

MADRAS RECORD OFFICE.

Government of Madras.

Public DEPARTMENT.

G.O. No.	905	Press ~~Mis.~~
Dated	21-7-	1970

Not to be folded or roughly handled

Read the following papers :—

No. 88. From Surgeon W. R. CORNISH, F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 6th June 1870, No. 638 :—

With reference to paragraphs 3, 4, and 5 of the Order of Government, dated 18th November 1869, No. 1577, I have the honour to report that the mode in which solid filth is being deposited on the site of the Sewage Farm has been objected to by the Superintendent of the Powder Manufactory as causing a nuisance to himself and establishment.

2. I inspected the locality on the 1st instant in company with Major Drever, Acting President of the Municipal Commission. We found that the smell complained of arose chiefly from the excavations for the reception of town refuse having been carried down to a depth below the water level, so that the decomposing mass was kept moist and fermenting, and the layers of earth covering in the rubbish were scarcely thick enough to prevent foul emanations from rising to the surface.

3. It seems that it is necessary to raise the level of the land in some spots by several feet, and this can only be economically effected by filling up the hollows with town sweepings. In a letter to the Acting President, Municipal Commission, I have expressed an opinion that, if the level requires raising in this manner, it should be effected by putting down alternate layers of rubbish and of earth, and that great care should be taken in covering up the town filth day by day as deposited, with a sufficiency of earth to prevent nuisance.

4. When Government consented to the use of solid filth on this site in addition to sewage, I imagine that it was not intended that a deposit of six feet or more of noxious and fermenting material should be heaped together for the purpose of raising the ground level. For immediate agricultural operations such masses of fermenting matter are objectionable, as they tend to overheat and destroy any seed or young plants that may have been sown or placed on the surface, and, in a sanitary point of view, such collections of refuse are still more open to objection.

5. The progress of sewage irrigation at Mellow's road has been carefully watched by me, ever since the commencement of the experiment, and since my succession to the office of Sanitary Commissioner, I have paid frequent visits to the site of the works, with the view of keeping myself acquainted with the progress of the experiment.

6. Since the end of the rains in January very little has been done in the way of planting out a larger area of grass for irrigation. A considerable quantity of the land has been levelled, trenched, and manured with night-soil, ready for planting when the rainy season shall have commenced. The stiff and unyielding nature of the soil, the absence of porosity in it, and its salty nature, are all very grave drawbacks to the rapid and successful reclamation of the waste, and its conversion into rich land. That these difficulties may be got over gradually is, I think, quite possible; but much patience and perseverance will be needed before the land at Mellow's road will ever be in a suitable condition for the successful practise of sewage irrigation.

7. The dry heat of the last few months has brought out prominently one very grave defect of the soil of the locality, viz., the large quantity of salt it contains.

This salt, under the influence of irrigation, rises to the surface in a manner which is very injurious to plants. So long as the natural rainy season lasted, and the grasses were refreshed by dews and a moist atmosphere, they thrived very well, but now that they get nothing but brackish water or sewage, the plants of guinea grass and hurryali are dying in large numbers, at the roots, instead of yielding crops, as was hoped, at the rate of eighty tons per acre per annum.

8. In addition to the salt contained in the soil, it must be remembered that "the sewage" of Madras, at this season of the year, must necessarily be highly saturated with chlorides. If we but for a moment consider the sources of the sewage, it will at once be seen how this arises. Most native houses in Madras have wells on the premises, which supply the water used for washing, bathing, and other house purposes. Good drinking water is too scarce a commodity to be poured into sewers, and as nine wells out of ten in native houses do not yield a water pure enough for drinking, it follows that the house water, which is the basis of the town sewage, must necessarily be a brackish water, which, as every body knows, is inimical to vegetation. During the rainy season, when the sewage was diluted by rainfall, and the wells were filled from the same cause, the noxious influence of the salt was not observed. It is only since the dry hot weather has set in that the concentration of salt in the sewage and in the soil has been noted to be so injurious to the plants under irrigation. Guinea grass is so hardy that it will thrive in good soil if watered by the ordinary brackish water of Madras wells, but it is unable apparently to resist the combined influences of the salty soil at Mellow's road, and the brackish sewage laid on to it.

9. To rid the soil of the excess of salt it contains, and to make it better adapted for the support of vegetation, it will be necessary to add sand and old mortar rubbish in considerable quantity, so as to make the stiff clay porous, and allow the rainfall to dissolve out, and carry away, the salt from the surface. I think the laying down of subsoil pipe drains to remove excess of moisture from the roots of the plants, as recommended by Dr. Ranking, will be necessary before sewage can be profitably applied to such a site. In process of time, as Madras becomes supplied with a pure water, the sewage will, doubtless, improve in quality. More fresh and less salt water will find its way into the drains, and the proportion of salt will be reduced so as to be comparatively harmless; but for some years to come, the experience of the present hot season would seem to indicate that no profitable results can be looked for, from the sewage irrigation of soils abounding in salt like that of Mellow's road, during the dry months of the year.

10. When Captain Tulloch reported on the farm in October last, he distinctly pointed out that the successful results, such as he then described, "were not altogether due to the sewage."

He observed, "The quantity of this fertilizing liquid is so small that each crop gets but very little indeed. When the sewage fails, water is used, and much of the good effect already produced is no doubt due to this cause."

11. In visiting the farm some months ago in company with Dr. Ranking and Colonel Denison, it occurred to me that the results of water and sewage irrigation ought to be compared side by side, before attributing results to sewage which might not fairly be its due. Dr. Ranking agreed with me, and in his report, para-

graphs 13 and 14, embodied the suggestion which Government in paragraph 6 of the order above quoted thought deserving of the notice of the Municipal Commissioners. So far as I know the suggested experiment has not been tried, except in an indirect way. Since the rains and night dews have ceased, and the sewage has supplied the chief moisture to the plants, the growth of the grasses has been much less vigorous than before.

This would seem to indicate that the former success was more owing to the use of fresh water than of sewage.

12. A large quantity of guinea grass has perished altogether, the hurryali grass is not looking strong, and the only grass which seems able to stand the sewage and thrive is a coarse swampy grass, which grows on the banks of the Cooum, and is not injured by salt. The botanical name of this grass I am not acquainted with, and as it is not in flower, I cannot identify it, but it is said to be a good food for cattle, and if further experience shows that it can be cultivated with success under sewage, it would, I think, be well to lay down more of it on the farm in Mellow's road, as it is apparently uninjured by the quantity of salt in the soil.

13. I am much more hopeful of the success of sewage irrigation on land which is naturally porous and sandy, and capable of absorbing large quantities of sewage. An experiment of this kind on a piece of waste land between Triplicane and the sea is contemplated by Colonel Denison, but has not yet been begun. I think it is of great importance that no delay should occur in experimenting with the Triplicane sewage with the view of seeing how far the soil may be in fault in the case of the Mellow's road experiment.

The reported success of the operations at Mellow's road has I see led many of the English newspapers to the conclusion that the whole of the difficulties of the utilization of sewage in Madras have been solved, whereas the question is still actually in its infancy, and the only thing as yet proved is that guinea grass planted in a salt clay soil, and watered only with sewage and brackish water, if it does not actually die under the operation, will, during the dry months of the year, maintain but a sickly vitality.

14. Many advocates of the use of sewage in agriculture are under the impression that the Indian fluid known by that name is identical in composition with the sewage of English towns, and similar results, they argue, ought to result from its use; but as a matter of fact the chemical constitution of the two fluids is wholly different, and this being so, there must necessarily be a difference in their action as fertilizers. The points of divergence may be best seen perhaps in the following parallel:—

English Town Sewage.

1. Has a basis of fresh water suitable for drinking and cooking.
2. Contains human excreta in suspension or solution.
3. Is of moderately low temperature and rarely fermented when applied to land.

Madras Sewage.

1. Has a basis of salt or brackish water unfit for drinking and cooking.
2. Contains no human excreta.
3. Is always of high temperature and smelling of sulphide of ammonium, proving that its organic matter has undergone change.

15. It is quite necessary, in dealing with the subject of sewage irrigation, that the very important differences in the constitution of English and Madras "sewage" should be borne in mind, and that we should not base our expectations of crops on English standards alone. I regard in the first place the quality of the water which forms the basis of sewage as of the very greatest moment. While we are compelled here to use very brackish water for household purposes, it is evident that the resulting sewage in this respect can never compare with that of an English town, derived from a water which is wholesome enough for drinking. Every practical gardener in India knows that his success or failure in the culture of certain plants is entirely a question of a few grains more or less of salt per gallon in the water he uses. And in sewage irrigation in India the quantity of salt in the water is sure to influence the results. In the rainy months, when the sewage is diluted, and the brackish wells are filled with rain water, no ill-effect will be perceived, but in the hot season, the increasing proportion of salt in the sewage is sure to diminish the luxuriance of vegetation.

16. This "salt" difficulty is peculiar to Madras and coast towns, and, as I have said before, the introduction of fresh water, from the Red Hills, for the use of the population, will, after a few years, so alter the constitution of the sewage, as to bring it more on a level in this respect with English sewage. There will be no difficulty hereafter in adding night-soil to the irrigated tracts, if it should be found impolitic or impracticable to remove the excreta of the town by water. The high temperature and its results, (speedy dissolution of the organic elements of sewage,) is a point in which Indian sewage must always compare disadvantageously with the fertilizers of more temperate climates, but with all the disadvantages I have pointed out, the utilization of sewage is so important a measure to every civilized community, that I hope no efforts may be wanting to carry out our experiments in Madras to a successful issue.

APPENDIX A.

From Colonel R. CADELL, Acting Superintendent of the Gunpowder Factory, to the President of the Municipal Commission, Madras, dated Madras, 30th May 1870, No. 178.

I have the honour to inform you that the odours coming from the masses of town filth on the west side of the Powder Mills road are sometimes very offensive. On Saturday, for instance, I happened to pass along that road with a friend at about 9 A.M., and we were both nearly sickened by the smells even before we came into contact with the most stinking emanations which rise from the abominable drains in the suburb to the west of the People's Park. Carts had very recently been emptied which caused principally the sickening original stink to which I have alluded, but it struck me that not nearly a sufficient quantity of earth is laid on the top of the mass of town filth, and that when rain comes the exhalations from rotting mass underneath will be more likely, even than they are at present, to spread sickness in the neighbourhood, and thus endanger the health of the employés in the establishment under my charge.

2. A copy of this will be sent to the Sanitary Commissioner, and, if necessary, the subject will be brought to the notice of higher authority.

APPENDIX B.

From Surgeon W. R. CORNISH, F.R.C.S., Sanitary Commissioner for Madras, to the President of the Municipal Commission, Madras, dated Madras, 1st June 1870, No. 609.

With reference to letter, No. 179, dated 30th ultimo, from Colonel Cadell, R.A., forwarded for my information, and to our inspection this morning of the locality complained of by that officer,

I think the nuisance has been in part due to the excavations in the Sewage Farm having been carried down below the water level, and to the filth having been put into moist instead of dry soil, with perhaps an insufficient covering of soil to absorb the odours arising from the fermentations of the rubbish.

2. Great care should be taken in giving a sufficient covering of earth to the contents of the rubbish carts, especially as the season is fast approaching when rain may be expected.

3. I think the burying of the town rubbish, according to the present method, is likely to be productive of nuisance, and to be of little value to the farm in an agricultural sense. If it is necessary to dig the pits so deep, they should be filled in again with alternate layers of rubbish and soil, and not with five or six feet of rubbish and a slight covering of earth as is now the case.

Attention to the covering in of the rubbish will, I have no doubt, diminish the nuisance complained of by Colonel Cadell.

4. I am sorry to observe that the irrigation with sewage since the hot weather has set in has not been a success. Some of the causes of failure in the experiment I shall report upon in a separate communication.

The Government resolve to send this correspondence to the Acting President of the Municipal Commission for his information, and for a report as to the steps he has taken to carry out the recommendations made by the Sanitary Commissioner in paragraph 3 of the letter, dated 1st June, addressed by that Officer to the Acting President of the Municipal Commission.

FORT SAINT GEORGE, (Signed) R. S. ELLIS,
9th June 1870. Chief Secretary.

No. 89. From Major W. S. DREVER, Officiating President of the Municipal Commission, Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 21st June 1870, No. 350.

With reference to the order passed on the Sanitary Commissioner's letter, No. 638, of the 6th June, to Government, I have the honour to inform you that the excavations of deep pits have been stopped, and Dr. Cornish's suggestion of filling them with alternate layers of rubbish and soil is being carried out.

No. 90. ORDER THEREON, 21st July 1870, No. 905.

Ordered that a copy of the letter from the Officiating President of the Municipal Commission, Madras, be forwarded to the Sanitary Commissioner.

(True Extract.)

Under Secy. to Govt.

To the Sanitary Commissioner.

„ Officiating President of the Municipal Commission, Madras.

Appendix A

No 178.

Gum Powder Factory
Madras 30 May 1870

To

The President.

Municipal Commission

Sir,

I have the honor to inform you that the odors coming from the masses of town filth on the west side of the Powder Mills road are sometimes very offensive. On Saturday for instance I happened to pass along that road with a friend at about 9 A.M. and we were both nearly sickened by the smells even before we came into contact with the most striking emanation which rises from the abominable drains in the suburb to the west of the Peoples Park. Carts have very recently been emptied which caused principally the sickening original stink to which I have alluded, but it struck me that not nearly a sufficient quantity of earth is laid on the top of the mass of town filth and that when rain comes the exhalations from rotting mass underneath will be more likely, even than they are at present to spread sickness in the neighbourhood and thus endanger the health of the employees in the establishment under my charge.

Gobt. of 1870; Madras.

PUBLIC.

To

THE SANITARY COMMISSIONER.

&c.,

&c.,

&c.

Dated July, 21st.

Recd.

Encl.

G. O., 21st July 1870, No. 905.

JULY.

Nos. 88-90.

Communicating letter from President of the Madras Municipal Commission, stating that the Sanitary Commissioner's suggestions in regard to the Sewage Farm on DeMellow's road are being carried out.

A copy of this will be sent to the Sanitary Commissioners and if necessary the subject will be brought to the notice of higher authority.

I have few
Sig^o R. Cadell Lieut. Coll: ~~18~~¹⁸ Colonel
Adj: Superintendent Gun Powder Factory

Appendix B.

N^o 609.

Office of Sanitary Comm^r
Madras 1st June 1870

From.

The Sanitary Commissioners
for Madras

To

The President

Municipal Commission

Sir.

With reference to letter N^o 179 dated 30th ulto: from Coll: Cadell R. A. forwarded for my information, and to our inspection this morning of the locality complained of by that officer. I think the nuisance has been in part due to the excavations in the sewage farm having been carried down below the water level, and to the filth having been put into moist instead of dry soil, with perhaps an insufficient

covering of soil to absorb the odors arising from the fermentations of the rubbish.

2. Great care should be taken in giving a sufficient covering of earth to the contents of the rubbish carts, especially as the season is fast approaching when rain may be expected.

3. I think the burying of the town rubbish according to the present method is likely to be productive of nuisance, and to be of little value to the farm in an agricultural sense. If it is necessary to dig the pits so deep they should be filled in again with alternate layers of rubbish and soil, and not with five or six feet of rubbish and a slight covering of earth as is now the case.

Attention to the covering in of the rubbish will I have no doubt diminish the nuisance complained of by Coll: Cadell.

4. I am sorry to observe that the irrigation with sewage since the hot weather has set in has not been a success. Some of the causes of failure in the experiment I shall report upon in a separate communication.

I have few S^o W. R. Cornish J. R. B. S.
Sanitary Commissioner
for Madras

"True copies"

J. R. B. S.

Sanitary Commissioner
for Madras.

N^o 138

Office of Sanitary Commissioner
Madras. 1st June 1870

From

The Sanitary Commissioner
for Madras.

To

The Chief Secy. to Government.
Public Department
Fort Saint George.

Sir,

With reference to paras 1 & 2 and 5 of the order of Government in the margin, I have the honor to report that the mode in which solid filth is being deposited on the site of the Sewage Farm has been objected to by the Supdt. of the Powder Manufactory as causing a nuisance to himself and establishment.

2. I inspected the locality on the 1st instant in company with Major Sherr, Act. President of the Municipal Commission. We found that the smell complained of arose chiefly from the excavations for the reception of town refuse having been carried down to a depth below the water level, so that the decomposing mass was kept moist and fermenting, and the layers of earth covering in the rubbish were scarcely thick enough to prevent foul emanations from rising to the surface.

3. It seems that it is necessary to raise

N^o 1577 dated
18th Nov^r 1869.

the level of the land in some spots by several feet, and this can only be economically effected by filling up the hollows with town sweepings. In a letter to the Ag. President Municipal Commission I have expressed an opinion that if the level requires raising in this manner it should be effected by putting down alternate layers of rubbish and of earth, and that great care should be taken in covering up the town filth day by day as deposited, with a sufficiency of earth to prevent nuisance.

4. When Government consented to the use of solid filth on this site in addition to sewage, I imagine that it was not intended that a deposit of six feet or more of noxious and fermenting material should be heaped together for the purpose of raising the ground level.

For immediate agricultural operations such masses of fermenting matter are objectionable as they tend to overheat and destroy ungerminated seed or young plants that may have been sown or placed on the surface, and in a sanitary point of view, such collections of refuse are still more open to objection.

5. The progress of sewage irrigation at Hellows road has been carefully watched by me, ever since the commencement of the experiment, and since my succession to the office of Sanitary Commissioner, I have paid

12
frequent visits to the site of the works, with the view of keeping myself acquainted with the progress of the experiment.

6. Since the end of the rains in January very little has been done in the way of planting out a larger area of grass for irrigation. A considerable quantity of the land has been levelled, trenched and manured with nightsoil, ready for planting when the rainy season shall have commenced. The stiff and unyielding nature of the soil, the absence of porosity in it, and its salty nature, are all very grave drawbacks to the rapid and successful reclamation of the waste, and its conversion into rich land. That these difficulties may be got over gradually is I think quite possible, but much patience and perseverance will be needed before the land at Hellows road will ever be in a suitable condition for the successful practice of sewage irrigation.

7. The dry heat of the last few months has brought out prominently one very grave defect of the soil of the locality, viz: the large quantity of salt it contains.

This salt under the influence of irrigation rises to the surface in a manner which is very injurious to plants. So long as the natural rainy season lasted, and the

The grasses were refreshed by dew and a moist atmosphere, they thrive very well, but now, by that they get nothing but brackish water, or sewage, the plants of guinea grass and *humpyali* are dying in large numbers, at the roots, instead of yielding crops as was hoped at the rate of 80 tons per acre per annum.

Q. In addition to the salt contained in the soil, it must be remembered that "the sewage" of Madras at this season of the year must necessarily be highly saturated with chlorides. If we, but for a moment, consider the sources of the sewage it will at once be seen how this arises. Most native houses in Madras have wells on the premises, which supply the water used for washing, bathing and other house purposes. Good drinking water is too scarce a commodity to be poured into sewers, and as nine wells out of ten in native houses do not yield a water pure enough for drinking, it follows that the house water, which is the basis of the town sewage, must necessarily be a brackish water which, as every body knows, is inimical to vegetation. During the rainy season when the sewage was diluted by rain fall, and the wells were filled from the same

was not observed. It is only since the dry hot weather has set in that the concentration of salt in the sewage and in the soil has been noted to be so injurious to the plants under irrigation. Guinea grass is so hardy that it will thrive in good soil if watered by the ordinary brackish water of Madras wells, but it is unable apparently to resist the combined influences of the salty soil at Mullows road, and the brackish sewage laid on to it.

Q. To rid the soil of the excess of salt it contains and to make it better adapted for the support of vegetation, it will be necessary to add sand and old mortar rubbish in considerable quantity, so as to make the stiff clay porous, and allow the rain fall to dissolve out, and carry away, the salt from the surface. I think the laying down of subsoil pipe drains to remove excess of moisture from the roots of the plants, as recommended by Dr. Kauffing, will be necessary before sewage can be profitably applied to such a site. In process of time as Madras becomes supplied with a pure water, the sewage will doubtless improve in quality. More fresh and less salt water will find its way into the drains, and the proportion of salt will be reduced so

as to be comparatively harmless, but for some years to come, the experience of the present hot season would seem to indicate that no profitable results can be looked for, from the sewage irrigation of soils abounding in salt like that of Hellows road, during the dry months of the year.

10. When Capt. Tulloch reported on the Farm in October last, he distinctly pointed out that the successful results such as he then described "were not altogether due to the sewage."

He observed "The quantity of this fertilising liquid is so small that each crop gets but very little indeed. When the sewage fails, and water is used, and much of the good effect already produced is no doubt due to this cause."

11. In visiting the farm some months ago in company with Dr. Rankin and Col. Denison it occurred to me that the results of water and sewage irrigation ought to be compared side by side, before attributing results to sewage which might not fairly be its due. Dr. Rankin agreed with me, and in his report pp. 13 and 14 embodied the suggestion, which Government, in pursuance of the order above quoted, thought deserving of the notice of the Municipal Commissioners. As far as I know the suggested experiment has not been tried, except in an indirect

way. Since the rain and night dews have ceased, and the sewage has supplied the chief moisture to the plants, the growth of the grasses has been much less vigorous than before.

This would seem to indicate that the former success was more owing to the use of fresh water than of sewage.

12. A large quantity of guinea grass has perished altogether, the hurviali grass is not looking strong and the only grass which seems able to stand the sewage and thrive, is a coarse swampy grass, which grows on the banks of the Coom, and is not injured by salt. The botanical name of this grass I am not acquainted with, and as it is not in flower, I cannot identify it. but it is said to be a good food for cattle, and if further experience shows that it can be cultivated with success under sewage, it would I think be well to lay down more of it on the farm in Hellows road, as it is apparently uninjured by the quantity of salt in the soil.

13. I am much more hopeful of the success of sewage irrigation on land which is naturally porous and sandy, and capable of absorbing large quantities of sewage. An experiment of this kind on a piece of waste land between Triplicane and the sea is contemplated by Col. Denison, but has not yet been begun. I think it is of great importance that no

delay should occur in experimenting with the Triplicane sewage with the view of seeing how far the soil may be in fault in the case of the Mello's road experiment.

The reported success of the operations at Mello's road, has led many of the English newspapers to the conclusion that the whole of the difficulties of the utilisation of sewage in Madras, have been solved, whereas the question is still actually in its infancy, and the only thing as yet proved is that guinea grass planted in a salt clay soil, and watered only with sewage and brackish water, if it does not actually die under the operation, will, during the dry months of the year, maintain but a sickly vitality.

14. Many advocates of the use of sewage in agriculture are under the impression that the Indian fluid known by that name is identical in composition with the sewage of English towns, and similar results, they argue, ought to result from its use, but as a matter of fact the chemical constitution of the two fluids is wholly different, and this being so there must necessarily be a difference in their action as fertilizers. The points of divergence may be best seen perhaps in the following parallel.

English town Sewage.

1. Has a basis of fresh water suitable for drinking and cooking.
2. Contains human excreta in suspension or solution.
3. Is of moderately low temperature and rarely fermented when applied to land.

Madras Sewage.

1. Has a basis of salt or brackish water unfit for drinking & cooking.
2. Contains no human excreta.
3. Is always of high temperature and smelling of Sulphide of hydrogen proving that its organic matter has undergone change.

15. It is quite necessary in dealing with the subject of sewage irrigation that the very important differences in the constitution of English and Madras "Sewage" should be borne in mind, and that we should not base our expectations of crops on English standards alone. In regard in the first place the quality of the water which forms the basis of sewage as of the very greatest moment. While we are compelled here to use very brackish water for household purposes, it is evident that the resulting sewage in this respect can never compare with that of an English town, derived from a water which is wholesome enough for drinking. Every practical gardener in India knows that his success or failure in the culture of certain plants

is entirely a question of a few grains more or less of salt per gallon in the water he uses. And in sewage irrigation in India the quantity of salt in the water is sure to influence the results. In the rainy months when the sewage is diluted, and the brackish wells are filled with rain water, no ill effect will be perceived, but in the hot season, the increasing proportion of salt in the sewage is sure to diminish the luxuriance of vegetation.

16. This "salt" difficulty is peculiar to Madras and coast towns, and, as I have said before, the introduction of fresh water from the Red Hills, for the use of the population, will, after a few years, so alter the constitution of the sewage, as to bring it more or less level in this respect with English sewage.

There will be no difficulty hereafter in adding night soil to the irrigated tracts, if it should be found impracticable or unpracticable to remove the excreta of the town by water. The high temperature and its results / speedy dissolution of the organic elements of sewage, is a point in which Indian sewage must always compare disadvantageously with the fertilizers of more temperate climates, but with all the disadvantages I have pointed out,

the utilization of sewage is so important at the need of every civilized community, that I hope no efforts may be wanting to carry out our experiments in Madras to as successful an issue.

I have the honor to be,

Sir,

Your most Obedt Servant.

Wm. Cornish. J. R. B. S.
Sanitary Commissioner
for Madras.

No. 360

From
Major H. S. Dwyer
Off. President Municipal Commission
Madras

To
The Honble R. S. Ellis
Chief Secretary to Government
Madras

With reference to the order
passed on the Sanitary Commission's
letter No. 638 of the 6th June to Govern-
ment, I have the honor to inform
you that the excavations of deep
pits have been stopped and
Dr. Cornish's suggestion of filling
them with alternate layers of sub-
sick and soil is being carried out.

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

W. S. Dwyer
Off. President
Municipal Commission

10. 6. 10
The girl unlike it sent this correspondence
to the President of the Municipality in his
information & in a report as to the steps he
has taken to carry out the recommendations
made by the Sanitary Commission in para. 3 of the
letter of 21st June addressed by Mr. Dwyer to the
Commissioners.

Public Health
from Mr. Dwyer dated 11th
The Sanitary Commission
for Madras
to the Chief Secy to Govt.
Public Health
Fort St. George

10638.
No. 911
Reports on the measures in
which sewerage irrigation
is carried on in the Survey
town at Chelmsford Road.
With sheets

107
Copy to Govt.
Dated 17th June
sent to
and
forwarded
letter No. 638 dated 6th
last to the Sanitary
Commission together with
the correspondence
information and report

To the Secy. Genl. in Charge
of the Public Health
of the City of Madras
10. 6. 10

Gort. of 1870 Madras.

Public

The Sanitary Commr.

for

Dated July 21.

Recd.

Encl.

G. O. 21 July.

1870, No 90.

Nos. 88. 90.

~~Concerning the Public Health~~
that the Sanitary Commr.
questions in regard to the
Sewerage & Drainage
works are being carried out.