obtained from the defaulting contractors, made the receipts under this head expand. The following are the items included under Miscellaneous:—

	Rs.	A.	P.
1885-86	306	4	5
1886-87	248	7	0

	Rs.	A.	P.
Sale of sweepings			
„ of avenues	17	13	10
„ of land	44	1	9
„ of materials, &c.	113	8	0
Interest	40	12	0
	32	3	5

16. The various items of receipts shown above are compared with their estimates with the necessary explanation in statement VI-B. Rs. 35 shown under "Advances recoverable" in the note to statement II of 1885-86 has been written off as irrecoverable, the books having become out of use as fresh editions superseded them. This was due to the remissness of the late dismissed inspecting schoolmaster who failed to dispose of them in time.

EXPENDITURE.

17. *Grant I, Public Works—New Works.*—Under this head no new works of any importance were carried out during the year, except that Rs. 315 was paid for balance due to the completion of the wooden fence at weekly market including the amount of compensation alluded to in the last year's report. Rs. 10-14-0 shown under Water-supply is the amount paid for railway freight, &c., of the centrifugal pump and its adjuncts which were received from the Grand anicut, Tanjore, on the 25th February 1887, for the purpose of trying the experiment ordered by Government in their order, dated 10th November 1886, Mis. No. 1126 M., Financial. It is to be very much regretted that the engine, or the boiler attached to the above pump, has not up to date been sent, nor any information furnished regarding it, in spite of several communications on the subject. The Collector of Madura was addressed in letter No. 2 of 2nd April 1887, bringing to his notice the non-receipt of the engine, to arrange for the procuring of some other engine and pump for the speedy trial of the experiment, as the Superintending Engineer, VI Circle, wished to know the probable period for which the centrifugal pump, which is lying waste ever since its receipt for want of the engine, will be required by the Dindigul Municipality. This is the only cause of delay in conducting the experiment which resulted in the non-utilization of the allotment sanctioned by Government under this head. Rs. 19-10-0 were spent for miscellaneous works.

	Rs.	A.	P.
1885-86	517	8	0
1886-87	415	8	0

18. *Repairs.*—The total outlay under Repairs amounts to Rs. 3,021-8-10 against an estimate of Rs. 4,280 for 1886-87. Thus a sum of Rs. 1,258-7-2 was left unspent at the close of the year for the following reasons.

	Rs.	A.	P.
1885-86	2,180	14	5
1886-87	3,021	8	10

Owing to want of rain and scarcity of water in the latter half of the year, the whole of the allotment for road repairs, viz., Rs. 3,450, was not spent, and the contractors who undertook these works have been exceedingly slow for the same reason shown above. They have been fined for their remissness as it was their fault. Hence the expenditure fell short of the estimate by Rs. 579-14-4. Under Buildings, estimates for the conversion of thatched sheds into tiled ones at the weekly market and in mosque lane were passed by the council a little late in the year and the works commenced already have not been finished within the year. But out of Rs. 139-10-11 shown under this head, Rs. 124-3-0 were paid for balance due to the completion of a tiled shed at weekly market where the council have proposed to convert all the sheds into tiled ones one by one every year; and Rs. 15-7-11 for repairing the latrine attached to the travellers' bungalow. Under Water-supply, the repair of the stone revetment and the flight of steps of the Fort tank was almost completed during the year, but a heavy shower of rain in March last nearly filled the tank and left the work unfinished. Hence the allotment of Rs. 200 under this head remained unspent. Miscellaneous repairs cost only Rs. 11-12-3 against an estimate of Rs. 30. The sum of Rs. 153-1-8 under Establishment was for the pay of the overseer under the separation of duties of overseer's work proper from those of the sanitary inspector, as has been explained in the

budget report of 1887-88, paragraph 16, recorded in G.O., 2nd March 1887, No. 195 M., Local and Municipal. This accounts for the excess expenditure of Rs. 3-1-8 over the estimate. The charges incurred for tools, plant and contingencies are small, being Rs. 32-6-4 below the estimate of Rs. 40; greater necessity was not felt for the utilisation of the whole allotment under this head. The following items of savings given in round numbers under the main heads of Grant I have merged in the closing balance, and sanction of Government is solicited for their utilisation under their respective heads during 1887-88 independent of the sanctioned allotments for that year:—

	Rs.
(1) New Works—	
(*d*) Water-supply	790
(2) Repairs—	
(*a*) Communications	580
(*b*) Buildings	600
(*d*) Water-supply	200
Total ..	2,170

19. *Grant II, Education.*—The considerable falling off in the expenditure for 1886-87 against the actuals of the previous year and an estimate of Rs. 3,300 for the year under report cannot be properly attributed to any specific cause in the absence of the usual report from the Deputy Inspector of Schools, who has been reminded on the subject more than once. But, however, in the year under review a sum of Rs. 600 has been provided under Salary grants, while there are no schools of that sort in the municipality. The noticeable decrease will be found in the payment of results grants which only amounts to Rs. 1,610-9-1 against Rs. 2,535-1-0 in the year previous, though the latter figure contains an arrear-payment of Rs. 548-8-0. This is still far less than the estimate for the year under review which amounts to Rs. 2,500. Under Inspection Rs. 115-1-6 were for the pay and contingencies of the inspecting schoolmaster against an estimate of Rs. 120; and under Miscellaneous out of an allotment of Rs. 80, a portion, viz., Rs. 39-14-0, was paid to the Mahomedan school for gymnastic apparatus. Statement V was not prepared for want of particulars as to its preparation which the Deputy Inspector of Schools has failed to furnish as noticed last year also. He has been called upon to submit the educational report without delay, and as soon as it is received from him statement V, with the Deputy Inspector's report, will go to Government.

	Rs.	A.	P.
1885-86	2,689	5	6
1886-87	1,765	8	7

20. *Grant III, Sanitation—Hospitals and Dispensaries—Medical College and Sanitary Inspection.*—The enormous difference between the two figures, as per margin, has been explained in paragraph 2 of the budget report of 1887-88 embodied in G.O., 2nd March 1887, No. 195 M., Local and Municipal. The contribution of Rs. 480 received from the Madura District Board, and Rs. 427-12-11 from Dr. Chester during the year under review for medicines, &c., supplied to the Dindigul dispensary, for which no provision was made on the debit and credit sides of the budget for 1886-87, is now found to recur in 1887-88 also. I beg, therefore, to suggest that in future, with a view to secure uniformity in the accounts of the municipality, the contribution due by the Madura District Board for establishment as well as medicines, &c., to the Dindigul dispensary be made regularly to be paid to the council so as to enable them to defray the charges themselves. Out of the total expenditure of Rs. 1,700-12-11 against an estimate of Rs. 790 for the year under review, Rs. 455 was paid for establishment and Rs. 1,077-12-11 for medicines, &c., supplied to the Dindigul dispensary, whose report Dr. Chester has not as yet furnished. It will be submitted as soon as it is received from him. The necessary statistics under this head will then be reviewed by the council before submitting it to Government. The sums of Rs. 6, Rs. 81, and Rs. 81 were the usual

	Rs.	A.	P.
1885-86	761	0	0
1886-87	1,700	12	11

contributions paid respectively for Reserve Medical staff, Medical College, and the Sanitary inspection during the year. The dispensary report alluded to above has since been received and is submitted herewith. It will be seen from the report that the total number of cases treated in the Dindigul dispensary during the year under review fell short of last year by 1,206 cases, and a considerable falling off in the number of in-patients also which amounts to 180 against 305 in 1885-86 and 286 in 1884-85. These differences indicate that the health of the district was satisfactory during the year under review. But, on the other hand, there is a remarkable increase in the number of villages, viz., 700, from which patients have attended the dispensary during 1886-87 against 575 last year and 482 in the year before last. Details as to diseases, classification, &c., of patients are given in the report.

21. *Vaccination.*—The charges of 1886-87 exhibit a slight decrease below that of 1885-86 and Rs. 28-6-0 less than the estimate. This is due to the fact that the municipal vaccinator was fined Rs. 5 on a reference made by the Inspector of Vaccination and Deputy Sanitary Commissioner, Madras, for furnishing incorrect returns, and almost the whole allotment of contingencies for the year under review has not been spent. Seven hundred and fifty-five cases in all were vaccinated during the year under report against 1,439 in the year previous. This vaccinator had been in the habit of operating cases at the weekly market also which underwent little or no supervision at all, nor was it found practicable to effect a proper scrutiny villagewar by the Deputy Inspector of Vaccination, and hence the vaccinator was restricted to the municipal town only during 1886-87. This may partly account for the abundant falling off in the number of vaccine operations during the year under review. Although the minimum fixed by the council, on the recommendation of the District Medical and Sanitary officer of Madura, is 100 per month, yet the vaccinator is found not to conform to the above, but complains that the rate fixed is too high. The matter is said to be under the local inquiry of the District Medical officer, who will be requested to report specially on the subject. Of the total number vaccinated during the year under review, 685 were successful, 61 unsuccessful, and 9 result unknown; and of the successful cases, 68 were infants under one year of age against 226 in the year previous. It is supposed that almost all the children in the town are now vaccinated and so the falling off is accounted for.

	Rs.	A.	P.
1885-86	222	13	3
1886-87	211	10	0

22. *Registration of Births and Deaths.*—The difference in the charges, as compared with those of 1885-86 and the estimate for 1886-87, calls for no remark. The following table shows the number of births and deaths registered during the year under review compared with those of the previous year, at the same time showing the causes of deaths during the two years compared:—

	Rs.	A.	P.
1885-86	128	12	10
1886-87	123	7	0

TABLE.

Year.	Deaths.									Births.		
	Causes of deaths.											
	Small-pox.		Fever.		Other diseases.		Total.		Total of both sexes.			
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.		Males.	Females.	Total of both sexes.
1885-86 ..	7	4	57	52	132	112	196	168	364	342	298	640
1886-87 ..	6	3	41	29	127	147	174	179	353	362	304	666

The matter of decrease in the total number of deaths registered and the increase under births, as compared with the figures of the previous year, has been observed.

23. *Conservancy.*—The expenditure of the two years noted in the margin exhibits no material difference, but the charges of 1886-87 fell short of the estimate by Rs. 228-9-7. Of the two dust-carts provided under (*a*), one only was made during the year. There were also some savings effected under (*c*), contract for the supply of bullocks, &c., having been given at a little reduced rate. Under (*d*) and (*e*) the allotments have not been fully spent as no necessity was found to do so in cleansing tanks and wells and contingencies. These causes account more or less for the short expenditure indicated above. The appointment of four additional sweepers, sanctioned in G.O., Mis. No. 67 M., dated 28th January 1887, Local and Municipal, was made on the 9th February 1887; but as their pay for March 1887 has been debited to the accounts of 1887-88, this addition in the number of sweepers has not been shown in statement II-B. The general health of the town was as good as the previous year, epidemic diseases not having shown their appearance during the year under review.

	Rs.	A.	P.
1885-86	2,898	0	4
1886-87	2,851	6	5

24. *Grant IV, Lighting.*—The outlay under this head during 1886-87 exceeded the budget allotment by Rs. 17-10-6 and Rs. 73-9-1 over the expenditure of last year. This is mainly due to the want of competition at the sale, and the small increase over the estimate was for the cost of fixing and refixing certain lamp-posts during the year.

	Rs.	A.	P.
1885-86	644	1	5
1886-87	717	10	6

25. *Markets and Slaughter-houses.*—Vast difference is found when comparing the two years' expenditure. This is particularly owing to the entertainment of larger establishments, &c., during a part of the year 1885-86 when the markets were, for the first time, sold to contractors. The charges of the year under report are also less than the estimate by Rs. 29-6-7 which is due to the non-utilisation of about half the market contingencies budgeted. In statement II-B it will be observed under this head that the pay of the watchman has been raised from Rs. 2-8-0 to Rs. 4 per mensem for which sanction is accorded in paragraph 2 of the G.O., dated 2nd March 1887, No. 195 M., Local and Municipal.

	Rs.	A.	P.
1885-86	335	9	10
1886-87	100	9	5

26. *Avenues.*—Out of the allotment of Rs. 210 under Avenues, Rs. 16-5-4 remained unspent during 1886-87. The larger expenditure during 1885-86 is, as has been already explained in last year's report, attributed to the inclusion of certain arrear-payments in the figures of 1885-86.

	Rs.	A.	P.
1885-86	270	5	2
1886-87	193	10	8

27. *Water-works.*—Although the difference exhibited, as per margin, is comparatively very small, yet the charges of 1886-87 exceeded the budget by Rs. 192-9-11. It was expected that this would have still mounted up higher, but as the old engine and pulsometer at Suppanuthu get constantly out of order whereby the need of firewood is less, the expenditure was less. Some information about this anticipated increase has also been given in paragraph 7 of the budget report of 1887-88. The council are very anxious to purchase permanently an engine of their own, but considering the tentative nature of the scheme, they are not in a position to do so.

	Rs.	A.	P.
1885-86	1,981	5	8
1886-87	1,992	9	11

28. *Travellers' Bungalow.*—No explanation is required, as the allotment is only Rs. 80 for the year under review.

	Rs.	A.	P.
1885-86	77	15	0
1886-87	76	4	4

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	Rs.	A.	P.
1885-86	77	15	0
1886-87	76	4	4

29. *Other Charges.*—This is almost twice as numerous as the actuals of the previous year and estimate for 1886-87. The only extraordinary item of expenditure under this head during the year under review is the law-suit, which alone has cost the council Rs. 153-2-0. This was a suit in regard to a piece of land lying in front of the daily market, which ended in favor of the council in the original court, but was reversed by the first appellate court, whose decision was confirmed by the High Court. The printing charges paid during the year were Rs. 337-10-6.

	Rs.	A.	P.
1885-86	302	15	3
1886-87	552	8	4

30. *Grant V.*—The total outlay under this grant shows a decrease of Rs. 67-14-0 and Rs. 117-12-2 below the actuals of 1885-86 and the estimate for 1886-87, respectively. The only reason that can be assigned for this drawback is the reduced percentage allowed to the present bill-collector, as has been explained in paragraph 3 *supra*. A sum of Rs. 15 was paid prior to the receipt of G.O., 14th April 1887, No. 338 M., Local and Municipal, for contribution to the central office establishment with a view to adjustments being made within the year.

	Rs.	A.	P.
1885-86	950	1	10
1886-87	882	3	10

31. Under refunds, Rs. 159 are shown, for which explanation has been given in paragraph 9 of this report.

32. During the year under review one member was elected, and the council has its full complement now. Thirty-one meetings were held, of which 23 were ordinary and 8 special, and the average attendance at each meeting was above 7. The strength of the council is 12, of which three-fourths are elected. The members have, as usual, discharged their duties with vigor and zeal, and I have also here much pleasure in stating that the head clerk has my confidence and discharges his duties ably; and the shroff and other municipal servants, except the menial establishment and a sanitary inspector, who began work well but ended badly, have worked much satisfactorily.

ENCLOSURES.

From E. TURNER, Esq., Collector of Madura, to the Superintending Engineer, VI Circle, Trichinopoly, dated Madura, 10th June 1887, No. 64.

Adverting to your letter, No. 34 M.D., of the 10th February 1887, I have the honor to state that, on the 26th February last, the Chairman, Dindigul Municipality, brought to my notice that the pump with 17 pipes and a box containing bolts, &c., were received from Tiruverumbúr station on the 25th idem without the boiler and its adjuncts, and that he would write again on the latter being received. Subsequently, on the 2nd April 1887, the same officer wrote to say that, on applying to the Executive Engineer of Tanjore for the engine, &c., he replied that he had received orders to send only the pump, and the chairman therefore requested this office to write for them or to obtain another engine, as the one at Dindigul might have to go to Ganjam. On the 5th April 1887 he again wrote to me that the marginally-noted accompaniments also should be sent for along with the engine. On the receipt of the above references, I applied to the Chairman, Madura Municipality, for a loan of the pulsometer belonging to that municipality, but that officer has sent in no reply up to date, apparently perhaps because the municipality are not disposed to lend it.

One brass gland for stuffing box, bore to be $1\frac{3}{4}$" diameter for centrifugal pump No. 8, 5" or 6" strap or belt with lace 50 feet in length.
Two oil cups for pully with trimming wire, whose diameter is three-quarter inch.

2. Thus, the centrifugal pump already received has remained at Dindigul unutilised for want of an engine. As I think that the pump will be of no use without an engine, and as it appears from your letter, dated 21st March 1887, No. 707 M.D., that it is required elsewhere, I request you to be so good as to cause the same to be returned to you.

3. I take this opportunity of informing you that, the matter being a municipal one, you may communicate with the chairman on the subject direct.

REPORT of the Dindigul Dispensary for the year 1886.

During the year under review, there have been treated, at the Dindigul dispensary, 8,961 new cases, or those coming for the first time. Many of these cases came subsequently to the dispensary, so that a total of 24,490 prescriptions were written.

2. Of the new cases noted, 180 were in-patients, remaining for days or weeks under treatment in the in-patient houses or the hospital sateram. And the majority of these provided their own food.

3. Of the total of new cases noted, 4,470 were medical, 4,119 surgical, 117 both medical and surgical, and 255 cases of vaccination. In these cases there were 16 Europeans, 95 Eurasians, 2,938 Native Christians, 1,013 Muhammadans and 4,899 Hindus. Under six years of age there were 861 males and 766 females; between six and twenty-one years of age there were 1,750 males and 914 females; over twenty-one years of age there were 2,880 males and 1,790 females.

4. Patients came to the dispensary from more than 700 different villages.

5. The classes of diseases treated were very much the same as in previous years, viz., fever, diarrhœa, dysentery, skin diseases, scrofula, leprosy, rheumatism, diseases of the eye and ear, and ulcers. There have been but few cases of cholera treated in the whole district. There were the usual number of surgical operations.

6. There have been 57 labor cases cared for by the two female native nurses, with diplomas, working in connection with the Dindigul dispensary. Some of these were brought to the hospital and required the use of instruments. These nurses have also assisted in the care of ordinary cases, among the women and children, coming to the dispensary for treatment, and have been called to the houses of the most respectable families among the Muhammadans and Hindus, even Brahmin women gladly availing themselves of their services. This has not always been the case, but it is most evident that the feelings of the people, in regard to European medical treatment, is being modified.

7. No mere figures or statistics will prove whether a dispensary is really popular or not. It is in the return of old patients for treatment, and the verbal and written reports we receive from scores of villages, which indicate this. And a good name will only come to a dispensary where good and successful work is actually done.

8. I can speak well for the faithfulness and good conduct of the dispensary and hospital assistants during the year.

9. My thanks are again due to the Dindigul Municipality, the Madura District Board, and many friends among the civilians and natives, who have kindly given grants and donations to the Dindigul dispensary.

DINDIGUL,
1*st April* 1887.

(Signed) EDWARD CHESTER, M.D.,
Medical Officer, Dindigul Dispensary.

Forwarded.

DINDIGUL,
31*st May* 1887.

(Signed) C. H. MOUNSEY,
Ag. Sub-Collector.

No. 201.

Submitted.

2. The total receipts of the municipality, including the opening balance of Rs. 4,574-2-0, amounted to Rs. 21,249-3-9 and the charges Rs. 14,925-2-1, leaving a closing balance of Rs. 6,324-1-8 at the close of the year, which is in excess of the closing balance of 1885-86 by Rs. 1,749-15-8 owing to savings effected chiefly under grant II (3 and 4).

3. The actual receipts of the municipality for 1886-87 (Rs. 16,675-1-9) as compared with the estimated receipts of that year (Rs. 16,730) show a decrease of only Rs. 54-14-3 below the latter, which is too small to call for any remark. The actual expenditure amounted to Rs. 14,925-2-1 as stated above against an estimate of Rs. 17,050, exhibiting a decrease of Rs. 2,124-13-11. This decrease is due to the unspent allotments under items I and II.

4. The total actual receipts and charges for 1886-87 as compared with those for 1885-86 are given below:—

	Receipts. Rs.	Charges. Rs.
1886-87	16,675	14,925
1885-86	16,294	14,146
	+ 381	+ 779

The increase under receipts over those of previous year chiefly occurs under income from markets, which is due to their having been sold by auction during the year under report for a higher rental than the previous year.

The increase under expenditure, which amounts to Rs. 779, is attributable to the increased expenditure under repairs to communications and under medicines and supplies.

5. The working of the municipality appears to have been satisfactory on the whole.

6. As regards delay, referred to in paragraph 17 of the chairman's letter, the undersigned begs to state that, on the chairman's writing to this office that the engine (boiler) had not been received and that it should be sent for or some other engine procured, the Chairman of the Madura Municipality was requested to lend the pulsometer belonging to that municipality, but no reply has been received as yet; hence the delay. The Superintending Engineer was not written to as regards the boiler, as it appeared from his letter No. 781 M.D., dated 21st March 1887, that the pump, &c., would be required back by him soon. The undersigned also begs to refer to the accompanying copy of letter No. 64, dated 10th June 1887, addressed to the Superintending Engineer on the subject.

MADURA,
10*th June* 1887.

(Signed) E. TURNER,
Collector.

ORDER—dated 8th July 1887, No. 644 M., Local and Municipal.

The receipts and charges of the Dindigul municipality for 1886-87 are compared below with the budget and revised estimates for the year and the actuals of the previous year:—

RECEIPTS.

	Actuals, 1885-86.	Budget estimate, 1886-87.	Revised estimate, 1886-87.	Actuals, 1886-87.
	RS.	RS.	RS.	RS.
Balance brought forward ..	2,426	1,790	4,570	4,574
Rates on houses and lands	3,457	3,550	3,540	3,195
Taxes on vehicles and animals	907	870	900	1,003
Taxes on carts	592	600	620	643
Tolls	4,340	4,400	4,400	4,403
Licenses	44	50	120	132
Assignments by Government	1,171	1,070	1,030	27
Contributions from local funds ..	..	..	..	480
Fines and fees	198	250	250	162
Income from markets	4,873	5,400	5,720	5,712
Rent of other buildings, gardens, &c.	272	260	260	241
Endowments, &c.	134	130	130	..
Miscellaneous	306	150	1,070	677
Total ..	18,720	18,520	22,610	21,249

CHARGES.

GRANT I.				
New Works—				
Buildings	505	..	410	509
Water-supply	..	800	800	11
Miscellaneous	13	20	20	20
Repairs—				
Communications	1,705	3,450	3,540	2,870
Buildings	366	600	730	16
Water-supply	67	200	200	..
Miscellaneous	43	30	30	12
Establishment	134	150	150	153
Tools and plant and contingencies.	36	40	40	7

CHARGES—*cont.*

	Actuals, 1885-86.	Budget estimate, 1886-87.	Revised estimate, 1886-87.	Actuals, 1886-87.
	RS.	RS.	RS.	RS.
GRANT II.				
Municipal schools—	..	600	..	..
Salary grants	2,535	2,500	3,100	1,611
Results grants	144	120	120	115
Inspection	10	80	80	40
Miscellaneous				
GRANT III.	625	630	1,540	1,533
Hospitals and dispensaries ..	136	160	170	168
Contributions to Government ..	223	240	220	212
Vaccination	129	130	130	123
Registration of births and deaths.	2,898	3,080	3,010	2,851
Conservancy				
GRANT IV.	644	700	700	718
Lighting	336	130	120	100
Markets	270	210	210	194
Avenues and watering roads ..	78	80	80	76
Travellers' bungalows	2,284	2,100	2,750	2,545
Miscellaneous				
GRANT V.	950	1,000	900	882
Supervision and management ..	15	..	..	..
Advances recoverable	..	..	..	159
Refunds	4,574	1,470	3,560	6,324
Balance				
Total ..	18,720	18,520	22,610	21,249

The hospital not being an endowed institution, its receipts will be transferred to the head "miscellaneous."

2. No information is furnished in the report as to the persons who held the office of chairman during the year; but it is observed that the Revenue Divisional officer has always been in charge, either under section 15 of the Act or as the elected chairman of the council. On the 31st March last the council consisted of 12 members, of whom 3 were appointed by Government and 9 were elected (one during the year under report). With the exception of the Revenue Divisional officer, all of these were non-officials.

3. Thirty-one meetings were held during the year, and the average attendance at each was 7 councillors (1 official and 6 non-officials). The Government are glad to have the chairman's testimony that the councillors have discharged their duties with vigor and success.

4. The opening balance amounted to Rs. 4,574. The current receipts of the year came to Rs. 16,675 against Rs. 16,730 estimated in the budget and Rs. 18,040 in the revised estimate. The total expenditure was Rs. 14,925, and the year thus closed with a balance of Rs. 6,324.

5. The chief sources of municipal income are the tax on buildings and lands, which yielded Rs. 3,195; tax on vehicles and animals Rs. 1,003; tolls Rs. 4,403, and market and other rents Rs. 5,953. The municipality derives no revenue from tax on arts. As compared with the revised estimate, there is a total decrease of Rs. 1,365, which occurs chiefly under tax on buildings and lands and assignments by Government, due in the one case to slackness on the part of the contractor to whom the collection was entrusted, in the other to no contribution having been required from Provincial funds on account of education, as the municipal expenditure under this head was below the 15 per cent. limit fixed by Government. There was a decrease of Rs. 482 in hospital receipts, which was, however, only nominal, as the entry under this head in the revised estimate included the District Board's contribution, which is now correctly shown under contribution from Local Funds.

6. The tax on buildings realized Rs. 3,167 and that on lands Rs. 28, total Rs. 3,195, against Rs. 3,540 anticipated in the revised estimate. Owing, it is said, to their realization having been entrusted to a new contractor on a reduced commission (2 per cent. instead of 5) the current collections (Rs. 3,152) formed only 87·8 per cent. of the demand, but it is stated that nearly the whole of the outstanding balance has since been collected. For the collection of these taxes 451 warrants were issued, the amount involved being Rs. 524, but it was not found necessary to distrain property in any case. Out of 2,115 houses in the town, 1,693 were assessed to the tax on buildings, and the average incidence per house was Rs. 2-1-6, the sanctioned rate being $7\frac{1}{2}$ per cent. on the rent value. The municipal council should consider whether it would not be more satisfactory to collect these taxes departmentally as is done in most other towns.

7. The tax on vehicles and animals yielded Rs. 1,003 against Rs. 900 anticipated in the revised estimate. The existence of arrears under this head and under licenses is an unsatisfactory feature of the year's administration.

8. The gross receipts from tolls, which are levied at three-fourths of the maximum rates, amounted to Rs. 6,605. The Local Fund share of this sum, which amounted to Rs. 2,202, was duly paid to the District Board, leaving Rs. 4,403 to the credit of the municipality. The tolls are leased on contract.

9. The rent of markets forms the most important item of municipal revenue, having yielded no less than Rs. 5,712. There are four markets in the town, three of which are leased to contractors, but remain under the supervision of one of the councillors. It is observed that slaughter-house fees are wrongly included under this head instead of under "Rent of other buildings, &c." It is presumed that the "pandal fees" included under this latter head (paragraph 13 of the chairman's report) are *bonâ fide* rents and not of the nature of license fees, and that the mutton stalls leased out are the property of the council.

10. The following statement shows the general incidence of municipal taxation per head of the population :—

	Including Tolls.	Excluding Tolls.
	A. P.	A. P.
Average incidence for all municipalities for 1885-86 ..	12 5	8 10
For Dindigul for 1885-86	10 6	5 8
For Dindigul for 1886-87	10 7	5 7

11. The total expenditure amounted, as above stated, to Rs. 14,925 against Rs. 19,050 the revised estimate for the year, and Rs. 14,146 the actuals of 1885-86. It was distributed as shown below :—

	RS.		
Grant I, Public Works	3,598	or 24·1	per cent.
„ II, Education	1,766	„ 11·8	„
„ III, Sanitation and Medical Services	4,887	„ 32·8	„
„ IV, Lighting and Miscellaneous	3,633	„ 24·3	„
„ V, Supervision and Management	882	„ 5·9	„
Refunds	159	„ 1·1	„
Total ..	14,925	„ 100·0	„

12. Under Grant I, an expenditure of Rs. 3,598 was incurred against Rs. 5,920 anticipated in the revised estimate. The decrease is fully explained in paragraphs 17 and 18 of the chairman's report. The allotments applied for in the latter paragraph are sanctioned; but it should be borne in mind that such applications are out of place in an annual administration report. The attention of the Public Works Department will be drawn to the delay in the supply of the engine referred to in paragraph 17. No new work of importance was undertaken during the year. The conversion of the thatched shed at the weekly market into a tiled one being a new work, the amount spent on it will be transferred from Repairs to New Works, Buildings. The amount spent on the repair of roads was Rs. 2,870, or 65·2 per cent. of the tolls revenue.

13. The educational expenditure amounted to Rs. 1,766 against Rs. 3,300 in the revised estimate. The reasons for the decrease have not been explained, nor has statement V with the details of expenditure been furnished owing to the non-receipt of the usual report from the Deputy Inspector of Schools. The Director of Public Instruction will see that similar delays do not occur in future. There is no school directly maintained by the council, but they employ an inspecting schoolmaster of their own.

14. In Dr. Chester's dispensary, which is supported both by the municipality and the Madura District Board, 180 in and 8,781 out patients were treated during the year against 305 in and 9,862 out patients in 1885-86. The decrease is said to be a sign of improved public health during the year under report. With reference to paragraph 20 of the chairman's report, it is observed that it is within his power to arrange with Dr. Chester and the Madura District Board for the payment to the council direct of the Board's contributions.

15. The number of vaccine operations performed during the year shows a most unsatisfactory decrease, being 755 against 1,439 in 1885-86, while the cost of each case rose from Annas 2-6 to Annas 4-6. The chairman's suggestion that the falling off may be due to "almost all the children in the town" having been already vaccinated is quite untenable, as is shown by the fact that against 666 births registered during the year under report there were only 68 successful vaccinations of children under one year. The result of the inquiry by the district medical officer referred to in paragraph 21 of the chairman's report is awaited.

16. The following statement shows the results of the registration of vital statistics during the year :—

	Births.	Rate per mille.	Deaths.	Rate per mille.
1885-86	640	45·1	364	25 7
1886-87	666	47·0	353	24·9

The very large excess of births over deaths is probably due in some part to defective registration under the latter head. The public health is reported to have been generally good.

17. On conservancy Rs. 2,851 were spent against Rs. 2,898 in 1885-86. No information has been furnished regarding the sanitary condition of the town, or about the working of the conservancy establishment. These defects should be supplied in future reports.

18. The expenditure under grants IV and V calls for no special remarks. The outlay on water-works (grant IV) was Rs. 1,993 against Rs. 1,981 in 1885-86.

19. The financial position of the municipality on the 31st March last was very satisfactory. There was a large cash balance of Rs. 6,324 besides premises of the value of Rs. 9,000, and there were no liabilities.

(True Extract.)

for Ag. Chief Secretary.

To the Chairman, Municipal Council, Dindigul,
through the Collector of Madura.
„ Revenue Department.
„ Board of Revenue.
„ Public Works Department.
„ Accountant-General.
„ Surgeon-General with the Government of Madras.
„ Sanitary Commissioner for Madras.
„ Director of Public Instruction.
„ President, District Board, Madura.

Exd. A. Raitt.

B. No 183 W. 21.1.87
" 3225 W. 6.12.86
" 3014 W. 15.11.86
" 2945 W. 9.11.86
" 2579 W. 1-10.86
" 2337 W. 15.9.86

No 903 C. 12.5.85
B. No 1325 W. 27.5.86
No 386 D. 12.7.86
No 321-322 D. 30.6.86
No 2578. 22.6.85
No 1808. 3.6.85

No. 2099 W of 6th August/87

Communicated to the Suptg: Engineer VI circle in continuation of G.O. No. 183 W dated 21st January 1887.

The Suptg. Engineer will report the cause of the delay in supplying the engine referred to in para 12.

[illegible] 10-7-87

[illegible] 31/7/87

S.E. VI circle [illegible]
[illegible] 6/8/87

[illegible] 6/8 [illegible] S.E. 17/7
[illegible] 2.8.87
[illegible] 12/8

Belley 9.7.87 R. 1.8.87

PWC No 5853

Govt. of {1887} Madras.

LOCAL AND MUNICIPAL.

(3)

8.SC

Issued

Recd. 28-7-87 Encl.

G.O., 8th July 1887, No. 644 M.

No. 2099 W of 6th August/87

JULY.

Municipal Report.

Reviewing the Dindigul — for 1886-87

OFFICE OF THE SUPERINTENDING ENGINEER,

6TH CIRCLE.

Madura 15th August 1887.

No. 489 M.D. D 20/.

From

Lt. Col. J. Pennycuick R.E.

~~The~~ Superintending Engineer,

6th Circle.

To

The Chief Engineer

P.W.D.

ENCLOSURE.

Sir,

With reference to G.O. No. 2099 W dated 6th Instant, I have the honor to report that an Engine was not lent by this Department to the Dindigal Municipality because we had none to spare.

2. The Municipality first asked for a pump only which was sent to them from the Grand Anicut under orders from this office in February last.

3. It was afterwards found that an Engine was also required by the Dindigal Municipality; it was not possible to spare one at that moment, and as the pump was useless without an Engine, the former was sent to the Vaigai Bridge where it was wanted.

4. On the 29th June /87, I informed the

Collector

Collector that when the foundations
of the Bridge are completed I should
probably be able to spare both pump
and engine for the Dindigal Municipality.

5 On the 2d Instant the Chairman,
Dindigal Municipality asked me "to call
"on the Superintendent of the P. W. Stores
"if he could lend the Municipality for
"a few days an 8 H.P. Engine for working
"an 8" centrifugal pump"; and that "any
"expenses would be defrayed by the Council".
I have replied "that the foundations of
"the Vaigai Bridge are so nearly com-
-"pleted that we shall probably be able
"to spare the Engine from there almost
"as soon as one could be obtained from
"Madras, as the application for the latter
"will have to go thro' the Chief Engineer".

I now however find that it is not
likely that the engine can be spared
for some time, as Mr. Clerk will want
both the engines he has for driving the
mortar mills. It will therefore be
necessary for the engine to be sent
from Madras, as none is available in
this Circle, or likely to be for some time.

I have the honor to be
Sir
Your most obdt. servant

Lt. Col R.E.

Supdg. Engineer VI Circle

2099 W. 6-8-87
1830 = 21-1-87 903 C. 12-5-85
3225 W. 6-12-86 1325 W. 27-5-86
3014 W. 15-11-86 386 D - 12-7-86
2945 W 9-11-86 321. 22 D 30-6-86
2579 W 1-10-86 25.76 - 22-6-85
2337 W - 18-9-86 180 - 3-6-85

Comd: to the Local & Municipal Dept with reference to para 12 of G. O. No 644. M. d/ 8th July /87

2. The Genl Supt P. W. Stores will report whether he can spare a suitable engine on the terms mentioned in para 5 of the S. E's letter

M.C.
23. 8. 87

J.O.H.
26/8/87

S.E. V & VI C.
L. & M. Dept. 2/9

G. 23. 8. 87 R. 29-8-87

P. W. D. 6TH CIRCLE.

P.W.C.S. No. 6557

(9)

From

The Superintending Engineer,

6th Circle.

To

The Chief Engineer
P.W.D.

No. 489 M.D.

Dated 15/20 } August 1887
Received 22

Enclosure.

No. 2352 W a/ 1st Septr '87

Engine:—

Reports the circumstances under which the ——— was not lent to the Dindigul Municipality.

No. 599 M.D.

Office of the Supt Engineer
6 Circle,

18th September /87.
2/23d

From

Lt Col J. Pennycuick R.E.
Supt Engineer 6 Circle.

To The Chief Engineer
P.W.D.

Sir,

With reference to G.O. No. 2352 W dated 1st Instant, I have the honor to inform you that the Municipality of Dindigul have made other arrangements for obtaining a pumping Engine. The one referred to in the G.O will therefore not be wanted.

I have the honor to be
Sir
Your most obedient servant.

J. [illegible]
Executive Engineer
for Supt Engineer, 6 Circle

PWC No. 7509

B. No. 2608 dy 3rd Oct 1887

(3)

communicated to the Local and Municipal department in continuation of G.O. No. 2352 W dated 1st September 1887 - Also to the S.E. V circle with reference to his letter No. 2515 dated 16th Sept. 1887.

MCN 27.9.87

Jou 30/9/87.

From

The Supg. Engineer
VI. Circle

To

The Chief Engineer
P.W.D.

No. 599 Md.

Dated - 18th September 1887.

R 27.9.87

B. No. 2608 dy 3rd Oct 1887

Reports for reasons stated that the Engine referred to in G.O. No. 2352 W d/ 1st Sept. will not be required by the Municipality -

Local & Munl: dept. ✓

S. E. V circle

S. E. VI circle. ✓ 4/10

Oct. 189. IX
W. Chandulu 29.9.87
M. 1.10.87

S.D.O. 2/10

with order

G. 27.9.87 R. 3.10.87

SUPERINTENDING ENGINEER'S OFFICE,
V Circle, Madras,
Chepák, Bangalore, 16 September 1887.

No. 2575.

From

Coll. H. M. Vibart. R.E.

SUPERINTENDING ENGINEER, V CIRCLE,

To

THE Chief Engineer
P.W. Department.

SIR,

Enclosures.

With reference to para 2 of G. O. No. 2352 W dated 1st Septr. 1887, I have the honor to state that the General Superintendent P.W. Stores reports that a 12 Horse Power Engine is available for issue to the Dindigul Municipality. The Municipality will have to pay the charges for the conveyance of the Engine from and to the P.W. Stores - the Workshops charges for the repair of the Engine - after it has been returned by the Municipality and 25 per

per cent ^ for wear and tear of boiler and Engine - on the present value Rs. 3600.

As authority for this last charge the General Superintendent refers to G.O. No. 3909 W of 8th October 1878.

I have the honor to be
Sir
Your Most Obed.t Serv.t

Alexander Sibbald
Superintending Engineer
5th Circle

Coll. P.W.C.

G.O. 3909 W. 8.10.78
B. No 2352 W. 1.9.87
" 2099 W. 6.8.87
" 183 W. 21.1.87
" 3225 W. 6.12.86
" 3014 W. 15.11.86
" 2945 W. 9.11.86
" 2579 W. 1.10.86
" 2337 W. 15.9.86
" 1325 W. 27.5.86
No 905 C. 12.5.85

No 386 D. 12.7.86
" 321 & 322 D. 30.6.86
" 2576. 22.6.85
" 1808. 3.6.85
G.O. 3909 W. 8.10.78

P.W.C. No 73485

No 2515.

(9)

From

The Superintending Engineer
5th Circle

To

The Chief Engineer
P.W. Dept.

MCW
22.9.87

J.L.
23/9/87

B. No 2609 W. d/3rd Octr 1887

Recorded with reference to G.O. No 2608 W d/3rd Octr 1887

3rd Oct

Dated 16th }
Despd 20th } September
Read } 1887.

MCW
4.10.87

J.L.
30/9/87

12 Horse Power Engine.

Reports that a — is available in the P.W. Stores for issue to the Dindigul Municipality subject to certain charges mentioned within.

S.E. V Circle √

4/10

W. 23.9.87

R. 3.10.87

22.9.87

Public Works Dept

Dindigul Water Supply

A file of papers on the above subject is circulated for information.

It is proposed to supply the town of Dindigul with water from the Sippanuthew well situated in the bed of an abandoned Stone built tank, near the foot of the Fort rock, to the South west of the town.

The water has been subjected to analysis and the medical opinion was that it was unfit ~~found to be unsafe~~ for potable purposes, but a hope is entertained that if all the water is pumped out of the well, and the spring reached, purer water will be obtained. The Experiment is accordingly to be tried and the sufficiency of the supply tested at the same time.

J.L.
9/10/87.

G.O. 3909 W. 8-10-90

B No 2 W 3-10-87 R. No 3014 W d/ 15-11-86
" W 3-10-87 " 2579 W " 1-10-86
W " 1-9-87 " 2337 W " 15-9-86
19 W " 6-8-87 " 1325 W " 27-5-86
" 183 W " 21-1-87
" 3225 W " 6-12-86

Dindigul Water Supply project

The Hon Mr Hutchins
- Hon Mr Master
- Rt. Hon the Governor

For Council

[illegible] 14/11/87

Seen. I don't quite know why these papers are circulated. I have always understood that the [illegible] water has long been considered by the people themselves, & before any med[l] analysis, most unhealthy PHH 11 Nov

Well. I suppose the result of the trial must be awaited. [illegible] 12/11

Yes: but I think it is quite possible ~~to~~ so to manage to clean the tank that the water wd be purer. The people seem to be satisfied with it [illegible]

circ. 10-11-87

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 1st May 1886, No. 411 M., Financial.

Abstract.—Referring to the Public Works Department, for inquiry and report, paragraph 9 of the Sanitary Commissioner's letter reporting on the project of water-supply in Dindigul, and stating that, if the proposal made therein be not found feasible, the Municipal Council will be asked to report on the scheme of bringing water from Koduvanar.

G.O., dated 22nd November 1886, No. 1172 M., Financial.

Abstract.—Awaiting the result of the experiment now being made of the Dindigul water-supply project, and directing the Sanitary Commissioner to furnish the Superintending Engineer, VI Circle, with the report required in paragraph 7 of his letter.

G.O., dated 12th January 1887, No. 27 M., Local and Municipal.

Abstract.—Recording, pending report on the result of the experiment of the Dindigul water-supply scheme, letter from the Sanitary Commissioner furnishing the information required by the Superintending Engineer, VI Circle.

Read—also the following papers :—

From H. M. WINTERBOTHAM, Esq., Divisional Officer in charge of the office of Chairman, Dindigul Town Council, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 29th October 1887, No. 119.

I have the honor to report the result of the experiment sanctioned in G.O., Mis. No. 1126 M., dated 10th November 1886.

2. I took charge at Dindigul on 29th September, and found that a large centrifugal pump and engine had been procured from Negapatam. With the piping supplied, I found it impracticable to get nearer the bottom of the well than 2½ feet. The bottom of the well is not level, being considerably deeper in the middle than at the sides. The water in the well (measuring at the side) stood at 13 feet 9 inches.

3. The pump emptied the well down to 2½ feet from the bottom in less than an hour; and it then became apparent that water was pouring freely into the well through cracks in the stones on all four sides, evidently by percolation from the adjoining tank.

4. Mr. Crole (paragraphs 8 and 11 of his letter printed at pages 2 and 3 of G.O., 1st May 1886, No. 411 M., Financial) believed the pumping-shaft to be hermetically sealed by a case " of solid masonry pointed with Portland cement;" but it appears that cement was only applied for about 2 feet below the usual water-level, that being the greatest depth to which the pulsometer then in use could sink the water.

5. The free percolation of the filthy tank water into the well vitiates the whole experiment both as to quantity and quality. However, as the pump had been procured and fitted up at a great expense, and with much trouble, I caused the well to be

G.O. 3909 W. 8-10-?0
B. No 2
4 3-10-87 B. No 3014 W dt 15-11-86
3-10-87 - 2579 W - 1-10-86
W - 1-9-87 - 2337 W - 15-9-86
19 W - 6-8-87 - 1325 W - 27-5-86
183 W - 21-1-87
3225 W - 6-12-86

Dindigul Water Supply project

The Hon Mr Hutchins
Hon Mr Master
Rt Hon the Governor

For Council

[illegible] 14/11/87

Seen. I don't quite know why these papers are circulated. I have always understood that the [illegible] water has long been considered by the people themselves, & before any med^l analysis, most unhealthy PHH 11 Nov

Well. I suppose the result of the trial must be awaited. [illegible] 12/11

yes: but I think it is quite possible ~~to~~ so to manage to clean the tank that the water will be pure. The people seem to be satisfied with [illegible]

Circ. 10-11-87

3rd February 1888, No. 107 M., Local and Municipal.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 1st May 1886, No. 411 M., Financial.

Abstract.—Referring to the Public Works Department, for inquiry and report, paragraph 9 of the Sanitary Commissioner's letter reporting on the project of water-supply in Dindigul, and stating that, if the proposal made therein be not found feasible, the Municipal Council will be asked to report on the scheme of bringing water from Koduvanar.

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2. I took charge at Dindigul on 29th September, and found that a large centrifugal pump and engine had been procured from Negapatam. With the piping supplied, I found it impracticable to get nearer the bottom of the well than $2\frac{1}{2}$ feet. The bottom of the well is not level, being considerably deeper in the middle than at the sides. The water in the well (measuring at the side) stood at 13 feet 9 inches.

3. The pump emptied the well down to $2\frac{1}{2}$ feet from the bottom in less than an hour; and it then became apparent that water was pouring freely into the well through cracks in the stones on all four sides, evidently by percolation from the adjoining tank.

4. Mr. Crole (paragraphs 8 and 11 of his letter printed at pages 2 and 3 of G.O., 1st May 1886, No. 411 M., Financial) believed the pumping-shaft to be hermetically sealed by a case " of solid masonry pointed with Portland cement;" but it appears that cement was only applied for about 2 feet below the usual water-level, that being the greatest depth to which the pulsometer then in use could sink the water.

5. The free percolation of the filthy tank water into the well vitiates the whole experiment both as to quantity and quality. However, as the pump had been procured and fitted up at a great expense, and with much trouble, I caused the well to be

pumped out to 2½ feet from the bottom on ten consecutive days excluding Sundays, and then took two samples of the water in the manner indicated by Mr. Crighton, and submitted them for analysis to the Chemical Examiner.

6. The time that the well took to refill was carefully noted, and the following was found to be the rate per foot, beginning at 2½ feet from the bottom as zero :—

From 0 to 1 foot.	...	35·4 minutes.
„ 1 to 2 feet.	...	36·6 „
„ 2 to 3 „	...	42·6 „
„ 3 to 4 „	...	48·8 „
„ 4 to 5 „	...	51·8 „
„ 5 to 6 „	...	64·0 „
„ 6 to 7 „	...	93·0 „
„ 7 to 8 „	...	102·2 „
„ 8 to 9 „	...	139·0 „
„ 9 to 10 „	...	205·0 „
10 feet	...	818·4 minutes.

Each foot in depth represents, as near as may be, 3,620 gallons. Thus, at 2½ feet from the present bottom the well fills at the rate of about 6,200 gallons an hour, the rate gradually decreasing as the water approaches the top. To rise 10 feet (36,200 gallons) takes 13 hours 38 minutes; 4½ inches of rain fell during the week prior to the day on which pumping began.

7. Pending receipt of the Chemical Examiner's report, it was resolved to endeavor to pump out the well and tank simultaneously, so as to get rid of the disturbing influence of the latter. For this end, a pulsometer was obtained from Madura (by the kind offices of the Collector and the Secretary, Agricultural Farm, Madura), but on setting the pulsometer to pump the well, it was found to be incapable of discharging more than 5,125 gallons an hour, and at a depth of 6 feet from the bottom the water comes into the well faster than the pulsometer could empty it. Also the iron pipes supplied with the centrifugal pump could not be adjusted so as to reach the bottom of the tank, and no additional piping is locally procurable. The Chemical Examiner's report on the water was also discouraging; and at a meeting of the Town Council this morning it was resolved, for want of the proper appliances, to abandon the project of pumping out the well and tank simultaneously and to return the centrifugal pump to Negapatam.

8. The Chemical Examiner's report on the two samples submitted to him is given below. Sample No. I was drawn from the surface of the well when full. Sample No. II was taken from the water gushing from the pump 3 minutes after pumping began, and thus represents the water 2½ feet from the bottom of the well when full :—

	Sample No. I.	Sample No. II.
Total solids, grms. per litre ...	1·560	1·680
Volatile solids, do. ...	0·510	0·670
Chlorine, do. ...	0·402	0·420
Total hardness, Clark's scale ...	66°·500	66°·500
Permanent hardness, Clark's scale ...	28°·000	43°·750
Free ammonia, mlgrms. per litre ...	trace.	trace.
Albumenoid ammonia, mlgrms. per litre ...	0·040	0·080
Nitric acid, mlgrms. per litre (as ammonia) ...	12·000	12·000
Apparent quality of the water as inferred from the results obtained on examination ...	Bad.	Bad.

Each sample contains much lime magnesia with traces of sulphuric acid, no deposit.

9. It is interesting for purposes of comparison to give here the results of former analyses of the same well-water. I do not know whether a chemist can account for what seem to be somewhat extraordinary variations.

	Water taken from the Well, July 1884.	Water taken from the Well, 15th September 1885.	Water taken from the Well, 22nd September 1885.
	No. 2 (*Vide* G.O., No. 411 M., Financial, dated 1st May 1886).	Sample No. II.	Sample No. I.
Total solids, grms. per litre ...	0·92	1·73	1·460
Volatile solids, do. ...	0·25	0·65	0·440
Chlorine, do. ...	0·018	0·426	0·369
Total hardness, Clark's scale ...	21°·7	35°·0	25°·9
Permanent hardness, Clark's scale ...	0°·28	15°·4	14°·7
Free ammonia, mlgrms. per litre ...	0·28	0·24	0·24
Albumenoid ammonia, mlgrms. per litre ...	0·12	0·16	0·12
Nitric acid, mlgrms. per litre (as ammonia) ...	11·25	45·0	45·0
Apparent quality of the water as inferred from the results obtained on examination ...	Suspicious.*	Bad.†	Bad.‡

* If carefully guarded from dangerous organic contamination, may be usable; but in their present state, they cannot be regarded as safe for drinking without boiling.

† *Microscopic Examination.*—Some yellowish white flocculent sediment consisting of organic debris including remains of insects and living extomostraca (*Cyclops*).

‡ *Microscopic Examination.*—Slight deposit of sharp sand mixed with decaying vegetable matters and containing infusoria, dietorus and other organisms.

10. However much the water may fall below the ideal standard of excellence, it is clear and palatable, and would, I imagine, compare favorably with what is usually drunk in most parts of the presidency. It is certainly now contaminated by the adjoining stagnant water, which might be got rid of; and it is also to be remembered that the Chemical Examiner's report is equally unfavorable as regards all the other available sources of supply.

11. I think the quality of the water can never be fairly tested until the tank has either been thoroughly cleared out, or (better) filled in in the manner contemplated in paragraph 17 of Mr. Crole's letter (page 4, G.O., 1st May 1886, No. 411 M., Financial), and when this is done, I think the quality of the water cannot but greatly improve. It is, no doubt, quite practicable to put in a layer of clay, 15 or 20 feet wide, between the well and the tank, which would effectually stop percolation. Until this is done, it seems useless to expect any improvement in the quality of well-water.

Forwarded.

(Signed) H. M. WINTERBOTHAM,
Sub-Collector.

No. 431.

Submitted.

2. The result is most discouraging. I agree with Mr. Winterbotham that if we submitted the water usually drunk by the masses in this country to a chemical test, the result would be even more unsatisfactory than in the present instance. The worst of it is that no one can find a better supply. Must then Dindigul go without water? The Sippanuthee water can at least be used for cooking and cleaning purposes.

Madura,
7th November 1887.

(Signed) E. TURNER,
Collector.

From the Rev. Dr. E. CHESTER, Dindigul, dated 2nd November 1887.

From the President, Sarvajana Sabha, dated Dindigul, 19th November 1887.

Abstract.—Submitting memorials from the members of the above Sabha praying that Sippanuthee water scheme may be sanctioned.

From the Private Secretary to the Right Honorable the Governor, dated 25th November 1887.

Abstract.—Transfers a petition from the Dindigul Sarvajana Sabha regarding the scarcity of water in the town.

Order—dated 3rd February 1888, No. 107 M., Local and Municipal.

The above papers relate to the scheme proposed by Mr. Crole, late Collector of Madura, for supplying the town of Dindigul with good drinking water. During the 11 years previous to 1885, several schemes were brought forward for this object, but they were dropped one after another on account of their impracticability or prohibitive cost. At length Mr. Crole, in consultation with Mr. Crighton of the South Indian Railway, devised a scheme which consisted in sinking a well in the bed of the abandoned Sippanuthee tank and pumping water therefrom into a reservoir from which the water was to be distributed through the town by small house service pipes. A local Water Project Committee was formed which took up this scheme and spent about Rs. 7,500 on it, making available, according to Mr. Crole, some 30,000 or 40,000 gallons of water for daily consumption. The Municipal Council subsequently took up the scheme in November 1884, and in March 1885 they requested the sanction of Government for the whole project, which was estimated to cost Rs. 31,551.

2. With regard to the quantity of water available in the well, there was no accurate information, and as to the quality, the Chemical Examiner who analysed two specimens in July 1884 pronounced one "bad" and the other "suspicious."

3. The Public Works Department, to whom the scheme was referred for scrutiny, found it incomplete, and it was returned to the Municpal Council for reconsideration. A fresh analysis of the water was also ordered to be made and the Sanitary Commissioner's remarks obtained thereon.

G.O., No. 225 M., dated 26th June 1885.

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G.O., No. 411 M., dated 1st May 1886.

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G.O., No. 1172 M., dated 22nd November 1886.

6. This experiment has been carried out and the Sanitary Commissioner has again pronounced the water to be bad. The results of the experiment were, however, vitiated by water freely percolating into the well on all sides from the adjoining tank.

7. The late Chairman of the Municipal Council, Mr. Winterbotham, states that the water of the Sippanuthee well is clear and palatable, and that it will compare favorably with what is usualy drunk in other parts of the presidency. Mr. Winterbotham was, however, new to the place, and it is observed that prior to the inception of Mr. Crole's scheme this water appears to have been looked on by the people with much distrust. Dr. Bidie upon personal inquiry in 1886 found that it had never at any time been used for drinking purposes, and similar evidence is afforded by the Rev. Dr. Chester who has resided in the town for over 20 years. The Government also understand that the bulk of the people have not shown any particular interest in the scheme.

8. His Excellency in Council does not, of course, look for ideally perfect water, but the water in question is far worse than imperfect, the highest chemical and sanitary authorities available being of opinion that it gives a degree of impurity, both organic and inorganic, beyond the line of safety. The mere fact that the use of the water was not immediately followed by an outbreak of sickness proves nothing, and it is stated by the present Sanitary Commissioner that a combination of impurities such as has been found therein cannot but be injurious to health. In these circumstances, His Excellency in Council must decline to sanction the scheme at present before him.

9. The Municipal Council should now proceed, without delay, to investigate some other scheme by which reliable drinking water may be obtained at a cost that shall not be prohibitive, and in this connection the following suggestions are thrown out for their guidance :—

(1) If, as is believed by many, the Sippanuthee spring is fed under-ground from the Sirumalays, the stream might be tapped before it reaches the polluted ground near the rock.

(2) Further prospecting for water might well be made beyond Nagalanaickenpatti, about a mile from Sippanuthee, where, it is understood, there are wells which never run dry.

The results of these or of such other experiments as the Council may think fit to make should be reported in due course.

10. With reference to the Collector's suggestion that the Sippanuthee water might be used as a subsidiary supply for washing and cooking purposes, it is observed that the first requirement of the town is pure drinking water, and that experience shows that if unwholesome water is supplied, it is impossible to prevent its being used for drinking purposes also.

(True Extract.)

Asst. Secy. to Govt.

To the Chairman, Municipal Council, Dindigul,
through the Collector of Madura
" Sanitary Commissioner for Madras.
" Public Works Department.

Exd. E. Fernandez.

No 643 W a/ 23? Feb/88

B

PWC No 1681

Communicated to
the Suptg. Engr. & Crole
the Suptg. Engr. VI Circle.

21.2.88

22/2/88

2608-q W-3-10-87
2352 W-1-9-87
2099 W-6-8-87
183 W-21-1-87
3225 W-6-12-86
3074 W-15-11-86
2579 W-14-10-86
2337 W-15-9-86
1325 W-27-5-86

Govt. of {1888} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. 21.2.88 *Encl.*

G.O., 3rd February 1888, No. 107 M.

No 643 W a/ 23? February/88

FEBRUARY.

Water Supply Project.

Declining, for reasons stated, to sanction the — at Dindigul, and making certain suggestions for the guidance of the Municipal Council for obtaining reliable drinking water at a moderate cost.

5

S.E. VI Circle

S.E. VI C ✓ Despd. 23-2-88

with order

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—again the following papers :—

G.O., dated 1st May 1886, No. 411 M., Financial.

ABSTRACT.—Referring to the Public Works Department, for inquiry and report, paragraph 9 of the Sanitary Commissioner's letter reporting on the project of water-supply in Dindigul, and stating that, if the proposal made therein be not found feasible, the Municipal Council will be asked to report on the scheme of bringing water from Koduvanar.

G.O., dated 22nd November 1886, No. 1172 M., Financial.

ABSTRACT.—Awaiting the result of the experiment now being made of the Dindigul water-supply project, and directing the Sanitary Commissioner to furnish the Superintending Engineer, VI Circle, with the report required in paragraph 7 of his letter.

G.O., dated 12th January 1887, No. 27 M., Local and Municipal.

ABSTRACT.—Recording, pending report on the result of the experiment of the Dindigul water-supply scheme, letter from the Sanitary Commissioner furnishing the information required by the Superintending Engineer, VI Circle.

READ—also the following papers :—

From H. M. WINTERBOTHAM, Esq., Divisional Officer in charge of the office of Chairman, Dindigul Town Council, to the Chief Secretary to Government (through the Sub-Collector of Madura), dated Dindigul, 29th October 1887, No. 119.

I have the honor to report the result of the experiment sanctioned in G.O., Mis. No. 1126 M., dated 10th November 1886.

2. I took charge at Dindigul on 29th September, and found that a large centrifugal pump and engine had been procured from Negapatam. With the piping supplied, I found it impracticable to get nearer the bottom of the well than $2\frac{1}{2}$ feet. The bottom of the well is not level, being considerably deeper in the middle than at the sides. The water in the well (measuring at the side) stood at 13 feet 9 inches.

3. The pump emptied the well down to $2\frac{1}{2}$ feet from the bottom in less than an hour; and it then became apparent that water was pouring freely into the well through cracks in the stones on all four sides, evidently by percolation from the adjoining tank.

4. Mr. Crole (paragraphs 8 and 11 of his letter printed at pages 2 and 3 of G.O., 1st May 1886, No. 411 M., Financial) believed the pumping-shaft to be hermetically sealed by a case "of solid masonry pointed with Portland cement;" but it appears that cement was only applied for about 2 feet below the usual water-level, that being the greatest depth to which the pulsometer then in use could sink the water.

5. The free percolation of the filthy tank water into the well vitiates the whole experiment both as to quantity and quality. However, as the pump had been procured and fitted up at a great expense, and with much trouble, I caused the well to be

pumped out to 2½ feet from the bottom on ten consecutive days excluding Sundays, and then took two samples of the water in the manner indicated by Mr. Crighton, and submitted them for analysis to the Chemical Examiner.

6. The time that the well took to refill was carefully noted, and the following was found to be the rate per foot, beginning at 2½ feet from the bottom as zero :—

From 0 to 1 foot.	... ...	35·4 minutes.
„ 1 to 2 feet.	... ...	36·6 „
„ 2 to 3 „	... ...	42·6 „
„ 3 to 4 „	... ...	48·8 „
„ 4 to 5 „	... ...	51·8 „
„ 5 to 6 „	... ...	64·0 „
„ 6 to 7 „	... ...	93·0 „
„ 7 to 8 „	... ...	102·2 „
„ 8 to 9 „	... ...	139·0 „
„ 9 to 10 „	... ...	205·0 „
10 feet	... ...	818·4 minutes.

Each foot in depth represents, as near as may be, 3,620 gallons. Thus, at 2½ feet from the present bottom the well fills at the rate of about 6,200 gallons an hour, the rate gradually decreasing as the water approaches the top. To rise 10 feet (36,200 gallons) takes 13 hours 38 minutes ; 4½ inches of rain fell during the week prior to the day on which pumping began.

7. Pending receipt of the Chemical Examiner's report, it was resolved to endeavor to pump out the well and tank simultaneously, so as to get rid of the disturbing influence of the latter. For this end, a pulsometer was obtained from Madura (by the kind offices of the Collector and the Secretary, Agricultural Farm, Madura), but on setting the pulsometer to pump the well, it was found to be incapable of discharging more than 5,125 gallons an hour, and at a depth of 6 feet from the bottom the water comes into the well faster than the pulsometer could empty it. Also the iron pipes supplied with the centrifugal pump could not be adjusted so as to reach the bottom of the tank, and no additional piping is locally procurable. The Chemical Examiner's report on the water was also discouraging ; and at a meeting of the Town Council this morning it was resolved, for want of the proper appliances, to abandon the project of pumping out the well and tank simultaneously and to return the centrifugal pump to Negapatam.

8. The Chemical Examiner's report on the two samples submitted to him is given below. Sample No. I was drawn from the surface of the well when full. Sample No. II was taken from the water gushing from the pump 3 minutes after pumping began, and thus represents the water 2½ feet from the bottom of the well when full :—

	Sample No. I.	Sample No. II.
Total solids, grms. per litre	1·560	1·680
Volatile solids, do.	0·510	0·670
Chlorine, do.	0·402	0·420
Total hardness, Clark's scale	66·°500	66·°500
Permanent hardness, Clark's scale	28·°000	43·°750
Free ammonia, mlgrms. per litre	trace.	trace.
Albumenoid ammonia, mlgrms. per litre	0·040	0·080
Nitric acid, mlgrms. per litre (as ammonia)	12·000	12·000
Apparent quality of the water as inferred from the results obtained on examination	Bad.	Bad.

Each sample contains much lime magnesia with traces of sulphuric acid, no deposit.

9. It is interesting for purposes of comparison to give here the results of former analyses of the same well-water. I do not know whether a chemist can account for what seem to be somewhat extraordinary variations.

	Water taken from the Well, July 1884.	Water taken from the Well, 15th September 1885.	Water taken from the Well, 22nd September 1885.
	No. 2 (*Vide* G.O., No. 411 M., Financial, dated 1st May 1886).	Sample No. II.	Sample No. I.
Total solids, grms. per litre	0·92	1·73	1·460
Volatile solids, do.	0·25	0·65	0·440
Chlorine, do.	0·018	0·426	0·369
Total hardness, Clark's scale	21°·7	35°·0	25°·9
Permanent hardness, Clark's scale	0°·28	15°·4	14°·7
Free ammonia, mlgrms. per litre	0·28	0·24	0·24
Albumenoid ammonia, mlgrms. per litre	0·12	0·16	0·12
Nitric acid, mlgrms. per litre (as ammonia) ...	11·25	45·0	45·0
Apparent quality of the water as inferred from the results obtained on examination	Suspicious.*	Bad.†	Bad.‡

* If carefully guarded from dangerous organic contamination, may be usable ; but in their present state, they cannot be regarded as safe for drinking without boiling.

† *Microscopic Examination.*—Some yellowish white flocculent sediment consisting of organic debris including remains of insects and living extomostraca (*Cyclops*).

‡ *Microscopic Examination.*—Slight deposit of sharp sand mixed with decaying vegetable matters and containing infusoria, dietorus and other organisms.

10. However much the water may fall below the ideal standard of excellence, it is clear and palatable, and would, I imagine, compare favorably with what is usually drunk in most parts of the presidency. It is certainly now contaminated by the adjoining stagnant water, which might be got rid of ; and it is also to be remembered that the Chemical Examiner's report is equally unfavorable as regards all the other available sources of supply.

11. I think the quality of the water can never be fairly tested until the tank has either been thoroughly cleared out, or (better) filled in in the manner contemplated in paragraph 17 of Mr. Crole's letter (page 4, G.O., 1st May 1886, No. 411 M., Financial), and when this is done, I think the quality of the water cannot but greatly improve. It is, no doubt, quite practicable to put in a layer of clay, 15 or 20 feet wide, between the well and the tank, which would effectually stop percolation. Until this is done, it seems useless to expect any improvement in the quality of well-water.

Forwarded.

(Signed) H. M. WINTERBOTHAM,
Sub-Collector.

No. 431.

Submitted.

2. The result is most discouraging. I agree with Mr. Winterbotham that if we submitted the water usually drunk by the masses in this country to a chemical test, the result would be even more unsatisfactory than in the present instance. The worst of it is that no one can find a better supply. Must then Dindigul go without water ? The Sippanuthee water can at least be used for cooking and cleaning purposes.

(Signed) E. TURNER,
Collector.

Madura,
7*th November* 1887.

From the Rev. Dr. E. CHESTER, Dindigul, dated 2nd November 1887.

From the President, Sarvajana Sabha, dated Dindigul, 19th November 1887.

Abstract.—Submitting memorials from the members of the above Sabha praying that Sippanuthee water scheme may be sanctioned.

From the Private Secretary to the Right Honorable the Governor, dated 25th November 1887.

Abstract.—Transfers a petition from the Dindigul Sarvajana Sabha regarding the scarcity of water in the town.

Order—dated 3rd February 1888, No. 107 M., Local and Municipal.

The above papers relate to the scheme proposed by Mr. Crole, late Collector of Madura, for supplying the town of Dindigul with good drinking water. During the 11 years previous to 1885, several schemes were brought forward for this object, but they were dropped one after another on account of their impracticability or prohibitive cost. At length Mr. Crole, in consultation with Mr. Crighton of the South Indian Railway, devised a scheme which consisted in sinking a well in the bed of the abandoned Sippanuthee tank and pumping water therefrom into a reservoir from which the water was to be distributed through the town by small house service pipes. A local Water Project Committee was formed which took up this scheme and spent about Rs. 7,500 on it, making available, according to Mr. Crole, some 30,000 or 40,000 gallons of water for daily consumption. The Municipal Council subsequently took up the scheme in November 1884, and in March 1885 they requested the sanction of Government for the whole project, which was estimated to cost Rs. 31,551.

2. With regard to the quantity of water available in the well, there was no accurate information, and as to the quality, the Chemical Examiner who analysed two specimens in July 1884 pronounced one "bad" and the other "suspicious."

3. The Public Works Department, to whom the scheme was referred for scrutiny, found it incomplete, and it was returned to the Municpal Council for reconsideration. A fresh analysis of the water was also ordered to be made and the Sanitary Commissioner's remarks obtained thereon.

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4. The Sanitary Commissioner, Dr. Bidie, reported that the result of the second analysis, made in September 1885, was more discouraging than the first, and that the water was hopelessly bad. He, however, thought that, as there was a large supply of ground water in the locality, it was desirable to ascertain whether the current could not be tapped in some other spot where a purer supply might be obtained. At the same time he suggested that a wholesome supply might be obtained from the Koduvanar river.

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5. The matter was then referred to the Superintending Engineer, who reported that he saw little chance of better water than that from the Sippanuthee well being obtained anywhere in the town, and that the proposal to bring water from the Koduvanar must be abandoned as impracticable on account of the great outlay it would involve. He suggested, however, that, before incurring the expense of searching for the under-ground current outside the town, the Sippanuthee water should be once more analysed after the well had been pumped out for ten successive days so as to get rid of local impurities.

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7. The late Chairman of the Municipal Council, Mr. Winterbotham, states that the water of the Sippanuthee well is clear and palatable, and that it will compare favorably with what is usualy drunk in other parts of the presidency. Mr. Winterbotham was, however, new to the place, and it is observed that prior to the inception of Mr. Crole's scheme this water appears to have been looked on by the people with much distrust. Dr. Bidie upon personal inquiry in 1886 found that it had never at any time been used for drinking purposes, and similar evidence is afforded by the Rev. Dr. Chester who has resided in the town for over 20 years. The Government also understand that the bulk of the people have not shown any particular interest in the scheme.

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(True Extract.)

W. S. MEYER,
Asst. Secy. to Govt.

To the Chairman, Municipal Council, Dindigul,
through the Collector of Madura
" Sanitary Commissioner for Madras.
" Public Works Department.

Exd. E. Fernandez.

No. 643 W a/ 23d. Feby/88

Comd: to the Supg. Eng. VI Circle

(Sd) H. R. C. W.

Govt. of {1888} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. *Encl.*

G.O., 3rd February 1888, No. 107 M.

No 643 W a/ 23d. Feby/88

FEBRUARY.

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