

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following G.O., dated 8th February 1883, Mis. No. 107, Political.

Read—the following letter from His Excellency the Governor of the French Settlements in India, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated Pondicherry, 10th January 1883, No. 4:—

In continuation of my letter of the 14th December last, No. 27, I have the honor of addressing to your Excellency a report from the Chief Officer in charge of Roads and Bridges concerning the Artesian wells dug on our territory during the last two years. This document is in a way a continuation of the Note supplied to your Government on the 14th August 1880.

2. I enclose herewith a drawing showing on the same scale as that of the plan previously transmitted, the geological tracings of the seven last Artesian wells as well as a chart of the territory of Pondicherry, on which are indicated the localities of each of the borings of which mention is made in the two reports.

3. Your Excellency will, I trust, permit me to hope that this information will seem sufficiently complete to judge of the results obtained in our territory. It has not been in the power of my Government to forward these documents earlier.

ENCLOSURES.

The Sequel to the Note of the 14th August 1880, on the Artesian Wells of Pondicherry.

Since the notice, addressed on the 14th August 1880, to His Excellency the Governor of the Presidency of Madras, regarding the seven Artesian wells then bored in the Settlement of Pondicherry, seven new borings have been executed in the same Settlement.

We are going to give briefly the notes collected regarding these borings made by Government as well as those made by the Civil Engineers who supervised them and who were good enough to communicate the notes taken daily of these works.

The first of these borings, or the eighth Artesian well of Pondicherry, was executed between the 4th March and 9th May 1881, in the rice-fields of M. Channemanga Moodeliar at Mouroungapacom, at about three-quarter of a mile north-west of the Artesian well of Arian-coupom, which latter is shown on the plan accompanying the notice of 1880 under No. 7.

Artesian Well No. 8, executed in 1881, by Mr. Lucien DeClossets, Civil Engineer.

Height of the soil above the mean level of the sea	3.00 meters.
Depth of the well in the soil	29.00 "
Diameter of the orifice of discharge	0.16 "
Discharge of water per minute at the level of the soil on the 18th November 1881	200 litres
Temperature of the water at the outlet of the orifice	32° centigrades
Hydrometrical degree (1) of the water	11°
Hydrostatic level of the spouting sheet of water above the soil	1.10 meters.
Hydrostatic level above the mean level of the sea	4.10 "

During the execution of this work the sounding lead met with the following series of layers:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of the Layers.	Depth of the Layers.	Remarks.
1	Vegetable earth	M. 1.00	M. 1.00	A very hard layer to bore through, also very dry.
2	Clay sand	0.20	1.20	This layer was easily bored through.
3	Hard brown clay	3.95	5.15	M. 4.95 level of the sheet of water of the surrounding wells.
4	Large grainy sand	3.15	8.30	This layer of large grainy sand was easily bored through.
5	Hard black clay	0.18	8.48	Easy work.
6	Hard grainy sand (bed of a river)	2.34	10.82	This layer after having been forced through by the auger was extracted by the valve.
7	Hard black clay	0.50	11.32	
8	Large grainy sand	1.04	12.36	M. 12.56 first ascending sheet of water, the level of which rose to M. 2.43 from the soil.
9	Hard black clay	6.77	19.13	We found it very difficult to work in this layer. We could not send down the tube without widening the hole that was made by the auger. I have found rotten wood on the top of the layer.
10	Large grained sand	1.63	20.76	M. 20.50 second ascending sheet of water, the level of which rose to M. 1.30 about the level of the soil.
11	Hard black clay	2.24	23.00	M. 25.62 third ascending sheet of water which stopped at M. 0.20 above the soil.

(1) At the Hydrotimetre of M. M. Bantrom and Bandet.

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of the Layers.	Depth of the Layers.	Remarks.
12	Blueish clay with colored pieces of pyrites of iron mixed with carbonate of lime. Gray sand with pebbles and gravels.	M. 3.20 2.80	M. 26.20 29.00	M. 29.00 spouting water; hydrostatic level M. 1.10 above the level of the soil.

These ascending sheets of water were met with in this boring at M. 12.56, M. 20.50 and M. 25.62. They rose respectively to M. 2.43, M. 1.30 and M. 0.20 in a downward direction to the level of the soil.

The spouting sheet of water was met at the depth of 29 metres in a layer of gray sand with pebbles and gravels. Its hydrostatic level rising to M. 1.10 above the soil.
The discharge was on the 18th November 1881 of 200 litres per minute.

Artesian Well No. 9, executed in 1881 by Mr. Louis Cornet, son of the Proprietor of the Savana Cotton Mills.

This well, situated in the Savana Manufactory, was bored between the 26th March to the 27th April 1881 at about 150 metres north-west of the Artesian well No. 1.

Height of the soil above the mean level of the sea	3.20 metres.
Depth of the well in the soil	26.20 "
Diameter of the orifice at its outlet	0.18 "
Discharge of water per minute at 0.20 centimetres above the soil on the 20th April 1881	200 litres.
Temperature of water at the orifice of outlet	32° centigrade.
Hydrometrical degree of water	10°
Hydrostatic level of the spouting sheet of water above the soil	1.00 metres.
Hydrostatic level above the mean level of the sea	4.20 "

During the execution of this work the sounding lead met with a series of the following layers:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of the Layers.	Depth of the Layers.	Remarks.
1	Ground lately embanked	M. 0.27	M. 0.27	
2	Vegetable earth	0.25	0.52	
3	Brown and blue clay	0.25	0.77	
4	Clay marbled with reddish, yellowish and grayish spots with a mixture of sand and carbonate of lime.	0.55	1.32	
5	Sandy clay with veins of yellow, brown and some garnets.	0.40	1.72	
6	Large size sand, soiled with brown clay.	0.30	2.02	M. 2.20 level of sheet of water of surrounding wells.
7	Large size sand with clay	2.50	4.52	
8	Large size blueish sand mixed with small pebbles and refuse of rotten wood, pieces of plastic clay, rolled up pebbles, basalt and amphibole.	2.08	6.60	

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
9	Grayish fluid sand and mica mixed up, agglomeration of black clay basalt and amphibole.	M. 0.50	M. 7.10	
10	Grayish black thin sand, black spots (titanate of iron), agglomerations of black clay, basalt and amphibole.	0.50	7.60	
11	Black plastic clay, broken up shells, refuse of rotten wood.	4.70	12.30	
12	Medium size sand and also fine, soiled by black clay, bits of shells, refuse of rotten wood.	1.00	13.30	1st ascending sheet of water, 1st April 1881, at 8 $\frac{1}{4}$ o'clock morning; hydrostatic level of sheet of water M. 3.20 of the soil
13-14	Blueish earth, large and medium bits of shells, refuse of rotten wood.	3.90	17.20	2nd ascending sheet of water M. 0.35 above the soil.
15	Black plastic clay.	5.30	22.50	
16	Black sandy clay.	0.50	23.00	3rd ascending sheet of water level of the soil.
17	Black plastic clay.	1.50	24.50	
18	Medium size sand with mica, soiled with black clay.	0.50	25.00	
19	Medium sand, mica, soiled black clay.	0.60	25.60	
20-21	Large size blueish sand (basalt and amphibole), shells, broken pieces of bricks, bits of shells, refuse of rotten wood.	0.60	26.20	

Three ascending sheets of water were met with in this boring at M. 13.30, M. 17.20 and M. 23.00. They rose respectively, the two first to M. 0.35 and M. 0.32 in a downward direction of the soil, and the third at the level of the soil.

The spouting sheet of water was met with at the depth of M. 26.20, in a layer of blueish large grained sand mixed with pebbles, some small shells and rotten wood. Its hydrostatic level rose to M. 1.00 above the soil, and its discharge of water on the 20th April 1881 of 200 litres per minute.

Artesian Well No. 10, executed by Government.

This boring was executed at Calapett, nearly in the centre of the French Possession, at 10 kilometres to the north of Pondicherry on the eastern coast of the road from Pondicherry to Markanum under the declivity of the table-land forming a portion of the hills known under the name of the Red Mountains or Sand-stones of Cuddalore.

The Commission of Artesian Wells was not favorable to the undertaking of this boring, the execution of which did take place, however, owing to the insisting of the population of the village and with a motive of exploration.

Government stopped the work as soon as it felt itself satisfied that a spouting sheet of water could not be met with on that ground except at a very great depth.

Height of the soil above the mean level of the sea about	M.
Depth of the boring in the soil	6.00
Diameter of the outlet of discharge at the orifice	40.90
	0.16

During the execution of this work, the sounding lead met with a series of layers as follows:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
	<i>Tertiary Ground.</i>	M.	M.	
1	Vegetable earth ...	1.20	1.20	
2	Brownish red sand with pebbles and gravels ...	1.73	2.93	
3	Gray and black sand mixed with a small quantity of clay ...	1.56	4.49	
4	Gray sand mixed with clay and lots of rolled pebbles.	7.92	12.41	
5	Reddish sand soiled with clay pebbles and ferruginous grit-stones	6.08	18.49	
6	Reddish sand mixed with ferruginous grit-stones and marbled clay with reddish, yellowish and grayish tints ...	0.49	18.98	
7	Clay of the color of the rainbow ...	0.50	19.56	
8	Yellowish sandy clay ...	2.79	22.35	
9	Yellow clay with refuse of rotten wood ...	0.20	22.55	
10	Yellow sandy clay with pieces of clay white and calcareous banks ...	3.05	25.60	M. 22.95 1st bank of thickness 23.66 2nd do. 24.01 3rd do. 27.12 4th do. 27.68 5th do.
11	Yellow sandy clay mixed with pebbles and calcareous banks ...	2.08	27.68	0.08 0.12 0.13 0.12 0.08
12	Yellowish sand mixed with rolled up pebbles and a little clay ...	1.96	29.64	
13	Yellowish and grayish sand mixed with clay pebbles and calcareous banks ...	4.50	34.14	33.50 6th do. 0.08
14	Gray clay and calcareous banks ...	6.20	40.34	36.31 7th do. 0.15 37.58 8th do. 0.12
15	Calcareous banks ...	0.60	40.94	40.34 9th do. 0.60

No sheet of water either ascending or spouting showed itself in this boring. Nine calcareous banks of a small thickness with the exception of the last which has M. 0.60 have been successively met with between M. 22.95 and M. 40.94 of depth. These banks constitute a solidified crust of several broken pieces and a sort of agglomerated calcareous and silicious cement.

Artesian Well No. 11, executed in 1881 by Mr. Charles Paulain.

This well, situated in the Savana Manufactory at 100 metres to the south of the well No. 9, was bored between the 28th August and the 10th December as far as M. 72.60. A spring, pretty abundant, having been met with at this depth the boring was stopped for some time.

Height of the soil above the mean level of the sea ...	3.02 metres.
Depth of the well in the soil ...	72.60 "
Diameter of the orifice of outlet ...	0.18 "
Discharge of water per minute at M. 0.87 above the soil ...	125 litres.
Temperature of the water at the orifice of discharge ...	33 centigrades.
Hydrometrical degree of the water ...	9"
Hydrostatic level of the sheet of spouting water above the side ...	1.52 metres.
Hydrostatic level above the mean level of the sea ...	4.54 "

During the execution of this work the sounding lead met with the series of the following layers:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
1	Vegetable earth	M. 1.00	M. 1.00	
2	Yellow brown sandy clay	2.00	3.00	
3	River sand, waters of the ordinary wells M. 3.50.	3.00	6.00	
4	Black muddy clay	0.60	6.60	
5	Rolled pebbles, black and white. ...	0.50	7.10	
6	Large grained gray sand clay. ...	2.40	9.50	
7	Same sand with clods of black clay.	0.85	10.35	
8	Black plastic clay	1.40	11.75	M. 11.80 a spouting spring the hydrostatic level of which is M. 2.50 above the level of the soil; discharge small.
9	Large grained sand gray with some pebbles at the basis.	5.37	17.12	
10	Black and white gravels and large grained sand	1.62	18.74	
11	Large grained and also thin sand, black sand and clay.	2.21	20.95	
12	Black sandy clay	0.40	21.35	
13	Large grained and fine sand soiled with clay, sand in the tube and clay.	0.75	22.10	M. 22.00 spouting spring the hydrostatic level of which is M. 0.50 above the soil; discharge small.
14	Finer sand gray, some grains of mica.	1.70	13.80	
15	Fluid sand gray, soiled with clay and clods of black clay.	6.20	30.00	
16	Compact black plastic clay ...	7.60	37.60	
17	Pebbles, quartz rolled stuck in black mud surrounded with yellow mud.	0.40	38.00	
18	Large grained sand, yellow and black clay.	2.00	40.00	
19	Same sand black and clay refuse of quartz and agglomerations of the same matters, some quartz rolled white.	1.00	41.00	Spouting spring, the hydrostatic level of which is M. 1.00 above the soil; discharge 40 litres.
20	Same sand with large pebbles conglomeration of quartz rolled with silicious cement.	1.10	42.10	
21	Sand not so large, gray with some broken quartz.	0.20	42.30	
22	Large size yellowish sand and thin fine yellow sand.	0.25	42.55	
23	Large sized sand gray, white, with rolled quartz.	1.00	43.55	
24	Very fine fluid gray sand with clods of black clay, some lumps of clay white and sandy.	0.40	43.95	
25	Gray sand still finer soiled with gray clay.	2.00	45.95	
26	Yellowish sand with broken pieces of ferruginous grit stone soiled with yellow ochre.	2.85	48.80	

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
27	Large grained sand quartz soiled, with yellow clay, broken pieces of ferruginous grit-stone larger than before, rotten wood.	M. 1.20	M. 50.00	
28	Large grained and fine sand soiled with yellow clay, ferruginous grit-stone, clay white, yellow alternately with reddish sand large sized and thin.	2.00	52.00	
29	Finer sand than the preceding with clods of white clay soiled by yellow clay.	1.00	53.00	
30	Quartz sand greatly soiled by clay some yellow and some orange with clods of clay, white, yellow and reddish ferruginous grit-stones, pebbles rolled up with a ferruginous cement (conglomerated).	2.00	55.00	
31	Large sized white sand with some crystallized white pebbles.	1.40	56.40	
32	Same sand slightly soiled with yellow clay, a few grey, black and white quartz rolled up most abundant at the basis.	0.70	57.10	
33	Thin and large grained sand soiled by clay gray, pearly with pieces of the same clay, pyrites of iron, ferruginous grit-stones, white, gray and black sand rolled up quartz.	1.90	59.00	
34	Same sand soiled by yellow clay, some quartz rolled up, white, gray, red pyrites of iron and white clay.	3.72	62.72	
35	Gray clay with a little sand large grained and also thin sand.	1.20	63.92	Spouting spring, the hydrostatic level of which is M. 1.00 above the soil.
36	Sand gray and white large grained and also thin, soiled by dirty gray clay and mica, gray clay in clods.	0.68	64.60	
37	Large grained sand soiled with yellow clay, useless quartz and ferruginous grit-stones, pyrites of iron, clay white and veined, yellow and red.	0.81	65.41	
38	Same sand and rubbish of yellow clay more abundant.	0.15	65.56	
39	Large grained sand soiled with white sandy clay with rosy veins, the sand rose colored.	0.20	65.76	
40	Same sand, same clay, ferruginous grit-stones and quartz.	0.30	66.06	
41	Large size sand soiled with clay yellow and rose, ferruginous grit-stones.	2.70	68.76	
42	Large sized and thin white sand soiled with grey clay with clods of the same clay, white pieces of clay, spotted red quartz stuck in ferruginous grit-stone.	0.40	69.16	

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
43	Large sized and also fine sand, quartz, ferruginous grit-stones, yellow and orange clay, conglomeration of quartz and ferruginous grit-stone, white and rose.	M. 0.46	M. 69.62	
44	Large sized sand soiled with yellow clay, pieces of clay yellow, red and white, ferruginous grit-stone, rotten wood.	1.43	71.05	
45	Large sized gray sand, refuse of ferruginous grit-stone, clods of clay white and yellow variegated with red sulphate of iron rolled up, gray, black and white quartz, rotten wood.	0.60	71.65	
46	Brick-red sand large sized and also thin with the same refuse.	0.15	71.80	
47	Large size white and red sand, yellow clay, quartz, ferruginous conglomerations.	0.80	72.60	Spouting spring, the hydrostatic level of which is 1.52.
48	Blackish sand large size and also thin, some quartz, white and black ferruginous grit-stones, pyrites of iron, ferruginous conglomerations of quartz, white clay.	0.85	73.45	
49	Red rose and yellow sand with gray sand, yellow clay, ferruginous quartz and rotten wood.	0.55	74.00	
50	Large grained gray sand with broken pieces of quartz and quartz varying from black to white from yellow to red, pudding stone, ferruginous grit-stone and quartz, rotten wood, yellowish red clay with small balls of rosy clay.	2.00	76.00	
51	Yellowish sand soiled with reddish clay same as above, rotten wood, conglomeration of quartz, and grit-stone ferruginous.	0.50	76.50	
52	Sand not so yellow mixed with rosy and reddish grains of sand, rolled up quartz and ferruginous conglomerations.	0.50	77.00	
53	Rosy and white sand soiled with blackish muddy clay wastage of ferruginous grit-stones, some small balls of rosy clay.	0.50	77.50	
54	Clods of sandy gray mud with yellow sand soiled with yellow clay.	0.50	78.0	
55	Sand not so yellow with yellow liquid clay and white sand, pieces of yellow and orange clay.	1.00	79.00	
56	Brick-red sand with clay of the same color diluted in the deposit of the sand.	0.50	79.50	
57	Yellowish sand slightly soiled with rosy clay.	0.10	79.60	

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
58	Sand of a dirty gray color large and thin soiled by clay of dirty red, rolled up quartz, pyrites of iron and gray kunker, ferruginous grit-stones.	M. 0.40	M. 80.00	
59	Same sand with same clay with clods of clay, sandy, changing from white to yellow and violet, rotten wood.	4.00	84.00	

After passing beyond the sheet of water of ordinary wells the sounding lead alternately met with five spouting sheets of water—

	M.
the 1st sheet of water of a small discharge at	11.80
„ 2nd do.	22.00
„ 3rd do.	41.00
„ 4th do.	63.92
„ 5th do.	72.60

The discharge of this last sheet of water would have been greater by lowering the orifice of the outlet to the level of the soil, but the quantity of water found having seemed insufficient to the owner, it was found necessary to continue the sounding which had been stopped at the depth of M. 84.00 where the lead alone had reached, owing to the difficulty to force in the column of guarantee beyond M. 83. No new spring having been met with between M. 72.60 and M. 84, the tube was brought up to M. 72.60 in the hope of finding back the spring beyond which it had been forced. This hope was frustrated and a phenomenon was brought about which must be mentioned, for it is pretty strange although admitting of an explanation. Here is the fact. The tube having been brought up to M. 72.60 as we have already said, the hydrostatic level of the water rose to M. 1.57 above the soil, that is to say five centimetres more than at the time of the discovery of the spring. But this level was establishing itself slowly, it required nearly a full hour to obtain it after bringing it down by the means of a syphon to the neighborhood of the soil, and when this level had been reached, the discharge of water was only 25 litres per minute at M. 0.87 above the soil, that is to say 100 litres less per minute than when the first passage through the spring took place. This fact can be explained by the circumstance of the aquiferous sheet of water of M. 72.60 having been put in communication with the upper permeable layers which would absorb the greater part of it. This sheet of water according to the geological details already given, was kept in or imprisoned between a layer of ferruginous grit-stones and a layer of yellow clay of very little thickness. The continuation of the boring causing an excavation under this layer must have brought on the crumbling down of this impermeable sheet, leaving an easy communication outside the tube to the running out of the lower waters under hydrostatic pressure.

After several unsuccessful attempts to cause this spring to reappear the column was lifted up M. 45. There remains, at present, in this boring M. 38 of guarantee tube which has been kept on lest its removal should cause the disappearance of the third spring which has not ceased, since it was found, to flow outside the column and the water of which is, until a fourth boring which is being executed in the Savana Manufactory allows it being given up. This new boring is situated at M. 40, north-west of the preceding one.

Artesian Well No. 12, executed in 1882 by Mr. Louis Cornet, son of the Proprietor of the Savana Cotton Mills.

This well, situated in the Savana Manufactory, was bored between the 9th March and the 6th April 1882 at 40 metres north-west of the well No. 11.

Height of the soil above the mean level of the sea	3.122 metres.
Depth of the well in the soil	45.00 „
Diameter of the orifice of discharge	0.18 „
Discharge per minute at the level of the soil on the 6th April 1882	60 litres.
Temperature of the water at the orifice of discharge...	32° centigrades.

Hydrometrical degree of the water ... 9°
 Hydrostatic level of the sheet of water above the level of
 the soil ... 1.30 metres.
 Hydrostatic level above the mean level of the sea ... 4.42 "

During the execution of this work the sounding lead met with a series of the following layers:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers	Depth of Layers.	Remarks.
1	Embanked ground, vegetable earth.	M. 0.80	M. 0.80	
2	Yellow, brown and sandy clay	0.10	0.90	
3	Clay-veined of reddish, yellowish and grayish tints with mixture of sand and carbonate of lime, some gravels.	1.00	1.90	
4	Water of the surrounding wells () large grained sand soiled by brown clay.	1.00	2.90	
5	Large grained clay, sand (manu- facture of mortar in the country), rolled up pebbles (basalt and amphibole).	3.60	6.50	
6-7	Large grained and also thin sand soiled by blackish clay mixed with small pebbles, refuse of rotten wood, black spots, pieces of a black plastic clay at the basis.	4.30	10.80	
8	Black plastic clay, refuse of rotten wood.	1.20	12.00	M. 12.00, ascending spring on the 13th March 1882; at 5 o'clock in the evening at M. 1.00 in a downward direction to the natural soil.
9	Large grained and also middle size blueish sand mixed with black clay, shelly pieces, refuse of rotten wood (teak), conglomeration of black plastic clay in the basis.	4.00	16.00	M. 15.80, 2nd ascend- ing spring M. 0.17 in downward direction to the soil hydrometrical degree 14°.
10-11	Compact black plastic clay, refuse of rotten wood.	6.00	22.00	
12	Black sandy clay, pieces of shells.	1.00	23.00	M. 23.00, 3rd ascend- ing spring level of the soil.
13	Compact black plastic clay.	2.80	25.80	
14	Large and medium size sand soiled by black clay, pieces of shells, pebbles, basalt, amphibole.	1.00	26.80	4th spouting spring of water at M. 0.10 below the soil; hydrometrical degree 11°. Temperature of the water 32° centi- grade.
15-16	Large medium and thin sand.	...	...	
17-18	Grayish rolled up pebbles (basalt, amphibole), pieces of shells, black spots.	3.20	30.00	
19	Large size sand soiled by black clay, pieces of black plastic dried up clay.	3.50	33.50	
20-21	Compact black plastic clay dried up at 34 metres, pieces of gray clay at M. 37.00, pieces of shells from M. 38.00, refuse of rotten wood (bamboo).	10.70	44.20	

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
22-23	Black sandy clay cemented by cal- careous concretes (carbonate of lime.)	M. 2.30	M. 46.50	
24-25 26-27	Large grained sand soiled by black clay with large pebbles (quartz, basalt, amphibole), 4 pieces of yellow ochre clay.	0.70	47.20	M. 45.00, spouting spring (6th April 1882); hydro- static level M. 1.30; tem- perature of the water 32° centigrade; hydro- metrical degree 90°.

Three ascending sheets of water were met with in this boring at M. 12.00, M. 15.80 and M. 23.00 of depth. They rose respectively, the two first to M. 1.00 and M. 0.17 in a down- ward direction to the soil, and the 3rd at the level of the soil.

A fourth sheet of water met with at M. 26.80 rose to M. 0.10 centimetres above the soil, but was not noticed on account of its small discharge. At last at 45 metres of depth a new sheet of water spouted out from a layer of large size sand mixed with pebbles and pieces of yellow ochre clay. Its discharge was of 60 litres per minute on the 6th April 1882. This boring would perhaps have been carried deeper if the column of guarantee instead of being imprisoned by the clay at 40 metres of depth had been free.

Artesian Well No. 13, executed in 1882 by Mr. Adrien DeClossets, Civil Engineer.

This well, situated in the property of Charles Pereira at 150 metres to the east of the road to Cuddalore and at about 100 metres on the right bank of the Chonnambar, was bored between the 5th and 22nd April 1882.

Height of the soil above the level of the sea ... 3.00 metres.
 Depth of the well in the soil ... 21.00 "
 Diameter at the orifice of outlet ... 0.18 "
 Discharge per minute at M. 0.50 below the level of the soil on the 27th April 1882 ... 400 litres.
 Temperature of the water at the orifice of discharge ... 11° centigrades.
 Hydrometrical degree of the water ...
 Hydrostatic level of the spouting sheet of water above the soil ... 2.20 metres.
 Hydrostatic level above the mean level of the sea ... 5.20 "

During the execution of this work the sounding lead met with the following series of layers:—

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
1	Vegetable earth	M. 0.46	M. 0.46	
2	Sand mixed with yellow clay	0.61	1.07	
3	Yellow clay mixed with sand	0.30	1.37	
4	Yellow clay veined by white clay	0.30	1.67	
5	Brown clay	0.50	2.17	
5	Brown clay mixed with broken pieces of shells.	0.50	2.67	Sheet of water from or- dinary wells, the hydro- static level of which rose to M. 3.00 below the natural soil.

Numbers of Layers.	Composition of the Ground traversed.	Thick-ness of Layers.	Depth of Layers.	Remarks.
		M.	M.	
6	Brownish clear and sandy soil ...	0.61	3.28	
7	Gray clear sand mixed with clay ...	0.20	3.48	
8	White and yellow sand and clay ...	0.30	3.78	
9	Sand mixed with clear brown clay...	0.20	3.98	
10	Fine gray sand with broken pieces of shells and rotten wood.	0.36	4.34	
11	Fine blueish sand with rotten wood.	0.53	4.87	
12	Large blueish sand ...	1.12	5.99	
13	Sand mixed with clay and rotten wood.	0.30	6.29	
14	Black clay with large sand...	0.61	6.90	
15	Large blueish sand with broken shells.	0.30	7.20	
16	Black clay with sand ...	0.08	7.28	
17	Fine blueish sand ...	0.10	7.38	
18	Black plastic clay ...	4.92	12.30	First ascending sheet of water, the hydrostatic level of which rose to M. 1.50 in a downward direction to the soil.
19	Sand mixed with black clay ...	0.40	12.70	
20	Fine gray sand ...	2.05	14.75	
21	Clear brown sandy clay mixed with pebbles, white and blueish clay.	1.23	15.98	Second ascending sheet of water, the hydrostatic level of which rose to M. 0.70 in a downward direction of the soil.
22	Large sand blueish, white and yellowish, gray, red with large white sand and conglomerations.	1.00	16.98	
23	Fine gray sand mixed with white sand, pebbles, clods of yellow clay and mica.	0.88	17.86	
24	Hard white clay mixed with yellow clay, greenish sand and pebbles.	0.30	18.16	
25	Fine green sand with white sand and clay.	0.98	19.14	
26	Clear brown clay marbled with yellow and blue.	1.32	20.46	
27	Large pale yellow sand mixed with gravels and pebbles.	0.54	21.00	Spouting sheet of water, the hydrostatic level of which rose to M. 2.27 above the natural soil.

Two ascending sheets of water were met with in this boring at M. 12.30 and M. 15.98 of depth. They rose respectively to M. 1.50 and M. 0.70 in a downward direction to the soil.

The spouting sheet of water was met with at the small depth of M. 21.00 in a layer of large sand, paleish yellow mixed with gravels and pebbles. The discharge of this sheet of water was on the 27th April 1882 of 400 litres per minute at M. 0.50 above the soil.

Artesian Well No. 14, executed by Government.

This Artesian well bored at Bahour between the 6th November 1881 and the 6th December 1882, is situated in a tope (cluster of trees) Illepay, to the south and against the road leading from Bahour to the bridges and roads between the Tamarecolom tank and the wall round the Pagoda to the west.

ed. 4/13

Nilgiri Division Office
Ootacamund, 12 March 1883

From

The Executive Engineer,
Nilgiri Division.

To

The Superintending Engineer,
II Circle.

Sir,

The Chief Engineer having, in his Inspection notes dated 26th & 27th Dec^r, called for Estimates for the construction of a Hoffmann's brick kiln near Ootacamund and as the early construction of the kiln is a matter of great importance, with a view to a future supply of good bricks, during my recent visit to Madras I obtained the Chief Engineer's verbal permission to at once purchasing the required number of common bricks, as if not now procured, before the rains put a stop to brick making, the building of the kiln would be indefinitely delayed. I have consequently the honor to report having commenced the purchase of bricks on account of a Hoffmann's kiln and request that you will allot a sum of Rs 2,670 to cover expenditure in this official year.

I may add that the plans for the kiln are under preparation in the Consulting Architects Office and will soon be finished.

And I would propose commencing actual work of construction as soon as ever I can secure a suitable site.

In connection with brick making I would strongly advocate the despatch to Colacound of a combined pugging and brick-making machine which I saw in the Madras Workshops: this machine will require either a steam engine or water power to work it, but without such a machine it will not be possible to manufacture good bricks at this place. The circumstances are very different from the Consulting Architects brick works at Madras. There, there is an abundant supply of a natural brick earth whereas here to obtain a good result two or more kinds of clay must be used and to ensure the thorough incorporation of the material essential to a good brick the clays must first be passed between rollers to crush all hard particles before being pugged. The absence of such a process is only too apparent in the bricks recently made here. That such a machine is not required nor used at the Madras brick works in no way affects

affects the question, as at Madras the brick clay is almost ready made to hand and does not require crushing.

I have already laid these questions both Demi officially and verbally before the Chief Engineer and now beg to submit them formally for, I hope, approval.

I have the honor to be
Sir

your most obedient servant

Executive Engineer

App.

From

The Executive Engineer
Nilgiri Division

No: 43C
E.W.

Supg. Engineer's Office, 4th Circle.
Camp Coimbatore, 17th March 1883.

From

The Supg. Engineer,
Fourth Circle.

To

The Chief Engineer,
Public Works Department.

Sir,

Enclosure 1
Original letter.

With reference to para 37 of your
notes of 26th and 27th December 1882, for-
warded with your endorsement No 17C
of 5th January 1883, I have the honor to for-
ward herewith for your information a
letter from the Executive Engineer, Nilgiri
Division, and to request that an allot-
ment of Rs. 2670 may be granted to
cover outlay in this year for the pur-
chase of bricks for the Hoffmann's
kiln, the estimate of which is under
preparation in the Office of the Con-
sulting Architect.

No. 4/3

Dated 14. 3. 83

Received

Enclosures. 1

Hoffmann's brick kiln
near Coimbatore. - reports
upon the proposal of con-
-structing -

I have the honor to be,

Sir,

Your most obedt. servant.

L. Beatty - Col. Ab.,
Supg. Engineer, 4th Circle.

P.W. No 2375

No 909W PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 21st March/83
Read the following:—

From
The Supg. Engineer,
Fourth Circle.

Letter from S.E. Fourth Circle. H.E. No. 43.C
E.W. of 17. March/83

- No 2309, 2310. C. 13.12.82
- " 16. C. 5.1.83
- " 17. C. 6.1.83
- " 221, 222. C. 19.1.83
- " 532. C. 7.3.83

Dated 17th
Despd: S. } March 1883.

No. 43C
E.W.

Enc: 1

Dricks

Asking for an allotment
of Rs. 2670 to cover outlay in
this year for the purchase
of — for the Hoffmann's
Rilw.

An allotment
of Rs 2670 is made from
the Provincial Reserve.

2. The General Supt.
M. Mores has already been
instructed to despatch
the Sug and Brick
machine to Otacamund.

Sigs

21/3

S.E. Fourth Circle ✓
Ex. M. accts. ✓

.R.S.

Obtt

19/3

No 909 Wd/21-3-83

CA 26/3

2029/0



B5

A