

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No.

1719

Press
Mis.

508-511

Dated

21-6

1865

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No. 508.

Read the following papers:—

From D. MACPIERSON, Esq., M. D., Inspector General of Hospitals, Officiating President Sanitary Commission, to Colonel C. A. ORR, R. E., Secretary to Government, Public Works Department, dated Madras, 25th May 1865, No. 53 A.

SIR,

1. I have the honor to acknowledge the receipt this day of your Memorandum No. 84, dated 20th instant, calling for my observations on the suggestions by the Barrack and Hospital Improvement Commission in England, regarding the sanitary works required for improving Military Stations in India.

2. The report referred to, details fully the general principles on which practical experience in sanitary works and measures are based, and as the introduction of these elsewhere, invariably result in an abatement of disease, the "Suggestions" are tendered by the Commissioners, "not with a view to fetter the judgment of authorities in India," but in the hope that, with certain modifications, to suit particular stations and localities, they may aid us in the introduction of the necessary reforms.

3. The suggestions are founded on the "Report of the Royal Commission on the sanitary state of the Indian Army, which show, that improvement at all stations includes the following elements:—

"(1.) A thorough drainage of ground occupied by stations.

"(2.) An abundant supply of pure water distributed over stations.

"(3.) The adoption of healthy principles of construction in Barracks, including suitable provision for the recreation and employment of Soldiers, * * *

"(4.) Improved principles of Hospital construction.

"(5.) Improving the Sanitary Police of stations, bazaars, and adjacent Native towns."

4. The Commissioners warn us against falling into the grave error to trust to any one of the above points as sufficient for the removal of local causes of disease, and urge that all should be carefully provided for, prior to the construction of new Barracks; on similar principles they advise a "consistent scheme to be drawn up for making our present stations habitable and healthy."

5. I consider that the majority of the improvements suggested can be practically applied to our Civil and Military stations in India, and in this opinion my colleagues in the Commission concur.

6. Generalising, as these suggestions do, so many minute points in detail, each very essential in themselves, we believe that they will materially aid the Engineer in drawing his attention to the introduction of measures which will add to the salubrity of the locality, and to the comfort of the troops and community.

7. The first subject treated by the Commissioners is *sub-soil and surface drainage, and paving*.

8. The advantages "acquired by *sub-soil drainage* in England, by increased "productiveness of the soil and improved health generally," are urged as a reason why similar works should be introduced into India, and we believe that there are few of our stations, where the system in whole or in part may not result in similar good. For malaria generated, by damp * * must diminish as the "water level is concentrated and lowered."

9. *Surface drainage* is even more important than sub-soil drainage in India, and connected with this subject should be considered the removal of soft and slopy inequalities, the levelling of pits and holes, the paving of immediate surfaces surrounding Barracks, the formation of gutters on the outside margin of raised footpaths along streets and roads, and the storage of water from the roofs of Barracks, either for domestic or for lavatory purposes, plunge-baths, &c.

10. *Sewerage and drainage*, the subject next dwelt on by the Commissioners, is a question of vital importance to us in India, as none of the now recognised principles of action have as yet been enforced within our Military and Civil stations. I

speak from personal observation, having professionally inspected all stations under this Presidency, as well as many on the Bengal and Bombay sides.

11. This subject and that last referred to ought to be considered hereafter as one, in order to guard against "the water lodging of the sub-soil with impurities, which is the main cause of miasmatic disease."

12. "As the question of drainage is intimately connected with the question of "levels and of outlets, the first step to be taken before beginning the drainage of any "station, town or district, is to make a detailed survey, on a suitable working scale "of the whole area to be drained, in order to settle the levels, with a view of ascer- "taining the fall and where the outlet should be placed."

13. In making this important quotation from the Commissioners' "Suggestion" I would urge, that District Engineers be called on to map out localities, as recom- mended therein, and that their plans be submitted to this Commission for considera- tion.

14. In preparing these plans they should follow the leading principles laid down by the Commissioners, not only in the construction and ventilation of sewers and drains, but also in the disposal of the sewage. The map should show the posi- tion of existing wells, streams, and reservoirs of water in use, a wide margin being allowed to guard against contamination by percolation through the sub-soil, into the lower level where the pure water may be.

15. As regards the final disposal of sewage proper and "effluent water, which after any form of treatment remains essentially sewage water," the Commissioners leave us but one course to pursue. "It should only be used for irrigation purposes." The produce of each day should be expended, so as to prevent the commencement of putrefaction, by applying it to the surface of the ground." "Fresh sewage is not injurious, but sewage retained in cess pools, in imperfect drains and sewers, fouls the sub-soil, contaminates the wells and produces gases of a most noxious and injurious character."

16. The simplest and most profitable method of disposing of fresh liquid sewage, is by direct application to land set apart for grass, the solids being re- moved and used as ordinary manure.*

17. I examined, in England, parks adjacent to towns irrigated in this manner, realizing profits averaging from a few Shillings to £10 an acre; as an example of the latter, I may mention the meadows near Edinburgh, which have been successfully irrigated on this system for half a century. These parks might be fenced and let out to contractors engaged in supplying Europeans with meat, for the disinfecting pro- perties of the soil and the growth of healthy vegetation thereon, as in all other cases where manure is applied, effectually removes evil results.

18. The principles which should guide us in the drainage of Barrack blocks, treated by the Commissioners under head No. 12, should be considered in connec- tion with that on which I have just observed.

19. It may be worthy the consideration of Government to form an establish- ment in connection with the public health service scheme now before them, who will be properly trained to carry out points of detail in the dry earth plan of conser- vancy, and in the system of sanitation proposed for this Presidency.

20. The whole subject of water supply follows next in consideration in the Sug- gestions by the Home Commissioners. Their recommendations are based upon the decision of the Royal Commission on the sanitary state of the Army in India, quoted in the margin. The value of their propositions cannot, I think, be over- estimated, treating fully as these does of the "examination and selection of water sources, storage of rain-water, means of distribution by pipes and otherwise. Watering troughs for Cavalry horses, water-filters, &c."

"8. That all existing water sources be subjected to analysis, and those rejected which contain matters injurious to health. That the present method of drawing and distributing water be discontinued wherever practicable. That all water used for drinking purposes be filtered, or otherwise purified."

Watering troughs for Cavalry horses, water-filters, &c."

21. The subjects of

*Barrack ablution rooms ;
Drinking fountains ;
Water supply of Barrack blocks ;
Wash-houses and Lavatory ;*

separately observed on by the Commissioners, should be considered by Sanitary Officers and Engineers in connection with that of water supply.

22. As more than 70 per cent. of all living organic matter consists of water, obtained from food and liquids taken into the stomach, we cannot over-estimate the advantages of a bountiful supply of this liquid in its purest forms at all stations in India. The Commissioners consider that not less than 12 gallons per head per day should be provided for men in health, and 30 to 35 gallons for sick in Hospital. That ready access to a free supply for drinking purposes should be provided for the Soldiers at numerous places specified, and that repeated analysis of the supply before and after filtration should be made and recorded.

23. Hitherto our great difficulty in India, as regards water, has been the scantiness of supply, and the rude means of distribution. Our wells usually average 20 to 30 feet in depth, and from their wide open mouths too frequently receive the contents of sub-soil or surface drainage.

24. It is not so in other tropical localities, as in the Dutch Island of Java, there, I observed, attached to Government Barracks and Hospitals, and even to hotels and private houses, a simply constructed force pump, one pipe from which descended through a boarded covering to the water, in the well, and another ascended to fill and replenish the cisterns on the roof, from whence pipes descended to every part of the house.

25. This Commission are unanimous in recommending that the "Suggestions" of the Commissioners in order to supply our deficiencies in this respect should be carried out.

26. Then night and day the Soldier will find in every apartment he enters pure water from a tap which will quench his thirst, and doubtless in many instances check his craving for ardent spirits.

27. The suggestions offered by the Commissioners on this head are applicable to all our Indian stations, and we quite concur with them in their concluding "fundamental principles" "that every drop of water brought into a station for use should be conveyed away again by drains, otherwise it will remain, more or less, in the sub-soil, and become an added source of unhealthiness."

28. The Principles of Barrack construction, which follow next in order in the Commissioners "Suggestions," are sub-divided into the following heads:—

*Barrack rooms to be raised on basements.
Number of men per room or block.
Space and area per man and proportion of rooms.
Windows and doors.
Verandahs.
Ventilation and cooling of Barracks.
Ceilings.
Night Urinals.
Structure of Wards.
Barrack Latrines and Urinals.
Means of employment and recreation.
Quarters for Non-Commissioned Officers and Married Soldiers.*

* Under each of the above heads.

29. Fully concurring, as this Com- mission does in the general principles laid down,* I need not extend these remarks by dwelling on them. I will therefore merely solicit the consideration of Engineers, entrusted with the construction of public buildings, to all the minute details, up to the formation of doors and windows, which the Commissioners have

*Proceedings of the Madras Government, Public Works Department,
21st June 1865.*

considered it necessary to observe on, as important essential points to be attended to where bodies of men are congregated in health or in sickness.

30. *The Principles of Hospital construction* and provision for their administration, as laid down by the Commissioners, will also, we hope, be enforced by Government, for no better or more complete scheme could be devised.

31. Under the section *Sanitary Police of Barracks, Hospitals and stations* are embodied,

1st.—*The duties of Regimental Medical Officers and Military Sanitary Officers of Stations.*

2nd.—*Duties of Sanitary Inspectors at Stations, Bazaars, and Native Towns.*

3rd.—*Regulation of Bazaars and Native dwellings.*

4th.—*Sanitary Police of Native Lines.*

5th.—*Officers of Health appointed for Civil duties in Towns.*

6th.—*Precautions against epidemic disease.*

32. The observations under these heads are founded on recommendation (32) of the Royal Commission, that the new Medical Regulations in use at Home be applied or adapted to all Stations in India.

33. The Code of Medical Regulations for this Presidency is, in my opinion, so obsolete and inapplicable to the present state of India, and to the requirements under each head treated in these "Suggestions," many of which refer more or less to the duties by executive and administrative Medical Officers, that I think the entire reconstruction of the work by a qualified Committee worthy the consideration of the authorities.

34. This work should embody all the knowledge in sanitary requirements which late years have taught us all. It should be drawn up in communication with the other Presidencies, and as far as possible become a standard Medical and Hygiene Code for all India.

35. I will not extend this letter by observing further on the last subject quoted in these "Suggestions," viz:—

36. *The Registration of Deaths*, further than to observe on the words of the Commissioners. "That in every country in Europe, not excepting the remotest Provinces of Russia, the births, deaths, and marriages are now registered, and there appears to be no reason why this should not ultimately be done in India, with such machinery as is suitable to that country."

No. 509. From R. COLE, Esq., Principal Inspector General, Medical Department, to Colonel C. A. ORR, R. E., Secretary to Government, Public Works Department, dated Fort Saint George, 31st May 1865, No. 170:—

SIR,

No. 835 of date 27th March 1865, Public Works Department.

1. Referring to Proceedings of Government, as per margin, I have the honor to state that I have perused the Report in question by the Barrack and Hospital Commission, and that many of the "Suggestions" appear to be practicable.

2. The Commissioners have thought it necessary to give much elementary matter, such as most Officers engaged in sanitary duties might reasonably be supposed to be acquainted with.

3. The remarks in Section I., would be much more to the point, if it was absolutely certain that water sewage was the system best adapted for India. Of this, however, grave doubts are entertained by those practically acquainted with the subject; and the experience of the Barrack and Hospital Improvement Commission, which does not embrace a practical acquaintance with the peculiarities of Indian climates, is powerless to help in settling which is the best method.

4. The remarks on "water supply" are judicious, though it is doubtful in this country whether water artificially stored will ever be so safe for drinking purposes as deep well water. The Vehar water used at Bombay is at the present moment said to be most offensive from organic impurity. The population are afraid to use it.

*Proceedings of the Madras Government, Public Works Department,
21st June 1865.*

poses as deep well water. The Vehar water used at Bombay is at the present moment said to be most offensive from organic impurity. The population are afraid to use it.

5. The importance of a liberal supply of pure water at all our Indian stations is sufficiently obvious. The means of supply are beyond my province to deal with.

6. The remarks on Barrack and Hospital construction will no doubt commend themselves to the notice of the Indian Government, when new buildings of this kind are required. I have lately expressed general approval of Colonel Crommelin's plans for Hospital construction.

7. As regards the Sanitary Police of Barracks, Hospitals, and stations, I may remark the duty of drawing up a Code of Regulations on these points devolves upon the Presidency Sanitary Commissions. The new Act for Military Cantonments will give the necessary powers to the authorities to make complete arrangements for Sanitary Police, so as to ensure the greatest possible protection from epidemic disease.

8. The "Registration of deaths" has already been provided for. At the Presidency town registration has been carried on without difficulty for the last ten years, the results being summarised weekly in the "Fort Saint George Gazette," and in quarterly and annual reports.

9. The registration of the "cause of death" must necessarily be imperfect, until a race of educated medical men spring up, to furnish the information. The Revenue authorities are about to make provision for the registration of deaths in the several Collectorates, and the returns will be tabulated either by the Sanitary Commission or Medical Department.

No. 510.

From the Quarter Master General:—

(Here enter 17th April 1865, No. 4,457.)

No. 511.

ORDER THEREON, 21st June 1865, No. 1,719.

MILITARY WORKS, No. 38.

Ordered that the following letter be despatched:—

(Here enter No. 1,720, dated 21st June 1865.)

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,

Secretary to Government.

To the Military Department.

.. Superintending Engineers.

Erd. S. T. Augustin.

PUBLIC WORKS DEPARTMENT,
FORT SAINT GEORGE,
21st June 1865.

No. 512.
From

No. 1,720.

COLONEL C. A. ORR, R. E.,
Secretary to the Government of Fort Saint George, P.W.D.,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA, P.W.D.

SIR,

MILITARY WORKS, No. 39.

With reference to your letter of the 21st February last, No. 16, I am desired to forward herewith the accompanying reports on the suggestions made by the Barrack and Hospital Improvement Commission, in regard to the Sanitary works required for improving Indian Stations, and to observe that the Madras Government acquiesce in the general principles laid down by the Commission, but consider that their application to buildings and works in this country will have to be determined as the occasion arises in reference to the particular description of building to be constructed, its site, &c.

I have the honor to be,
Sir,

Your most obedient servant,

(Signed) CHARLES A. ORR, Colonel, R. E.,

Secretary to Government.

Ed. S. T. Augustin.

From the Quarter Master General of
the Army - Madras.
Dated 17th April 1865 No 4457.

States that it does not occur to His
Excellency the Commander in Chief to offer
any remarks on the contents of the volume
of sanitary "Suggestions" forwarded with the
order of Government No 835 of 27th March
last for reasons assigned.

From the Officiating President Sanitary
Commission - Madras.
25th May 1865 No 53 A.

Submits observations on the suggestions
by the Barrack and Hospital improvement
Commission in England, regarding the sanitary
works required for improving Military Stations
in India.

From the Principal Inspector General
Medical Department 31st May 1865 No 170-
do. do. do.

Is forwarded for the information and
orders of Government.

I do not see that we can do
more than record it.

WD

I suppose

WB

The general principles

Laid down by the Royal Commissioners
and I conclude in the main undeni-
-able. Their application to building
and works in this Country will have
to be considered as the other is on
basis in reference to the particular
building the construction is
rather - like some

J. J. J.
W. J.

proposed to be built
and all the necessary
arrangements for
the purpose of
the building
which will be
the first of
the series of
buildings to be
erected in the
country.

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SUGGESTIONS

IN REGARD TO

ANITARY WORKS REQUIRED FOR IMPROVING INDIAN STATIONS

PREPARED BY THE

BARRACK AND HOSPITAL IMPROVEMENT COMMISSION.

IN ACCORDANCE WITH

Letters from the Secretary of State for India in Council, dated
8th December 1863 and 20th May 1864.



LONDON:

PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,
FOR HER MAJESTY'S STATIONERY OFFICE.

1864.

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