M.R.O. 1—30,000—16-10-25.

MADRAS RECORD OFFICE.

Government of Madras.

Judicial **DEPARTMENT.**

G.O. No. 629 — Press Mis.

193-194

Dated 26.4— 19 (R.I.)

26/23

Not to be folded or roughly handled

Proceedings of the Madras Government, Judicial Department, 26th April 1865.

No. 193. Read the following Proceedings of Government in the Military Department, dated 10th April 1865, No. 1376.

Passing orders in favor of the introduction into this Presidency of the "earth system" of conservancy. (Vide Proceedings, Military Department, dated 10th April 1865, Nos. 214—224.)

No. 194. ORDER THEREON, 26th April 1865, No. 629.

Copy furnished to the Inspector General of Jails for information.

(Signed) A. J. ARBUTHNOT,
Chief Secretary.

To the Inspector General of Jails.

Exd. J. Tulloch.

MILITARY DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following papers :—

From the Quarter Master General, Fort Saint George, 26th December 1863, No. 10,137; to the Secretary to Government, Military Department.

With reference to paragraph 4 of my letter, No. $\frac{121}{6421}$, dated 8th August 1863, I have now the honor, by desire of His Excellency the Commander-in-Chief, to submit an approximate Estimate of the cost of introducing the dry system of Conservancy in this Presidency, and to request that the necessary provision of funds may be made in the Budget.

2. It will be noticed that the original cost of providing new buildings or altering old ones, &c., &c., is estimated at Rupees 1,35,371, and that the monthly increase on the present expenditure is put down at Rupees 942-8-0.

3. It has been with some difficulty that these results have been arrived at, but they are not to be depended upon entirely, and should not therefore bar a larger expenditure should it be found necessary when the work is actually taken in hand.

[*Statement*

STATEMENT of the estimated cost of introducing the dry system of Conservancy at the various Stations in the Madras Presidency.

Divisions.	Stations.	Corps.		Cost at first hand for new work or for alterations to existing arrangements.	Monthly cost of old system.	Monthly cost of new system.	Difference. Increase.	Difference. Decrease.	Remarks.
Force.	Kamptee.	.....	Quick-lime for Privies and Urinals...	.....	90	46		44	*Privies, already sanctioned but not yet built, in substitution of old and condemned ones, are :—
			4 Bildars for digging filthpits at 4 Rupees.....	*	.....	16	16		Cost on former Standard Plan. Cost on dry system. Saving.
			44 Toties.....	.....	141	258	117		14 Privies..... 26,880 14,238 12,642
									7 Privies which would require altering..... ... . 140 140
					231	320	133	44	Saving in Privies as per new system..... 12,502
			Deduct saving in lime.....				44		64 Air-tight Receptacles at Rupees 44-14 each..... 2,872
			Monthly increase on Establishments.....				89		14 Iron Trays for Urinals at 11 Rupees each..... 154
									160 Iron Pans (in lieu of glazed earthern ones not procurable) at Rupees 15-8-0..... 2,480
									6 Carts for Iron Receptacles... 759
									3 Carts for the conveyance of Casks with dirty water, &c., at Rupees 126-8-0 each..... 380
									6,645 6,645
									Saving, at first hand, in adopting the new system..... 5,857
Nagpore	Seetabuldee.	.....	Expenditure at first hand ..	*1634	.....	.....	.....		RS. A.
			1 Bildar...	.....	.....	.....	4		*1 New Privy..... 1,106 0
			1 Toty extra to present number.....	.....	.....	.....	5½		3 Air tight Receptacles 140 4
							9½		1 Iron Tray..... ... 11 0
			Deduct monthly saving in lime.....	.....	.....	.....	2		8 Iron Pans..... ... 124 0
									1 Cart for Iron Receptacles..... ... ... 126 8
			Total monthly increase...	.....	.....	.....	7½		1 ,, ,, dirty water.. 126 8
									1,634 4
	Chindwarra.	.....	Expenditure at first hand ...	*1634	.....	.....	7½		*As above.
	Goonawarra.	.....	Do. do. ...	*1634	.....	.....	as above. 7½ as above.		*As above.
Ceded Districts.	Bellary and Ramandroog.	.....	Expenditure on starting.....	*19,339	.....	.....	.....		*Alterations to existing arrangements..... 6,683
			40 Toties for Privies of Barracks at 6 Rupees each.	.....	.....	240	.....		184 Privy Pans for Barracks and Hospitals, at Rupees 15-8-0..... 2,852
			Lime for Soil Pits, &c... ...	.....	.....	45	.....		41 Urinals for do. do. at Rupees 45.... 1,845
			4 Coolies to dig Soil Pits at 5 Rupees each.	.....	.....	20	.....		41 Iron Trays for do. do. 451
			9 Pairs of Bullocks with Drivers for Carts at 15 Rs ...	.....	.....	135	.....		67 Air-tight Receptacles at Rupees 45..... 3,033
			Present Establishment.						146 Privy Pans for married quarters at 15-8-0 2,263
			13 Toties at 6 Rupees	.....	78	.....	.....		20 Air-tight Receptacles for do. at 45 .. 900
			6 Carts with Drivers at 19 Rupees.	.....	114	.....	.....		6 Platform Carts for air-tight Receptacles at 145 each..... 870
			Lime for Privies and Pits ...	.....	83	.....	.....		3 Carts with Casks for dirty water at 145 Rupees each..... 435
					275	440	165		Total cost starting... 19,339
Mysore Division.	Bangalore.	.....	Cost at starting...	*39,228	.....	.....	.....		*Taking up old flooring and laying down floors on dry system..... 600
			No increase in Toties	.....	.....	.....	.....		Arched openings in rear walls..... ... 500
			Hire of Cattle and Driver for 12 Carts.....	.....	.....	180	.....		Carts Sheds and Sheds for Orderly Sweeper with Screen Walls..... 18,500
			Hire of 4 rubbish Carts with Bullocks and Drivers	.....	.....	60	.....		Pits..... 150
			Tar and Lime.....	.....	.....	300	.....		Contingencies..... 250

Statement of the estimated cost of introducing the dry system of Conservancy, &c.—(Continued.)

Divisions.	Stations.	Corps.		Cost at first hand for new works or for alterations to existing arrangements.	Monthly cost of old system.	Monthly cost of new system.	Difference. Increase.	Difference. Decrease.	Remarks.	
Mysore Division.	Bangalore.—*(Continued.)*	....	Old system.							
			Lime.....	.....	350	.....	.....		Adapting Privies and Urinals to new system in Barracks and Hospital.....	2,500
			Water Carts for flushing Privies and Drains...	.....	120	.....	.....		138 Air-tight Receptacles at 60 Rupees each.	8,280
			Scavengers' Carts..... ...	.....	140	.....	.....		93 Urinals at 45 Rupees each.....	3,600
									93 Pans for above at 6 Rupees each..... ...	558
									270 Privy Pans at 7 Rupees each.....	1,890
					610	540		70	12 Carts for removing filth at 200 Rupees each.....	2,400
										39,228
Division.	Wellington.	.....	Original outlay	4107	.....	.....	.....		Adapting present Privies to the new system...	2,047
			New system.						15 Iron Receptacles at 45..... ...	695
			27 Toties at 6 Rupees... ...	.....	.....	162	.....		64 Pans at 15 Rupees each.....	960
			6 Carts to remove receptacles and sweepings at 15 Rs.	.....	.....	90	.....		2 Carts at 200 Rupees.....	400
			Quick lime	.....	.....	125	.....		5 Iron Trays at 11 Rupees.....	55
			2 Permanent Coolies for digging Pits	.....	.....	12	.....			4,107
			Old system.							
			19 Toties {16 at 6 Rupees / 3 at 7 ,,}	.....	117					
			7 Carts.....	.....	115					
			Quick lime.....	.....	62					
			Tar	.....	5					
					299	*389	90		*If the dry system is carried out in full, the cost will be 508-11-9	
Southern Division.	Trichinopoly.	Artillery and Infantry Barracks and Hospital.	Amount necessary for altering existing Privies and supplying necessary Seats, Pans and Urinals...	3,330						
			Cost of constructing 6 Carts.	360						
				3,690						
			New system.							
			Cost of carrying out the new system.	.....	.....	71				
			Hire of Bullocks for 6 Carts.	.....	.....	84				
			Digging pits.....	.....	.....	4				
			Lime for do.	.....	.....	1				
			Total...	.....	.....	160				
			Old system.							
			Present cost of Establishment.....	.....	66	.....	94			
Centre Division.	Fort Saint George. Saint Thomas' Mount.	The introduction of the dry system of Conservancy in the Fortress to be made as far as may be practicable with the present Privies, and as for as existing buildings and space will admit.								
		Barrack, Hospital and family Quarters.	*Original outlay.*	*9,405					*Cost of erecting 11 new Privies.....	5,698
			Monthly cost of new system,						Do. of 22 Receptacles for solid matter ...	770
			11 Bullocks and Drivers for Carts.	.....	.....	159½			Do. of 11 do. for Urinals.....	385
			44 Toties.....	.....	.....	192½			Do. of 88 Pans.....	132
			1,279lbs. of Chunam...	.....	.....	4			Do. of construction of 11 Carts.....	770
						356			Do. of erecting a sked for 11 Carts... ...	1,650
			Cost of old system	.....	81		275		Total...	9,405
	Poonamallee.	Barracks and Hospital.	Original outlay.	*1,680					*Cost of erecting 4 new Privies.....	848
			Monthly cost of new system.						Do. of 6 Receptacles for solid matter.....	210
			2 Bullocks and Drivers for Carts.....	.....	.....	29			Do. of 4 do. for Urinals.....	140
			6 Toties...	.....	.....	26			Do. of 28 Pans.....	42
			364lbs. of Chunam	.....	.....	1			Do. of construction of 2 Carts..... ...	140
						56			Do. of erecting a Shed for 2 Carts... ...	300
			Monthly cost of old system...	.....	25	.....	31		Total...	1,680
	Palaveram.	No alteration of the present system need be made.								

Statement of the estimated cost of introducing the dry system of Conservancy, &c.—(Continued.)

Divisions.	Stations.	Corps.		Cost of original outlay for new works, or for alterations to existing arrangements.	Monthly cost of old system.	Monthly cost of new system.	Difference. Increase.	Difference. Decrease.	Remarks.	
Hyderabad Subsidiary Force.	Secunderabad.	18th Royal Irish.	Original outlay.	*13,602					*For flooring Privies with Asphalte.....	5,433
		Her Majesty's 17th Lancers.							Do. 111 Air-tight Iron Receptacles... ...	3,330
		108th Regiment.	Monthly cost of new system.						Do. 468 Iron Pans.....	3,712
		C Battery 14th Brigade.	19 Carts with hired Drivers						Do. 37 Iron Trays.....	407
		B Battery 23rd Brigade.	and Bullocks at 15 Rs. each.	.....	.....	285			Do. 37 Earthen Pans at 1-8.....	56
		B do. 3rd do.	3 Toty Maistries at 6 Rs.						Do. Ledges of wood for seats...	131
		5th do. 17th do.	each.....	.....	.....	18			Do. Contingencies.....	533
		Family Quarters.	97 Toties at 5-2-3 each	.....	.....	499				13,602
			27 Bildars at 3-6-10	.....	.....	93				
		Cantonment Guards.	3 Peons for general super-							
	Only for Carts and Peons.	2nd Light Cavalry.	intendence of the whole of							
		19th Native Infantry.	the Pits at 5-2-3.	.....	.....	15				
		32nd do.								
		38th do.				910				
			Cost of the old system.....	.....	1,205	.....		295		
Northern Division.	Waltair.	B Battery 20th Brigade Royal Artillery and Veteran Company and Hospital.	Original outlay.	*275					*Re-construction of the European Veteran Company Privy.....	250
			New system.						5 Iron Pans.....	25
			21 Toties at 4 Rupees each.	.....	.....	84				275
			2 Attendants at 4 Rs. each.	.....	.....	8				
			Quick lime	.....	.....	6				
						98				
			Cost of old system...	.....	27	.....		71		
Pegu Division.	Rangoon Thyetmyo and Tonghoo.	2 Regiments of European Infantry and 3 Batteries of Artillery and Hospital and Family Quarters.	Original outlay.	*45,000					* 42 Latrines at 800 Rupees each...	33,600
			Total monthly increase of new system.....	.....	.....	.....		480	126 Air tight Receptacles at 27 Rupees.... ...	3,402
									84 Urinals at 27 Rupees.....	2,268
									336 Pans at 3 Rupees.....	1,008
									For smaller Latrines for Guards with their Utensils.....	1,722
									15 Carts at 200 Rupees each.....	3,000
										45,000

Abstract.

Division.	Stations.	Original outlay in introducing the new system.	Monthly cost of new system.	Monthly cost of old system.	Difference. Increase.	Difference. Decrease.
		To be carried out as far as practicable.				
Centre.	Fort Saint George	9,405	356	81	275	
	Saint Thomas' Mount	1,680	56	25	31	
	Poonamallee	No alteration of the present system to be made.				
	Palaveram					
Southern.	Trichinopoly	3,690	160	66	94	
	Wellington	4,107	389	299	90	
Northern.	Waltair	275	98	27	71	
Mysore.	Bangalore	39,228	540	610		70
Ceded.	Bellary and Ramandroog	19,339	440	275	165	
Hyderabad Subsidiary Force.	Secunderabad	13,602	910	1,205		295
Nagpore.	Saving of 5,857		320	231	*89	
	Kamptee	1,634	9½		7½	
	Seetabuldee	1,634	9½		7½	
	Chindwarra	1,634	9½		7½	
	Goonawarra	1,634				
Pegu.	Rangoon, Thyetmyo and Tonghoo	45,000	3,297½	2,819	480	365
	Total	1,41,228			1,317½	
	Deduct saving at Kamptee	5,857				
		1,35,371				

*Less 44 saving in lime.

(Sd.) F. [illegible] SCOTT, Lieut.-Colonel, *Quarter Master General.*

QR. MR. GENL.'S OFFICE, FORT ST. GEORGE, *26th December* 1863.

6.

With Report from the Controller of Mily. Accounts, 8th July 1865, *C.*

Referred, with letter No. 10,137, to the Sanitary Commission, with reference to paragraph 3 of the Order of Government, No. 1135 of the 6th April 1864, for early consideration and report.

19th July 1864.

From the Quarter Master General, Head Quarters, Ootacamund, 19th October 1864, No. $\frac{423}{9587}$; to the Secretary to Government, Military Department, Fort Saint George.

I have the honor by order of His Excellency the Commander-in-Chief, to submit the enclosed report and correspondence bearing on the introduction of dry earth as a deodorizer in Hospitals and Jails in this Presidency, the same having been called for in Proceedings of Government, dated 22nd April last, No. 1360.

2. The efficiency of the system after being largely tried, is attested by, it may be said, the whole service, there being scarcely a dissentient voice. The reports from Burmah have not been received; but the experience in that country cannot differ greatly from those now presented.

3. Stations falling within the influence of the South West Monsoon, which is usually very heavy, cannot be expected to derive the same benefit as others that are not, because dry earth is not to be had; but where this is found to be the case, the use of tar is an excellent substitute.

4. The question of cost and establishments is the next consideration. On this the reports do not give very definite or satisfactory information. Some Medical Officers think that the existing establishments of Native Infantry Corps will suffice, others ask for more appliances; while all agree that for European Troops additional means are needed. The only apparently reliable data is that afforded by the Physician of the General Hospital, who states as follows:—

"The expense of carrying out earth sewage at the General Hospital is "found to be for each European eight Annas per month, and for each Native three "Annas and three Pies nearly. The gross total of the old system was Rupees 76 "monthly, against Rupees 120 for the new; being an increase of Rupees 44 a "month for the latter."

"Of this one-fifth or Rupees 8-12-9 may be considered as the increased "outlay for 100 Natives, and two-fifths or Rupees 17-9-6 as the increased charge "for each 100 Europeans."

5. If this be taken as a guide, the gross increase of establishment for the Army may be approximately estimated.

6. In conclusion, I am directed by His Excellency to say, that if even without an addition to establishments such marked benefit has accrued from the use of dry earth, nothing but perfect success can be anticipated when its introduction is systematized and promoted by the grant of further aid.

From the Officiating Principal Inspector General Medical Department, Fort Saint George, 6th October 1864, No. 339; to the Quarter Master General.

With reference to the Order* of Government on the subject of "dry earth sewage" in the Latrines of the Hospitals of this Presidency, I have as yet received reports only from the Presidency, Mysore, Bellary and Secunderabad Divisions, summaries of which, I have now the honor to forward for submission to His Excellency the Commander-in-Chief.

* *No.* 1360, 22*nd April* 1864, *Mily. Dept.*

2. The experimental trial thus far made goes conclusively to prove the value of the dry earth system as a deodorizer in this country, and its superiority over that hitherto in use.

3. It will be observed from the report from Cannanore that from the difficulty of procuring earth, sand, not always in a perfectly dry state, has been partially used, and apparently with good results; but no satisfactory opinion upon the point can be offered, until a fair trial of the system has been given in the 102nd Regiment, and the reports from Burmah received

4. Several of the Medical Officers seem to have found little difficulty in carrying on these experiments with the present establishment of sweepers; but I am not prepared to say that the permanent introduction of the system will not be attended with increased expenditure, more especially if it be determined that it is to be carried out in the Hospitals on the Malabar and Burmah Coasts during the heavy monsoon seasons.

Surgeon Major Macfarlane reports that the dry earth system has fully succeeded and can be carried on with the present Conservancy Establishment.

Surgeon Major Blacklock finds that 6lbs. of dry earth is required for a Native Latrine where the earth is laid in trenches and the greater part of the urine drains away. 5lbs. for each man should be deposited in the trench, and 1lb. for each man should be placed in a tub, and the sick compelled to use it as their only urinal; but 17lbs. is required for each European in Hospital.

Clay when available with a moderate admixture of sand is the most suitable quality of earth; 5½lbs. of such earth absorbs exactly 1lb. of water or urine. The expense of carrying out earth sewage at the General Hospital is found to be for each European 8 Annas per month and for each Native 3 Annas and 3 Pies nearly. The gross total of the old system was Rupees 76 monthly against Rupees 120 for the new, being an increase of Rupees 44 a month for the latter.

Of this ⅓th or Rupees 8-12-9 may be considered as the increased outlay for 100 Natives, and ⅔ths or Rupees 17-9-6 as the increased charge for each 100 Europeans.

In a letter to the Deputy Inspector General Mr. Blacklock observes, in reporting on the insufficiency of Carts for removing the soil, "fortunately the dry earth system is so perfect a deodorizer that no inconvenience has been, or is likely to be occasioned by the unwonted retention of the soil in the Hospital compound"—Mr. Blacklock recommends that between the Hospital and People's Park an interchange should be made, of soil, for earth, an excellent suggestion for both, but I understand that some Members of the Committee have objected to permit the soil to be received. As no possible inconvenience, but the reverse, could occur from the use of the soil, and as the Park is supported from public funds, it appears to me that the interference of Government might be legitimately exerted.

In a communication "on sifting the earth," he remarks, "that the earth he receives is almost entirely sand with an admixture of gravel, so unsuitable for Latrine use that 210 lbs. of it are required: even with this earth, however, the Latrines, are kept very free from odour, and the earth system continues to afford me and every one who knows what our Latrines were in former days, the very greatest satisfaction." From trials of pure clay, Dr. Blacklock states that 7 lbs. is equal to 17 lbs. of the best earth found close to Madras. Clay is to be found about 3 miles from the Hospital; 7 lbs. per day for each European and 2½ lbs. for each Native would be sufficient, but the expense of conveyance would be greater than under the present system.

Dr. Donaldson reports that earth sewage in the Vepery Dispensary and Female Orphan Asylum has been quite successful in dry weather, and even in wet, overcame the stench to some degree.

He makes no mention of extra establishment being required.

The Medical Officer of the 27th Regiment at Cuddapah, reports favorably on the system; and apparently the Regimental Toties perform the work, conveying the soil to the neighbouring fields where it is used as manure.

Surgeon Major Linton, at Bellary, considers the old "tar system" preferable; because it is "independent of self-action," which the earth system is not; and concludes by stating "application of tar once a month with the dry earth in small quantities, would answer better, and would not require a larger establishment, than at present. I have adopted this plan and find that it succeeds very well."

Ramiah 2nd Dresser, Cumbum Hospital, works it effectually by means of Hospital Toty.

No Report has been received from the 21st Regiment.

Dr. Mackintosh in charge of Royal Artillery Hospital states "that he has not adopted the dry earth sewage, as no means were supplied for the purpose."

7.

In the Kurnool Jail and Civil Dispensary, it has been found to answer well, and no remark regarding establishment is made.

Assistant Surgeon Arnold, 26th Regiment, Kurnool, reports that the present Conservancy establishment is sufficient for the purpose if a new arrangement of the privy flooring could be effected which would allow of water (used by Sepoys after defecation) filtering off under the floor.

Dr. Ogilvie, of the 30th Regiment, reports that in the Jail Hospital at Bellary, the plan has been found to answer admirably; but in the Regimental Latrine it has in some degree failed from the difficulty of getting the men to use the earth.

Dr. Johnston, Royal Horse Artillery, Bangalore, pronounces earth sewage a failure in his Latrines, from being unable to prevent the admixture of fæces and urine.

Assistant Apothecary Wells, of the Remount, has employed it most successfully. The present Hospital Establishment has been sufficient.

Garrison Surgeon Rogers reports that the faulty construction of the privy prevented him giving it a fair trial.

Dr. Brett, 14th Regiment, pronounces on the very satisfactory working of the system and considers that the only additional expense that may be incurred is the procuring fresh earth, which, he thinks, is not likely to be great.

Dr. Henderson, 33rd Regiment, reports its introduction with good effect, nearly all odour is destroyed and cleanliness is more easily secured; but owing to the liability of the Native using water after going to stool, perfect dryness cannot be ensured.

In the Hospital of A/14th Battery Royal Artillery, the system answered admirably; but failed in Barrack Latrines from the men not carrying out the instructions.

Dr. Rogers on Lock Hospital considers that an extra Toty would be necessary, and arrangements for supplying the earth are requisite.

In the Hoonsoor Hospital it has been attended with success.

16th Regiment, Hurryhur, Dr. Cleveland considers that the system cannot be carried out effectually with the present Conservancy Establishment.

25th Regiment at Mercara, Dr. Harper states that no trial has been made of the new system owing to the impossibility of procuring dry earth during the rains.

6th Regiment, Mysore, Dr. Gibbs states dry earth is at present prepared by the Toties, but a machine for sifting and a shed for receiving soil, until removed by the Conservancy Carts, and for storing dry earth, are required.

In the Tellicherry Civil Dispensary and Jail Hospital it has answered very well, and the present Establishment of servants is said to be ample.

In the 102nd Regiment at Cannanore, the system could not be tried because of the impossibility of getting dry earth there during monsoon. Mr. Young seems to consider an extra establishment will be required.

Acting Garrison Surgeon Pickering at Cannanore reports that the system had not been tried in the Garrison or Lock Privies; but in the Jail wards at night it is found to answer well, even when fæces and urine are mixed.

In the Mangalore Jail and Dispensary, it has had a fair trial, and the results are exceedingly satisfactory. The present Conservancy Establishment is said to be sufficient.

Mr. Nicholson, in charge of Royal Artillery, Cannanore, considers that, with the present system of India sewage, a well tarred tub seems preferable.

Dr. Ashton, 102nd, Calicut, pronounces it perfect. The mass of excrementitious matter and earth had been kept for a week without removal, and at the end of that period proved quite inoffensive.

For the Barracks he thinks extra establishment would be necessary, because the men would doubtless neglect to employ this earth.

Assistant Surgeon Pearse at Calicut considers, that, for the introduction of the system into the Jail at that Station, a very expensive arrangement of troughs would be necessary,* though, in a subsequent letter on the subject, he admits, "that the real necessity is a plan adapted to nocturnal rather than diurnal use," in which case the arrangement so successfully pursued, and without any additional expense to Government, in the Jail at Mangalore, might well be tried here. The earth (or sand) can be brought in and stored by convict labor.

**Amounting 1st year Rupees 1,200. 2nd year 600 Rupees.*

At Cannanore, Garrison Surgeon Pickering and Assistant Surgeon Dickinson report, that, after having the filthy flooring of the former privies dug up and re-placed by layers and charcoal and sand to about the depth of two feet, and the chunam removed from the surrounding walls to the height of four feet and covered with tar, the simple use of sea sand, by no means always dry, was found to meet the two desiderata—cleanliness and freedom from offensive effluvia—alluding to the Latrine of the Hospital of the 13th Regiment, after the introduction of the system, Dr. Pickering adds, "I never saw a Native privy so perfectly clean and free from all offensive odour." The plan appears to be carried out without any additional expense or increase to the regular Hospital establishment, the soil being removed and thrown into the sea by the Toty, who is directed to return with a basket of fresh sand to prevent diminution of the flooring layer.

Secunderabad. Dr. Kellie of the 17th Lancers, having, for the sake of comparison, set aside a privy in which coal tar alone was used, and a second, with merely dry earth which was used daily by twenty or twenty-five men, states that the latter has been found to stop all offensive smell and the mixed soil removed without any stench. In this respect, he is of opinion, it is preferable to the use of coal tar. He considers that, to enable the system to be properly carried out by the men, wooden boxes to contain a supply of earth and suitable scoops are necessary.

Surgeon Major Ranking, after having tried the system in relation to both Europeans and Natives, states that he has formed a most favorable opinion of it. In both privy and urine tubs, provided the earth is used in sufficient quantity, it is perfectly efficient as a deodorizer. He determined by experiment that the contents of a privy tub in use for a whole week, properly supplied from time to time, (after each use, that is,) with earth, was perfectly free from smell when removed at the end of that period; and there is no question, in his opinion that, if the system be properly worked, it is most efficacious. But he considers that the present Hospital Establishment is not sufficient, and that Carts and extra Toties must be employed.

Dr. Stewart has "found it perfectly successful" in the Hospital of the 18th Royal Irish, but considers it cannot be carried out effectually without an addition to the regulated Conservancy establishment.

Surgeon Baillie of the 108th, pronounces in favor of the system, but makes no remark on extra establishment.

Assistant Surgeon O'Leary, Royal Artillery, reports favorably on the system.

Dr. Macleod of the 2nd Light Cavalry, apparently without giving the earth sewage a trial, considers that, under the existing arrangement of Native Hospitals, the employment of earth in supersession of that of tar, is not advisable; nor does he anticipate any advantage from a conjunction of the two, as he has found that tar alone suffices, with the ordinary appliances of cleanliness, to preserve a common privy in a state of perfect salubrity.

Surgeon Williams of the 38th Native Infantry reports that, because of the habits of the Sepoys washing after defecation, the earth system has failed in the privy of his Hospital.

The Assistant Surgeon of 32nd Native Infantry, has used it with very favorable results—no remark on extra establishment.

No. 1573.

CIRCULAR.

MEMORANDUM.

The undersigned has the honor, by desire of the Principal Inspector General, to forward copies of a paper on the efficiency of dry earth as an immediate and perfect deodorizer, for distribution to Medical Officers, with a request that the plan may be tried in Military, Civil and Jail Hospitals, and the result reported at the end of three months for the information of Government. It must be stated whether the new system can be arranged for with the present Conservancy Establishment.

By order,

OFFICE OF PRINL. INSPR. GENL., MEDL. DEPT.
FORT SAINT GEORGE, 12*th May* 1864.

(Signed) W. R. CORNISH,
Secy. to Prinl. Insp. Genl. Medl. Dept.

To the Deputy Inspector General of Hospitals, Madras.

[*The following paper was read before the Society of Arts on the 13th of May last, and was published with other papers on the same subject, in the Society's Journal of May 15th,* 1863.]

ON A SYSTEM OF EARTH SEWAGE BY THE REV. H. MOULE.

In a paper on the "Utilization of Town Sewage," which is contained in Vol. XXIV, Part I, of the *Journal of the Royal Agricultural Society*, Mr. Lawes has written thus :—"No one will "doubt that if the sanitary requirements of the nation could be attained by any system which would "preserve the excrements of the population free from admixture with water, and present them for "use at once undiminished in value by decomposition, and in a portable and innoxious condition, the "land of the country devoted to the growth of human food might, by their application to it, be "greatly increased in its productiveness. The question of the sanitary arrangements of our towns "was taken up by our Engineers before Agricultural Chemistry was much studied: and they have "committed us to plans which, though they effectually remove the noxious matters from our dwel-"lings, must greatly limit the area and mode of their agricultural utilization, and which, at the "same time, have tended to the pollution of our streams. To say nothing of the enormous cost "that would be involved in entirely subverting the present methods of removing the excrements "of the inhabitants of our large cities from their dwellings, it must be admitted that no feasible "scheme has yet been proposed by which this could be accomplished without the use of water. Such "is certainly a great desideratum, but, perhaps, a consummation more to be wished than expected."

By thus placing this extract from Mr. Lawes' paper at the head of that which I am about to read, I would not lead to the expectation of any attempt on my part to prove that, for the removal of the excrements of the inhabitants of our large towns from their dwellings, the scheme I propose is perfectly feasible. Such a proof, indeed, I am quite prepared to give; but so great is the array of prejudice, of self-interest, and, shall I say, of ignorance, against it, that, though I should establish my scheme beyond all contradiction, my proof would not, for any practical purpose with reference to our great cities, have, at the present time, the weight of a feather. It will probably require another half-century of experience to convince the public that the present drainage system, while relieving particular premises and special localities, is at the best but a shifting of an evil, increasing in its noxious character as it goes along from one spot to another, and that even the boasted and extravagant drainage of this metropolis is only a palliation and a temporary relief. The day will come, when, from the increase of the population higher up the river, and equal amount of pollution to that which is now to be withdrawn from it will be poured into the Thames; and when, from the increase of filth, sand, and rubbish poured into them, the main sewers, calculated for the present evil, will then be ineffectual for their purpose. There is only one observation which I would make on my scheme, with reference to its application to large cities in which the water drainage now exists. Mr. Lawes says that the subversion of the present system in favor of any other would be attended with enormous expense. Now, in the establishment of the earth sewage system, no public works are required, whilst the three and a half millions being spent by the Metropolitan Board for the greater efficiency of the public works now existing, would have defrayed double the cost of all private works of the earth sewage system for London; and the manure saved instead of wasted would, on the very lowest estimate, have produced a clear income of £50,000 a year. But enough of this; I will proceed to state

I. The principles of what I have ventured to call the system of earth sewage.

II. The mode of their application in closets, or commodes and urinals.

III. The provision of earth for single dwelling houses, or for large establishments, and for our smaller towns.

I. The peculiar adaptation of various kinds of earth for the complete and economical removal of excrementitious matter consists not in the mere fact that such earths are good deodorizers. This has long been observed and known. But it was not known, until a very recent period, that, under certain circumstances, the quantity of earth required for this purpose is very small. When the contents of a vault or cess-pool have been allowed to ferment and generate offensive gases for months and years, it has been found that the proportion of earth required to destroy its offensiveness is immense. If, however, the evil be taken in detail, and the remedy applied at once, the reduction in the quantity required is incredible until tried. Three half-pints of earth dried in the atmosphere and passed through a sieve with a mesh of one-eighth or one quarter of an inch, is amply sufficient

for each use of an earth closet. It at once stops emission of offensive smell ; it prevents fermentation ; and these results are so complete and lasting, that either the same day, or after a week, or even a longer period, the mass of soil and earth can be removed from the room and the premises without any offence. If when thus removed a coarse sieve be used, the earth which passes through the sieve will in a day or two be dry enough to be used again, while all that which will not pass through, being thoroughly mixed together by a spade, or in any other way, forms a highly concentrated and inoffensive manure. Or, if on removal the whole mass be thus mixed together and left to dry, it may with equal absorbing and deodorizing efficacy be employed in the closet again. And so remarkable is this capability of earth for the absorption of such substances and gases, that I have myself subjected it to this repeated action ten times.

Here, then, in the case of a single closet is exactly that which Mr. Lawes requires. Indeed, if comfort and sanitary considerations be taken into the account, there is more than he requires ; for, together with the entire suppression of fermentation and of the escapes of noxious and offensive gases, there is here "the preservation of the excreta free from admixture with water ; and they are "presented at once undiminished in value by decomposition, and in a portable and innoxious "condition."

II. As to the mode of application of earth in closets and commodes, it is obvious that it can in many cases be done without the use of machinery ; and thus, in fact, it has been applied in not a few cottages, and amongst other public institutions, in the workhouse school of 55 children at Bradford-on-Avon. A box of dry earth, with a scoop, is placed in the privy, and the children are required to throw in a scoopful on each occasion of its use. This has been attended with such complete success, that the Vice-Chairman of the Board of Guardians of the Bradford Union states that, where all before was "noxious pungency," there is now no offensive smell. And as to the quantity of earth used, he states that, from the repeated use of the same earth, the whole mass at the end of five months amounted to no more than 1½ ton, but that a mass of valuable manure.

It soon became clear however, that in such cases self-action would be advisable, and in some cases almost a matter of necessity, whilst an application of the earth by machinery would be far more convenient, and might be more immediate than by hand. Accordingly, a very simple contrivance was tried for a time, which, however, soon in its use betrayed two or three defects. In consequence of these defects, Mr. James White, of Dorchester, applied his mind with much ingenuity and patience to a subject attended with far more and greater difficulties than any one who has not gone into it can conceive, and has produced in the patent earth closet of his manufacture that which, while almost equally simple with the former plan, obviates all its defects, and is, in my estimation, perfect. In its simplest form it may be thus described. At the back of the commode or closet is a box or reservoir filled with dry earth, at the lower part of which is a revolving hopper with four compartments, each of which is capable of containing the required quantity of earth. By a very simple piece of machinery the weight of the body in sitting down turns this hopper and fills the compartment with earth. On the person rising from the seat, the hopper revolves one quarter of its circumference, and throws the earth by means of a shoot directly on to the soil and under the pan. The same operation can, of course be performed by the use of a lifting handle, and in this case the application can be instantaneous, an advantage which, in sick rooms and in Hospital wards, appears to me to be incalculable. The excreta and earth together can of course be received, in the case of a commode, in a bucket, or from a fixed closet passed through a pipe or shaft into a receptacle below, from whence its removal would be the most practicable. There is another form of closet, consisting of a set of knives in the form of a screw, which mixes the mass and at the same time cuts the paper to pieces, and forces the whole out in a perfectly inoffensive form. But the description of this I leave to the manufacturer. As to the use of earth in urinals, no machinery is necessary, and its efficacy is complete. A truck or pit, eighteen inches or two feet deep, and filled with dry earth, occupies the space both under the standing place and three or four feet in front of this. The standing is formed of an iron grating, the continuation of the iron railing which forms the barrier. All offensiveness is thus prevented and a valuable manure produced. Public urinals on this plan in the metropolis, and in large towns, and at our Railway Stations, instead of the nuisances such urinals now are, might be completely inoffence and innoxious, and might be made to pay. One ton of earth or of London clay would be sufficient for 1,000 uses, and dried at a temperature under boiling heat, might be used for the same purpose and with increase of value again and again.

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III. In speaking of the supply of earth for closets, &c., I will take first the case of a detached house with a garden. All that I, in such a case, have to do is to take a few barrow loads of earth from my garden and allow it to lie for a time to dry. When used sufficiently in the closets, instead of being a loss to the garden, it is returned, as money borrowed with interest. It has become a manure, highly concentrated, and so easy of application that a handful or two may be equal to a barrow load of ordinary manure. This I have proved by many experiments. If from this we rise to a large establishment, say a Barrack with two Troops of Cavalry, the same farmer who supplies straw for the Horses, as soon as he sees the value of the human excrement, and can have the opportunity of removing it, will supply earth for closets. He will not grudge the earth from his fields, which is to be returned to him after a time equal in value, as it may be made to superphosphate, or crushed bones, or guano. But if his soil be light and thin, and he have clay in the neighbourhood, then he can easily and cheaply procure that substance, and if he mix it with such ashes as he can get, or with street sweepings, he obtains by the admixture a most valuable manure, exactly suited to his land. Or if, in the last place, we take the case of a town which either is in such a position that it cannot be drained, or the inhabitants of which being unwilling to enter on the expensive, and now doubtful, system of water drainage, should be disposed to adopt the earth system, a company could provide, according to the circumstances of the neighbourhood, clay, peat, earth, silicate of alumina, or any other earth or sub-soil, except chalk or limestone, and adding to it, if they please, soot or any other fertilising materials, they might send it with as much ease as they send artificial manure to those parts of the country which manure prepared from any of those earths and substances would best suit. For instance, the manure of London, instead of being either wasted in the sea, or, not much better, wasted on a few thousand acres in the marshes of Essex, if mixed with the clay which is everywhere at hand and with the soot and some ashes and street sweepings, might convert the sandy heaths to the west and south-west into fruitful pastures and corn-fields. There would, in the one case, moreover, be no transfer, as there is in the other, of the locality of malaria and offensive smell from the town to the country. And, whilst the whole neighbourhood of the Essex marshes will abominate the daily influx into those marshes of a lake of filthy slush, the most offensive part of that slush, freed from the water and converted by the earth into an inodorous and valuable fertiliser, would, by the owners and occupiers of the heaths of Surrey, Hants and Dorset, be not welcomed but readily purchased.

MEMORANDUM BY THE PRISON COMMITTEE.

The practice of using dry earth to deodorize excrementitious matter has been in use in some of the Punjab Jails for many years, from whence the system was adopted by the Inspector of Prisons in Bombay for the Jails in that Presidency. Dr. Wiehe speaks highly of its perfect success in his Rules for Conservancy lately published, see page 69 paragraphs 9 to 14.

The Prison Committee having personally tested the extraordinary efficacy of dry earth as a deodorizer, when sprinkled or sifted over either fœcal or urinous matter (the experiment having been lately tried in the Allipore Jail and Calcutta House of Correction), beg to recommend its universal adoption, not only in Barracks, Hospitals, Jails and all Public Institutions, but in Schools, and private families ; and at the same time strongly urge the abolition of lime, charcoal, ashes or any other substitute, which do not have the same direct and *immediate* effect as dry earth. With this object in view, they recommend the dissemination of the above paper, as widely as possible, being convinced that, wherever the plan is tried, it will never be given up.

(Signed) A. A. ROBERTS, C. S.,—*President.*
(,,) H. L. ANDERSON, C. S.
(,,) R. S. ELLIS, C. S.
(,,) JOHN STRACHEY, C. S.
(,,) J. W. SHERER, C. S.
(,,) F. J. MOUAT, M. D,
(,,) CHAS. HATHAWAY, M. D.
(,,) JAS. PATTISON WALKER, M.D
(,,) T. FARQUHAR, M. D.
} *Members.*

CALCUTTA, 29*th March* 1864.

(A true Copy.)
(Signed) W. R. CORNISH,
Secy. to Prinpl. Insp. Genl. Medl. Dept.

From the Officiating Deputy Quarter Master General, Fort Saint George, 15th July 1864, No. 6674 ; to the Principal Inspector General, Medical Department.

Transferred to the Principal Inspector General, Medical Department, with a request that the result of the experiments ordered may be communicated as soon as possible. The Commander-in-Chief thinks it of importance that, if good, the system should be adopted at once.

From the Officer Commanding Hyderabad Subsidiary Force, Secunderabad, 5th July 1864, No 217 ; to the Quarter Master General, Ootacamund.

I have the honor to forward herewith original letter* No. 195, dated 29th June 1864, from the Deputy Inspector General of Hospitals Hyderabad Subsidiary Force, recommending that the plan of using dry earth as a deodorizer, may be tried in the different Regimental Latrines and reported on after three months, and with reference to your memorandum† No. 5148, dated 23rd May at foot of Order of Madras Government, No. 1360, dated 22nd April 1864, I have to request that you will inform me whether the experiment is to be carried out in the Regimental Latrines as well as in Hospitals.

* *With printed Circular from Secretary to Principal Inspector Genl. (to be returned.)*

† *Forwarded to the Officer Commanding Hyderabad Subsidiary Force for information ; a Circular has been issued by the Principal Inspector General, Medical Department, directing the trial of "earth Sewage" in Hospitals, and a report on the subject to be submitted after three months' experience of the new system.*

2. With regard to the suggestion made in the third paragraph of the letter from the Deputy Inspector General, I consider the arrangement proposed to be very good, and request your sanction for its being carried out.

3. The privies alluded to in the fourth paragraph are attached to the range of Quarters occupied by the Officers Royal Artillery, and are built at a little distance from the Quarters—a requisition for doors to these privies has already been forwarded to the Executive Engineer.

From the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad, 29th June 1864, No. 195 ; to the Officer Commanding Hyderabad Subsidiary Force, Secunderabad.

With reference to the accompanying Circulars* forwarded for my information by the Principal Inspector General, Medical Department, and communicated by me to all Medical Officers, for adoption in their respective Hospitals, I have the honor to suggest that the same may be notified to the Officers Commanding the various Regiments of the Force for adoption in the Regimental Latrines.

* *Nos.* 1573 *and* 1831.

2. I have lately visited some of these latter buildings, and in most cases, can testify to the cleanliness observed, which is much enhanced by the free use of coal-tar.

3. The urine tubs however, give off a vast effluvia ; this might be considerably remedied by a tin-saucer-shaped cover to fit the pail, freely perforated with holes, and filled with charcoal, which, I think, would be productive of the best results.

4. While on the subject, I desire to notify the extremely dirty state of the privy of the Officers of the Artillery at Trimulgherry, it is evidently the resort of Natives. If not required for the purpose for which constructed, I would suggest that the entrances be closed.

From Surgeon Major A. Blacklock, Physician, General Hospital, Madras, 29th July 1864, No. 361; to the Deputy Inspector General of Hospitals, Presidency.

I have the honor to enclose to you, for information, a copy of a Report which I addressed yesterday to the Secretary to the Sanitary Commission, Madras, on the trial which has recently been made of the earth sewage system in the General Hospital.

Report on a trial of the earth sewage system in the General Hospital, Madras.

Under the designation of General Hospital at Madras, there are at present Her Majesty's European Regimental Hospital and the Civil European General Hospital ; and in the same compound there is a Military Hospital for Sepoys and Lascars, a Hospital for Civil male Natives and one also for females of every class. The European Regimental Hospital, situated in the upper story, has two Latrines on the same floor, one at the North-west, the other at the North-east angle of

the West-wing. The Civil European Latrines, also two in number, are immediately below the European Regimental Latrines, and the sewage from the upper Latrines can be removed only by passing it in buckets into the lower Latrines by a trapped aperture in the ceilings of the latter. Each of these four Latrines has four seats, or sixteen in all, and they have to accommodate daily about 200 men.

3. The Latrines of the Native Hospital are three in number, one for Sepoys and Lascars, one for male Civil sick and one for women ; all these have walls of bamboo matting with chunam floors. The excreta are passed into a trench twelve inches wide and twelve inches deep, extending the whole length of the floor close to the rear wall of each building. The length of each of two of these trenches is thirty feet ; the length of the other trench is twenty feet.

3. Prior to the introduction of the earth sewage system, the European Latrines had a glazed pan below each seat, and an aperture at the back of each for the removal of the pans. The pans after being used were emptied into tarred tubs placed in a small room behind the seats. These tubs were emptied morning and evening into an iron cistern Cart, the Cistern of which could be tightly closed by a screwed down plate, and the contents were taken to a Farm in the vicinity of Madras. In the Native Latrines the excreta were daily flushed by chatties of water into a large tub placed in a pit immediately behind each Latrine. These tubs were, like the tubs in the European Latrines, emptied into the iron cistern Cart morning and evening.

4. On this old fashioned plan the stench was very great ; and, at the time the tubs were emptied into the carts, almost overpowering to those who did the work. The European had always a worse odour than the Native Latrines, partly because the alvine excretions of Europeans have almost always a greater tendency to rapid decomposition than those of Natives ; and partly because the external air had less freedom of access to the European Latrines, owing to their being built of stone and lime with too few apertures, while the Native Latrines were of very open matting with considerable space between walls and roof The chunamed walls retained the odour tenaciously, while the Bamboo matting remained comparatively inoffensive.

5. The earth sewage system which was to supersede the old filthy slopping plan of management was begun at the request of the Honorable the President of the Sanitary Commission of Madras, by trying it in the upper and lower European Latrines at the North-west angle of the Hospital wing on 12th June 1864. On 22nd June, the plan was introduced into the upper and lower European Latrines at the North-east angle. On 22nd June it was extended to the Latrine of the Native Military Hospital, and on 23rd June to the two Latrines for males and females respectively in the Civil Native Hospital, which is entirely under charge of Dr. Paul.

6. To those who have encountered the opposition of the lower classes of any country to the introduction of new plans of any kind, the necessity for the change from wet to dry being extended only gradually through the Hospital will be apparent. The patients were indifferent to the change ; but the Toties objected to it, wrangled over it and did their best for some days to thwart it. Two were dismissed. The earth plan was soon found to be easily carried on, and free from offence, and opposition ceased.

7. The first and most important point to determine in commencing the earth system in this country was the quantity necessary to confine completely the odours from human excreta. The Reverend Mr. Moule states in his paper on earth sewage, re-printed in Circular Memorandum, No. 1573, dated 12th May 1864, by the Secretary to the Principal Inspector General Medical Department, that a pint and a half of dry sifted earth is sufficient for each use of a close stool. A pint and a half of the dry clay earth from the People's Park weighs two and a half pounds, and is in my experience just enough to completely absorb the urine—eight fluid ounces, passed at stool by the generality of Native adults, but it will not to a certainty envelope the fæculence at the same time and retain the odour also. Neither is that quantity nearly enough for one use of a close stool by a European in India unless he is in high health and taking plenty of exercise. In sickness among Natives the intestinal excreta do not undergo any very offensive change, till several hours after being voided. But it is very different with the excreta of European sick in India. The European also passes a greater weight both of solids and fluids and when in Hospital voids the whole into Hospital utensils. The Native on the contrary not only passes less solid and fluid, but when in Hospital it is found to be impossible to make him pass more than a moiety of the latter in the latrines or urinaries. The rest is deposited promiscuously. In the European Latrines, too,

almost every drop of urine is received into tubs. In the Native Latrines not above one eighth of the urine goes into the tubs placed there. Good part of it is deposited in the trench, but only to leak into the earth at the bottom or to run off and be absorbed into the earth outside.

8. Each sick Native and European passes on an average very nearly two alvine evacuations daily.

9. Six pounds of dry earth is enough for a Native Latrine where the earth is laid in trenches and the greater part of the urine drains away. Five pounds for each man should be deposited in the trench and one pound for each man should be placed in a tub and the sick should be compelled, if possible, to use it as their only urinal. If the earth in the trench is moved occasionally during the day, so as to ensure the covering of deposits, a complete change of the earth in the trench need not be made oftener than once in 24 hours.

10. Seventeen pounds of dry earth is found to be necessary for each European in Hospital. Granting that forty ounces of urine (measure nearly equal to weight) or two and a half pounds are passed by each man in 24 hours, and this is about the quantity, thirteen and three quarter pounds of dry earth will be needed to convert it into a paste. This paste will be ample to envelope the fæces also, but the mass will be so moist as to be still somewhat offensive. The rest of the 17lbs. of earth or 3¼lbs. will therefore be required to cover the mass and keep it from becoming offensive.

11. The earth is of the most suitable quality when it is composed of clay, with a moderate admixture of sand, to allow it to be easily pulverized when dry, and to hinder it from being too adhesive and difficult to raise with a spade when wet. Five and a half lbs. of such earth absorbs exactly one lb. of water, or urine, and the mixture forms a pretty tenacious paste, capable of forming an air-tight envelope for any decomposing animal matter.(a) Gases do not readily form in it nor escape from it, but it exhales a powerful odour of the animal matter it contains, the moment that the moisture permeates to the surface. As this surface moisture has free scope for decomposition it should be covered with a little dry earth as often as it appears. For the same reason a small quantity of earth should always be sprinkled on the mass after it has been emptied from the tubs into the Cart.

12. The state of firm paste is the best for the mass of mixed earth urine, and fæculence to be in; provided, as I have said, its surface is dry. Decomposition in the interior is then at a stand. But if too much earth is mixed with the mass, oxidation with the atmosphere is permitted and the mass exhales an odour of strongly heated flannel. That empyreumatic animal odour is characteristic of animal excreta dried in dust, and is more offensive to the throat from its acridity than in moist decomposition to the nostrils. It is this empyreuma from slow animal oxidation which has been supposed, on good grounds, to be one great source of Dyphtherite, and possibly of some still more serious affections.

13. The following table calculated at the rate of 6 lbs. of earth for each Native, and 17 lbs. for each European, gives the number of lbs. per 100 men and the number of Carts required to convey the quantities.

At six pounds for each Native.

	Men.	lbs.	Carts.	lbs.
For	50	300	¼	27½
	100	600	½	54½
	200	1,200	¾	109
	300	1,800	1¼	64¼
	400	2,400	1¾	109½
	500	3,000	2¼	54¾
	600	3,600	2¾	,,
	Europeans at seventeen pounds for each man.			
	100	1,700	1¼	65¾
	200	3,400	2½	131½
	300	5,100	3¾	191¼
	400	6,800	5	255
	500	8,500	6½	nearly.
	600	10,200	7¾	55¼
	700	11,900	9	119
	800	13,600	10¼	183
	900	15,300	11½	247
	1,000	17,000	13	nea.

(a) A number of trials with weighed quantities of earth in recently passed stools, each with the usual average quantity of urine, proved that 5½lbs. of earth is not more than enough for one use of a close stool by a European in a Hospital in India. The quantity of earth for each varied from 7½lbs. to 11b. When 7½ or 7lbs. were required for one use of the Pan, the patient had had a purgative. Half a pound to one pound of urine was usually passed with a morning evacuation in the experiments, I made. The quantity was generally close on a pound, and sometimes about it.

14. Seven parahs of common clay earth make a Cart-load. The earth is little increased in bulk by the addition of the excreta, but the mass returned from a European Latrine is about one-seventh heavier than the original dry earth, or each Cart-load should be heavier by about 200 pounds.

15. The expense of carrying out this plan in the Latrines of European and Native Hospitals in this Country is as follows:—the calculation has been made with great care by Mr. Harvey, Assistant to the Professor of Chemistry.

Europeans..... 200.			
Pay for one Toty at Rupees 7 per month...	7	0	0
Six Toties at 6 Rupees do.	36	0	0
For digging earth to 1¾ men at Rupees 8 per month per man.....	14	0	0
Two pairs of Bullocks with Cart and Driver at 12 annas per day per pair for 30 days.....	39	4	0
To cover wear of spades, scoops, &c.....	3	12	0
Total...	100	0	0

Or Annas eight per man per month.

Natives..... 100.			
Pay for two Toties at Rupees 6 per month per man.....	12	0	0
For digging earth.....	2	0	0
Cart-hire per month.....	5	12	0
To cover wear of spades.....	0	4	0
Total...	20	0	0

(b) Or Annas three and Pies three nearly, per man per month.

16. The cost of the old system was Rupees 76-0-0 monthly, as per margin. The expense of the new system is Rupees 120-0-0 monthly or Rupees 44-0-0 more than the old plan; of this sum one-fifth or Rupees 8-12-9 may be considered as the increased outlay for 100 Natives and two-fifths or Rupees 17-9-6 as the increased charge for each 100 Europeans.

1 *Toty at Rupees 7*.....	7	0	0
3 *Toties at Rupees 6 each*..... ...	18	0	0
2 *Cistern Carts at Rs. 25½ each*...	51	0	0
Total ..	76	0	0

17. This outlay might be diminished somewhat by drying the earth wetted in the urine tubs and using it again and again, as recommended by the Reverend Mr. Moule. But observation shows me that only about half a Cart-load of earth would be saved daily by this plan for four days out of five, and I think I would not be justified in recommending a saving in this way at the risk of the first case of Cholera that may occur in the compound, having its origin attributed to stale urine.

18. More economy might be hoped for were it possible to keep urine and fæces entirely separate, so that the former could be taken to the suburbs in a Cistern Cart, while the latter only would require to be mixed with earth. But I am convinced that such separation could not be carried out steadily, even if all the sick were well educated, intelligent people, with complete control over their movements, and therefore can never be hoped for in Hospitals where the generality of the inmates are not only not very intelligent, but are frequently also very careless. Some readers of the paper by the Reverend Mr. Moule have been led to believe that his system can be carried out satisfactorily with only a small quantity of earth. It may be so in England where the temperature will admit of frequent use of the same earth; but here, economy of the kind cannot be safely or even comfortably attempted, owing to the rapidity of decomposition; and although the products might, in general, be very harmless, we cannot be sure that they would not at times, under some atmospheric disturbance, become very virulent and cause more loss in one day than could be re-placed by the price of hundreds of Carts of earth. My advice therefore is to be liberal with earth.

(b) NOTE.—The cost of hire of Carts and Bullocks has been estimated for the distance from the People's Park Pits to the Hospital, a distance of only about three quarters of a mile. An increase in Cart-hire will have to be provided for if the distance is greater.

19. I have only to add that a fourth more earth than is actually required daily should be brought in each day during the dry months; and this fourth should be stored for the wet season. In Burmah and the Western Coast nearly twice what is required each dry day would have to be brought to Hospital for use in the rains.

(Signed) A. BLACKLOCK, Surgeon Major,
Physician, General Hospital.

MADRAS, 28*th July* 1864.

From Surgeon Major A. BLACKLOCK, Physician, General Hospital, Madras, 2nd August 1864, No. 442 ; to the Deputy Inspector General of Hospitals, Presidency.

I have the honor to enclose to you a Report on the sifting of earth for Latrines, for transmission to the Sanitary Commission, through the Principal Inspector General Medical Department.

Report on the sifting of earth for Latrines.

On 9th August 1864, I was requested by the Honorable R. S. Ellis, C. B., President of the Sanitary Commission, to make a trial of sifted earth in the General Hospital Latrines ; on the 25th August, I received the sieve, and on the same day the sifting was commenced. The earth I was then, and am now, obtaining from the Contractor for Carts and from the People's Park was, and is, almost entirely sand with an admixture of gravel, and so unsuitable for Latrine use that twenty-four pounds of it are required for each European. Sifting removes from it one-eighth by weight of coarse gravel, but does not improve it otherwise in the slightest degree.

The effects of sifting in improving earth for Latrine use cannot be determined by any such experiment, and I must, therefore, postpone deciding on the value of sifting, till I can obtain earth suitable in itself for Latrine purposes.

I have been making trials of comparatively pure clays, and find that two pounds of such clay absorbs one pound of water as completely as the same quantity of fluid is taken up by six pounds of the best earth. I have hitherto tried, seven pounds of this clay is equal for Latrine use to seventeen pounds of the best earth found close to Madras. Could I obtain such clay, only seven pounds per day would be required for each European, and two and a half pounds for each Native. The only objection to it is, that it so tough when wet as to be difficult to work. The nearest place from which I can procure it at present is Ineveram, about three miles from the Hospital. The price is eight Annas for a Cart-load of one thousand pounds. The cost of fifty-two Carts of this earth for a month of thirty-one days for two hundred Europeans and one hundred Natives would be Rupees 26 ; pounding, not sifting, would be required. Two Carts would be to be provided to remove pondrette ; each would cost Rupees 22. Therefore Rupees 70 would be the cost for getting rid of the soil of the Hospital. The Toties could do the pounding.

Even with the unsuitable earth we have at present, the Latrines are kept very free from odour, and the earth system continues to afford me, and every one who knows what our Latrines were in former days, the very greatest satisfaction. In private, I have tried almost every obtainable deodorizer in close stools, but none have acted so perfectly as dry, or even damp, earth. All the Chemical deodorizers are objectionable for the purpose, as, although they put away the bad odour at the moment of application, they soon permit decomposition to re-commence, and the new odour is often worse than the first. The earth on the contrary not only at once effectually arrests decomposition and its bad odour, but also never allows putrefaction to commence again till the mass is wetted. On account of temporary difficulty in obtaining sufficient carriage, many large tubs of pondrette have sometimes been detained for several days in rear of the Latrines, and I have sometimes been asked by strangers, if these were tubs of *fresh* earth ready for use ; so free were they from odour. Indeed, I consider the earth system for Latrines the greatest boon that has ever been conferred on this Hospital.

(Signed) A. BLACKLOCK, Surgeon-Major,
Physician General Hospital.

GENERAL HOSPITAL, MADRAS,
2nd August 1864.

From Surgeon Major A. BLACKLOCK, Physician, General Hospital, Madras, 12th August 1864 No. 393 ; to the Deputy Inspector General of Hospitals, Presidency.

With reference to your letter, No. 2313, of 8th instant, enclosing memorandum, No. 2518, o 6th instant, from the Secretary to the Principal Inspector General Medical Department, regardin

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the Contract for the removal of Latrine soil from this Hospital, I have the honor to enclose, for your information, a copy of letter, No. 391, which I addressed to Thomas Pritchard, Esquire, on the 11th instant, and a copy of his reply just received.

2. The present Contract is not working satisfactorily. In fact this Establishment has never been out of trouble since it commenced. A very insufficient quantity of earth has been delivered ; and, had there not been many Cart-loads in store on the 1st of this month, the Latrines would have been in a very bad state. That store of earth is nearly exhausted, and, although from two to three tubs full of soil above what the Carts should fairly carry away have been placed on them daily, seventeen tubs of filth will have accumulated by this evening. Fortunately the dry earth system is so perfect a deodorizer, that no inconvenience has been occasioned, nor is likely to be occasioned, by this unwonted retention of soil.

3. While earth was brought from, and the soil was carried to, the People's Park, there was the utmost regularity and perfection in the working of the new Latrine system, and the discontinuance of the exchange of good offices between this Hospital and the Park has been a serious loss to the latter. The want of sewage, too, will be very apparent in the Park when the vegetation has exhausted the old nutritive materials in its soil, and that time cannot be distant. It would therefore be good for Park and Hospital were an arrangement made for the removal of the sewage to the Park as formerly.

From Surgeon Major A. BLACKLOCK, Physician, General Hospital, Madras, 11th August 1864, No. 391 ; to THOMAS PRITCHARD, Esq.

Your Agent, Arcot Veerasawmy, having just informed me that he cannot supply more than two Carts once a day to bring earth to, and remove soil from, the General Hospital, unless he has a written order from me, I have the honor to quote for your consideration paragraph 2 of Memorandum, No. 2518, which I received on the 8th instant, from the Secretary to the Principal Inspector General Medical Department.

"In the contract concluded on the 1st of this month, Arcot Veerasawmy, the Contractor, has engaged to supply two Carts daily for the General Hospital ; and, though not stated, it was intended to be used as often as required. Should Veerasawmy demur to this view, the Deputy Inspector General will report the same to this Office, in order that the contract may be cancelled."

From Veterinary Surgeon T. PRITCHARD, Body Guard ; to Surgeon Major A. BLACKLOCK, Physician, General Hospital, Madras.

I have the honor to acknowledge the receipt of your letter, No. 391, of the 11th instant, and in reply to state that, when tenders are invited for night soil Carts, it is always understood that each Cart is to make one trip in twenty-four hours, as is the case with those used in the Fort, Vepery Infantry lines, and other places.

From August 1860 to February 1864, I supplied one Cart every night to the General Hospital. In March following, it was considered desirable to have the ordure removed during the day also, when the Cart then in use was not required to make two trips daily ; but I was asked to supply a second Cart at Rupees 25-8 a month, which was done till 30th June, when the dry Conservancy was introduced.

Observing in the Fort Saint George Gazette, that the Secretary to the Principal Inspector General, Medical Department, called for tenders for two Carts, I concluded they were to re-place those sent by me previous to the removal of the night soil to the People's Park ; and I desired my Agent, Arcot Veerasawmy, to send in a tender for Rupees 22 per Cart (Rupees 3 less than I used to get) which was accepted.

Having shown that the Contractor has acted up to his contract, I have only to state that, should the Principal Inspector General, *still* deem it necessary to cancel it, there will be no objection raised to his doing so.

No. 2645.

MEMORANDUM.

The Deputy Inspector General of Hospitals Presidency is requested to report on this subject ; and he will be good enough to offer any suggestions that may occur to him. *To be returned.*

(Signed J. SHAW,
Offg. Princ. Inspr. Genl. Medl. Dept.

FORT SAINT GEORGE,
19th Aug. 1864.

From Surgeon Major BLACKLOCK, Physician General Hospital, Madras, 20th August 1864, No. 413 ; to the Deputy Inspector General of Hospitals, Presidency.

In reply to endorsement, No. 2591 of 15th instant, on letter No. 266* of 12th instant, from the Honorable R. S. Ellis, C. B, President Sanitary Commission, to J. Shaw, Esquire, F. R. C. S., Officiating Principal Inspector General Medical Department, I have the honor, with reference, to paragraph 2 of that letter, to submit to you, the subjoined tabular view of the additional number of Toties required for 200 Europeans and 100 Natives in the General Hospital by the introduction of the earth sewage system.

* *Herewith returned.*

	Toties for wet system.	Toties for earth system.	Additional Toties required by earth system
2 European Latrines in upper story...	3	3	None.
2 European Latrines in lower story and 1 Native Military Latrine... ...	2	4	2
2 Latrines in Civil Dispensary...	1	2	1
Total increase of Toties for earth system for 200 European, and 100 Natives	...	...	3

No additional Toty has been required in the upper story of European Latrines because the Regimental Toties do not assist in moving earth or putting pondrette into the Carts.

As seven Toties are more than sufficient for four European Latrines at present, 18 Toties should be sufficient for the twelve European Latrines when they are completed.

2. Two Carts are at present supplied by Contract, at Rupees 22 each, for the service of the abovementioned Latrines. These Carts come once a day to Hospital, one in the morning, the other in the evening. They bring earth and remove pondrette. Two Carts are not sufficient for the purpose. Four cart-loads of earth are required daily. Three of these are for the day's supply. The other cart-load should be stored for rainy days. Three carts of pondrette should be removed daily.

3. Twenty-one parahs of dry earth are required daily for 200 Europeans and 100 Natives. At least seven parahs should be placed in reserve daily.

4. After careful observation, I have concluded that there should be one earth and pondrette shed for the Civil Division of the Hospital, and one for the Military.

5. The present Dead-room would make a good earth store if extended to the west. This extension would make it nearly central in position between the west and centre wings, and it would supply four Civil Latrines at its west end and two Civil Latrines at its east end.

6. The earth shed for the Military Division should be made out of the General Hospital Serjeant's present quarters ; the old Native guard-room and old gate-way, all adjoining. This block would be nearly central between the centre and east wings, and would supply earth for two Military Latrines of centre wing and four Military Latrines of east wing.

7. The above plan would leave no room for a Dead-house ; but, as there should be one Dead-house for Civil and one for Military, I recommend that the former be near the river and a few yards from the road, and the other on the site of the present quarters of the Medical Officers of the General Hospital.

8. The entrance gate for the Military Division of the Hospital should be at the eastern extremity of the compound. The gate of the Civil Hospital compound should be the present western gate from Hospital street. There should not be any other gate. The Tannah should be removed to the corner which joins Mall street to Hospital street. The eyes of the Peons would be as circumspective there as in the present Tannah, and Police assistance would be at hand if any disturbance occurred in Hospital. The west or Civil gate should have a small lodge for a Peon at its side, so that it could be under control at night. By this arrangement, and proximity to Police, a Military Guard would not be required for the Civil Hospital. The Regimental Hospital Guard-room would be at the eastern gate. The Regimental Serjeant's quarters should be near that gate. The Civil Hospital Serjeant's house should be at the junction of the Canal with the river.

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From Surgeon JAMES DONALDSON, 2nd District, Vepery Dispensary, 3rd September 1864, No. 93 ; to the Deputy Inspector General of Hospitals, Presidency.

I have the honor, in obedience to Circular Memorandum, No. 1573, dated 12th May 1864, from the Secretary to the Principal Inspector General Medical Department, forwarded by you, and received in beginning of June last, to report that I have used the system therein described, and in the manner therein laid down, in connexion with the Hospitals attached to the Vepery Dispensary, and the Female Orphan Asylum, for the three past months, and that the system is quite successful in dry weather, no smell being observable in passing close to the hole where the fœcal matters were deposited. During and after heavy rain however, as the only place available for the experiment in both cases, was in an open plain, without shelter of any kind from rain, a quantity of water necessarily accumulated in the pits, transforming the decomposing mass into something resembling the contents of an old cess-pool, or badly flushed sewer, and while in this state and during the process of digging up, the stench was very perceptible, though by no means so great as might be expected, and connected chiefly I doubt not, with the dejectures more recently thrown in.

No. 2898.

MEMORANDUM.

Forwarded to the President of the Sanitary Commission for information. *To be returned.*

FORT SAINT GEORGE, *7th Sept.* 1864.

(Signed) J. SHAW,
Offg. Princ. Inspr. Genl. Medl. Dept.

From Surgeon Major D. MACFARLANE, M. D., in Medical charge Body Guard, Madras, 5th September 1864, No. 7 ; to the Deputy Inspector General of Hospitals, Presidency Division.

I have the honor, in reference to Circular Memorandum, No. 1573, dated 12th May 1864, from the Principal Inspector General Medical Department, requesting me to report on the system of earth sewage as carried on in the Latrine of the Body Guard, that so long as the old system was in use, the Hospital latrine had to be shut up for years past, owing to the great nuisance caused by the nearness of the Latrine to the Hospital, and the offensive odours arising from it. The sick had in consequence to go a considerable distance to the common Latrine of the Body Guard.

2. I purchased a dozen flat chatties, filled them with dry sifted earth, and placed them inside the building, with a large chatty filled with earth in a corner, and the patients were directed to throw a little over the stool each time the chatty was used. A large chatty was placed in a corner outside for the receipt of the contents of the small chatties, and was emptied once a day in a small shed built for the purpose. Another large open chatty was filled with earth, and placed under a small pandal and used as a urinal.

3. The whole expense was not more than Rupees four, or five. No odour of any kind is now felt, and the plan gives the greatest satisfaction to all concerned.

4. I will carry out the same plan in the Troop Latrine, so soon as some necessary repairs, now being carried out by the Department Public Works, are finished.

5. The dry earth system can be carried on with the present Conservancy Establishment.

No. 2899.

MEMORANDUM.

Forwarded to the President of the Sanitary Commission for information. To be returned.

7th September 1864.

(Signed) J. SHAW,
Offg. Princ. Inspr. Genl. Medl. Dept.

From R. E. PEARSE, Esq., Civil Surgeon, Malabar, Calicut, 29th July 1864, No. 33; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to Circular Memorandum, 1573 of the 12th May 1864, regarding the system of "dry earth sewage," I have the honor to inform you that, finding on inquiry, that its introduction will be attended with heavy outlay, I have deemed it desirable to bring the following estimates and suggestions before you, for your sanction and approval before taking action in the matter.

2. In the Circular on the subject forwarded to the Officer in charge of the Jail, the Inspector General of Jails, advocates the adoption of "troughs on the Guntoor plan." I, therefore, applied to that Officer for information on this point, but find that he is unacquainted with the arrangements; accordingly, I proceeded to procure estimates from the Contractors here of the probable cost of fixing the troughs, at what appeared to me the lowest practicable size, *viz.*, 3 feet, 6 inches long, by

1 foot, 6 inches deep and 1 foot 6 inches broad; of these, about (36,) thirty-six, would be required for the Jail Establishment, being twenty-three for the Jail itself; six for the Jail Hospital, and seven for the Out-Jail, making at Rupees 0-12-0, each, Rupees 351, to which must be added about Rupees 25 for five smaller troughs for the solitary Cells, together with Rupees 76-14-0 for the accompanying Pail and Shovel, for each, or a total of Rupees 452-14-0, whilst the three other Hospitals, *viz.*, Civil Dispensary, Leper and Small Pox Hospitals, would cost at the same rate about Rupees 47-8-0 each, or Rupees 142-8-0 for the three.

3. Another heavy item of expense in this damp climate, will be the earth itself, or rather the drying of it; as in the monsoon, it will require to be artificially dried,—for this purpose, I would propose, that a small room in each of the six (6) buildings should be stored with well dried earth, previous to the setting in of the monsoon, thus requiring only to be kept dry at a probable expenditure of two baskets of charcoal to each room per diem, and reckoning the monsoon at 120 days, (a very low estimate,) the sum thus expended will average Rupees 540.

4. Of the earth itself, I have said nothing; as I conclude this will be procured and prepared by Convict labor.

5. Supposing the earth to be obtained cost-free, it thus appears that the first year's expenditure will be about Rupees 1,200, and about Rupees 600 for each succeeding year, placing the estimates at the lowest possible figure; but should the tubs now in use in the Jail be utilized, the expense would be much reduced. Awaiting your further instructions on the subject.

No. 2646.

MEMORANDUM.

The Deputy Inspector General of Hospitals, Mysore Division, is requested to be good enough to give his opinion as to the necessity or otherwise for the large expenditure proposed by Dr. Pearse, and also to report as to the feasibility of carrying out the earth sewage system on the Western Coast—*to be returned.*

FORT SAINT GEORGE,
19th August 1864.

(Signed) J. SHAW,
Offg. Principal Inspr. Genl., Medl. Dept.

From E. BALFOUR, Esq., Deputy Inspector General of Hospitals Ceded Districts, Ag. in Mysore Division, Bangalore,——September 1864, General No. 1015 / No. 363; to the Secretary to the Principal Inspector General Medical Department, Fort Saint George.

I have the honor to report to the Officiating Principal Inspector General on the subject of the orders in No. 2646 of 19th ultimo, on the letter from the Civil Surgeon of Calicut, No. 33 of 29th July, which is herewith returned. In that letter the Civil Surgeon was of opinion that, in order to introduce the dry earth Conservancy system at Calicut, the first year's out-lay would amount to Rupees 1,200, and to about Rupees 600 in each succeeding year, but, with a possibility of much reduction, if the tubs now in use in the Jail were utilized.

2. The proposed expenditure was to be occasioned by providing 36 troughs at Rupees 0-12 each for the Jail Establishment, *viz.*

For the Jail itself..... 23				
,, Hospital... 6				
,, Out Jail... 7				
	Total Rs.	351	0	0 and
Also 5 smaller troughs each at Rs. 5; total Rs.		25	0	0 for the Solitary Cells.
Pail and Shovel, each, ...	total ,, ...	76	14	0
Civil Dispensary as above...	47	8	0	
Leper Hospital...	47	8	0	
Small Pox Hospital...	47	8	0	
		142	8	0
An earth room in each building		540	0	0
Grand total, Rs...		1,135	6	0

3. Since receipt of the Order in No. 2646, I have twice asked for information and sketches to enable me to report (*a*) as to the necessity for the proposed large expenditure and (*b*) as to the feasibility of carrying out the earth sewage system on the Western Coast, and Dr. Pearse has obligingly complied with my requests.

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4. I am of opinion that such elaborate provision as the Civil Surgeon proposed is not needed and that it is quite feasible to carry out the earth sewage system on the Western Coast of India.

To my letter, No. 992/350 of 16th instant, herewith forwarded, I have attached extracts from the enclosed Reports of the Medical Officers in the Mysore and Cannanore Circles of this Division, and these will show that in general, the Officers generally are able to carry out the earth sewage system. I place, however, under a separate wrapper, two very important letters from Surgeon Major Pickering and Assistant Surgeon Dickinson on this subject of such importance that I have not made extracts from them, preferring to submit them for the perusal of the Principal Inspector General in their entirety.

6. These Officers have taken so much care over the Establishments under their care, that the results of their experience are of particular value; and the success following. Assistant Surgeon Dickinson's changes have evidently been perfect.

7. His system is to excavate the floor of the Latrine, to two feet deep; place a layer of charcoal a foot deep; over it a layer of sand a foot in depth, and the excreta falls on one part of this sand floor. The person using the Latrine throwing some of the sand of the floor on the excreta; also, the plaster was driven from the wall to a height of 4 feet from the floor, and tar applied to the surface thus based under this system.

8. Surgeon Major Pickering mentions that, on inspecting the Hospital Latrine of the 13th Madras Native Infantry, he never saw a Native Latrine so perfectly clean and free from all smell He found sea-sand alone employed, and that "by no means always dry."

9. I do not know that any thing could be added to these letters from Surgeon Major Pickering and Assistant Surgeon Dickinson at Cannanore, which would add force to the opinion that clean earth or clean sand, by no means always dry, can be applied in the simplest manner to the existing Latrines with the fullest success.

10. If the plans which have been so obligingly forwarded by the Civil Surgeon Calicut, and which are herewith enclosed, be returned to this Office, I think, I could, in communication with Assistant Surgeon Pearse, arrange for the introduction of earth sewage.

From the Deputy Inspector General of Hospitals, Ceded Districts, acting in Mysore Division, Bangalore, 16th September 1864, No. 992/350; to the Secretary to the Principal Inspector General Medical Department, Madras.

I have the honor to enclose, for submission to the Principal Inspector General, ten Reports from Mysore and eight from the Malabar range, on the system of earth Conservancy.

2. I have arranged these into the two Ranges, as the climates greatly differ, and thus afford opportunities of testing its merits; and I have extracted the words of the Officers reporting, which they use, in describing the results. Other Reports have still to come to hand.

3. The Principal Inspector General will observe that these Reports are generally favorable to dry earth Conservancy, and do not consider it will cost more.

4. I would submit that tar has also been largely used, seemingly.

From Asst. Surgeon J. E. DICKENSON, in temporary charge of Royal Artillery, 19th Nov. 1863, No. 199; to the Officer Commanding F. Battery 20th Brigade Royal Artillery, Cannanore.

I have the honor to report having visited the Latrines attached to the Hospital Royal Artillery and beg to suggest the following improvement as urgently necessary.

1st. That three more windows be opened out in the back wall of the Latrine, two below and one above, forming a triangle.

2nd. That the chunam of the walls up to four feet from the flooring be removed and that the walls to the above extent be coated with Tar.

3rd. That the whole flooring be removed and that charcoal and sand be laid down, instead of as follows, *viz.*, one foot of charcoal in depth, being laid below, and a foot of sand above.

4th. That the drains of the Latrines leading from within outwards be sloped more and a ditch three feet deep be cut outside having two feet of sand in it to allow the urine to percolate to the earth beneath. I am of opinion that the above measures if carried out, will entirely remove the filthy smell now existing in the Latrines.

From Assistant Surgeon. J. E. DICKINSON, 40th Native Infantry, in temporary Medical charge Royal Artillery, Cannanore, 23rd November 1863, No. 120; to the Officer Commanding F. Battery 20th Brigade Royal Artillery.

In continuation of my letter, No. 199, dated 19th November 1863, I have the honor to suggest that the back wall of the women's Latrine have three windows opened out in a manner similar to that recommended for the men's Latrines.

2. The flooring of men's Hospital, bath-room, requires repairing, and also the bathing tub, which latter will not hold water.

3. The Latrine tubs at the Barracks, requires to be well coated inside and out, with Tar.

4. The Latrine tubs at the Drivers' Barracks also require to be coated well with Tar. I observe that there are only three instead of six such tubs at the above mentioned Barrack, and the result is the human filth is deposited on the ground: this should at once be prohibited; the walls of the same Latrine should be well tarred up to four feet from the ground, and the Drivers continue not to commit a nuisance against the wall, as they have been in the habit of doing.

From Acting Garrison Surgeon C. W. PICKERING, in Medical charge Left Wing 13th Regiment, Cannanore, 10th September 1864, No. 84; to the Deputy Inspector General of Hospitals, Mysore Division, &c., &c.

With reference to your Circular Memorandum, No. 883, and forwarding letter, No. 16, from the Medical Officer in charge Left Wing 13th Regiment, I have the honor to state, for your information, that I fear some misapprehension exists.

2. As reported by the Medical Officer, a dry Conservancy system, that is, in contradistinction to the former wet, and water flushing system, has been carried out at the Hospital of Left Wing 13th Regiment, but the *dry earth* Conservancy system has neither been carried out nor attempted.

3. Immediately, on my assuming Medical charge of the Wing 13th Regiment Hospital, I made a point of inspecting the Hospital Privy, (it is a small one) and I never saw a Native Privy so perfectly clean and free of all offensive odour: on inquiry as to the system adopted, I found sea-sand, and that alone was employed; the excreta mixed well, and covered by the sand, was placed in tubs or baskets and daily carried away and thrown into the sea.

4. A former Medical Officer finding the Privy offensive and filthy, suggested removal of flooring and improvements, the same as had been carried out in the 40th Regiment and Artillery Hospitals, and I beg, for your information, to annex copies of correspondence, showing what the suggestions were: the work was carried out at the time by the Public Works Department, and the sand then placed on the flooring has sufficed for all uses up to the present moment. There is no pit or drain used.

5. The walls for a considerable height are tarred all round, so also are the small stone seats around, except the top of the stones: (which I have since had also tarred) the whole flooring is covered with sea-sand: sand is placed between the stone seats to receive the excreta: the whole flooring had been dug out and filled with first a thick layer of charcoal, and on this the sea-sand, total about one and a half or two feet, By digging I have verified this: the patient on using the seat throws some of the sand taken up from the flooring over the excreta and covers them: the whole afterwards removed by the Toty. I directed the menial to return daily with a basket of sand, when he went to the sea with the excreta, to prevent diminution of the flooring layer.

6. The Garrison Hospital Privy had been treated in the same way: the flooring, charcoal and sand, and sand used to cover and carry away the excreta; but I found in addition a wooden seat, and tubs used, which occasioned dirt and soiling, and consequently removed the former from use.

7. This mode of treating the Privy, and this system of sea-sand (by no means always dry) Conservancy I find on inquiry, had been much adopted.

8. I have only to add that it appears quite to secure the two desiderata, cleanliness, and freedom from offensive effluvia.

From Assistant Surgeon J. E. DICKINSON, 1st Class, in Medical charge Left Wing 13th Native Infantry, Cannanore, 22nd June 1864, No. 4; to the Officer Commanding Left Wing 13th Regiment Native Infantry.

I have the honor to bring to your notice that the Hospital Latrine Left Wing 13th Regiment Native Infantry, is in a sad filthy state, and I would beg to recommend that the same measures be

adopted in reference to it, as were made use of in the 40th Hospital* Latrine, so as to purify the Latrines from the present disgusting state. At this season of the year dry earth sewage is quite impracticable.

* *This the same as in Arty. Hospital.*

From R. E. PEARSE, Esq, Civil Surgeon, Malabar, Calicut, 27th August 1864; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

I have the honor to acknowledge the receipt of your letter of 22nd instant, returning mine, No. 33 of the 29th ultimo,* on the introduction of the earth sewage system, and have the pleasure herewith to enclose a rough sketch of the troughs, Pails, &c., which, I hope, will be intelligible; but as regards the Latrines themselves, I do not see that any special alterations will be called for, as the troughs, from their size, will be capable of being carried out and emptied as often as necessary. The only alteration I would suggest in my original scale would be, some reduction in the breadth of the trough, so as to admit of a person standing across it, as well as in its height, say from 1 foot 6 inches each way, to 1 foot 3 inches in height, by 1 foot broad at the top—the length remaining the same.

* *Herewith returned.*

From E. BALFOUR, Esq, Deputy Inspector General of Hospitals, Ceded District, Acting Mysore Division, Bangalore, 2nd September, 1864, General No. 874 / No. 297; to the Civil Surgeon, Malabar, Calicut.

I have the honor to acknowledge your letter, No. —— of 27th ultimo, and to thank you for your pen and ink sketch enclosed.

I would esteem it a favor your sending me a rough sketch of the Latrine and one of its plan for which two or three strokes of your pen would suffice, and if a plan of the Jail were added, constructed by means of a ruler, I would be indebted.

The simplest, and for a large body of prisoners with whom seclusion is not advisable, plan for the dry Conservancy is to have a surface of the ground allotted, with or without a mere screen wall and with or without a cover as the case may be, but with a layer or rows of layers of fresh earth or sand, over which the Native sits the manner usual to him. The removal of the excreta is then a very simple matter. The instant repression of the mal-odour can be effected by each prisoner throwing with his foot scraping over the excreta a portion of the clean earth.

For this mode of carrying out the earth plan no re-arrangement or expense is needed, and it generally can be introduced at once, any where. But as it is possible that your Jail would not admit of it, I am asking the favor of the sketches as above.

From R. E. PEARSE, Esq., Civil Surgeon, Malabar, Calicut, 12th September 1864, No. 46; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

I have the honor to acknowledge receipt of your letter, No. 874 of the 2nd instant, regarding the dry earth Conservancy which my absence at Goodalur has prevented my replying to earlier, and enclose the sketches of the Latrines and Jail therein called for, which I trust may prove explanatory.

2. With regard to the very simple plan proposed in paragraph 3 of your letter, I fear that the construction of this Jail (the 2 Civil Debtors Wards perhaps excepted) precludes the possibility of its adoption there being no vacant space available, the interial between the wards or cells and the wall being but 18 feet on three sides and 10 on the fourth.

Whilst the Jail Hospital is constructed in the form of three sides of a hollow square opening inwards and not surrounded by any wall, so that for security's sake Prisoners are not allowed to pass in rear of the Building.

3. Again, I would observe that the Cells are all locked at night, and the prisoners all out at work during the day, so that the real necessity is a plan adapted to nocturnal rather diurual use, hence my advocacy of the trough system.

From R. E. PEARSE, Esq., Civil Surgeon Malabar, Calicut, 13th September 1864, No. 47; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to Circular, No, 1573, calling for reports on the subject of the dry earth Conservancy system, I have the honor to state that, owing to the causes pointed out in my several letters

as per margin,* rendering its introduction a matter of considerable difficulty and expense at this Station, (correspondence which you are aware is still under consideration,) I have not been able to test its efficacy in the Jail of this place. I have however taken the opportunity of watching its effects in the small European Detachment here, where its introduction was easy, and for these observations I entertained no doubt of its efficacy ; the only respect in which trouble may be anticipated is the extreme difficulty of inducing Natives to take the necessary trouble, especially amongst Convicts and such like, when the number necessarily horded together, renders detection well nigh impossible ; this remark will apply with special force to Jails at night, when I fear prisoners simply will not take the trouble to do it, and amongst a number congregated together in one ward, it will be useless to attempt to discover the delinquent; as the major questions of expense and adaptability to this Court have already been submitted for your consideration, it is unnecessary for me to enter into any detail on these points.

*1 *Letter*, *No.* 33, 26*th July* 1864.
2 *Do.* *No.* 43, 27*th August* 1864.
3 *Do.* *No.* 46, 12*th September* ,,

From 1st Class Assistant Surgeon J. E. Dickinson, 40th Regiment Madras Native Infantry, Cannanore, 12th September 1864, No. 81 ; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to your memorandum, No. 883, relative to "dry earth conservancy," I have the honor respectfully to call your attention to the fact that Assistant Surgeon Beaman does not state he had made use of "dry earth conservancy," but "dry conservancy," which dry conservancy was established by me.

For some time I was in Medical charge of the Royal Artillery as well as my own Regiment. I found the Hospital and Barrack Latrines in a very filthy and disgusting state, and I recommended that the puckha flooring, (which had become saturated with urine) should be removed, and the earth excavated to the extent of three feet, and this excavation filled up with charcoal and sand—that the chunam should be removed from the side-walls up to four feet and coal-tar applied in its place, to be renewed as often as necessary—the urine tubs to be also coal-tarred, within and without ; that the ventilation should be improved by the dead wall forming the back of the Hospital Latrine, having three openings made in it. I am writing from memory only, but believe this statement to be correct ; my plan was approved of and ordered to be at once carried out ; the result was most satisfactory ; the Latrine which had been previously a sink of filth and abomination, became perfectly sweet, and several inspecting Officers expressed themselves as satisfied and pleased with the state of these Latrines.

I then applied to have my own Regimental Hospital Latrine (the 40th) improved in the same way, which was also sanctioned and carried out ; but as Natives do not use close stools, we threw down sand above and below the deposit ; but are *now* using earth instead, under instructions from this Office. Subsequently I was placed in Medical charge of the Left Wing 13th Regiment Madras Native Infantry, and finding the Hospital Latrine in a filthy state, I again applied to the authorities to sanction my system of dry conservancy at the 13th Hospital Latrine ; it was granted and carried out, in every respect in a similar manner as was adopted by me in the 40th Hospital Latrine.

I would venture to suggest that Dr. Beaman is alluding to this system of "dry conservancy" and not "dry earth conservancy ;" as Dr. Beaman relieved me from Medical charge of Left Wing 13th Regiment Madras Native Infantry, in the middle of the monsoon, and at that time it was perfectly impossible to obtain dry earth ; the sand used was not dry, it was brought from the sea-side so was quite damp. Dr. Beaman's letter was penned, I presume, on a misconstruction of your memorandum calling for a report. I am led to address you on this subject, as having established a complete change in the system of conservancy, in three different Hospitals during my residence at Cannanore, I would not like you to labor under the idea that I was less impressed with the necessity of complete and thorough conservancy, than my brother Medicos, or less willing to carry out any orders I may receive on this important subject.

From Assistant Surgeons W. J. Busteed, M. D., Zillah Surgeon of Mangalore, and F. O. B. Wither, doing duty 8th Regiment Native Infantry, Mangalore, 13th August 1864, No. 35 ; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to Circular, No. 473 of 8th June, from your Office, enclosing Circular, No. 1573 of 12th May 1864, from Office of Principal Inspector General of Hospitals, we have

the honor to report that the plan of "earth sewage" has now had a fair trial in the Regimental Hospital, the Jail and the Dispensary at Mangalore, and that the results are exceedingly satisfactory.

2. Measures are in force in each Privy to receive the urine separately.

3. The present Conservancy Establishment is sufficient.

From Surgeon J. Brett, M. D., 14th Regiment Native Infantry, Bangalore, 27th August 1864, No. 184 ; to the Deputy Inspector General of Hospitals, Mysore Division.

Agreeably to the direction, given in Circular Memorandum, No. 312, dated 25th April 1864, from the Office of the Deputy Inspector General of Hospitals, Mysore Division, I have the honor to state, that I have tried the new system of earth sewage for a period of three months, and in obedience to instructions conveyed in Circular Memorandum, No. 1573, dated 12th May 1864, issued from the Office of the Principal Inspector General Medical Department, Fort Saint George, I beg to report the result. The system has, in my opinion, answered exceedingly well in respect of its deodorizing quality. A quantity of dry and fine earth well suited for the purpose has been hitherto supplied from the excavations of two large Wells in the Sepoys' Garden, situated in the vicinity of the Hospital. In the three compartments of the Privy close to the seats are placed broad-mouthed chatties of medium size capable of holding a sufficient quantity of dry earth for the daily supply, and which are regularly replenished. The patients in Hospital have been ordered to cast a certain proportion of this earth over each evacuation, and are now established in the custom of doing so. The same plan is also adopted as regards the urinal.

The advantages of this system are well marked, as shewn by the inodorous and clean condition of the Privy. I may mention however that I think it advantageous in addition, to keep the chatties and urinal well tarred, and to have a basket filled with charcoal suspended from the roof : all the soil is removed twice a day by the Conservancy Carts. There is unquestionably a great improvement in the state of the Latrine upon the former wet system.

The only additional expense that may be incurred from the adoption of the earth sewage, *viz.*, in procuring fresh earth is not, I should think, likely to be great. I have no means of judging what this expense might be, but the extra cost would, in my opinion, be more than counter-balanced by the advantages gained.

From Assistant Apothecary S. Wells, M. D., in Medical charge Remount Depôt, Oossoor, 27th August 1864, No. 19 ; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to the Principal Inspector General's Circular, No. 1573, dated 12th May 1864, I beg to state that I have hardly any data on which to frame a report of the results of "Dry Conservancy." Indeed, I may say none, as far as the Remount Hospital is concerned.

My attention was directed to the subject even before the receipt of the Circular. In fact the whole reading public must have had their attention drawn to the matter by the prominence given to it in the local Journals.

The Remount Hospital is in effect a Dispensary for out-patients. Unless in a case of fracture or other severe accident, it is seldom tenanted. The Horse-keepers and other followers mostly attend for medicine, as are seen by me at their huts. I have not had more than one patient *in* Hospital since the receipt of the Circular.

I have strongly recommended "Dry Conservancy" for adoption by the people here in their domestic economy, and I have practised it for many months in my own dwelling. My method of working has been simply that of the Reverend H. Moule. A cart-load of dry earth is placed at one corner of the Necessary and from it small quantities are used as required. I have tried it too in a stabling used by Cows and Goats, and have found it render the air sweet and free from smell in an incredibly short space of time. There can be no doubt as to the value of dry earth as a deodorizer. It must also prevent the emanation of other noxious effluvia, removing as it does, in a great measure, one of the conditions favorable to decomposition, and consequent generation of gases, *viz.* the presence of moisture. My little experience is entirely in favor of the "new system."

In conclusion, I beg to state that, as far as the Remount Hospital is concerned, no addition is required to the Conservancy Establishment.

From Surgeon Major W. JOHNSTON, M. D., D. Brigade Royal Horse Artillery, Bangalore, 29th August 1864, No. 390 ; to the Deputy Inspector General of Hospitals, Mysore Division.

In accordance with instructions indicated in Circular Memorandum, No. 1573, of the 12th May last, relative to the use of earth in the Latrines of the Artillery Hospital at this Station, I have the honor to report, for the information of the Principal Inspector General, that this experiment has been under trial for a period of two months, and so far, has proved a failure—a result which a priori reasoning might have shewn ; success being wholly contingent on the non-admixture of the fæces with the urine. Until, therefore, a means of separation can be applied, a successful result must be despaired of, an opinion which cannot be gainsayed, resting, as it does, on Chemical laws. Possibly, however, this view might be qualified and made less general on the assumption, that, since surface soils vary in their composition, so there may be soils which, instead of accelerating, might arrest the process of decomposition. Be this as it may ; for it is of no application to the soil of this Station, which formed for the most part of disintegrated metamorphic formations, and therefore intimately blended with silicate of Potash, the necessary result of its admixture with the urine and fæces is to accelerate the process it is intended to arrest decomposition. I may add that, were it not for the deodorizing influence exercised by the use of Coal-tar, the smell from the tubs, whose contents undergo a more rapid decomposition than would otherwise be the case were no earth to be employed, would be intolerable.

From Assistant Surgeon A LEWER, in Medical charge A Battery 14th Brigade Royal Artillery, Bangalore, 30th August 1864, No. 74 ; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to your Circular, No. 802, I have the honor to report, for your information, that the system of dry Conservancy answered extremely well during the three months trial of it in the Latrine of the Hospital A/14th Brigade ; dry earth thoroughly deodorizing excrementitious matter. This system was also tried in the Latrines attached to the Barracks of the A/14, but the results were unsatisfactory, from the difficulty that was experienced in making the men carry out the plan as laid down in the paper circulated with Circular Memorandum, No. 1573 of 12th May 1864.

From Garrison Surgeon M. ROGERS, Bangalore, 30th August 1864, No. 171 ; to the Deputy Inspector General of Hospitals, Mysore Division.

I have the honor to draw attention to my letter, No. 157, dated 30th July 1864 reporting that the very faulty construction of the Privies attached to the Garrison Hospital, rendered impossible the perfect carrying out of the earth Conservancy system.

To render this method really efficient, it would be necessary to have the Privies built on some such plan as that recommended in Dr. Cornish's Pamphlet, as in the Privies here, there are no openings for the removal of excreta from behind, neither is there any ventilation but the very little which can take place through the door-way. Besides a building constructed on sanitary principles one extra Toty would be required, and a constant supply of dry earth would also be requisite.

From Surgeon M. ROGERS, in Medical charge of Lock Hospital, Bangalore, 30th August 1864, No. 106 ; to the Deputy Inspector General of Hospitals, Mysore Division.

I have the honor to report that the earth Conservancy system has been adopted in the Lock Hospital, as far as practicable, since the receipt of the Circular Memorandum, No. 473, dated 8th June 1864, and found very efficacious.

I consider that the earth system cannot be thoroughly carried out with the present Establishment, and an extra Toty will be necessary, besides some arrangement for supplying the dry earth requisite for the purpose.

From Surgeon Major H. YOUNG, in Medical charge Her Majesty's 102nd Regiment, Cannanore, 30th August 1864, No. 82 ; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

In acknowledging your Circular Memorandum, No. 802, of the 29th instant, I have the honor to inform you that it has been impracticable to carry out the dry earth Conservancy during the heavy monsoon that has prevailed upon this Coast for the past three months.

MEMORANDUM.

No. 872.

Favour is requested of explanation of details to explain impracticability.

(Signed) E. BALFOUR,
Dy. Inspr. Genl. of Hospitals.

BANGALORE,
2nd September 1864.

From Acting Garrison Surgeon, C. W. PICKERING, Cannanore, 31st August 1864, No. 82 ; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to your Official Memorandum, No. 802, calling for a report regarding "Dry Conservancy," I have the honor to state, for your information, that the trial has not been entered upon either at the Garrison or Lock Hospitals.

2. I believe the difficulty of procuring and storing dry earth during the monsoon months, and want of efficient means has prevented the system being adopted.

3. At the Jail, dry earth has been employed, as a deodorizer, with considerable success, but the dry earth Conservancy has not been tried or adopted in its entirety.

4. Instead of urinals or privy, or common ordure chatty, in the Jail wards, at night each Convict is provided with a small chatty, with rope sling, which he takes into the ward with him at night when locked up : a little dry earth having been placed into the bottom of each. Each Convict makes use, if he requires it, of his own chatty only. The urine mixes with the earth : if fæces are passed, the Convict immediately after throws a little more dry earth ready provided in baskets in the ward, into the chatty, so as to cover the fæces. This has been found quite to check all odour. In the morning each Convict brings out his chatty, empties its contents over the cliff, a few yards distant, into the sea, washes the chatty clean at the same spot, when it is set aside for the next night. The Privy for day use, is on the brink of the cliff, saved by the prisoners, and the filth thrown into the sea. The flooring of the Privy is dry, sanded ; and the seats tarred.

5. The earth has been dug, and brought by the Convicts, and stored and dried in a vacant ward, the drying occupying some days. The earth is the soft red soil abundant here.

6. In the periodical inspection of the Jail wards that I have made, I was struck with the freedom from all offensive odour, though the wards are ill-ventilated, and in fact might be designated low, bomb-proof tunnels ; I should mention however that the walls all round a couple of feet in height, and the whole of the flooring have been tarred, dry sand is thrown over the flooring also daily, and swept up previous to evening.

7. It will be seen that, at the Jail, all filth is finally disposed of into the sea.

From Assistant Surgeon, E. S. CLEVELAND, 16th Regiment Madras Native Infantry, Hurryhur, 1st September 1864, No. 28 ; to the Deputy Inspector General of Hospitals, Mysore Division.

I have the honor to report upon the use of dry earth in the Hospital of the 16th Regiment at Hurryhur, during the last three months.

Dry earth has been used in the Hospital Privy and at the Regimental Cells at this station as advocated by the Prison Committee of Bengal.

Having witnessed its property as a ready and effective deodorizer, I am prepared to accept the much advanced opinion in favor of its use.

The admissions and average daily sick in the Regimental Hospital during the last six months marginally noted, would indicate a practical result in its favor, the admissions of the last three being greater, and the average daily sick less than that of the three months preceding.

	Average daily sick.	*Admission.*
March	10½	31
April	10	35
May	8½	21
June	9½	34
July	9	47
August	9	35

The new system cannot be carried out effectually with the present conservancy establishment.

From Assistant Surgeon, G. ASHTON, M. D., Detachment Her Majesty's 102nd Regiment, Calicut 5th September 1864, No. 57 ; to the Deputy Inspector General of Hospitals, Mysore Division.

I have the honor to report on the system of dry earth sewage which has been employed in the Hospital of this Detachment for the last three months, and beg to state that, I have found it a most perfect deodorizer. Having for the sake of experiment kept the accumulating mass of excrementitious matter and earth for a week without removal at the end of that period, it proved quite inoffensive.

2. The adoption of the system in Barracks or large Hospitals would, I apprehend, be unsuccessful, unless the earth was applied by the aid of Machinery, as numbers would doubtless neglect to employ it. I may therefore state that I do not consider the system can be arranged for here with the present Conservancy Establishment.

From Assistant Surgeon J. HENDERSON, M. D, 33rd Regiment Madras Native Infantry, Bangalore, 6th September 1864, No. 82; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

I have the honor to report that the system of earth sewage or dry Conservancy has been pursued in the Hospital 33rd Regiment Madras Native Infantry, with good effect: nearly all odour is destroyed and cleanliness is more easily secured.

It is to be regretted, however, that owing to the habits of the Natives of using water after going to stool, perfect dryness cannot be ensured.

From F. O. B. WITHER, Esq., Acting Zillah Surgeon, Tellicherry, 7th September 1864, No. 42; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to your Circular Memorandum, No. 802, dated 23rd ultimo, I have the honor to state, that the system of *dry Conservancy* carried out in the Civil Despensary and Jail Hospital answers very well indeed, and that the present Establishment of servants for the purpose is ample.

From Surgeon Major H. YOUNG, in Medical charge Her Majesty's 102nd Regiment, Cannanore, 7th September 1864, No. 86; to the Deputy Inspector General of Hospitals Mysore Division.

In reply to your Memorandum (herewith returned) No. 872, 2nd September 1864, I have the honor to inform you that it was impracticable, without proper stowage, to procure the required supply of dry earth, to carry out the plan alluded to; moreover the proper appliances or necessary establishment for giving the plan a satisfactory trial in a European Hospital had not been obtained.

On the cessation of the rains, means will be proposed for doing this.

From Surgeon J. G. GIBBS, doing duty 6th Regiment Native Infantry, new Cantonment, Mysore, 7th September 1864, No. 310; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to the dry earth system, I have the honor to state, that dry earth has been used in Hospital with good result in deodorizing, but, as a temporary Latrine has been in use, which is open above, the system has been only partially tried.

2. The dry earth is, at present, prepared by the Toties, but a machine for sifting and a shed for receiving soil, until removed by the Conservancy Carts, and for storing dry earth are required.

3. I shall be glad to receive instructions respecting these.

From Assistant Surgeon E. NICHOLSON, in Medical charge F Battery 20th Brigade Royal Artillery, Cannanore, 10th September 1864; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to your Circular Memorandum, 23rd August 1864, I have the honor to state that the system of Conservancy recommended was tried in this Hospital. It was found to be useful for the close stool-pans and also to some extent in the Latrines, though in the latter, with the present system of Indian sewerage, a well tarred tub seems preferable.

From Surgeon Major H. HARPER, 25th Regiment Native Infantry, Mercara, 12th September 1864, No. 16; to the Deputy Inspector General of Hospitals, Mysore Division.

With reference to your Circular Memorandum, No. 802, and the Principal Inspector General's Circular, No. 1573, received on 11th June, I have the honor to inform you that, no attempt has been made at this Station to introduce the dry Conservancy system, owing to the impossibility of procuring dry earth during the rains.

From the Assistant Surgeon in charge, Hoonsoor Grazing Farm, Hoonsoor, 13th September 1864, No. 315; to the Deputy Inspector General of Hospitals, Mysore Division, Bangalore.

With reference to Circular Memorandum marginally noted,* I have the honor to report that the experiment of dry Conservancy has been tried in the Hospital under my charge, and as far as my limited means of observation in an Establishment

* *Circular Memorandum, No.* 802.

in which the daily average number of sick is only five, will permit to speak, it has been attended with success.

It does not seem however to remove the ammoniacal odour from urinals so well as the mixture of two parts of lime and part of coal-tar hitherto in use.

From the Officer Commanding Hyderabad Subsidiary Force, Head Quarters, Secunderabad, 18th August 1864, No. 254; to the Quarter Master General, Ootacamund.

With reference to your Memorandum No. 5148, dated 23rd May 1864, entered at the foot of Proceedings of Madras Government, No. 1360, dated 22nd April 1864, I have the honor to forward herewith a report on dry earth as a deodorizer, furnished by the Superintendent of Police; the system having been tried in the privy attached to the Civil Jail at this Station.

2. Further reports on the system as tried in the different Hospitals and Privies will be forwarded when received.

From the Sub-Assistant Commissary General and Superintendent of Police, Secunderabad, 25th June 1864, No. 695; to the Assistant Quarter Master General, Hyderabad Subsidiary Force, Secunderabad.

In reply to your docket No. 1813 of the 23rd instant, forwarding Extract Proceedings* of Government, Military Department, No. 73, on the subject of the use of dry earth as a deodorizer, I have the honor to inform you, that the plan has been adopted in the Jail for upwards of a month, and found exceedingly beneficial.

* *Herewith returned.*

2. Orders have been issued for the extension of the system to all the public Latrines and a report shall be made as soon as sufficient time has elapsed to judge of its working.

3. It is however doubtful whether it will be as beneficial in the latrines on account of their being open and consequently causing the earth, though applied in a dry condition, to become speedily wet during the rainy months, thereby counteracting its good effects.

From the Assistant Superintendent of Police, Secunderabad, 26th July 1864, No. 828; to the Assistant Quarter Master General, Hyderabad Subsidiary Force, Secunderabad.

In continuation of my Report* on the subject of dry earth conservancy, I have the honor to state that, on further trial, the system proves itself to be most beneficial. The offensive odours from the privies having been almost entirely removed.

* *No.* 695, *dated 25th June* 1864.

2. I would however point out that there is a great defect in the way the privies are constructed, the channels and spaces between the small walls being almost level, or the slope being so very gradual that the water used by the Natives does not readily flow off. If this defect were remedied by causing the slope to be made very much greater, the water could be allowed to accumulate in one spot in a cess-pool or barrel, giving facility for its removal and preventing its lying about the place as it now does, thereby neutralizing the effect of the dry earth.

3. By drawing off the water in this way, the privies could be kept perfectly dry and the absorbing property of the earth would be far more efficacious in its action.

From Assistant Surgeon J. KEESS, M. D., Civil Surgeon, Kurnool, 6th August 1864, No. 35; to the Deputy Inspector General of Hospitals, Ceded Districts, Bellary.

I have the honor to report on the subject of "dry Conservancy," as tried at the Jail and Civil Dispensary, Kurnool.

2. You are aware that there is no Latrine in the Kurnool Jail. The prisoners are marched out of the Jail, morning and evening, for the purposes of nature. During the night baskets are placed in each of the four wards, partially filled with earth, and when a prisoner has used a basket, he is required to throw in a few handfuls of earth. Since the adoption of this system, no offensive odour issues from the night baskets.

3. You are also aware that, the inside of the urine-pots was formerly coated with tar. The present system is this:—Some earth is thrown into each pot, and some is placed on the basket which covers the mouth. The prisoners pass their water in the basket; it passes through the earth, before entering the pot, and then mixes with the earth at the bottom.

The pots were examined several times in the morning, and were found to be nearly free from smell.

From Assistant Surgeon J. S. RIDINGS, M. D., 20th Regiment Native Infantry, Bellary, 10th August 1864, No. 66 ; to the Deputy Inspector General of Hospitals, Ceded Districts.

I have the honor to state that the dry earth system of Conservancy has been in use in my Hospital since the 25th March last, and that I consider it to be the nearest approach to perfection possible.

2. If fully carried out, all bad smell is totally obviated.

3. Coal-tar has been used conjointly, and though of itself extremely valuable, it appears to me that the earth system alone will be found to be amply sufficient as a deodorizer.

Report on the experiment of using dry earth as a deodorizing agent, by 2nd Dresser Ramiah, No. 251, in charge of Station Hospital, Cumbum.

I ordered the Toty on the morning of the 16th June last, to bring a basketful (about 50lbs.) of earth from a garden which is quite close to the Hospital, and allow it to dry till the evening and afterwards to place it in the privy in a convenient place. I ordered all the patients in Hospital to throw a handful or two on their excrements and urine, on each occasion they went to stool. This plan was continued for three days, and I found the privy during the time almost devoid of smell, certainly much less offensive than when it was cleaned out twice a day with water.

After three days, the accumulated human soil and earth were well mixed together with a country spade and removed from the privy without any bad smell, and was re-used by means of a potsherd, after allowing it to dry in the sun for about ten hours ; this process I repeated about three times, with the same earth, and it was equally efficacious in preventing fermentation and offensive smell. The soil was afterwards removed to a garden and there used as manure, which proved to be of a very rich description.

The result of these experiments were so satisfactory, that I have continued to carry it out subsequently.

CUMBUM,
7th August 1864.

(Signed) RAMIAH, No. 251, 2nd Dresser,
In Medical Charge Station.

Report upon the "Dry Earth" system of Conservancy.

Agreeably to Circular Memorandum, No. 1573, dated 12th May 1864, I have the honor to state, that I introduced the system of "dry earth" Conservancy into the Hospital Latrine, 27th Regiment Native Infantry, on the 1st of June, and have to report most favorably of its efficiency. I was struck by the total absence of all smell when I entered the Latrine which I do frequently, and in my opinion the "dry earth Conservancy" is far superior to other substitutes tried, such as "Lime," "Coal-tar," and the "Wet System." In short, it is as perfect as can be desired ; a large basket of dry earth is kept in the Latrine, and into each chatty a small quantity of dry earth is placed, and after use, the patients cover it over with more earth.

The Toties twice a day empty the chatties into a basket, and convey the soil to neighbouring fields, where it is used as manure ; the chatties are thoroughly washed and again re-placed for use.

CUDDAPAH,
10th August 1864.

(Signed) F. FLETCHER, Surgeon Major,
27th Regiment Native Infantry.

From Assistant Apothecary D. STEWART, in Medical charge Civil Dispensary, Ghooty, 10th August 1864, No. 53 ; to the Deputy Inspector General of Hospitals, Ceded Districts.

With reference to Principal Inspector General's Circular, No 1573, dated 12th May 1864, and your Memorandum, No. 750 of 25th ultimo, I have the honor to state that, although no means exist in the Chuthrums for trying the dry Conservancy, I have tried it in my private dwelling and found it to answer as an immediate and perfect deodorizer. No Conservancy Establishment attached to the Civil Dispensary.

Memorandum with reference to Circular No. 1573, from the Secretary to the Principal Inspector General Medical Department, respecting the use of dry earth.

For the last two months, it has been used in the Hospital Latrine and in the two attached to the Barrack Serjeant's Quarters.

19.

There is but little doubt that it is as valuable as a deodorizer, as it is simple and cheap ; but from what little experience I have had in its use, I am of opinion that the system cannot be arranged for with the present Conservancy Establishment ; where self-action is required, it is a difficult matter to carry any system of this kind out, especially where there are a number of children, of all ages, who (although the dry earth is ready at hand) will not take the trouble to throw a small quantity in as required ; and again, sick persons may omit to use it unintentionally. It therefore appears to require other than self-action to carry it out efficiently. This objection does not apply to the use of Tar which is in my opinion equally good as a deodorizer and requires no self-action. If applied once a fortnight and a net of charcoal suspended in the Latrine to absorb exhalations from the refuse before removal, it is quite sufficient to stop all offensive smell and to prevent fermentation, probably the application of Tar once a month, with the dry earth in small quantities, would answer better and would not require a large Establishment than at present. I have adopted this plan and find that it succeeds very well.

BELLARY,
12th August 1864.

(Signed) R P. LINTON. Surgeon Major,
1st Regiment Light Cavalry.

From Assistant Surgeon R. ARNOLD, 26th Regiment Native Infantry, Kurnool, 11th August 1864, No. 65 ; to the Deputy Inspector General of Hospitals, Ceded Districts, Bellary.

1. I have the honor to report, for information, that the experiment to ascertain effects of dry earth as a deodorizer were only commenced at the beginning of this month in consequence of the Hospital privy having been undergoing repair and the floor removed.

2. Since the 1st August 1864, the plan has been carried out as laid down in Circular, No. 1573, from Secretary to Principal Inspector General Medical Department, and the conclusion arrived at are that

1st. Dry earth is capable of deodorizing animal excretions, and the use of it in Hospital privies is of great benefit.

2nd. That with the present style of Hospital privies, only partial results are attainable on the dry Conservancy system, in consequence of the practice of Sepoys using water for cleansing themselves, and there being no perforations in the floor under the earth to allow water to filter away, but the results are sufficiently satisfactory to recommend continuance of the plan.

3rd. That the present Conservancy Establishment is sufficient for the purpose, if a new arrangement of the flooring could be effected, which would allow of water filtering off under the floor.

No. 36.

MEMORANDUM.

The dry earth plan has been tried in the Privy of the 30th Regimental Hospital for the last three months. The Toties went into the Privy frequently and scattered the earth over the contents of the flat chatties, as the patients would not attend to do it themselves.

2. For the first few weeks the smell of the coal-tar remained so strong that it was impossible to say whether the earth was effectual or not in preventing the effluvia from rising into the air, but afterwards when the tar had lost its power, one could judge as to the value of the other plan.

3. I am of opinion that the dry earth is an excellent deodorizer if properly used, but that there will always be a difficulty in getting the men to use it themselves.

BELLARY,
12th August 1864.

(Signed) J. K. OGILVIE, M. D., Surgeon Major,
30th Regiment N. I.

From Surgeon Major J. K. OGILVIE, M. D., in Medical charge of Zillah Jail, Bellary, 22nd August 1864, No. 27 ; to the Deputy Inspector General of Hospitals, Ceded Districts.

I have the honor to state for your information that the dry earth plan of Conservancy has been freely used in the Jail Hospital Necessary, and been found to answer admirably.

Report on the dry earth system of Conservancy.

With reference to Circular Memorandum, No. 1573, from the Principal Inspector General Medical Department, desiring me to report, at the end of three months, on the efficacy of "dry earth" as a deodorizer, I beg to submit the following brief remarks thereon.

1. Dry earth, when sprinkled over human excrement, absorbs and prevents the emission of offensive smell completely and instantaneously.

2. Its effect is lasting and permanent, so long as it is kept dry.

3. As there are no Latrines on the premises of the Civil Dispensary, the inmates were allowed to go out to the neighbouring fields, and consequently I was unable to introduce this mode of sewage on an extensive scale. I have, however, used it with patients who cannot leave their beds from injuries, debility &c. A broad shallow chatty, half filled with dry earth, is kept near the cot of such patients, close to a small basket containing the same material. They are enjoined, if capable, to throw in a handful of earth out of the basket on each occasion of its use. Otherwise, the Toty attached to the Hospital, or frequently the relatives attending on such patients, are directed to do so.

The aforesaid vessels are removed twice a day, or oftener if necessary, and their contents deposited in a large ditch, at one end of the Hospital, and a quantity of loose earth is then thrown over the whole. This effectually prevents fermentation. The atmosphere in and around the pit, is rendered inoffensive and innoxious.

At the end of each year, the manure in the pit will be sold to the Ryots for the benefit of the Institution.

3. I intend to propose to the Sub-Committee at the next Meeting, the expediency and practicability of building two proper Latrines for the use of the male and female patients of the Dispensary and Poor-House.

4. I have, with some success, introduced the application of this system among private families and schools, and the practice is followed in the public Latrines in the town. The scheme under consideration, will, moreover, receive due attention as soon as our Municipal Association obtains the required number of Scavengers from Madras, or elsewhere, to keep the town clean.

5. In conclusion, I consider this mode of Conservancy most simple, economical and effectual, and far superior to all other systems which have, from time to time, been tried.

CUDDAPAH,
11*th August* 1864.

(Signed) M. IYASAWMY,
Native Surgeon.

From Surgeon Major W. H. MACKINTOSH, M. D., in Medical charge Royal Artillery Bellary 19th August 1864, No. 9 ; to the Deputy Inspector General of Hospitals, Bellary, Ceded Districts.

With reference to your Memorandum, No. 924, regarding "the dry earth Conservancy," I have the honor to state that it was not tried in the Hospital of Royal Artillery, as no means were supplied for the purpose.

From Assistant Surgeon T. WALSH, in Medical charge, Ramandroog, 20th August 1864, No. 52 ; to the Deputy Inspector General of Hospitals, Ceded Districts, Bellary.

Agreeably to your Memorandum, No. 925, of the 16th instant, I have the honor to enclose the accompanying Report on the "dry earth Conservancy."

Report on Dry Earth Conservancy.

Agreeably to Memorandum, No. 1573. dated 12th May last, from the Principal Inspector General Medical Department, I have tried the dry earth Conservancy in the Depôt Hospital Privy, but from the strong odour emitted for some weeks from the Coal-tar, with which the walls and floors of the Privy had been freshly painted over, and the difficulty experienced at all times in maintaining the earth in a perfect state of dryness in the damp and foggy weather, I have not been able to judge fairly of its effects as a deodorizing agent.

I am however of opinion that, if the system could be effectually carried out, "dry earth" would prove a good deodorizer.

RAMANDROOG,
20*th August* 1864,

(Signed) T. WALSH, Assistant Surgeon,
In Medical charge.

From the Officer Commanding Southern Division, Head Quarters Trichinopoly, 31st August 1864, No. 360 ; to the Deputy Quarter Master General, Fort Saint George.

In transmitting agreeably to your instructions conveyed in memorandum, No 5148, dated 23rd May 1864, copy of a report on "dry earth sewage," from the Deputy Inspector General of Hospitals Southern Division, I have the honor to state that, judging from the collective opinions of the Medical Officers named in the margin, it appears to be most efficacious as a perfect deodorizer, and might be introduced with the greatest success.

Surgeon Major Kennedy, M. D., *Garrison Surgeon, Trichinopoly.*
Surgeon Major P. G. FitzGerald, M. D., *H. M.'s 105th Regt. Light Infantry.*
Assistant Surgeon W. H. Morgan, 23rd Regiment Light Infantry.

From the Deputy Inspector General of Hospitals, Southern Division, Trichinopoly, 27th August 1864, No. 340 ; to the Deputy Assistant Quarter Master General, Southern Division, Trichinopoly.

With reference to your letter, No. 397, dated 8th ultimo, I have the honor to state that Reports on "dry earth sewage" have been received from the Medical Officers named in the margin.

Surgeon Major J. Kennedy, M. D.,
Do. P. G. FitzGerald, M. D.
Assistant Surgeon W. H. Morgan.
Do. W. O'Halloran.

2. The Garrison Surgeon states "that this description of sewage has been used in the Privies of the Garrison and Lock Hospitals since the last three months with marked benefit—the application of the earth in the manner stated has manifestly prevented the diffusion of noxious gases to a great extent."

3. Surgeon P. G. FitzGerald, M. D., in charge of Wellington, states that the system has been in operation in the Hospitals at that Station since the 15th June 1864, and that in comparison with the old plan he is enabled "to affirm without any reservation, that the dry earth is the most efficient, and at the same time the simplest and most economical system that has yet been tried or suggested."

4. Assistant Surgeon W. H. Morgan, 23rd Regiment Madras Light Infantry, had the ordure previously covered with earth, removed daily to empty barrels sunk in the earth at a distance from the Hospital, for the purpose of experiment ; earth was put into these barrels daily, "and the total absence of offensive smell was remarkable." The floor of the privy so saturated with urinous and fæcal matter, that it could hardly be approached, has recently been covered with a layer of dry earth, which is removed from time to time, and much of the offensive smell has been removed."

5. Assistant Surgeon W. O'Halloran, Royal Artillery, reports that "owing to impaired sense of smell he was unable personally to test the merits of the proposed plan" and was therefore obliged to depute Assistant Apothecary Lincoln to note the results of the trial in the Hospital under his charge, whose report he forwards. This report states that "earth sewage was employed in one out of three Latrines, and Coal-tar used in the other two, the former has been a fair and uninterrupted trial for three months, with freshly-sifted *sand* daily, but it has not proved so beneficial as Coal-tar ;" the latter "being much cleaner and at the same time a more purifying agent."

6. On the whole, it appears that the dry earth system has been generally approved of, and I would therefore recommend its adoption in both Barrack and Hospital privies—to carry the system out properly, some alteration may probably be required in the construction of the privies.

7. The experiment, as tried in the Artillery Hospital here, is hardly a fair one ; inasmuch as *sand* has, it would appear, been used instead of *earth*.

8. I send herewith the original reports (to be returned) for the Major General's satisfaction.

9. Those Officers who have not yet reported on this subject have been called upon to do so without delay.

From the Officer Commanding Hyderabad Subsidiary Force, Secunderabad, 4th October 1864, No. 307 ; to the Deputy Quarter Master General, Fort Saint George.

With reference to Memorandum, No. 5148, dated 23rd May 1864, attached to Proceedings of Government, No. 1360, dated 22nd April 1864, I have the honor to forward, for submission to His Excellency the Commander-in-Chief, a report on the dry earth system in Hospitals, as furnished by the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

From the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad, 3rd October 1864, No. 299 ; to the Officer Commanding Hyderabad Subsidiary Force.

With reference to docket No. 2821, dated 1st October, from the Assistant Quarter Master General, by order, I have the honor to state that my report on earth as a deodorizing agent was forwarded to Government on the 23rd September.

I annex a copy of my letter, No. 288, dated 23rd September 1864.

I beg to repeat my recommendation in my letter, to your address, No. 195, dated 29th June 1864, that the system of dry earth sewage should be adopted in all the Barracks and public Latrines of the Force.

From the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad, 23rd September 1864, No. 288 ; to the Principal Inspector General, Medical Department, Madras.

With reference to Circular No. 1573, dated 12th May 1864, and received by me on the 6th June 1864. I have the honor to forward reports from Executive Medical Officers, on dry earth sewage in the various* Latrines attached to the Hospitals at this Station.

The plan is most favorably reported on generally, though it will be seen that Drs. Macleod and Williams differ in opinion from the other Officers.

*1 *Letter No.* 33, *dated* 3*rd Sept.* 1864 *from the Medical Officer in charge* 17*th Lancers.*
1 *do.* ,, 82, ,, 7*th* ,, ,, *from do.* 108*th R gt.*
1 *do.* ,, 73, ,, 7*th* ,, ,, ,, ,, 18*th Royal Irish.*
1 *do.* ,, 5*th* ,, ,, ,, ,, *Royal Artillery.*
1 *do.* ,, 19, ,, 8*th* ,, ,, ,, ,, *B By.* 23*rd Brig.*
1 *do.* ,, 44, ,, 19*th* ,, ,, ,, ,, 2*nd L. Cavalry.*
1 *do.* ,, 236, ,, 10*th* ,, ,, ,, ,, 32*nd N. Infy.*
1 *do.* ,, 25, ,, 5*th* ,, ,, ,, ,, 38*th N. Infantry.*
1 *do.* ,, 17, ,, 5*th* ,, ,, ,, ,, *Lock Hospitals.*

In most cases the deodorizing effects of the dry earth have been almost perfect and would have been quite so, more particularly in the Native Hospitals, if the construction of the privies fully equalled the requirements and the Conservancy Establishment was somewhat improved.

Coal Tar has been judiciously employed, as will be seen in the reports in combination with dry earth.

In occasional personal inspection of some of the Native Hospital privies in the early morning, I have had occasion to comment on the want of perfect cleanliness—the excuse offered has been the resort to the building during the night in comparative darkness. I consider a night lamp should be allowed and suspended in all these buildings.

From Surgeon JAMES KELLIE, M. D., Her Majesty's 17th Lancers, Secunderabad, 3rd September 1864, No. 33 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

As directed by your Circular Memorandum, No. 197, that a report be forwarded at the beginning of this month on the "system of earth sewage" as recommended in Circular No. 1573, and memorandum by the Prison Committee, dated Calcutta, March 29th 1864, I have the honor to state that, for the last two months, one privy holding five seats and, used daily by twenty or twenty-five men was set apart, in which the dry earth was employed as a deodorizing agent.

The earth used was a good loam, got from the vicinity of the nearest cultivated ground. The earth previously dried and passed through bamboo sieves was placed in the privy and a toty detailed to throw in a sufficient quantity every time the tubs were used by the patients.

In another privy, coal tar alone was used as a deodorizer to compare the efficacy of the dry earth, the latter has been found to stop all offensive smell and the mixed soil removed without any stench ; in this respect, it is preferable to the use of coal tar for the same purpose.

But in the event of the dry earth system being adopted, I would suggest that wooden boxes with suitable scoops be supplied, as then the men themselves may be expected to throw in the earth, as at present they will not do it and the toties at times otherwise engaged cannot always attend properly.

From Surgeon G. BAILLIE, M. D , Her Majesty's 108th Regiment Trimulgherry, 7th September 1864, No. 82 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad.

With reference to Circular Memorandum No. 273 from your office, relative to earth sewage, I have the honor to state for your information, that the plan has been followed in the Hospital privy

of Her Majesty's 108th Regiment for about a month past ; the practie has been to place buckets containing dry earth in front of the seats, and the patients instructed to throw a scoopful or two over the excreta after each visit to the place. Upon the whole, there has been a very sensible improvement in the air of the place since the earth has been in use, and I have no doubt that the plan properly carried out, might be permanently adopted with great benefit.

From Surgeon W. STEWART, M. D., Her Majesty's 18th Royal Irish Regiment, Secunderabad, 7th September 1864, No. 73 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad.

Adverting to Circular, No. 1573, dated 12th May 1864, I have the honor to state that the practice of using dry earth, as a deodorizer, has been tried in the Hospital of the 18th Royal Irish Regiment under my charge, and found to be perfectly successful.

Six baskets containing dry earth are placed in the privy, for each of which, a scoop is provided, and the men are required to throw in a scoopful on each occasion of its use, by which any offensive smell is completely prevented. It is equally efficacious, when used in the urinals ; but a much larger quantity of earth is required for this purpose.

The above system however cannot be carried out effectually in the Trimulgherry General Hospital, without an addition to the regulated Conservancy Establishment.

From Surgeon Major J. L. RANKING, Hospital Royal Artillery, Secunderabad, 5th September 1864 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

No. 1573 *of* 12*th May* 1864, *from the Principal Inspector General Medical Dept.*

In accordance with instructions conveyed in the Circular Memorandum quoted in the margin, I have the honor to report upon the working of the "dry earth" system of Conservancy.

2. It has been adopted on trial in the Hospital of the Royal Artillery, the Cantonment and Civil Dispensary, and in relation both to Europeans and Natives.

3. I have formed a most favorable opinion of the system.

4. In the Hospital of the Royal Artillery it has been used both in the privy and urine tubs, and provided the earth is used in sufficient quantity, it is perfectly efficient as a deodorizer.

5. It has been determined by experiment that the contents of a privy tub in use for a whole week, properly supplied from time to time (after each 'use' that is) with earth were perfectly free from smell when removed at the end of that period; and there is no question that if the system be properly worked it is most efficacious.

6. In dealing with the *urine* tubs however, some difficulty has been experienced, as the quantity of earth required to be used is considerable, and the removal of it entails some labor.

7. "Three half pints" of earth the Rev. Mr. Moule pronounces sufficient for each 'use,' but the quantity required depends, I apprehend, very much upon the quantity of urine voided with each 'use,' upon the amount in fact of liquid to be absorbed.

8. According to experiments undertaken, by my direction, by Mr. Apothecary Finlay, each Imperial Gallon of urine requires 6¼lbs. weight of earth to absorb and deodorize it.

9. At this rate a Hospital, say, of 100 sick, would require (allowing for each man 35oz. of urine exclusive of solid fæculence) 1,400lbs or 12½ cwt. daily. Extend this to a Regiment of 1,000 strong, and the amount is 6¼ tons.

10. Mr. Moule allows in *urinals* one ton for 1,000 'uses.' If by such '*use*' be meant each act of micturition, and 4 such acts to be performed in each 24 hours, then the quantity will be 4 tons for each 1,000 men ; or 120 tons per mensem, and 1,440 tons per annum.

11. This leads to the question of "establishment" necessary to the efficient working of the system.

12. In the Hospital of the Royal Artillery I have (1) one Scavenger's Cart and (2) two Toties. The Cart has been employed to bring the earth which is dug up by the Toties, and I do not think it possible for two men with a Hospital averaging 30 sick to work the system efficiently, to be always in fact in attendance and to supply the fresh earth and remove the used material in addition.

13. Neither do I think that the establishment allowed to Regiments and Batteries will suffice for supply and removal, in addition to constant attendance at the Privies.

14. Supply and removal should, I think, be quite independent of the Toties, whose duties should be to keep the privy and urine tubs sufficiently supplied with the dry earth, and to assist the men in charge of the Scavenger's Carts in emptying the contents of the tubs into the Carts.

15. The Toties require to be constantly on duty, for although orders have been given (and they are hung up in the buildings) that every man after using a tub throws into it two or three handfuls of earth, the order is constantly neglected, and the Toties have to go-round constantly to inspect the tubs, a duty which they also will neglect, unless constantly watched.

16. The introduction of some simple machinery as described by Mr. Moule, would of course obviate this risk of neglect.

17. I continue to associate the Coal tar with the use of the earth. The tubs are still painted with it, and it is used purely in the building, the walls of which are painted with it up to the height of about 16 inches. An objection has been raised to the use of the tar in the tubs, which it is said cannot be cleaned, the earth adhering so tenaciously to the sides of them ; but I have not found any difficulty on this score. The Toties assure me that the tubs are easily scraped and cleaned when a fresh coat of tar is required. I trust therefore that, if the "dry earth" system be generally introduced, Coal tar may also be allowed.

18. In Native Hospitals, the difficulty in carrying out the system is greater. The quantity of earth required to absorb all liquids, owing to the habits of the Native, is proportionately greater. My views on this subject, with a plan of a Native Privy adapted to this system, have been submitted, and a copy of that communication was appended to my last quarterly sanitary report upon the Cantonment Hospital. I need therefore only remark here that I consider that the supply of the earth and its removal should be effected by Contract, the Toties being exclusively employed at the Hospital.

From Assistant Surgeon E. F. O'Leary, Royal Artillery, Trimulgherry 8th September 1864, No. 19 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force, Secunderabad.

In accordance with Circular No. 273, I have the honor to report that the dry earth system for Privies has been tried in my Hospital, and found to be successful as a deodorant.

Three baskets with earth have been placed in the privy, and the patients were directed to throw in sufficient earth to completely cover the alvine evacuations of each ; particular instructions were given directing the patients to avoid, as much as posible, passing any water into the privy Buckets, but to urinate into the tub set apart for that purpose.

From Surgeon Major A. C. Macleod, M. D., doing duty 2nd Regiment, Light Cavalry, Secunderabad, 19th September 1864, No. 44 ; to the Deputy Inspector, General of Hospitals, Hyderabad Subsidiary Force.

I have the honor to report the following trial of earth as a deodorant in the Hospital of the 2nd Light Cavalry.

2. From a tub of common garden earth, each visitor to the privy has been instructed to take a handful and to sprinkle it over the evacuation. The sweepers are also directed to attend from time to time and to perform this office, where it has not been done already, or done ineffectually.

3. It is found that the mere covering over of the fæcal matter in this way arrests the further diffusion of *effluvium* ; and I am also satisfied that a thorough mixing of the two, as recommended by the originator, results in an inodorous mass ; confessedly an important object when, as in continental privies, ordure is allowed to accumulate for weeks or months together ; but of less consequence under circumstances of daily removal.

4. As regards the effect on urinal *effluvia*, the result is less satisfactory. I do not find that any sensible benefit is produced by throwing into a tub of urine a moderate quantity of earth ; and in the privy of a Native Hospital, as at present constructed, where there must always be, in front of the seats, a gutter more or less soaked with this excretion, the consequence is a nasty mess of mud, not only offensive to view, but actually obstructive to the flow of fluid into the receptacle outside, and it is impossible to prevent the occasional falling of earth, not only into this gutter, but on the common floor.

5. I would, therefore, with much deference, express my opinion that, under the existing arrangements of Native Hospitals, the employment of earth in supersession of that of Tar, is not

advisable. Nor do I anticipate any advantage from a conjunction of the two, as I have found that Tar alone suffices, with the ordinary appliances of cleanliness, to preserve a common privy in a state of perfect salubrity. The use of earth might be desirable in the possible absence of Tar.

6. But though, as these prives are now ordered, I would not advocate the use of earth. I am no less of opinion that, by introduction of the "dry system" and by the use of longitudinal troughs for the joint reception of both fæces and urine, it would be a valuable adjunct, and would leave, as regards this important object, nothing to be desired. For details of this arrangement, I would beg to refer you to my memorandum on the construction and conservancy of privies in the Hospitals of Native Regiments, dated the 22nd May 1864.

From Assistant Surgeon W. A. Smith, M. D., in Medical charge, 32nd Regiment Native Infantry, Secunderabad, 10th September 1864, No. 236 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

With reference to memorandum, No. 1573, dated 12th May 1864, I have the honor to report that the dry earth system has been adopted for the past few months in the Latrine attached to the Hospital of this Regiment with very favorable results.

Tubs are supplied to this Latrine and the patients instructed to use the earth in the way directed in the above memorandum. So long as these instructions are carried out, the Latrine remains perfectly free from all smell of any kind ; but it sometimes happens, the men pass urine into the tubs and also empty water into them which necessarily deteriorates the value of the earth as a deodorant.

On the whole, from the trial I have given it, I consider that in suitably constructed Native Latrines it is the best system I have yet seen adopted.

From Surgeon J. T. Williams, Her Majesty's 38th Regiment Madras Native Infantry, Secunderabad, 5th September 1864, No. 25 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

With reference to Circular, No. 1573, dated Fort Saint George, 12th May 1864, directing a report to be made on the efficiency of the "dry earth system" of conservancy, I have the honor to state, that, after a careful trial in the Hospital privy of the 38th Regiment Madras Native Infantry, I am reluctantly compelled to admit, that the "earth system" fails to meet the requirements of Native Hospitals. In my letter to you, No. 8, dated 25th April 1864, I mentioned to suggest the difficulties which have been found to militate against the fair trial of the "dry system." The Sepoys do not appreciate the value of it, they cling with great tenacity to the Native custom of washing the nates after defecation, and, without the co-operation of the patients, and a discontinuance of the washing, it is simply impossible that a satisfactory "dry system" can be carried out.

From Surgeon J. T. Williams, in charge of Lock Hospitals, Secunderabad, 5th September 1864, No. 17 ; to the Deputy Inspector General of Hospitals, Hyderabad Subsidiary Force.

With reference to the report on the "earth system" of conservancy, I have the honor to state, that up to the 1st ultimo the "Lock" existed only as a ward of the Civil Hospital. I have consequently no report to make.

Memorandum from the Deputy Quarter Master General, Fort Saint George, 25th November 1864, No. 10,736 ; to the Secretary to Government, Military Dept.

Forwarded to Government, in continuation of the correspondence submitted with letter No. $\frac{423}{2557}$, dated 19th October 1864.

From Surgeon Major A. Blacklock, Physician General Hospital, Madras, 16th November 1864, No. 547 ; to the Deputy Inspector General of Hospitals, Presidency.

I have the honor to inform you that omissions and errors have been discovered in certain calculations in my Report on a trial of the earth sewage system in the General Hospital, Madras, dated 28th July 1864, and as these miscalculations may have an influence on further applications of the earth system, I am anxious to correct them by having paragraphs 14, 15 & 16 re-placed by the paragraphs hereto appended.

14. Seven parahs of common clayey earth make a cart-load. The parah is 172 to 187 pounds. In this paper it is taken at the lower rate of 172 pounds. The earth is little increased in bulk by the addition of the excreta, but the mass returned from a European Latrine is about one-seventh heavier than the original dry earth; or each cart-load of poudrette is heavier by about two hundred pounds than the original cart-load of earth.

15. The expenses of carrying out this plan in the Latrines of European and Native Hospitals are given in the following tables. The expenses of the old wet system are also stated to show the difference of the cost of the two systems. The Ward Toties are included so as to give at one view the cost of the entire Scavenging Department of a European and a Native Hospital at Madras. The calculations have been made with care and have been revised by Mr. Harvey, the Assistant to the Professor of Chemistry.

For dry system Latrines for a Hospital with 200 *European Sick.*

Ward Toties, 6 on Rupees 6 each per month, ...	36	0	0
Latrine Toties, 1 on Rs. 7 and 5 on Rupees 6 each per month,	37	0	0
Box carts three* to bring earth and remove poudrette, ...	66	0	0
Coal-tar, 50 lbs a month at 2 Annas per pound, ...	6	4	0
Tubs, 3 per month at 4 Rupees each tub, ...	12	0	0
Expenditure for Mamoties per month, ...	0	8	0
Total expenditure per month...	157	12	0

* *This allows half a cart-load for storage for the rain season. The table in paragraph* 13 *gives only the exact quantity used daily.*

For wet system Latrines for a Hospital of 200 *European Sick.*

Ward Toties, 6 on Rupees 6 per month, ...	36	0	0
Latrine Toties 4, one on 7 Rupees a month and 3 on 6 Rs. each a month,	25	0	0
Cister - Carts, 1½ at Rupees 25½ each per month, ...	38	4	0
Coal-tar, 38 lbs. a month, at 2 Annas per pound, ...	4	12	0
Tubs 3 per month at 4 Rupees each.	12	0	0
Total expenditure per month...	116	0	0

For dry system Latrines for a Hospital with 100 *Native Sick.*

Two Ward Toties, one on 7 Rs. a month, and one on 6 Rs. a month, ...	13	0	0
Latrine Toties, 2 at 6 Rupees a month each, ...	12	0	0
Tubs, on an average of one per month, ...	4	0	0
Coal-tar, 12 lbs. a month, at 2 Annas per pound, ...	1	8	0
Box Carts, to bring earth and remove poudrette, one at 22 Rs. per month,* ...	22	0	0
Expenditure for Mamoties per month, ...	0	4	0
Total expenditure per month...	52	12	0

* *This allows rather less than half a cart load for storage for the rain season. The table in paragraph* 13 *gives only the exact quantity used daily.*

For wet system Latrines for a Hospital of 100 *Native Sick.*

One Ward Toty on 7 Rupees a month, and one on 6 Rs. a month,	13	0	0
One Latrine Toty 6 Rupees per month, ...	6	0	0
Tubs, on an average of one per month, ...	4	0	0
Coal-tar 12 lbs. a month at 2 Annas per pound, ...	1	8	0
Cistern cart, ½, ...	12	12	0
Total expenditure per month...	37	4	0

The extra expense of the dry system for two hundred Europeans and one hundred Natives in Hospital is Rupees fifty-seven Annas four (Rupees 57-4) more than was required on the old wet plan.

16. When Latrine soil is better appreciated as a manure, as it will be when it is more generally known that nine crops of hay can be obtained each year from ground over which such manure has been sprinkled, there will likely be no difficulty in finding parties who will bring earth and remove poudrette from the Latrines with little or no charge to Government.

(Signed) A. BLACKLOCK, Surgeon Major,
Physician General Hospital.

No. 3886.

MEMORANDUM.

Forwarded to the Quarter Master General, in order that the necessary correction may be made in the original forwarded with this Office letter, No. 339 of the 6th ultimo. *To be returned.*

(Signed) R. COLE,
Prin. Inspr. Genl. Medl. Dept.

FORT SAINT GEORGE,
23rd November 1864.

With Report from the Acting Controller of Military Accounts, 22nd Feby. 1865, *E.*

From Major J. H. M. SHAW STEWART, Royal Engineers, Member Sanitary Commission, Madras, 12th December 1864, No. 404; to the Secretary to Government, Military Department.

I have the honor to forward, in the absence of the President, Sanitary Commission, and at his desire, two copies of a printed Report, with covering letter by the Honorable Mr. Ellis, on a series of experiments upon the efficacy of "Dry Earth," for Conservancy purposes.

Enclosures two.

From the Quarter Master General, Head Quarters, Secunderabad, 27th December 1864, No. 11,790A; to the Secretary to Government, Military Department, Fort Saint George.

I have the honor, by order of His Excellency the Commander-in-Chief, with reference to paragraph 4 of Proceedings of Government, No. 4480, dated 15th instant, to state that the Commander-in-Chief highly approves of the suggestions of the Sanitary Commission that the new system of Dry Conservancy should be made applicable to all buildings and localities occupied by Soldiers.

2. In my letter, dated 19th October 1864, the same recommendation was submitted.

No. $\frac{423}{9587}$

3. He would observe that the Carts employed to carry away the Poudrette could be made use of to bring dry earth back to the Latrine, where it would be sifted. Earth would every where have to be brought from a distance as it would not do to have neighbourhood of the Barracks or Latrines interfered with for this purpose.

4. Each Cart would have to be provided with tools and a man to dig the earth, if the driver of the bullocks could not be made to do it himself.

5. The Commander-in-Chief suggests that the Sanitary Commission be requested to draft a General Order explanatory of the mode of operation of the new system, in order that failure no where arise from a want of that knowledge.

6. The system introduced by Dr. Hathaway, which consisted in carting away the excreta in air-tight iron boxes, without any attempt at previous deodorization, and may therefore now be considered as superseded by this latter measure, and the alterations proposed to existing buildings (*Vide* my letter, dated 26th December 1863 and the Estimate accompanying) are no longer necessary.

No. 10,137.

7. The Commander-in-Chief finds some difficulty in offering an opinion as to whether hired servants or contract service would be the better arrangement. The Commissary General is perhaps better qualified to make that assertion. But as far as the Commander-in-Chief is able to judge, he thinks that hired servants being more immediately at hand and under control of the head of the Hospital, would be preferable to the other plan.

Memorandum from the Deputy Quarter Master General, Fort Saint George, 21st February 1865, No. 2153; to the Secretary to Government, Military Department.

Forwarded to Government, in continuation of the Reports submitted with letter No. $\frac{423}{2387}$, dated 19th October 1864.

From the Officer Commanding Pegu Division, Rangoon, 23rd January 1865, No. 9; to the Quarter Master General, Fort Saint George.

I have the honor herewith to forward copies of letters as per margin, reporting upon the efficiency of dry earth as a deodorizer, in accordance with instructions conveyed in Proceedings of Government, No. 1360, dated 22nd April 1864. From these reports it will be apparent that wherever dry earth is procurable, the experiment has been most satisfactory.

1 *Letter from Officer Commanding, Thyetmyo.*
1 *Do.* *do.* *2/19th Regt. at Thyetmyo.*
1 *Do.* *do.* *Tonghoo.*
1 *Do.* *Assistant Surgeon in Medical charge of 2/19th Regt. at Tonghoo.*
1 *Do.* *do.* *do. of Royal Artillery at Tonghoo.*

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The season of the year is so adverse to a fair trial, on account of the difficulty in procuring dry earth, on which quality (dryness) its efficacy as a deodorizer depends, and in the Artillery, the Privies from long use and faulty construction have become so steeped in urine exhaling state and offensive odours, that I cannot consider the trial at all conclusive, but with new Privies constructed to suit the system with means of storing, sifting and drying the earth with an Establishment of Toties, to admit of one being always present in each Privy *at once* to throw on the earth on each occasion of the privy being made use of. On those conditions I am of opinion that the system would be entirely successful both as regards Sanitary requirements and on grounds of economy and simplicity.

THYETMYO, 28*th June* 1864. } (Signed) G. BRIGGS, Brigadier General, *Commanding Thyetmyo.*

I have the honor to report, as directed by your Memorandum of the 19th ultimo, relative to Assistant Quarter Master General's letter, No. 339 of 3rd May 1864.

It is found that no offensive smell is perceptible from dung, when the excrement is covered with dry earth.

It is found that libations of urine upon dry earth are in this country productive of offensive emanations.

When Soldiers are not prevented from making water upon the dry dust under their verandahs, there results a most unpleasant smell. I have been able to remark upon the question of smell only. The question, whether hurtful exhalations from decaying matter are rendered inoccuous by being passed through a stratum of earth is one which I have not the means of experimenting upon. Nevertheless, I have a very decided opinion on the subject.

It is unquestionable that the dessecation of animal or vegetable matter arrests decay, and dry-dust, will of course absorb moisture, although I fail to remark that its action is more direct and immediate than that of lime.

(Signed) R. WARDEN, Lieut.-Colonel, *Commanding 2/19th Regt.*

Agreeably to the instructions conveyed in your demi-official letter, dated 17th July, I have now the honor to forward the Reports on the experiment of the dry earth system of sewage in the two European Hospitals at this Station, the result of which has been very satisfactory and successful in a Sanitary point of view.

TONGHOO, 4*th January* 1865. } (Signed) T. G. E. KENNEY, Lieut.-Colonel, *Commanding Tonghoo.*

I have the honor to report that the dry earth system of sewage has been carried on the Latrines of the Hospital of the Right Wing 2nd Battalion 19th Regiment since the latter part of October last. The working of the system has been successful in a Sanitary point of view and inexpensive.

In the Latrine are two boxes for the earth, each with a small spade for the purpose of transferring a quantity (about 2lbs.) from the box to the Latrine-pan after use. The earth is procurable with very little difficulty at a short distance from the Hospital.

The only objection I see to the system is the constant supervision it requires, for it has been found that many men will not take the trouble to throw the earth on unless perpetually looked after.

(Signed) D. MACPHERSON, Assistant-Surgeon, *In Medl. charge of Right Wing 2/19th Regt.*

I have the honor to inform you, with reference to your letter from the Station Staff Officer (No. 237) forwarded to me, that immediately upon receipt of it, the experiment directed was commenced and during the last three months the dry earth sewage system has been tried in the Hospital Latrines of No. 5/20 Brigade Royal Artillery. Three times daily earth, previously dried in the sun, was by appointed persons thrown into the Latrines, besides which the patients were ordered after each evacation to throw some in; "dry earth and a shovel" being kept in the Latrine for that purpose.

The result was most satisfactory, and I believe the system much superior to that in ordinary use.

TONGHOO, 27*th December* 1864. } (Signed) P. P. LYONS, Assistant-Surgeon, *In Medl. charge 5/20th B. Royal Arty.*

In reference to the system of dry earth-sewage, I regret that the monsoon has prevented Medical Officers trying it at Rangoon, it is just commenced in the Artillery Hospital. From May till October, it is impracticable. I have seen it in the Strait Settlement, where it answers perfectly, especially in Jails, where labor is abundant and the earth kept very dry and well sifted. It does not answer with Natives, who, from their habit of washing, convert the dry earth into offensive mud.

RANGOON, 18*th January* 1865. } (Signed) C. J. SMITH, *Dy. Inspr. Genl. of Hospitals, Pegu Division.*

From the Barrack Master, Presidency, Fort Saint George, 23rd February 1865, No. 1471; to the Secretary to Government, Military Department.

With reference to the proposed general introduction of the dry system of conservancy, I have the honor to report, that the published opinions as to its advantages, have been fully confirmed by the trials at the privies erected for the use of the families of the Regiment in Garrison, and for the East Indian Clerks on the North East Berm.

2. It has also been partially tried at the several Guard-room privies in the Fort, (the earth having been supplied gratuitously by the Contractor for removing the receptacles,) and the improvement in the atmosphere is so marked, that I have no doubt with a larger and more constant supply of earth, and the addition of pans and receptacles, that no ill-effect or real annoyances would ever be experienced even in these unventilated Casemates.

3. The result of these experiments confirms me in the opinion that the costly system of standard plan privies, with the requisite watching establishments, is by no means a necessity, and that equally effective arrangements can be ensured by improving the ventilation of the present privies, fitting them with divisions, and contrivances for a mechanical delivery of earth into the receptacles—one man only being retained for filling the reservoirs from time to time with dry earth.

4. The removal of the vessels from the privies would be effected by a separate set of men according to circumstances, who would attend also at the soil pits to cleanse and wash them.

5. I would suggest therefore, that a single experiment may be permitted at the Mount, where the ordinary form of privy is in use, to determine, whether the plan here mentioned would not be equally effectual in preserving purity of atmosphere within them, and whether it is likely to obviate the necessity of erecting entirely new privies.

6. The experiment may first be tried with the present coal-tarred wooden tubs with a hand supply of earth occasionally; and subsequently, with pans, receptacles and mechanical delivery of earth; which I have no doubt can be readily contrived by the Executive Engineer.

7. The cost of the supply of dry earth would be trifling, and as receptacles and pans form part of the furniture of the new privies, it will be merely an anticipation of the expense under this head. The reservoir and hopper would, I imagine, make but an inconsiderable increase to the cost.

8. I may add that I have the approval of the Major General Commanding the Centre Division in submitting this subject for consideration.

ORDER, No. 1376, 10th April 1865.

The foregoing papers relate to the experiment ordered in Proceedings of Government marginally noted, on the system of "Earth Sewage" recommended for trial, by the Government of India, in some of the Hospitals, Jails and Public Buildings in this Presidency.

No. 1360, *dated* 22*nd April* 1864.

2. From the Reports now submitted, the Governor in Council learns that the system in question is almost unanimously approved, and that it only requires to be more thoroughly organized in detail, to ensure complete success.

3. The President of the Sanitary Commission, in his Report, expresses himself as follows, on the value of dry earth as a deodorizer:—"I am now satisfied that it possesses a marked superiority over all other means of Conservancy generally available in India, and I have no hesitation in recommending that the use of the earth system of Conservancy should be insisted upon in all Barracks, Jails, Hospitals and other Public Institutions." His Excellency the Commander-in-Chief "highly approves of the suggestions of the Sanitary Commission, that the new system of dry Conservancy should be made applicable to all buildings and localities occupied by Soldiers;" and in a subsequent letter remarks:—"The efficacy of the system, after being largely tried, is attested by, it may be said, the whole Service, there being scarcely a dissentient voice." The Principal Inspector General Medical Department observes, "the experimental trial thus far made goes conclusively to prove the value of the dry earth system as a deodorizer in this country, and its superiority over that hitherto in use."

4. In submitting a Report on the probable extra expenditure, the Controller of Military Accounts bases his Estimate on the extra assistance which has been required at the Presidency Hospital alone, which is calculated at 3 Annas and 4 Pies for each sick European, and 2 Annas and 6 Pies for each Native Soldier, giving an aggregate of extra annual expenditure for the whole Army of over a lakh of Rupees; it does not however appear certain that extra Establishments, to a similar extent, will be required at every Station; generally the experiments have been carried out without extra assistance, and, in some instances, it is not even demanded. Further and enlarged operations will, however, decide this point.

5. The Sanitary Commission include in their Report, Estimates for new Privies generally at a cost of 2,700 Rupees for 48 Europeans, and 2,400 for 40 Natives. This extra cost may, however, be avoided if the Plan submitted by the Barrack Master, in his letter, No. 1471, above recorded, proves successful. The Governor in Council considers it at any rate, deserving of trial, and sanctions the experiment being carried into effect as early as practicable in the manner proposed; for which purpose the Barrack Master will place himself in communication with the Sanitary Commission, and will report the result to Government.

6. The most immediate requirement at present, however, is storage for the "earth," that it may be kept dry at all seasons; and as the Plan submitted by the Sanitary Commission for a cart shed and earth store, is combined with that for the new Latrines* and may not prove suitable for the Privies now in use, the Department of Public Works will, in communication with the Sanitary Commission, submit a Plan and Estimate of an earth store and cart shed to meet present requirements at Stations where the experiment is in operation, as well as for the General Hospital at the Presidency. The buildings in question need not be of an extensive nature.

* *Page 53 of No. 403, 12th December* 1864.

7. The Commander-in-Chief recommends that the Sanitary Commission be requested to draw up a set of Rules, explanatory of the operation of the "earth system," that failure may no where arise for want of knowledge in this respect. The Governor in Council concurs in this recommendation, and directs that the Rules be printed in Pamphlet form and translated into the Vernacular languages, for general information and distribution.

8. These Proceedings will be reported to the Government of India, with reference to their letter adverted to in paragraph 1 of this Order, with an intimation that this Government are of opinion that the experiments hitherto recorded have proved satisfactory, and that thus far the system commends itself for general adoption.

To the Secy. to the Govt. of India, Mily. Dept. | Here enter 10th April 1865, No. 1377.

(True Extract.)

Under Secretary to Government.

To the Quarter Master General.
" Controller of Military Accounts.
" President Sanitary Commission.
" Barrack Master, Presidency.
" Adjutant General.
" Principal Inspector General Medical Department.
" Public Works Department.
" Military Accountant.
" Examiner Pay Department.
" Commissary General.
" Judicial Department, } for information.
" Revenue Department, }
"

Exd. T. Stubbs.

Pub: Pro: 26th April 1864 Nos 111—112
Subj — No 6 — May 9 1864

Judicial 1865 Dec

Proceedings of Govt
Military Dept
No 1376

Dated 10th
Rec'd 22d April 65

No 933

Forwarding a Memo in favor
of the introduction
into the Presidency of
the "Earth Pipe"
Commode &c.

No

Copy furnished to the
Inspector Genl. of Jails for
information.

The Inspector Genl.