

MADRAS RECORD OFFICE.

Government of Madras.

Petroleum DEPARTMENT.

G.O. No. 735

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Dated

28. 4. 1864

Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
28th April 1864.*

No. 443. Read the following Proceedings of the Madras Government in the Military Department :—

Communicating to the Commander-in-Chief and Principal
Inspector General, Medical Department, certain papers } (Here enter 22nd April 1864, No. 1,360.)
received from Government of India on a system of earth
sewage.

No. 444. ORDER THEREON, 28th April 1864, No. 735.
Forwarded to the Board of Revenue for information.
(True Extract.)

(Signed) C. G. MASTER,
Deputy Secretary to Government.

To the Board of Revenue, with Proceedings Military Department, No. 1,360,

Exd. S. T. Augustin.

MILITARY DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following papers:—

From the Secretary to the Government of India, Military Department, Fort William, 4th April 1864, No. 76; to the Secretary to Government, Military Department, Fort Saint George.

In transmitting the accompanying (2) copies of a paper on the efficiency of dry earth as an immediate and perfect deodorizer, I am desired to request that the Government of Fort Saint George may be moved to cause the plan to be tried in some of the Hospitals, Jails and Public Buildings in the Madras Presidency, the result being reported for the information of the Government of India.

[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 dwellings, 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 principle 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 inoffensive 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.

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 fecal 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, }
29th March 1864. }

ORDER, No. 1360, 22nd April 1864.

Communicated to the Commander-in-Chief and Principal Inspector General Medical Department, in view to the experiment being tried and the result reported.

(True Extract.)

Almon Sturges
Deputy Secretary to Government.

To the Adjutant General.

" Quarter Master General.

" Prinl. Insp. Genl. Medl. Dept.

" Judicial Department.

" Revenue Department. *With 10 spare Copies.*

" President Sanitary Commission, for information.

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Proceedings of the
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Forwarded to the Board
of Rec. for information. —

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