M.R.O. 1—77,006—8-6-31.

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MADRAS RECORD OFFICE.

Government of Madras.

Public (Works) DEPARTMENT.

G.O. No. 1375 Press / Mis.
1865-69

Dated 6 - 5 1867.

Not to be folded or roughly handled

150/

Read the following papers:—

No. 165. Endorsement of the Superintending Engineer, 4th Division, dated Madras, 9th April 1867, No. 127.

Read the following letter from the Secretary, Sanitary Commissioner, Madras, to the Superintending Engineer, 4th Division, dated Madras, 22nd March 1867, No. 630.

1. I have the honour, by desire of the Sanitary Commissioner, to enclose for your information a Memorandum upon certain subjects connected with the experimental trial of the dry-earth system at the Fort, and more especially upon points connected with the provision of the proper apparatus and alteration of existing buildings for the above purpose.

1 Copy of Proceedings of the Sanitary Commission, dated 24th February 1866, (to be returned)

2. As you are aware, serious delay has already occurred in carrying out the experiment, and you will observe that the pug-mills now erected are not in accordance with the plans which were approved of by the Sanitary Commissioner, the result being that the mixing process is most imperfectly effected with vast amount of unnecessary labour.

3. Mr. Ellis trusts that no time will be lost in setting up mills of the same pattern as that now in operation at the Male Orphan Asylum, otherwise the success of the experiment will be most materially affected.

MEMORANDUM.

1. In June last the Government of India desired to be informed whether the dry-earth system had been thoroughly established throughout this Presidency, and whether it is really a great public benefit.

2. In order to give a complete answer to the latter portion of this question, namely, whether this system of conservancy is successful and a public benefit, it was essential that the dry-earth conservancy system should have been carefully and completely tested in at least one large station.

3. In the early part of 1865, the Sanitary Commission prepared a pamphlet containing detailed information regarding this conservancy system, which was widely circulated in all the stations of the Presidency.

No 2,205, dated 28th June 1866.

4. After many delays and much correspondence the Government, by their Order as per margin, directed the early introduction of the system into the Regimental latrines at the Fort, and into those of the 2nd Battalion, 21st, at Secunderabad.

5 One of the essentials for the proper working of the dry-earth conservancy, as applied to large Regimental or public latrines, is the provision of one or more pug-mills. I wish to record the manner in which this provision has first been delayed, and after two pug-mills have been erected in the Fort, the imperfect manner of their construction, and the negligence which has attended the carrying out the conservancy system.

Vide Proceedings of this Commission, 24th February 1866, pages 42 and 43

6. On the 15th February 1866, Mr. Arnold Smith, Acting Secretary to the late Sanitary Commission, requested the Superintending Engineer, 4th Division, to erect a pug-mill to be worked in connection with the new latrine then in the course of construction in the lines of the Native Regiment in Vepery.

7. On 10th March 1866, the Superintending Engineer forwarded to this Office a drawing of pug-mill. This was approved with the following exceptions :—

"The bottom of the mill, it was observed, should be conical in form, otherwise "the poudrette would collect at the bottom of the mill and close it"

"The arms inserted in the revolving axis should only be at right angles with "it at the top."

"The lower ones should point downwards, their angle with the axis becoming "more acute as they descend."

A plan of a pug-mill constructed on this principle, was forwarded with the letter from which the three preceding paragraphs are copied.

8. On 7th June 1866, my Secretary directed the attention of the Superintending Engineer to the fact that a latrine then recently erected for the use of the men of 2nd Regiment, Madras Native Infantry, at Vepery, was in use, though not provided with a pug-mill, and information was requested as to the date upon which the pug-mill would be completed.

9. On 27th June 1866, the Superintending Engineer reported that the Vepery latrine had been handed over to the Barrack Master, when it was completed (no date of transfer was given),* and he added that he was unable to say when the pug-mill would be ready. He also stated that an experimental one was about to be erected at the Male Orphan Asylum.

* In Proceedings of Government, Public Works Department, No. 515, dated 25th February 1867, it is stated that the latrine was handed over on the 29th January 1866.

10. On 7th July 1866, the Barrack Master, addressing my Secretary, requested to be informed as to whether the pug-mill was to be considered as an absolute necessity, and proposed that it should not be so far certain reasons.

11. Colonel Worster suggested that as the whole dry-earth system was on trial and might be eventually condemned, the cost of pug-mills might be avoided. The reply is that the pug-mill at the Male Orphan Asylum only cost less than 20 Rupees (that built by the Department of Public Works has cost 150). Colonel Worster stated that the earth mixed with the excreta by the sweepers would sufficiently deodorize them. He also supposed that the toties would require extra pay for working the pug-mill. To this it may be replied that the pug-mill, if properly constructed, need necessitate only a very small amount of physical labour, and that by it the poudrette is rendered perfectly inodorous, and much less calculated to cause annoyance in transit through crowded thoroughfares.

12. On 10th of same month (July 1866) my Secretary addressed Colonel Worster, and pointed out the importance of supplying a pug-mill as essential to the perfect trial of the system of dry-earth conservancy, and showed how important it was that suitable carts for the removal of poudrette should be supplied. He also directed attention to the value of the pug-mill in preventing decomposition and fermentation of excreta in latrines, which might prove a source of nuisance, even though some earth had been used ; and he further showed that unless passed through the pug-mill, the poudrette should be removed in air-tight vessels.

It was also pointed out to Colonel Worster that one toty was able to attend to the latrine used by 300 boys at the Male Orphan Asylum.

13. On 24th July 1866, the Officiating Superintending Engineer forwarded a series of objections urged by Mr. Gover, as rendering the experimental pug-mill constructed by the Department of Public Works unsatisfactory, and promising that another, "very similar to that now in constant use at the Military Male Orphan "Asylum, but with some improvements in construction, though not in principle, "*and one-third larger*," was to be erected near the latrine of the lines in Vepery (eight months have since elapsed and the pug-mill has not been placed near this latrine). Mr. Gover objected to the pug-mill sent to him in consequence of its vast size, and general ill-construction, and pointed out in detail many errors in it.

14. On the day following that upon which the foregoing letter was received, I addressed the Officiating Superintending Engineer, and urged the desirability of his having a pug-mill made with the alterations as to size and details of construction suggested in his and Mr. Gover's letters.

15. On 14th January 1867, the Barrack Master addressed Government, and represented that no pug-mills had up to that date been provided either for the Fort latrines or that in the Regimental lines in Vepery.

Government, in Order No. 386, dated 31st idem, ordered the carrying out of the experiment "without further delay."

16. On 15th of February 1867, the Superintending Engineer solicited sanction for expending 115 Rupees for the experimental pug-mill, and 150 for a new one for the Vepery latrine. Sanction for this was accorded on 25th idem. The pug-mill has not yet been supplied to the Vepery latrine.

17. On 1st March 1867, the new privy was opened at the Fort The construction of this building is little suited to the dry-earth system, as the arches through which the vessels are removed and introduced are small and prevent the easy application of dry-earth.* But the essential addition, the pug-mill, is found on examination to be faulty. It is 6 feet 9 inches in height and 3 feet clear in diameter. Mr. Gover's being only 1 foot 6 inches in diameter by 4 feet in height.

* This necessary alteration was pointed out in paragraph 8 of a Report on the dry-earth system, entered in the Proceedings of 24th February 1866, page 37.

18. According to the plan submitted to the Sanitary Commissioner by the Superintending Engineer, the height of the pug-mill should have been 5 feet and the breadth 2 feet.

It was particularly explained that the arms of the spindle should not be made in the shape of blades, but of square pieces of wood or iron, and that the upper ones

should be horizontal to the spindle, and the lower arms sloped at varying angles to it, so as to sweep the conical bottom of the machine.

19. The machine constructed in the Fort, which is destined to be the model of other pug-mills, is three feet in width clear, which causes unnecessary lengthening of the arms of the spindle and increased leverage, and the arms are blade-shaped, being only about one-third of an inch in thickness, which causes to cut through, but not to mix the material requiring to be made into poudrette.

20. But not alone does the Fort pug-mill differ in point of capacity and construction from the standard pug-mill at the Military Male Orphan Asylum, but I have by personal examination satisfied myself that in details of management there is great negligence.

21. In the Military Male Orphan Asylum, where the conservancy is admirably conducted, the excreta are covered with earth immediately upon being passed into the latrine vessels, and, if required, an additional quantity of earth is added before these vessels are emptied into the pug-mill. The construction of the latter and various other details connected with the practical working of the dry-earth system were specially pointed out to the Engineer and Barrack Master.

22. In the Fort, on the contrary, the excreta are simply emptied into the pug-mill, and there allowed to remain decomposing until the earth is added just before the milling process is commenced. Hence the admixture of the two materials is slowly and with great difficulty effected. Four toties worked for one and three-quarters of an hour to complete the manufacture of the poudrette in the Fort, the same process being effected, chiefly by one man, in less than quarter of an hour in the Male Orphan Asylum. In fact, in the latter Institution, the poudrette is already in great part formed before the mill is used; and in the Fort the whole process of mixing has to be effected under the greatest difficulty, as all the urine and fæces are at the bottom of the mill, and the dry-earth works down with difficulty, and while the lower poudrette is too damp and consequently offensive, the upper portion is almost pure earth.

23 The valve at the bottom when opened, gave exit to a quantity of offensive ammoniacal gas, and then watery and most offensive poudrette; and on a subsequent occasion, at 8 A. M, the exit of pure fæces and urine which had been emptied into the pug-mill apparently without any earth.

24. I must point out also that, in another respect, the arrangements in the Fort were far from satisfactory. The earth used consisted, in great part, of large lumps weighing half a pound and upwards, and these would take a long time to become broken down by absorption of water.

25. On the last inspection made by my Secretary, Dr. Montgomery, this morning, it appeared that no sifted or other earth had been placed in the pans prior or subsequent to these being used by the men.

26. The absolute success of the dry-earth system is evidenced by the Male Military Orphan Asylum, where, under the careful supervision of the Principal, Mr. Gover, the new conservancy has answered admirably, and with only a trifling increase of expense. Judged by this Institution, it would be easy to report to the

Government of India that the system is an entire success. Judged by the experiments in the Fort, it would be necessary to state that the system is a failure.

(Signed) R S. ELLIS,
Sanitary Commissioner for Madras.

MADRAS,
22*nd March* 1867.

From the Executive Engineer, No. 1 or Northern Range, to the Superintending Engineer, 4th Division, dated Fort Saint George, 26th March 1867, No 1,271

1 Memorandum of Sanitary Commissioner, dated 22nd March 1867
1 Remarks by the Executive Engineer, Northern Range, on the points of the Memorandum of Sanitary Commissioner

1 In reference to your Order No 5,196, dated 25th instant, and accompaniment (herewith returned as ordered), I have the honour to enclose a running commentary on such points of the Memorandum by the Sanitary Commissioner as, seem called for

2 I most emphatically deny the allegation that the pug-mills are not in accordance with the plan. They are in strict accordance therewith I trust I made this clear in my letter No 1,257, dated 25th March 1867.

Memorandum by the Sanitary Commission	*Remarks by Executive Engineer, Northern Range, Presidency*
Paragraph 11 —"The pug-mill at the Male Asylum only cost less than 20 Rupees, that built by the Department Public Works has cost Rupees 150"	The pug-mill at the Male Asylum is of brick, and that constructed by the Department Public Works is of teak and iron, as recommended by Mr Gover, I think, when I was in consultation with him So much for material It will appear fully in the sequel that the pug-mill constructed by the Department Public Works is very much larger than that at the Asylum, and hence the increase in cost Satisfactory detailed information in regard to price can be furnished, if required.
Paragraph 7, last clause states that—"a plan of a pug-mill constructed on this principle was forwarded with the letter from which the three preceding paragraphs are copied"	This plan was scrupulously adhered to in the construction of the pug-mills in the Fort I took the measurements carefully myself before putting the pug-mill in hand My letter No. 1,257, dated 25th March 1867, to your address, explains, the whole The plan was erroneous, and hence the pug-mill's defective construction has its source in the Office of the Sanitary Commission
Paragraph 13, last clause —"Eight months have elapsed and the pug-mill has not been placed near this latrine"	The Order of Government, No 515, dated 25th February 1867, sanctioning its construction, was only received by me on the 5th March 1867, and the work was immediately put in hand The pug-mill will be completed to-morrow, and was only fifteen working days under construction
Paragraph 16, last sentence —"The pug-mill has not yet been supplied to the Vepery Lines"	
Paragraph 17, first part.—"The construction of the building is little suited to the dry-earth system."	It was never built for the dry-earth system, but for the old system, on an estimate sanctioned by Government in No. 1,405, dated 16th May 1864.

	The best that can be done has been done, unless Government desire to re-construct the rear of the privies at a considerable expense This it is undesirable to do until the conclusion of the experiment
Paragraph 17, last part —" But the essential addition the pug-mill is found to be faulty It is 6 feet 9 inches in height and 3 feet clear in diameter Mr Gover's being only 1 foot 6 inches in diameter by 4 feet in height "	Already disposed of
Paragraphs 18 and 19 —" According to the plan submitted to the Sanitary Commissioner by the Superintending Engineer, the height of the pug-mill should have been 5 feet and the breadth 2 feet " " It was particularly explained that the arms of the spindle should not be made in the shape of blades, but of square pieces of wood or iron, and that the upper ones should be horizontal to the spindle, and the lower arms sloped at varying angles to it, so as to sweep the conical bottom of the machine "	Yes This was the result of my observations in company with Mr Gover at the Male Asylum. It was my own original design, but the dimensions were much increased in the plan furnished by the Sanitary Commissioner's Office *Vide* my letter No 1,257, dated 25th March 1867, to your address before referred to The diameter of the mill having been increased to 3 feet, I gave the arms the character of blades, in order to avoid perpetual fracture
19 " The machine constructed in the Fort, which is assumed to be the model of other pug-mills, is 3 feet in width clear, which causes unnecessary lengthening of the arms of the spindle and increased leverage, and the arms are blade-shaped, being only about one-third of an inch in thickness, which causes to cut through, but not to mix the material requiring to be made into poudrette "	The additional leverage provided in the Sanitary Commissioner's plan would, I am convinced, have broken to pieces round or square arms In my original plan, adverted to by the Sanitary Commissioner, the arms are represented as *round* and not blade-like The lower arms of the Fort pug-mills are placed at varying angles, however, as suggested

FORT SAINT GEORGE,
26th March 1867.

(Signed) J GODDARD, Captain, R E,
Executive Engineer, Northern Range

MEMORANDUM
No 2,278

The pug-mills erected at the Regiment and Family Privies on the berm are of the same size and capacity apparently

2 The blades of the Regimental pug-mill are not sufficiently near the periphery of the well, and the "mixed soil" is not so perfectly milled as in that of the Family privy, where this effect is remedied

3 The mills are effective, but each requires four men to work the soil into poudrette.

4. The pugging of the contents of the buckets accumulating during the day of twelve hours requires about two hours to form the poudrette for inodorous removal, and as the matter becomes plastic, requires the full labour of four men to overcome the resistance

5 The mills appear cumbrous and of an inconvenient height, involving additional labour in lifting and discharging the contents of the buckets into the mill.

6 I would not, however, recommend any alteration or change, as the experiment itself will be sufficiently costly.

N B —The blades would be more effective had they been placed obliquely to the shaft—the cutting edge being sharper

FORT SAINT GEORGE,
16*th March* 1867

(Signed) W. K WORSLEY, Colonel,
Barrack Master

From the Executive Engineer No 1 or Northern Range, to the Superintending Engineer, 4th Division, dated Fort Saint George, 18th March 1867, No 1,219

I have the honour to submit the foregoing in reference to your Order No 4,969, dated 14th instant

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1. Submitted to Government for information.

2. It must be admitted that the experiments in pug-mills for poudrette have hitherto not succeeded

3. The Superintending Engineer has authorized the Executive Engineer, Northern Range, Presidency, to set upa mill of the same pattern as that in operation at the Male Orphan Asylum, as asked for in paragraph 3 of the enclosed letter of the Secretary to the Sanitary Commissioner, a measure which it is hoped will meet with the approval of Government.

(Signed) A. J M. BOILEAU, Colonel, R. E.
Superintending Engineer, 4th Division.

No. 166. Endorsement of the Superintending Engineer, 4th Division, dated Madras, 17th April 1867, No. 313

From the Executive Engineer, No. 1 or Northern Range, to the Superintending Engineer, 4th Division, dated Fort Saint George, 16th April 1867, No 138.

1 Plan
1 Memorandum No 86, dated 12th April 1867

In obedience to your Order No. 250, dated 15th instant, I have the honour to report that the plan received with the Order under reply, and herewith returned, is that which I closely followed.

Forwarded to Government with reference to Secretary's Memorandum No. 86, 12th April 1867.

(Signed) A J. M BOILEAU, Colonel, R. E.,
Superintending Engineer, 4th Division.

No. 167. ORDER THEREON, 6th May 1867, No. 1,375.

MILITARY WORKS, No. 15.

1. The Government regret to observe that so much misunderstanding has existed with regard to the constructive details and the management of the pug-mill referred to in these papers. The plan furnished by the Sanitary Commissioner, which is stated to have been closely adhered to, is accompanied by no scale, nor are the dimensions of the mill

given, and the Government are nowhere informed as to whether these necessary details were subsequently furnished for the guidance of the Executive Engineer, and if so, by whom.

2. Much time has been lost in carrying out the experimental measures ordered by Government for the introduction of the dry-earth system of conservancy, but His Excellency in Council hopes that the steps which have now been taken by the Superintending Engineer will result in an early determination of the question of whether that system can be successfully brought into operation throughout the Presidency.

(True Extract.)

Colonel, R. E.,
Secretary to Government

To the Superintending Engineer, 4th Division
,, Sanitary Commissioner
,, Military Department

Exd. S. T. Augustin.

Memo. by the Sanitary Commissioner

para 11
" The pug mill at "
" the Trade asylum only "
" cost less than 20 Rupees "
" that built by the "
" Department Public "
" Works has cost Rs 150. "

para 7.
Last clause states that
"a plan of a pug mill "
"constructed on this principle "
"was forwarded with the "
"letter from which the these "
"preceding paragraphs "
"are copied" "

Remarks by Ex. Engineer Northern Range Presidency

7

The pug mill at the Trade asylum is of brick and that constructed by the D. P. W is of Peak Varian as recommended by Mr. Gover & I took when I was in consultation with him. so much for material.

It will appear fully in the sequel that the pug mill constructed by the D. P. W. is very much larger than that at the asylum and hence the increase in cost.

Satisfactory detailed information in regard to price can be furnished if required.

This plan was scrupulously adhered to in the construction of the Pug mills in the Fort. I took the measurements carefully myself before putting the pug mill in hand. My letter No. 1257 dated 25 March 67 to your address explains the whole.

The

The plan was erroneous and hence the pug mills defective construction has its source in the Office of the Sanitary Commissioners.

The order of Govt. No. 545 dated 25 February /67 sanctioning its construction was only received by me on the 5th March /67 and the work was immediately put in hand - The pug mill will be completed in one month and was only 15 working days under construction

It was never built for the dry earth system: but for the old system on an estimate sanctioned by Govt. in No. 1405. dd 18th May 1864.

The best that can be done has been done unless Government desire to reconstruct the rear of the prisons at a considerable expense.

Thus it is undesirable to do until the conclusion of the experiment

para 13. last clause
Eight months have elapsed and the pug mill has not been placed near this latrine
para 16 last sentence
The pug mill has not yet been supplied to the Upper Lines.

para 17 - 1st part.
The construction of the building is little suited to the dry earth system.

para 17 last part.
But the essential addition the pug mill is found to be faulty. It is 6 feet 9 inches in height and 3 feet clear in diameter - Mr. Gover's being only 1-6" in diameter by 4 feet in height.

para 18 & 19.
According to the plan submitted to the Sanitary Commissioners by the Superintending Engineer the height of the pug mill should have been 5' and the breadth 2'.

It was particularly explained that the arms of the spindle should not be made in the shape of blades but of square pieces of wood horizontal and that the appearance should be horizontal to the spindle and the lower arms sloped at varying angles to it so as to sweep the Conical bottom of the Machine.

Already disposed of

Yes - This was the result of my observations in Company with Mr. Gover at the Female Asylum - It was my own original design: but the dimensions were much increased in the plan furnished by the Sanitary Commissioners Office Vide my letter No. 1257 dated 25th March /67 to your address before referred to.

The diameter of the Mill having been increased to 3' I gave the arms the character of

of blades in order to avoid perpetual fracture. The additional leverage provided in the Sanitary Commissions plan would soon cause the arms to be broken to pieces round or square arms. In my original plan adopted by the Sanitary Commission the arms are represented as round & not blade like. The lower arms of the Bort pugmills are placed at varying angles however as suggested.

19. The machine constructed in the Bort which is destined to be the model of other Pug Mills is 3 feet in width clear, which causes unnecessary lengthening of the arms of the spindle and increased leverage, and the arms are blade shaped being only about 1/3 of an inch in thickness which causes it cut through, but not to mix the material requiring to be made into pandrette.

J. Lamond Captain R.E.
Exc: Engineer N. & W. R.

Fort St. George
26: March 1867.

No. 1271.

From

The Executive Engineer. No 1
of Northern Range,

To

The Superintending Engineer
4th Division
Madras.

Sir,

In reference to your order
No 5196 dated 25th instant and accompaniment (herewith returned as ordered)
I have the honor to enclose a running
Commentary on such points of the
items by the Sanitary Commissioners
as seem called for.

2. I most emphatically deny
the allegation that the pugmills are
not in accordance with the plan.
They are in strict accordance therewith
Strict I made this clear in my letter
No 1257. dated 25th March 1867.

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

J. Lamond Captain R.E.
Exc. Engineer Northern Range

Fort St. Georg
26: March 1867.

Memorandum

In June last the Government of India desired to be informed whether the dry earth system had been thoroughly established throughout this Presidency, and whether it is really a great public benefit.

2 In order to give a complete answer to the latter portion of this question, namely, whether this system of conservancy is successful and a public benefit, it was essential that the dry earth conservancy system should have been carefully and completely tested in at least one large station.

3 In the early part of 1865 the Sanitary Commissioner prepared a pamphlet containing detailed information regarding this Conservancy system which was widely circulated in all the stations of the presidency.

4 After many delays and much correspondence the Government by their order as per margin, directed the early introduction of the system into the Regimental Latrines at the Fort and into those of the 2nd Battalion 21st at Secunderabad.

No 2205 of 28th June/66

5 One of the essentials for the proper working of the Dry Earth Conservancy, as applied to large Regimental or Public Latrines, is the provision of one or more Pug Mills. I wish to record the manner in which this

Vide Proceedings of this Commission 24 February 1866 Pages 42 and 43.

the

From
The Ord: Deputy
To
The Offg Supt: Ord: Depot
Dated 26th Decr 1866
Rec: 28th Dec: 1866.

Forwarding a Memorandum regarding Conservancy, and certain Forms of the Proceedings of the Sanitary Commission regarding the Dry earth system at Secunderabad.

Ord: Dept: Secunderabad
No 1225 of 1866

this provision has first been delayed, and after two Pug Mills have been erected in the Fort, the imperfect manner of their construction and the negligence which has attended the carrying out the Conservancy system

6. On the 15th February 1866, Dr Arnold Smith, Acting Secretary to the late Sanitary Commission, requested the Superintending Engineer, 4th Division, to erect a Pug Mill to be worked in connection with the new Latrine then in the course of construction in the Lines of the Native Regiment in Vepery.

7. On 19th March 1866, the Superintending Engineer forwarded to this Office a drawing of a Pug Mill. This was approved with the following exceptions.

"The bottom of the Mill, it was observed should be conical in form, otherwise the foundrillo would collect at the bottom of the Mill and close it."

"The arms inserted in the revolving axis should only be at right angles with it at the top."

"The lower ones should point downwards, their angle with the axis becoming more acute as they descend."

A plan of a Pug Mill constructed on this principle was forwarded with the letter from which the three preceding paragraphs are copied.

8 On 7th June 1866, my Secretary directed the attention of the Superintending Engineer to the fact

9 3

fact that a Latrine then recently erected for the use of the men of 2nd Regiment Madras Native Infantry at Vepery, was in use though not provided with a Pug Mill, and information was requested as to the date upon which the Pug Mill would be completed.

9. On 27th June 1866 the Superintending Engineer reported that the Vepery Latrine had been handed over to the Barrack Master, when it was completed (no date of transfer was given*), and he added that he was unable to say when the Pug Mill would be ready. He also stated that an experimental one was about to be erected at the Male Orphan Asylum.

10. On 7th July 1866 the Barrack Master addressing my Secretary requested to be informed as to whether the Pug Mills was to be considered as an absolute necessity and proposed that it should not be so for certain reasons.

11. Colonel Worster suggested that as the whole dry earth system was on trial and might be eventually condemned, the cost of Pug Mills might be avoided. The reply is that the Pug Mill at the Male Orphan Asylum only cost less than 20 Rupees (that built by the Department of Public Works has cost 150.) Colonel Worster stated that the earth mixed with the excreta by

* In Proceedings of Government, P.W.D. No 545 of 25th Feby/67 it is stated that the Latrine was handed over on the 29th January 1866.

The

by the Sweepers would sufficiently deodorize them. He also supposed that the Police would require extra pay for working the Pug Mill. To this it may be replied that the Pug Mill, if properly constructed, need necessitate only a very small amount of physical labor and that by it the Poudrette is rendered perfectly inodorous and much less calculated to cause annoyance in transit through crowded thoroughfares.

12. On 10th of same month (July 1866) my Secretary addressed Colonel Worster and pointed out the importance of supplying a Pug Mill as essential to the perfect trial of the system of dry earth Conservancy and showed how important it was that suitable carts for the removal of Poudrette should be supplied. He also directed attention to the value of the Pug Mill in preventing decomposition and fermentation of excreta in Latrines, which might prove a source of nuisance, even though some earth had been used, and he further showed that when passed through the pug mill, the poudrette should be removed in air tight vessels.

It was also pointed out to Colonel Worster that only was able to attend to the Latrine used by 300 boys at the Male Orphan Asylum. 7 (?)

13. On 24th July 1866 the Officiating Superintending Engineer forwarded a series of objections urged by Mr Gover

10 4

to Mr Gover. as rendering the experimental Pug Mill constructed by the department of Public Works unsatisfactory and promising that another, "very similar to that now in constant use at the "Military Male Orphan Asylum, but with some "improvements in construction; though not in principle, and one third larger was to be erected near the Latrine of the Lines in Vepery. Eight months have since elapsed and the Pug Mill has not been placed near the Latrine. Mr Gover objected to the Pug Mill sent to him in consequence of its vast size, and generally ill construction and pointed out in detail many errors in it.

14. On the day following that upon which the foregoing letter was received, I addressed the Officiating Superintending Engineer and urged the desirability of his having a Pug Mill made with the alterations as to size and details of construction suggested in his and Mr Gover's letters.

15. On 14th January 1867 the Quarter Master addressed Government and represented that no pug mills had up to that date been provided either for the Fort Latrines or that in the Regimental Lines in Vepery

Government, in order No 306, dated 31st idem. ordered the carrying out of the experiment "without further delay".

16. On 15th of February 1867, the Superintending Engineer

the

Engineer solicited sanction for expending 115 Rupees for the experimental Pug Mill and 150 for a new one for the Refery Latrine. Sanction for this was accorded on 25th idem. The Pug Mill has not yet been supplied to the Refery Latrine

17. On 1st March 1867 the new privy was opened at the Fort. The construction of this building is little suited to the dry earth system as the arches through which the vessels are removed and introduced are small and prevent the easy application of dry earth.* But the essential adortion, the Pug Mill, is found on examination to be faulty. It is 6 feet 9 inches in height and 3 feet clear in diameter - Mr Evans being only 1-6 in diameter by 4 feet in height.

18. According to the plan submitted to the Sanitary Commissioner by the Superintending Engineer the height of the Pug Mill should have been 5 feet and the breadth 2'.

It was particularly explained that the arms of the spindle should not be made in the shape of blades, but of square pieces of wood or iron and that the upper ones should be horizontal to the spindle and the lower arms sloped at varying angles both, so as to sweep the conical bottom of the Machine.

The

* This necessary alteration was pointed out in para 8 of a report on the Dry Earth System entered in the Proceedings of 24th February 1866, page 37.

19. The machine constructed in the Fort which is destined to be the model of other Pug Mills is 3 feet in width clear, which causes unnecessary lengthening of the arms of the spindle and increased leverage, and the arms are blade shaped, being only about 1/3 of an inch in thickness which causes to cut through, but not to mix the material requiring to be made into pondrette.

20. But not alone does the Fort Pug Mill differ in point of capacity and construction from the Standard Pug Mill at the Military Male Orphan Asylum, but I have by personal examination satisfied myself that in details of management there is great negligence.

21. In the Military Male Orphan Asylum where the conservancy is admirably conducted the excreta are covered with earth immediately upon being passed into the Latrine vessels and, if required, an additional quantity of earth is added before these vessels are emptied into the Pug Mills. The construction of the latter and various other details connected with the practical working of dry earth system were especially pointed out to the Engineer and Barrack Master.

22. In the Fort, on the contrary, the excreta are simply emptied into the Pug Mill and there allowed to remain decomposing until the earth is added just before the milling process is commenced. Hence the admixture of the two materials is slowly and with great difficulty effected. 4 hours worked for 1½ hours to complete the manufacture of the pondrette in the

Fort

The

For the same process being effected chiefly by one man in less than ¼ of an hour in the Male Orphan Asylum. On fact in the latter institution the Poudrette is already in great part formed before the Mill is used, and in the Fort the whole process of mixing has to be effected under the greatest difficulty as all the urine and faces are at the bottom of the Mill, and the dry earth works down with difficulty, and while the lower poudrette is too damp and consequently offensive, the upper portion is almost pure earth.

23. The valve at the bottom when opened, gave exit to a quantity of offensive ammoniacal Gas and then watery and most offensive poudrette, and on a subsequent occasion at 8 AM. the exit of pure faces and urine which had been emptied into the Dry Mill apparently without any earth.

24. I must point out also that in another respect the arrangements in the Fort were far from satisfactory. The earth used consisted in great part of large lumps weighing ½ lb and upwards, and these would take a long time to become broken down by absorption of water.

25. On the last inspection made by my Secretary, Dr Montgomery, this morning it appeared that no sifted or other earth had been placed in the pans prior or subsequent to these being used by the men.

The

12/6

26. The absolute success of the Dry Earth System is evidenced by the Male Military Orphan Asylum, where under the careful supervision of the Principal, Mr Gover, the new conservancy has answered admirably, and with only a trifling increase of expense. Judged by this Institution, it would be easy to report to the Government of India that the system is an entire success. Judged by the experiments in the Fort, it would be necessary to state that the system is a failure.

Office of Sanitary Commissioner, Madras 22nd March 1867. } (Signed) R. S. Ellis
Sanitary Commissioner for Madras

I True copy/

W. A. Smith Lt
For Secretary Sanitary Commissioner
for Madras

No. 630.

Office of Sanitary Commissioner
Madras, 22 March 1867.

141

From

Surgeon E.D. Montgomery MD
Secretary Sanitary Commission, Madras.

To

Colonel A. J. M. Boileau RE.
Superintending Engineer, 4th Division
Madras.

Sir.

I have the honor by desire of the Sanitary Commissioners to enclose for your information a Memorandum upon certain subjects connected with the experimental trial of the Dry Earth system at the Fort and more especially upon points connected with the provision of the proper apparatus and alteration of existing buildings for the above purpose.

Enclosure
1 Copy of Proceedings of the Sanitary Commissioners of 26th February 1866
(to be returned)

2 As you are aware serious delay has already occurred in carrying out the experiment and you will observe that the Pug Mills now erected are not in accordance with the plans which were approved of by the Sanitary Commissioners the result being that the mixing process is most imperfectly effected with a vast amount of unnecessary labor.

3 Mr Ellis trusts that no time will be lost in getting up Mills of the same pattern as that now in operation at the Male orphan Asylum, otherwise the success of the experiment will be most materially affected.

I have the honor to be
Sir
Your most obedient Servant
Edward Smith Lt
for Secretary, Sanitary Commissioner

Barracks Buildings Officers

No. 2278

Quarter Master General's Office
16th March 1867.

Sir,

I am directed to transmit herewith for the information of the Secretary of State for War a Report from the Sanitary Commissioners on the Barracks at Aldershot, and to request that you will lay the same before Mr Secretary Sidney.

2. I am to add that Mr Secretary Sidney has expressed a wish that the Sanitary Commissioners should be requested to report whether the Buildings recently erected at Aldershot for the Officers of the Royal Artillery are sufficiently well ventilated.

3. I am to request that you will move Mr Secretary Sidney to cause the Plans of the Buildings at Aldershot for the Officers of the Royal Artillery to be transmitted to this Office.

I am, Sir,
Your obedient Servant,
[illegible]
Adjutant General.

The Under Secretary of State
for War.

From Gen: Offr. N. Rs 26.
March 67 G.H.Qrs 7218

To Gen: Offr. N. Rs 25.
March 67 No 5196.

From
The Secretary
Sanitary Commission No 630
dated 22nd March 1867.
Rec'd 25 do

No 5196.

Forwarded to the Adjutant General for information.

Dr. J. W. 1325/67

In Let 25 March 67.

Forwarding for information a Memo upon certain "Subjects" connected with the Experimental trial of the Dry Earth System at the Fort

the cutting edge being sharper.

N: 1219

To The Superintending Engineer
4: Dn.
Madras.

Sir

I have the honor to submit the foregoing in reference to your order N: 4960 dated 14: instant.

I have the honor to be
Sir
Your most Obt. Servant

J. Spencer Captain R.E.
Executive Engineer N. Dist R.

For Lt. Genl
18th March 1867.

N 127.

Submitted to Government for information.

2. It must be admitted that the experiments in Pug Mills in Pondrette have hitherto not succeeded.

3. The Supt Engineer has authorised the Ex. Engr. N. Range Presidency to set up a Mill of the same pattern as that in operation at the Male Orphan Asylum as asked for in Para 3. of the enclosed letter of the Secretary. & the Sanitary Commissioner will meet with a measure which it is hoped, will meet with the approval of Government.

9 April 67

A.T.S. on leave
Supt Engr 4 Dn

S.E. Office 8 April 1867

N 1768

Recd 15 April 1867

Rejd Govt for May
Recd 1325

The Superintending Engineer
4th Dn.

For
The Secretary to Govt
P. W. D.

Dated 8th
Recd 13 } April 1867.

Ex. 4 No 127

Submitting for information Correspondence on the Subject of Pug Mills and stating that the Executive Engineer Northern Range Presy has been authorized to set up a Mill of the same pattern as that in operation at the Male Orphan Asylum in the Fort.

No 1375. Dn. 13

A/155

c. 26 March 1867

Remd as to whether

N: 138.

From The Executive Engineer
N: Lower Bazar Range

17 To

The Superintending Engineer
N: E Division
Madras.

Sir,

In obedience to your order
N: 250 dated 15: instant, I have the
honor to report that the plan received
with the order under reply and herewith
returned is that which I closely
followed.

I have the honor to be
Sir,
Your most Obt. Servant

Fort St. George
16: April 1873

D: Jameson
Captain R.E
Ex. Engineer N: Lower R.

Rec'd Court for Ditto
From 1st Oct 1867

The Superintending Engineer
4th Division

To.

The Secretary to Government
D. P. W

dated 16th April 1867.
received 22nd
Ex: 1 Plan
No. 313

Forwards a letter
from the Executive Engineer
Northern Range Presidency
regarding Pug Mills.

No. 166

No. 1375 - dated 29th April 1867

C. 26 to 29 April 1867 A. 29

No. 556.

From
The Ex: Engr. N. R.

To
The Supt. Engr. 4th Div.

Dated 16th April 1867.
Rec'd. 22nd April 1867.

Enclosures. 2. Ex: 1/38.

Returning Plan of Pug Mill & informing that this was closely followed.

Turn over

No. 313

Forwarded for the information of the Supt. Engr. 4th Division.

1st Secretary's Office, Colombo, 29th April 1867.

A. Blackmore
Secy to Govt

Supt Engr 4th Div
Chandpur
18 April 1867

The cutting edge being sharper

Public Works Department.

No 1375

PROCEEDINGS of the MADRAS GOVERNMENT.

Dated the 6th May 1867.

Read the following

From the Supdg Engineer of NCD 11th Dn Hereinafter Letter of 8th April 67

From the — Dr — 1st Dn (Here enter No. 213 dated 18—)

The Government regret to observe that so much misunderstanding has existed with regard to the constructive details and the management of the plug mill referred to in these papers. The plans furnished by the Sanitary Commissioner, which is stated to have been closely adhered to, is accompanied by no scale nor are the dimensions of the parts given, and the Govt are nowhere informed as to whether

a measure which it is reported to the approval of Government 9 April 67 Abbotsleigh Supt Engr

these necessary details were subsequently furnished for the guidance of the Executive Engineer, and if so, by whom -

2. * Much time has been ~~unnecessarily~~ lost in carrying out the ~~situations of Govt in this matter~~, but His Excellency in Council hopes that the steps which have now been taken by the Supdg Engineer will result in an early determination of the question of whether that ~~dispensary~~ system can be

experimental measures ordered by Govt for the introduction of the dry earth system of conservancy

Mr Richardson's report of 15th ult. [illegible] depend [illegible] by [illegible] [illegible] certain [illegible] [illegible]

be successfully ~~introduced~~ brought into operation throughout the Presidency

J. Pringle
Sanitary Commr
Bldy Depts

Mysa 7/5/67

Pub. Works 1867 Department

Pro. of Govt. for May

No. 1375

Pro. of the Madras Govt.
Dy. 6th May 1867

Passing orders on certain correspondence relative to the construction and management of Peg Mills, in Fort. Saint George.

No. 165 @ 167

26 Mch 1867