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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.
Secy - 10/3/60

G.O. No. <u>459</u>	Press <u>Mis.</u>
<u>30.31</u> Dated <u>2-3</u>	18 <u>60</u>

Not to be folded or roughly handled*15/11/38*

*Proceedings of the Madras Government, Public Works Department,
for the month of March 1860.*

No. 30. Read the following letter from Colonel J. H. BELL, Chief Engineer; to the Secretary to Government, dated 9th February 1860, No. 10105.

In the order of Government noted in the margin, the Chief Engineer was called on to obtain reports from all District Engineers, on the state of the ventilation of all Government buildings inhabited by Europeans, and to submit them to Government with his own views on the subject; and in a late order* a report was required on the state of the sewage of all Government buildings and localities, such as military stations, cantonments and bázárs.

No. 1559, dated 9th August 1858.
Summary of replies received from District Engineers
Original letters Nos. and dates referred to in summary.
* No. 1889, dated 14th Sept. 1858.

2. The several reports have now been received from the districts on both subjects; and being in many cases in one letter, it appears desirable that I should place the information obtained before Government in one statement, which I have the honor to do in the enclosed summary.

3. From the reports of the District Engineers, it will be observed, that the ventilation of buildings inhabited by Europeans is much more perfect than might have been expected; and where it is defective, the evil is not so great or extended as to warrant my recommending the immediate adoption of any general remedial measures. It will, I consider, be quite sufficient on this head, if instructions were issued that on repairs of any kind being required to a barrack, hospital, or other Government buildings for Europeans; advantage should be taken of the opportunity to include therewith ridge ventilators, and where locally considered desirable, also swing windows high up in the walls, and ground slide ventilators, by which means thorough ventilation will be gradually introduced.

4. As regards sewage, the reports are much less favorable. It is defective in connection with barracks and hospitals; and as respects cantonments, bázárs, and native regimental lines, little appears to have been done any where beyond cutting a few drains and ditches; which, with the natural slope of each locality, answer to carry off surface drainage; but are of little avail as sewers when there is no rain: much is urgently required to be done for every station without exception, in regard to the sewerage, but as this is a work which it is, I believe, intended shall be undertaken by conservancy committees to be appointed at each station; it would only appear requisite for me to mention here generally that, I would advocate the adoption of covered drains for all European barracks, hospitals, and such buildings: that much might be done to improve the sewerage of cantonments, bázárs and native lines, by greater attention to the existing drains and ditches, and by giving to all where a good fall is not obtainable, a masonry lining, but that whatever plan or system may be adopted at each station, it is most desirable that the means should be provided for the occasional flushing of all the drains with water.

Order Military Department, November 11th 1859 No. 4013.
In order of Nov. 19, 1859 No. 2706.

5. The order of the 9th August 1858 called for reports without denoting them as periodical. That of the 14th of September 1858, alludes to the reports called for as annual. Those now submitted have not been obtained without many reminders, and I beg to suggest that they may be considered as disposing of the subject, and that the District Engineers be directed to act upon the information contained in them in the mode suggested in paragraph 2.

SUMMARY of replies from District Engineers to the Circulars addressed to them on the subject of the ventilation of all Government buildings inhabited by Europeans, agreeably to Extract Minutes Consultation, No. 1559, 9th August 1858, and on the subject of the drainage of all Government buildings and localities, agreeably to Extract Minutes of Consultation 1889, 14th September 1858.

GANJAM.—The District Engineer reports that he has in communication with the officers commanding regiments and stations, ascertained that the ventilation of the Government buildings in his district, which are inhabited by Europeans, is all that could be desired, and in respect to

drainage he remarks as follows. The drainage of some streets of Berhampore is defective, and an estimate will be prepared for securing the drainage by proper side channels and for filling up cess pools and swamps. At Russelcondah, a piece of ground near the sepoy lines liable to be flooded by the river may be embanked: with the above exceptions; the Government buildings, lines, bázars, &c. in this district, are well drained.

VIZAGAPATAM.—Reports that the Government buildings in his district occupied by European troops are badly ventilated. Mentions the case of the European hospital, the construction and situation of which produce a perfect stagnation in the air, unsuit it for the purposes of a hospital; states that near the hospital is a sewer, the odour from which is very offensive. In regard to the European barracks, the District Engineer reports that the building is of the old Bombroof style and quite unsuited for a barrack, that it has a groyned roof without ventilators, with very low arches and small windows, that the pillars are enormously massive and that the cubic content per man is about $\frac{1}{3}$ th of that usually allowed. The room above the barrack and extending nearly its whole length, is said to be used as a school room; but the windows are extremely small. The main guard room is ventilated by only one door and four small windows and the European prisoners' ward in the jail is reported to be badly ventilated. Captain Blagrove reports that there is a sewer leading from the jail at Vizagapatam to the backwater, much of the liquid contents of which are absorbed by the soil through which it passes. The hospital also has an open sewer which is carried to the outside of the compound wall emptying itself in a pigsty. At Vizianagaram there are merely small open drains on either side of the streets in the lines, and these discharge their contents into two channels of larger dimensions at the north end through which the sewage is conveyed into two tanks. The drains are said to require enlargement. The District Engineer adverts to the desirability of constructing a reservoir and pumping into it sea water, for the purpose of flushing the drains and cleansing the town of Vizagapatam.

GODAVERY DISTRICT.—The only public buildings inhabited by Europeans are the jail at Rajahmundry and the military buildings at Daulëshwarum. The improvement of the former has already received sanction, and the ventilation of the latter is perfect, as is also the sewage of both.

KRISHNA DISTRICT.—The Masulipatam hospital has been provided with the means of ventilation. Lieutenant Beatty, Executive Engineer, proposes openings at intervals in the walls above the level of the windows. The European barracks are without the means of ventilation, and it is proposed to remedy this in the manner just mentioned. The solitary cells are not provided with any means of ventilation, and as they are totally unfitted for the purposes for which they are built, their improvement is not recommended. The officers' quarters do not require any additional means of ventilation. Ventilation is said to have been left out of consideration altogether in the construction of the Artillery barracks. There is but one subterranean sewer from the privies of the garrison hospital in the fort. A similar sewer is said to be needed from the officers' quarters and the European barracks. The few drains that have been constructed in the Masulipatam fort have been allowed to get out of order, and many highly necessary drains have never been excavated at all. For the improvement of the drainage in the cantonment, the District Engineer suggests a few deep ditches leading to the swamp well supplied with culverts.

NELLORE.—Reports that there are no Government buildings in the district occupied by Europeans and that there are no military stations, cantonments or bázars in the district, which would appear to require to be reported on under the orders of Government.

CUDDAPAH.—Reports that the only Government buildings inhabited by Europeans in his district are the jailor's house and the staff serjeant's quarters in the cantonment. The former is about to be converted into a guard house for the sepoy guard at the jail, and the latter is said to be sufficiently ventilated. The military cantonment near Cuddapah is not provided with any artificial drainage, beyond the usual open drains at the sides of all public thoroughfares. No inconvenience has resulted from the want of a more perfect system. The only public building in the district in which a regular system of sewage has been attempted and with success, is the Cuddapah jail. The taluq kach'háris throughout the whole district have no provision whatever for drainage; but as they are in a ruinous condition, the District Engineer considers that, any

expenditure in improving the drainage of the present buildings would be thrown away. The same remarks are said to be applicable to the various munsiffs' court houses, but the want of a better system of drainage is not nearly so much felt. No necessity exists for any artificial sewage for the travellers' bungalows.

BELLARY.—The subject of sewage has not been attended to at all in this district, and in many of the buildings, particularly the taluq kach'háris and record offices, ventilation has been left out of consideration altogether. The new European barracks and hospitals at Bellary are well ventilated, but have neither been provided with shade nor drains, which should be remedied as soon as possible. The huzur kach'háris, jail and other buildings are not provided with proper drainage, but this want has been greatly supplied. The Bruce pettah and cowl bázár are very badly drained, and the buildings in the taluqs are every much in the state in which those at Bellary are. The barracks, hospital and other buildings on the Ramandroog require enclosed verandahs.

CANARA.—Reports that there are no Government buildings inhabited by Europeans in this district, the staff serjeants' quarters at Mangalore excepted, the ventilation of which will be attended to in carrying out the estimate for repairing the roof of the building. The sewage of public buildings is reported to be as good as is necessary, the Moosuffarkhanas excepted. The District Engineer recommends that all sepoy's lines should be provided with privies.

KURNOOL.—Reports that there are no Government buildings occupied by Europeans in the district, and that the situation of the town of Kurnool renders the existing sewage sufficient. Considers that the native infantry lines would be benefitted by the excavation of a few ditches.

NORTH ARCOT.—The buildings occupied by Europeans are the upper barracks and the hospital. It is recommended that the high wall surrounding the compound of the former should be removed and that the roof of the latter be raised five feet, and "the windows enlarged and the venetians removed, from the two end windows." It is recommended also that the windows of the lower barracks should be enlarged and the roof of the two small flanking barracks should be raised. The staff serjeants' quarters at Vellore are reported to be badly ventilated. It is suggested that the windows where practicable should be converted into doors or else enlarged, and that apertures be made in the roofs. The old hospital at Raneepett, used as a barrack by the European infantry depôt is naturally well drained. The District Engineer recommends the construction of an open drain to be carried above the entrance gateway and out through the compound wall. The present hospital needs only an escape for the rain water through the enclosing wall. The cavalry barracks and the native veteran lines do not require improved means of drainage. The drainage of the Vellore fort is carried out of the fort wall into the ditch, if the drains are attended to, excepting from the the arsenal, which is lower than the general level of the fort, and at the gateway there is a drop of several steps so that it becomes flooded, and is also lower than the level of high water in the ditch. There is a surplus sluice at the north west angle of the ditch, which carries off the water in the monsoon when the ditch becomes full, but before the water reaches this height, it percolates through the ground in some places in the arsenal enclosure, and to prevent this, it would be necessary to lower the bed of the surplus channel. The privies in the fort form a cess pool, which is now and then cleared out. The greater part of the N. I. lines at Vellore is low and the north end is a perfect swamp. A nullah forms the west boundary, and to keep this in its own channel, a bund has been thrown up, and the earth for this purpose taken from the side of the lines. The bed of the nullah is thus higher than the north west part of the lines and that corner is a foul swamp.

CHINGLEPUT.—The District Engineer submits a detailed report on the state of the ventilation of the Government buildings at St. Thomas' Mount inhabited by Europeans. Throughout the bázár streets, as well as those inhabited by the higher class of natives, are drains on each side of the street made of brick in mud, which lead into either the large ditches by the sides of the main road or into the open country. In the north foot artillery canteen square is a brick in chunam drain, which at present merely carries the water into the compound where the new army school is to be built. From thence it can be easily conveyed into the ditch on the north side of the parade ground. In the north foot artillery barrack square is a large covered drain running into the ditch in front of the main guard. From the canteen there is a similar drain

which falls into the ditch in front of the main guard, which falls into the ditch on the south side. In the south foot artillery barrack square are similar drains. The drainage of the Palaveram cantonment is conveyed entirely by open ditches from east to west, emptying themselves into the Adiyar river. The drainage of the Poonamallee fort is conveyed by small openings in the wall into the fort ditch, and that of the barrack square is through a covered drain.

SOUTH ARCOT.—Reports that there are no Government buildings in his district inhabited by Europeans. The drainage of the Cuddalore jail, the Cuddalore hospital and the Munja-cupum dispensary is said to be sufficient.

SALEM.—Reports that there are no Government buildings inhabited by Europeans in his district.

TANJORE.—Reports that there are no Government buildings in the district occupied by Europeans, and that as regards sewage, there are no buildings of the description of those alluded to in the circular.

TRICHINOPOLY.—The buildings occupied by Europeans are the barracks and hospital of the European regiment. Half of the former is reported to be badly ventilated, affording very limited accommodation. Improvements have been executed to the other half to improve the ventilation. The hospital is a tiled building with gable ventilators, which the District Engineer contemplates to improve in communication with the military authorities. As regards sewage, the District Engineer remarks that, beyond water courses running through the cantonments, there are no means of drainage. The soil from the barracks is carried to a distance in carts employed by the Commissariat. The rest of the cantonment is more or less filthy. Parts of the fort ditch are most offensive, and the road round the walls is filthy in the extreme. The District Engineer represents that the villagers take no interest in the matter of cleanliness and are under no control. He suggests the making over to military rule the control of the police in the cantonment.

COIMBATORE.—The District Engineer reports that the buildings inhabited by Europeans are

1. The Collector's Kach'hari at Coimbatore.
2. Judge's Court.
3. Hospital at Coimbatore.
4. District Engineer's office.
5. Sub-Collector's Kach'hari at Carur.
6. Church at Coonoor.
7. Hospital at do.
8. Church at Utakamund.
9. Commandant's office and Post office at do.
10. Sub-Judge's Court at do.
11. Jail at do.
12. Civil Dispensary at do.
13. Hospital at do.
14. 26 Traveller's Bungalows.

Of these the only building that possesses any contrivance for ventilation is the Coimbatore hospital. The first five buildings need the means of ventilation, the 1st and 5th especially, for carrying out which object, the District Engineer proposes to submit plans and estimates in connection with other works. The 6th, 7th, 9th, (Post Office) 10th, 12th, 14th, are said not to require ventilation. The others need it. Buildings occupied by natives exclusively are represented to be generally to be "a thousand times worse" than the above. The plains of Coimbatore are so undulating, dry and porous, and the annual rain fall so light that no part of the district requires artificial drainage. The only building that requires drainage is the Coimbatore jail, but this desideratum has in some measure been supplied, and the Inspector of Prisons is opposed to any considerable outlay on the work, as the building may be altogether abandoned at no distant date. The District Engineer states that the first thing to be done towards the drainage of the Nilagiris is to regulate the surface of the lake; there should be a long regulating weir built at its lower end, and another bridge built under the road called the Willow bund. This would allow of the lower part of the bazar being drained; and if an artificial margin raised three feet above water

were made, it would no longer be what it is. These improvements, in the District Engineer's opinion, should be extended to Kaudal, Coonoor and Kotagerry. The District Engineer suggests that Mr. Thomas, the Collector, should be requested to complete the report on the improvement of these stations commenced by the late acting Collector, and that he himself should be permitted and supplied with professional means to prepare a general design for the improvement and future extension of these stations.

MALABAR.—There are three stations in this district in which Europeans are located, viz, Cannanore, Calicut and Mallapuram, the buildings at which places are all well ventilated. The drainage of the public buildings in the district is said to be sufficient. Another main drain in connection with the European barracks at Cannanore would, it is represented, be useful, and as the small drains have not sufficient slope; the District Engineer states that it would be an improvement to relay them with a greater fall. He considers that more attention should be paid by the local authorities to the clearance of the drains in all the large bazars at Cannanore, Palghat and elsewhere.

MADURA.—Reports that the sepoy lines in Madura and Dindigul are well situated, both as regards ventilation and sewage, but that in respect to the latter, they are almost entirely dependent on local rains. As regards the sewage of native towns, the great want is said to be water to flush drains. The town of Dindigul is represented to be well situated for drainage, and the District Engineer points out the advisability of storing water at that town or raising it from wells or both, for flushing the drains. No public buildings in the district are occupied by Europeans excepting the Tankam in Madura.

TINNEVELLY.—Reports that there are no Government buildings inhabited by Europeans in the district, and that the lines and bazar of the native regiment, quartered at Palamcottah, are situated on a slight incline, and are well drained by means of small ditches on both sides of the road between every two rows of line.

JACKATALLA.—The Executive Engineer reports that in all the new buildings at Jackatalla, the Commissariat staff serjeant's house excepted, the ventilation is perfect.

BANGALORE.—In the present infantry barracks there are a few air holes in the roof, but these are far from being sufficient to allow of thorough ventilation. The new blocks in the dragoon square have ridge ventilators, the whole length with swing windows above the inner verandah and ground sliding ventilators. The Executive Engineer suggests a slight change in the position of the ground ventilators. The ventilation of the dragoon barracks hospital is very bad, as is also that of the solitary cells. It is suggested that ventilators of the description of those given in the standard plan of kach'haris be put up in all the roofs of the latter. The new barracks on the race course do not require artificial ventilation. The Executive Engineer expresses his conviction of the decided preference to be given to ridge ventilators for barracks. Every building will shortly be more or less provided with ventilation. As regards drainage, Captain Mayne forwards a letter from General Beresford, and agrees with that officer as to the urgent necessity for improving the drainage of the bazar, and for preventing the great accumulation of filth now annually increasing in the bed of the Ulsur tank. This latter subject has already been taken up by the Commissioner of Mysore, and Captain Mayne suggests that the Commissioner be addressed on the subject and his consent obtained, for a plan to be drawn up for the better drainage of the cantonment and bazar jointly.

CIVIL ARCHITECT.—The penitentiary and Her Majesty's jail are well ventilated, but the general hospital is badly ventilated, care has been taken to supply this want in the revised plans for a new hospital. The buildings are generally well drained, with the exception of the penitentiary. The open drain on the south side of this building, it is recommended, should be converted into a covered drain and carried out into the river for at least 20 yards. It is proposed that a system of flushing the drains in the penitentiary be adopted, that the ground immediately in rear of the west enclosure wall of the building be filled up, and the bank of the river between the bridge and S. W. flanking tower revetted with a masonry wall. The Civil Architect proposes that the Municipal Commissioners should be requested to carry out into the middle of the river, the offensive drains which run into the Kuvam.

Proceedings of the Madras Government, Public Works Department,
for the month of March 1860.

GARRISON ENGINEER.—This officer submits a report of the means which have been provided for the ventilation of the several buildings in his charge. He reports that the ventilation of all these buildings is ample with the exception of

The Artillery Serjeant Major's quarters.
Garrison Key Serjeant's do.
Engineer Serjeant Major's do.

All the casemated quarters away from the sea face of the fort would be improved by enlarged ventilators like the one at the Commissariat staff serjeant's quarters. No report is made of the sewage of the barracks. Each of the quarters has a branch into the drains passing near them throughout the fort. The removal of filth by hand carriage is general to all. The Body Guard, the Perambore, and the Vepery lines have imperfect means of drainage. The introduction of attic windows to the staff serjeant's quarters in the Perambore and Vepery lines is recommended.

No. 31.

ORDER THEREON, 2nd March 1860, No. 459.

Paragraph 1. In the order of Government marginally* noted reports were called for from the several District Engineers on the state of the ventilation of all Government buildings inhabited by Europeans; and in a subsequent† order it was directed that information on the state of the sewage also should be obtained: these latter reports were to include all Government buildings and localities, such as military stations, cantonments, bazárs, &c., which are more directly under the supervision and control of Government.

2. Colonel Bell now submits a summary of replies received on these subjects. The first order above quoted shewed that the enquiry about ventilation was intended to refer primarily at least, to public buildings inhabited by Europeans; several of the replies received from the districts however contain information about all the public buildings in the district.

3. As to the general question of ventilation Colonel Bell is of opinion that it is much more perfect than might have been expected; that no immediate remedial measures are necessary; and that it will be sufficient to issue instructions that on repairs of any kind becoming necessary, opportunity should be taken to introduce such modes of ventilation as are specified in paragraph 3 of his letter under consideration. The Government approve of this recommendation and the Chief Engineer will issue the necessary instructions for bringing these views into effect.

4. The sewage it appears is very defective throughout the Presidency; it is observed that as far as the principal cantonments are concerned, a remedy was sanctioned by Government in their Proceedings in the Military Department marginally‡ noted. Sufficient time has not yet elapsed for the effects of that order to be visible. A copy of these Proceedings together with Colonel Bell's letter and its enclosure, will be furnished, through the Military Department, to the Quarter Master General of the Army, and he will be requested to take steps to bring into operation the various suggestions made by the Chief Engineer in paragraph 4 of his letter.

5. With regard to paragraph 5 of Colonel Bell's letter, the Government are of opinion that no object will be attained by obliging the submission of such reports as the present, every year. It will be sufficient if an annual report is made shewing what improvements have been effected during each year both as regards ventilation and sewage, and if none, the reason why.

(Signed) T. PYCROFT,
Chief Secretary.

Central Office of
Sepatikan

9th July 1860

17-10105

From

The Chief Engineer

To

The Secretary to Government P.W.D.

Sir

In the order of Government noted

M. 1559 of 9th Aug.
1858

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1. Summary of replies
received from 27 Sept.

Original letters to
be dated 27 Sept. & in summary

District Engineers on the state of the ventilation of all Government buildings

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M. 1559 of 11th Sep.
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Bazars

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summary of replies

in one letter, it appears desirable that I should place the information obtained before Government in one Statement which I have the honor to do in the enclosed Summary.

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Order of the
Govt. of India
In Order of the
14/3/94 No. 2706.

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summary of report

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mode suggested in para 2.

Sept 11th 1859
Yours most obed^t Serv^t
J. A. Bell Colonel
Chief Engineer
To the Secretary
Government of India

Sept 11th 1859

summary of report

13

Summary of replies from District Engineers
to the Circular addressed to them on the subject of
the Ventilation of all Government Buildings inhabited
by Europeans agreeably to Ex. Min. Order No. 1559 of 9th
August 1858 and on the subject of the drainage of
all Government Buildings and localities agreeably
to Ex. Min. of Order 1889 of 14th September 1858.

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By Mr. August 1858 No 66-67
- 14th Sept 1858 - 100-101
- 20th Nov 1859 - 139-97

By Mr. 1860 206-207
By Mr. 1861 123-124
By Mr. 1862 123-124
By Mr. 1863 123-124
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the River may be embanked with the
above exceptions, the Government building,
since Bazarang in the District
and well drained.

Reports that the Government Nagapattam
Buildings in this District occupied
by European Troops are badly ventilated.
Mentions the case of the European Hospital
at the construction and situation of which
produce a perfect stagnation in the air
unsuitable for the purposes of a Hospital.
States that near the Hospital is a
sewer the odour from which is very
offensive. In regard to the European
Barracks the District Engineer reports
that the Building is of the old Bomb
Proof style and quite unsuited for a
Barrack, that it has a groined roof
without ventilation with very low
Arches and small windows, that
the pillars are enormously massive
and that the Cubic Content per man
is about 1/3 of that usually allowed.
The Room above the Barrack and
extending

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extending nearly the whole length is said
to be used as a school room, but the
windows are extremely small. The
Main Guard Room is ventilated by only
one door and 4 small windows and the
European Prisoner's Ward in the jail is
reported to be badly ventilated. Captain
Blagrove reports that there is a
sewer leading from the Jail at Nagapattam
to the Backwater, much of the
liquid contents of which are absorbed
by the soil thro which it passes.
The Hospital also has an open sewer
which is carried to the outside of the
Compound wall emptying itself in a
pigsty. Mr. Vijayagaram there and many
small open drains on either side of the
streets in the lines and these discharge
their contents into 2 Channels of larger
dimensions at the N. End thro which
the sewage is conveyed into his Tanks.
The drains are said to require enlargement.
The District Engineer advocates the
desirability of constructing a Reservoir
and pumping into it Sea water for the
purpose

purpose of flushing the drains and
cleaning the town of Nagapattam.

The only Public Buildings inhabited by Europeans are the Jail at Rajamundee and the Military Buildings at Sowlesheram. The improvement of the former has already received sanction, and the ventilation of the latter is perfect, as is also the sewage of both.

The Masulipattam Hospital has been provided with the means of ventilation. Lieutenant Beatty, Executive Engineer, proposes openings at intervals in the walls above the level of the windows. The European Barracks are without the means of ventilation and it is proposed to remedy this in the manner just mentioned. The Military Cells are not provided with any means of ventilation and as they are totally unfit for the purposes for

Godever,
District.

Stushna
District.

for which they are built, their improvement is not recommended. The Officers Quarters do not require any additional means of ventilation. Ventilation is said to have been left out of consideration altogether in the construction of the Artillery Barracks. There is but one subterranean sewer from the Spices of the Garrison Hospital in the Fort. A similar sewer is said to be needed from the Officers Quarters and the European Barracks. The few drains that have been constructed in the Masulipattam Fort have been allowed to get out of order and many highly necessary drains have never been excavated at all. For the improvement of the drainage in the Cantonment the District Engineer suggests a few deep ditches leading to the Swamps well supplied with Culverts.

Nellore.

Reports that there are no Government Buildings in the District occupied by Europeans and that there are no Military Stations, Cantonments or Bazaars in the District which would

... I have ... in ...

... that the only Government Building inhabited by Europeans in this District and the District Office and the Staff Sergeant's Quarters in the Cantonment. The former is about to be converted into a Guard house for the Sepoy Guard at the Jail and the latter is said to be sufficiently ventilated. The Military Cantonment near Cuddapah is not provided with any artificial drainage beyond the usual open drains at the sides of all public thorough fares. The inconvenience has resulted from the want of a more perfect system. The only Public Building in the District in which a regular system of Sewage has been attempted and with success is the Cuddapah Jail. The Taluk & Revenue Comptroller's whole District have no provision whatever for drainage, but as there is no serious question, the District Engineer considered that any expenditure on improving the drainage of the

the present buildings would be thrown away. The same remarks are said to be applicable to the various Amiff's Court House, but the want of a better system of drainage is not nearly so much felt. Necessity exists for any artificial Sewage for the Travellers Bungalows.

Bellary

The subject of Sewage has not been attended to at all in the District and in many of the Buildings, particularly the Taluk Catchment and District Office, Ventilation has been left out of consideration altogether. The new European Barracks and Hospital at Bellary are well ventilated but have neither been provided with shade nor drains, which should be remedied as soon as possible. The Major's Mess and other Buildings are not provided with proper drainage, but this want has been greatly supplied. The District Office and Civil Bazaar are very badly drained and the Buildings in the Taluk are

summary of report

very much in the state in which those
at Bellary are. The Barracks, Hospital
and other buildings on the Roman Street
require enclosed. Veranda etc.

Reports that there are no Bellary
Government Buildings inhabited by Europeans
in this District. The Staff Sergeants quarters
at Mangalore excepted the ventilation of
which will be attended to in carrying
out the Estimate for repairing the roof
of the Building. The sewage of
Public Buildings is reported to be as good
as is necessary. The Mouassar Khanah
excepted. The District Engineer re-
commends that all Sepoy's lines should
be provided with privies.

Reports that there are no Surmial
Government Buildings occupied by Europeans
in the District and that the situation
of the town of Surmial renders the existing
sewage sufficient. Considers that the
Native Infantry Lines would be
benefitted by the excavation of a few
ditches.

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North Crest. The Buildings occupied by
Europeans are the Upper Barracks and
the Hospital. It is recommended
that the high wall surrounding the
compound of the former should be removed
and that the roof of the latter be raised
5 feet and the windows enlarged and the
panes removed from the 2nd
window. It is recommended also that
the windows of the lower Barracks should
be enlarged and the roof of the two small
flanking Barracks should be raised. The
Staff Sergeants Quarters at Bellary are
reported to be badly ventilated. It is
suggested that the windows where
practicable should be converted into doors
or else enlarged and that apertures be
made in the roofs. The old Hospital
at Parappett used as a Barrack by
the European Infantry Regt is naturally
well drained. The District Engineer re-
commends the construction of an open drain
to be carried above the entrance gateway and
out thro' the compound wall. The present
Hospital needs only an escape for the
rain.

Rain water thro' the enclosing wall. The Cavalry Barracks and the Indian Victoria Lines do not require improved means of drainage. The drainage of the Cellars Port is carried out of the Port wall into the Ditch of the drains are attended to excepting from the Arsenal which is lower than the general level of the Port, and at the gateway there is a trap of several steps so that it becomes flooded and is also lower than the level of high water in the Ditch. There is a surplus sluice at the N. E. angle of the Ditch which carries off the water in the monsoon when the Ditch becomes full, but before the water reaches this height it percolates thro' the ground in some places in the Arsenal enclosure, and to prevent this it would be necessary to lower the bed of the Surplus Channel. The Pivots in the Port form a cesspool which is now and then cleared out. The greater part of the N. E. Lines at Vellore is low and the north end is a perfect swamp. A Mullah forms the west boundary and to keep this in its own channel

Channel a bund has been thrown up and the earth for this purpose taken from the side of the Lines. The bed of the Mullah is thus higher than the N. E. part of the Lines and that corner is a foul swamp.

Chunglesput.

The District Engineer submits a detailed report on the state of the ventilation of the Government Buildings at S. P. S. M. inhabited by Europeans. Throughout the Bazaar streets as well as those inhabited by the higher class of natives are drains on each side of the street made of brick round which lead into either the large ditches by the sides of the main road or into the open country. In the North Fort cutting Canton square is a Drain in Chumam drain which at present merely carries the water into the Compound where the new Army school is to be built. From thence it can be easily conveyed into the Ditch on the north side of the Parade Ground. In the North Fort Artillery Barrack square

is a large covered drain running into the
ditch in front of the main guard.
From the Canton there is a similar drain
which falls into the ditch in front of the
main guard which falls into the ditch on
the south side. In the South foot Artillery
Barrack square are similar drains.
The drainage of the Palaveram
Cantonment is conveyed entirely by open
ditches from East to West emptying
themselves into the Coyar River. The
drainage of the Purnamali Fort is
conveyed by small openings in the
wall into the Fort ditch and that of
the Barrack square is thro a covered
drain.

Reports that there are no South Arcot
Government Buildings in his District
inhabited by Europeans. The drainage
of the Ouddalore Jail, the Ouddalore
Hospital and the Mingacipum Dispensary
is said to be sufficient.

Reports that there are no Salem
Government Buildings inhabited by Europeans

in his District.
Reports that there are no Government
Buildings in the District occupied by
Europeans and that as regards Sewage there
are no buildings of the description of those
alluded to in the Circular.

Pichinopoly The buildings occupied by
Europeans are the Barracks and Hospital
of the European Regiment. Half of the
former is reported to be badly ventilated, affor-
ding very limited accommodation. Improve-
ments have been executed to the other half
to improve the ventilation. The Hospital
is a tiled building with gable ventilators
which the District Engineer contemplates
to improve in communication with the Military
authorities. As regards Sewage the
District Engineer remarks that beyond
water courses running thro the Canton-
ments, there are no means of drainage.
The soil from the Barracks is carried
to a distance in carts employed by the
Commissariat. The rest of the Cantonment
is more or less filthy. Parts of the Dist.

Ditch one week offensive and the road
round the water is filthy in the extreme.
The District Engineer represents that the
Villagers take no interest in the matter
of cleanliness and are under no control.

He suggests the making over to Military
Rule the control of the Police in the Cantonment.

The District Engineer reports Combr.
that the Buildings inhabited by Europeans
are.

1. The Collectors' Quarters at Combr.
2. Judges' Quarters
3. Hospital at Combr.
4. District Engineer's Office
5. S. Collectors' Quarters at Varur
6. Church at Vonnor
7. Hospital at B.
8. Church at Wathamund
9. Commandants' Office and Post Office
at B.
10. Sub Judges' Quarters at B.
11. Jail at B.
12. Civil Dispensary at B.
13. Hospital at B.
14. 26 Travellers Bungalows

of

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Of these the only Building that requires
any contrivance for Ventilation is the
Combr. Hospital. The first 5 Bungalows
need the means of Ventilation, the 6th
and 5th especially for carrying out which
object the District Engineer proposes to
submit Plans and Estimates in connection
with other works. The 6th, 7th, 9th, 10th,
11th, 12th, 14th are said not to require
ventilation. The others need it. Buildings
occupied by Natives exclusively are
represented to be generally to be "a thousand
times worse" than the above. The plans
of Combr. are so undulating, dry
and porous and the annual rain fall
is slight that no part of the District
requires artificial drainage. The only
Building that requires drainage is the
Combr. Jail but this desideratum
has in some measure been supplied
and the Inspector of Prisons is
opposed to any considerable outlay
on the work as the Building may be
altogether abandoned at an distant date.

The

The District Engineer states that the first thing to be done towards the drainage of the Malabar is to regulate the surface of the Lake. There should be a long regulating weir built at its lower end and another Bridge built under the road called the Willow Bund. This would allow of the lower part of the Bazaar being drained, and if an artificial margin raised three feet above water level made it would no longer be what it is. These improvements in the District Engineer's opinion should be extended to Kanur, Coonan and Nottaherry. The District Engineer suggests that Mr. Thomas the Collector should be requested to complete the report on the improvement of these Stations, commenced by the late Acting Collector, and that he himself should be furnished and supplied with professional means to prepare a general design for the improvement and future extension of these Stations.

There are 3 Stations in this Malabar District in which Europeans are located

29^c
viz Cannanur, Calicut and Malappuram the Buildings at which places are all well ventilated. The drainage of the Public Buildings in the District is said to be sufficient. Another main drain in connection with the European Barracks at Cannanur would it is represented be useful and as the small drains have not sufficient slope the District Engineer states that it would be an improvement to lay them with a greater fall. He considers that more attention should be paid by the local authorities to the clearance of the drains in all the large Bazaars at Cannanur, Palghat and elsewhere.

Madura Reports that the Sepoy lines in Madura and Rindigul are well situated both as regards ventilation and sewage but that in respect to the latter they are almost entirely dependent on local parties. In regard to the sewage of Native houses, the great mass is said to be water to flush drains. The town of Rindigul is represented

to be well situated for drainage and the District Engineer points out the advisability of storing water at that town or raising it from wells or both, for flushing the drains. No Public Buildings in the District are occupied by Europeans excepting the Tankam in Madras.

Reports that there are no Government Buildings inhabited by Europeans in the District, and that the Lines and Bazaar of the Native Regiment quartered at Palametta are situated on a slight incline and are well drained by means of small ditches on both sides of the Road between every two rows of lines. Tinnevely

The Executive Engineer reports that in all the new Buildings at Jachakalla, the Commisariat Staff Sergeants house excepted, the ventilation is perfect. Jachakalla

In

Bangalore

24 ✓

In the present Infantry Barracks there are a few air holes in the roof but these are far from being sufficient to allow of thorough ventilation. The new Blocks in the Bazaar square have large ventilators the whole length with strong chimneys above the inner verandah and ground strong ventilators. The Executive Engineer suggests a slight change in the position of the ground ventilators. The ventilation of the Bazaar Barracks Hospital is very bad as is also that of the solitary Cells. It is suggested that ventilators of the description of those given in the Standard Plan of Cutcherry be put up in all the roofs of the latter. The new Barracks on the Race Course do not require artificial ventilation. The Executive Engineer expresses his conviction of the decided preference to be given to large Ventilators for Barracks. Every building will shortly be more or less provided with ventilation. He regarding drainage Captain Moque forwards a letter from

from General Bercford and agree
with that Officer as to the urgent necessity
for improving the drainage of the Bazaar
and for preventing the great accumulation
of filth now annually increasing
in the bed of the Mole tank. This
latter subject has already been taken
up by the Commissioner of Mysore
and Captain Mayne suggests
that the Commissioner be addressed
on the subject and his consent
obtained for a plan to be drawn
up for the better drainage of the
Cantonment and Bazaar jointly.

The Penitentiary and Her Civil Architect
Majesty's Court are well ventilated, but
the General Hospital is badly ventilated
care has been taken to supply this
want in the revised Plans for a new
Hospital. The buildings are generally
well drained with the exception of the
Penitentiary. The open drain on the
South side of this building it is
recommended should be converted into
the

33
a covered drain and carried out into the river
for at least 20 yards. It is proposed
that a system of flushing the drains in
the Penitentiary be adopted that the grime
immediately in rear of the fresh enclosure
wall of the Buildings be filled up and
the bank of the river between the Bazaar
and S. B. Flanking Tower protected with
a masonry wall. The Civil Architect
proposes that the Municipal Commis-
sioner should be requested to carry out
into the middle of the river the offensive
drains which run into the stream.

Garrison Engineer

This Officer submits a report
of the means which have been provided for
the ventilation of the several buildings
in his charge. He reports that the
ventilation of all these buildings is
ample with the exception of

The Artillery, Serjeant Majors Quarters

Garrison Regt Serjeants Qr.

Engineer Serjeant Majors Qr.

All the casemated Quarters away from
the sea face of the Fort would be improved

Summary of replies received

by enlarged ventilators like the one at the
Commissariat Staff Sergeants Quarters. It
represents made of the sewage of the
Barracks. Each of the Quarters has a
branch into the drains passing near
them throughout the Fort. The removal
of filth by horse Carriage is general to
all. The body Guard, the Perambore,
and the Veterinary lines have imperfect means
of drainage. The introduction of a line
to the Staff Sergeants Quarters
in the Perambore and Veterinary lines is
recommended.

Central Office of the
Department
9 Feb 1860

J. H. Bell Colonel
Chief Engineer

B. H. Gray

W. 459. R. W. D.
 Proceedings of the General Council
 under date the 2^d March 1860.
 Read the following letter from
 the Chief Engineer 31

Submitting a summary
 of replies received from
 the different District
 Engineers on the subject
 of the ventilation of all
 Government buildings
 inhabited by Europeans,
 & their sewage.

Ag
 were entered Feb^y
 1860 No. 10105.

Para. 1. In the order of Government made
 of August 1858. No. 1559 originally noted reports were called
 for ~~on the~~ from ^{the several} District En-
 gineers on the state of the
 ventilation of all Government
 buildings inhabited by Europe-
 ans; and in a subsequent order
 it was directed that informa-
 tion on the state of the sewage
 also should be obtained: these
 latter reports were to include
 all Government buildings and
 localities, such as Military
 Stations, Cantonments, Bazaars
 &c. which are more directly un-
 der the supervision and control
 of Government.

14 Sept. 1858. No.
 1559 -

Bazars

The only measure in
 respect to the
 sewage should

2. Col. Bell now submits a
 summary of replies received

Enclosure in a letter from
 the Chief Engineer
 to the Secy. of the Govt. dated

Order of 1st Feb^y 1860.

1859-60/60

Summary of replies from
 the different District
 Engineers on the subject
 of the ventilation of all
 Government buildings
 inhabited by Europeans,
 & their sewage.
 1859-60. No. 10105.

on these subjects. The first
order above quoted showed that
the enquiry about ventilation
was intended to refer, primar-
ily at least, to ^{public} buildings
inhabited by Europeans;
several of the replies re-
ceived from the District
Commissioners contain informa-
tion about all the pub-
lic buildings in the Dis-
trict.

3. As to the general ques-
tion of ventilation Col Bell
is of opinion that ~~it~~ it is
much more perfect than
might have been expected;
that no immediate remedial
measures are necessary;
and that it will be suffi-
cient to issue instructions
that on repairs of any kind
becoming necessary, opportu-
nity should be taken to intro-
duce such modes of venti-
lation as are specified in
para 3 of his letter under
consideration. The Govern-
ment approve of this re-
commendation and the
Chief Engineer will issue
the necessary instructions

11 November 1889.
No. 4013.

for bringing these views into
effect. 39

4. The sewage it appears is
very defective throughout
the Presidency; it is observed
that as far as the principal
cantonnments are concerned,
a remedy was sanctioned by
Government in their Proceed-
ings in the Military Depart-
ment marginally noted.
Sufficient time has not yet
elapsed for the effects of
that order to be visible. A
copy of these Proceedings to-
gether with Col. Bell's letter
and its enclosure, will be
furnished, through the Mi-
litary Department, to the
Quarter Master General
of the Army, and he will be
requested to take steps to
bring into operation the
various suggestions made
by the Chief Engineer in para
4 of his letter.

5. ~~With reference to para 5 of~~
~~Col Bell's letter. The Government~~
~~are of the opinion con-~~
~~tained in para 5 of Col~~
~~Bell's letter, that it appears~~
~~to be necessary for making~~

~~These reports should be submitted~~
~~to the same authorities as~~
~~submitted to the Local Officer~~
~~Sub-sec~~

17 Feb.

JP

With regard to para 5 of Col.
Bell's letter, the Government
are of opinion that no object
will be attained by obliging
the submission of such re-
ports as the present, every
year. It will be sufficient
if an annual report is made
showing what
improvements have been
effected during each
year both as regards ven-
tilation & sewage, and
if none, the reason why.

LW

25/2/6.

JP

Copied to the Chief Engineer 25/2/6
" " 25/2/6

17 Feb 1824

Public Works Dept.
Pro: of Govt 10th March.

No. 459.

Pro: of the Madras Govt.
D^y 2nd March/60.

Pro: of the Public Works Dept.
28th March 1860 Cir 849 in
Pro: 2/14th April No 755.

From the Chief Eng^r 2/17th Aug^t No 628/1875
in Pro: 10th Aug^t No 1701.

Passing orders on the
report of the state of the
ventilation of all Govt build-
ings inhabited by Europeans
and of the sewage of all Govt
buildings and localities.

No 30 + 31.

Pro: of the Public Works Dept.
D^y 14th July
Cir No 1675 in Pro
25th July No 1886