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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

PUBLIC WORKS DEPARTMENT

G.O. No. / B.P. No.	2351-W	Press. / Mis.
Dated	31/5/1878	~~197~~.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

31st May 1878, No. 2,351 W.

General.
Account.

Read the following paper:—

No. 352. From Surgeon-Major W. R. CORNISH, F.R.C.S., Sanitary Commissioner for Madras, to the Secretary to Government, Public Works Department, dated Madras, 20th May 1878, No. C-6.

REFERRING to Proceedings of Government, No. 1,699 W, of 4th April 1878, (Public Works,) I have the honor to state, for the information of His Grace in Council, that registers of the level of sub-soil water have been kept for some years past in the places marginally noted, and the results are recorded in the annual reports of the Sanitary Commissioner.

Madras.
Combaconum.
Negapatam.
Madura.
Calicut.

2. These observations were undertaken with the view of testing a theory of Professor Von Pettenkoffer of Munich, that outbreaks of cholera bore a direct relation to the level of sub-soil water.

3. My object in writing is merely to point out the utility of the apparatus employed for registering the level of sub-soil water, and to suggest that if experiments on this point are to be continued by the Public Works Department that Pettenkoffer's apparatus is both simple and cheap, and well suited to yield accurate results.

4. A full description of the apparatus and its use will be found in my Proceedings, Vol. VI (August), a copy (to be returned) of which is herewith forwarded.

No. 353. ORDER THEREON, 31st May 1878, No. 2,351 W.

RECORDED. The apparatus is not adapted for use in the localities where observations have been ordered to be taken.

(True Extract.)

(Signed) E. A. FOORD, Colonel, R.E.,
Secretary to Govt., P.W.D.

(True Copy.)

Major, R.E.,
Under Secy. to Govt., P.W.D.

To the Sanitary Commissioner.

Exd. C. Howarth.
Spare Copies

GENERAL
ACCOUNT.

Govt. of (1878) Madras

PUBLIC WORKS.

To

THE SANITARY COMMISSIONER.

Dated 1 May 1878.

G. O., dated (?) 1878, No. 2 of (?).

MAY.

Nos. 352-353.

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MINUTES

OF

PROCEEDINGS

OF THE

Sanitary Commissioner for Madras,

FOR THE

MONTH OF AUGUST 1869.

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MADRAS:
PRINTED BY H. MORGAN, AT THE GOVERNMENT PRESS.
1869.

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MINUTES

OF

PROCEEDINGS

OF THE

Sanitary Commissioner for Madras,

FOR THE

MONTH OF AUGUST 1869.

MADRAS:
PRINTED BY H. MORGAN AT THE GOVERNMENT PRESS,
1869.

A/235

PROCEEDINGS OF THE SANITARY COMMISSIONER FOR MADRAS FOR THE MONTH OF AUGUST 1869.

198 **Registration of Births and Deaths in Madras.**

Read, with reference to para 5 page 183, under minute No. 103 and para 2 of the G. O., recorded at page 414 under minute No. 181, of these Proceedings, the following letter No. 2,722, dated 2nd August 1869, addressed by the Sanitary Commissioner for Madras, to the President of the Municipal Commission, submitting his opinion on the necessity for ensuring a more accurate system of Registration of births and deaths in the Town of Madras than at present obtains :—

I have the honor to address you, with reference to the order of Government No. 994 of the 17th July 1869 upon the Vital Statistics in Madras for the first quarter of the current year, drawn up by my late Secretary, Dr. Montgomery; and especially with reference to the remark made by him regarding the unsatisfactory working of the Department of Registration of births and deaths under Clauses 218 to 224 of Act IX. of 1867.

2. Dr. Montgomery did not communicate to me the steps he contemplated taking in the matter, nor the measures he intended proposing to remedy the existing faulty system; but having given the subject due consideration, I have to suggest certain measures for your consideration.

3. That the system has failed, and that the Act is largely evaded, both in registration of births and deaths, and more especially in the registration of births, is patent.

4. The total number of births registered since the system was introduced amounts to 5,842 or 12·98 per mille upon the population, being 12·63 per mille less than the deaths; and, as Dr. Montgomery justly remarked if correct, points to a speedy extinction of the population of this city. In regard to deaths you are aware that, before registration under the Act was introduced, they were reported by Mortuary Conicopillays entertained by the Municipality, and who obtained their information from grave-diggers and others employed either in burying or burning in the different grave yards or burning grounds. On the entertainment of Registrars under the Act, it was considered advisable to retain for a time the services of the Conicopillays as a means of assistance and check upon the registrars, and they are still so entertained.

5. During the fifteen months, from April 1868 to June of the present year inclusive no less than 7,242 deaths have been reported by Conicopillays, which have escaped registration by the registrars.

6. It is alleged, I am aware, that the Conicopillays acted in a spirit of jealousy of, and opposition to, the Registrars, under the belief that on the latter getting into good working order, they would be dismissed; and this allegation is held to be supported by the fact, that in the instance in which I brought to your notice that eleven deaths in a given day had been reported by them, which had not been registered, on prosecution of the parties a conviction was obtained only in two cases, upon I believe the admission of the parties themselves.

7. I would however remark that it is not within the Conicopillays' power to give that proof of death necessary to support a prosecution in a court of law. They have no personal knowledge of the burial or cremation of any corpse; but obtain their information, by report only, from grave diggers and other functionaries employed in carrying out the last rites of sepulture or cremation. The burial and burning grounds are so numerous that it is quite out of their power to do more than simply visit them, and get the best information they can; and I am disposed to think, and I know the late Dr. Montgomery was of the same opinion, that their reports are reliable, although they may fail to afford that proof necessary to prosecution before the Police.

8. In support of the belief that the Conicapillays' returns are reliable, I may state that the numbers reported by them closely approximate to those recorded prior to the entertainment of Registrars, and before the influences alleged now to actuate the Conicopillays, were in operation.

9. In the margin I give a table showing the deaths for a number of years past as compared with those for the year 1868. If from the number of deaths in the latter year we deduct the numbers recorded by the Conicopillays, the figures are 4,583; but as these are only for the months from April to December, we must add, the deaths recorded in January, February and March, which bring the number up to 7,725, or much below those of any previous year; while if the excess recorded by the Conicopillays' returns are added, the figures approximate to those representing the deaths of former years.

1859	...	13,198
1861	...	14,170
1862	...	14,781
1863	...	17,359
1864	...	10,109
1865	...	15,216
1866	...	13,981
1867	...	14,145
Means.		14,051
1868	...	12,702

10. I will make this a little more clear in another form. In the nine months of the year 1868, the Registrars have recorded 4,583 deaths which reduced to an annual rate will be represented by 6,110. The Conicopillays returned 9,660 or at the annual rate of 12,880. The latter figure is within 571 of the average of deaths for the eight years ending 1867, during which period the Conicopillay's had not the inducement to falsify their returns now alleged to be actuating them. The Registrar's returns are on the other hand so palpably short of the average, as to be utterly unreliable. I think therefore that the Conicopillays' returns must be accepted as being as trustworthy as the imperfect system admits of.

11. It is manifest if this conclusion is accepted, and I think it must be, that the law requiring every death to be registered is largely evaded; and it becomes necessary to adopt some measures by which registration of every death may be ensured.

12. This can only be done by bringing every burial and burning ground under Municipal supervision and control, and by requiring, under a special bye-law, if necessary, that no corpse shall be interred or burnt without a certificate being presented by the relations or friends of the deceased, that the death has been duly registered.

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13. To carry out this it will be necessary that the number of burial and burning grounds shall be reduced within reasonable limits and that a person (warder) shall be in charge of each with instructions and power to allow no corpse to be buried or burnt without the production of a registrar's certificate, that the provisions of Clause 223 of the Act has been duly complied with.

Or authority might be given to the warder of the ground to enter the necessary information in a register kept for the purpose, when a registrar's certificate is not produced. One or other of these measures of check and record might be adopted as appears most suited to meet caste scruples and prejudices.

14. From the returns of burial and burning grounds, which you were good enough to transmit to me, I have prepared an abstract which is appended. There are no less than 157 used by the native community and it is for the commission to determine what number it may be necessary to close and how it will be possible to bring those retained under control and supervision.

15. I am well aware that the question is overlaid with very considerable difficulties; but unless registration of deaths is to be a farce, some measures must be devised to ensure the provisions of the act being complied with.

16. One very difficult question, and which also involves sanitary considerations of the greatest importance, is the disposal of first born children on their decease. The custom is, as you are ware, to bury them upon the premises often beneath the floor of the dwelling. This practice is beset with and founded upon so many superstitions that it will perhaps be difficult to interfere with it. The subject is one that requires consideration; but as burial in private or unauthorised ground is forbidden by the Municipal Act under heavy penalties, power manifestly exists to put a stop to the custom; and indeed one offender was prosecuted and fined.

17. Some remarks by Dr. Mair, Deputy Coroner of Madras, published in the Madras Journal of Medical Science in an article entitled "Statistics of unnatural deaths in Madras and other Presidencies," are so pertinent to these questions and so deserving of attention that I give them at length.

"The difficulties which stand in the way of any interference with Hindoo burial or burning grounds, with the interment of first born children in private grounds, and with night funerals, though unquestionably great, owing to the deeply rooted prejudice and antipathy of the native to any interference with long established customs, are not more so than the difficulties which have been so effectually overcome, with reference to other long standing customs, Suttee and the swinging festival for example, believed to be closely identified with the Hindoo religion, and which formerly were the cause of many unnatural deaths occurring throughout India.

"The Municipal Acts now in operation almost everywhere throughout India, all constructed on the same model, confer powers sufficient to meet some of the difficulties referred to.

"Existing grave and burning grounds can be closed and other places apart for the same purposes. Responsible persons ought to be placed in cha of these grounds, persons whose duty it should be not to permit any body to buried or burned without a certificate from the District Registrar.

"With reference to Registrars, there is an omission in the Municipal A of sufficient importance to call for remark. At present the Registrars of Deat appointed under these Acts, record every death and its cause according to t information given them, and there their functions cease.

"A considerable number of deaths may thus be registered, respecting wh no sufficient evidence of the cause of death is produced; and persons wh deaths are thus registered may be interred without any enquiry being made i the manner in which they came to their death.

"It is evident that such a system as this, is fraught with danger to the pu lic. It would be no difficult matter—

1st. To require that incomplete or irregular information regardin death be sent to the Coroner or other similar officer before registration.

2nd. That every Registrar be instructed not to register any death t has occurred from violence, or from other than natural causes, or even any de that has occurred suddenly without any known cause, until the case is refer to the Coroner, and his decision given to the Registrar whether he will hold inquest or not.

"Magistrates should have the power not only to inflict a penalty for int ring bodies in other than authorized burial grounds, but also to compel t removal of bodies so interred.

"No dead body should be permitted to be buried or burned, except wit specified hours, say between sunrise and sunset.

"None of these measures would, if carried out, seriously violate or offe the religious prejudices of the Hindoos, and there is little doubt that they mig be enforced with little or no difficulty, beyond that incidental to anything be ing the shape of an innovation. They might be the means of preventing so unnatural deaths, while they would bring to light others that, under present c cumstances, pass unrecorded as such."

18. The measures necessary to be taken to enforce the correct registrati of births and deaths resolve themselves into :—

i. The closing of all burial grounds which are objectionable either account of being already overcrowded or injurious to health; and the limitati of their numbers to the actual requirements of the community.

ii. Similar limitation of burning grounds.

iii. Registration (if not already effected) of the same under Section 1 of Act IX of 1867, and the enforcement of the penal clause of the said Secti in all cases of burial of corpses in other than authorized grounds.

iv. That some responsible person be placed in charge of each and eve burning or burial ground, and that no corpse be burned or buried without a cer ficate from the District Registrar.

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v. That when bodies may have been buried in other than authorized ground power be given to compel the removal of the corpse to a registered burial ground.

vi. That the penal clauses of Section 222 of the Act be rigidly enforced in all cases of non-registration of births.

19. I would also advise that the Registrar's Offices should be in more accessible places and brought into more official relation with the Municipality than they now are. It would be advantageous to locate them at the principal police tannahs of each district. There have been many complaints of the out of the way places in which the Registras now live and hold Office. Their location near the police tannahs would tend to keep them also more under observation.

Abstract of Burial and Burning Grounds in the different Divisions of the Municipality of Madras.

Division.	Locality.	Burial grounds.	Burning grounds	Class of persons used by.	Remarks as to overcrowding and necessity of closing.
1	Sunjeveeroyen Pettah.	1	1	Chetties... ...	Not overcrowded, not objectionable.
„	Tondiarpettah ...	1	...	Brahmins ...	Do.
„	Do.	19	3	Hindoos... ...	20 not overcrowded, not objectionable, 2 not overcrowded, but would recommend being closed.
„	Do.	...	1	Chetties... ...	Overcrowded, should be closed.
„	Do.	1	1	Washerman ...	Not overcrowded, not objectionable.
„	Cashmoode	3	....	Christians ...	Not overcrowded.
„	Do.	1	...	Mahomedans...	Not overcrowded, not objectionable.
„	Do.	1	...	Jafferjies ...	Do.
„	Do.	1	...	Chinamen ...	Do.
„	Washerman's Pettah	1	1	Hindoos ...	Do.
„	Do.	6	...	Mahomedans...	Do.
			2	Hindoos... ...	4 Not overcrowded, not objectionable, 2 not overcrowded but would recommend being closed, and 2 objectionable.
„	Do.	6	...	Christians ...	Not overcrowded, not objectionable.
„	Royapooram ...	1	1	Hindoos. ...	Objectionable.
„	Coorookapettah ...	8	2	Do. ...	6 not overcrowded, not objectionable, 1 burning portion objectionable, 2 no objection.
4	Pursewalkum ...	5	...	Christians ...	1 situated in open ground not objectionable, 4 amongst houses objectionable on Sanitary grounds.
„	Do.	3	1	Hindoos... ...	Situated in open ground not objectionable.
„	Do.	1	...	Mahomedans...	Amongst houses, objectionable on Sanitary grounds.
„	Perambore	1	...	Do.	Do.
„	Do.	1	1	Hindoos... ...	Not objectionable, being situated in open ground.
4 & 5	Vepery	2	...	Christians ...	1 closed not in use, 1 objectionable being situated amongst houses.
4	Chooley	2	1	Hindoos... ...	Near houses, objectionable on Sanitary grounds.
„	Vissarapady	1	1	Do.	Not objectionable, situated in open ground.
5	Egmore	1	..	Mahomedans...	Closed not in use.
6	Mannarsawmy Covil.	1	...	Hindoos... ...	Near houses, objectionable on Sanitary grounds.
„	Nungumbakum ...	1	1	Do.	Not objectionable, situated in open ground.

Abstract of Burial and Burning Grounds in the different Divisions of the Municipality of Madras.

Division.	Locality.	Burial grounds.	Burning grounds.	Class of persons used by.	Remarks as to overcrowding and necessity of closing.
7	Chintadripettah ...	5	...	Christians ...	Not objectionable.
„	Triplicane	1	...	Do.	Sufficient place more but close to houses.
„	Do.	10	...	Mahomedans...	3 almost full and should be closed, 1 sufficient place more for the Carnatic Family, 4 close to houses and roads should be closed, 2 sufficient place more.
7	Do.	2	2	Hindoos ...	Very close to dwellings and public roads should be closed.
„	Purdoopaukum ...	2	...	Mahomedans. .	1 sufficient place more but close to houses and 1 place more for interment (Family.)
„	Royapettah	1	..	Do. ...	Some more ground for inie rment.
„	Thowtteeswaripettah	1	...	Do. ...	There are several family cemeteries in the Burial ground and in a few of them there is some ground for interment however all of them should be closed as they are close to dwellings.
6	Kilnamyettah ...	46	...	Do. ...	2 not full but close to houses, 29 al most full and full, and should be closed, 15 more place for interments 1 a large piece of ground containing several family cemeteries many full recommended to be closed, 2 the front is full and should be closed but there is space at the rear which will be used, 6 more place for interments in the pavements.
„	Mylapore	20	...	Do. ...	5 almost full and should be closed, 11 more place for interments, 3 more place for interments but close to houses, and 1 not in use.
„	Do.	2	1	Hindoos ...	Sufficient place more but close to houses and 1 also to public Road.
„	Do.	10	...	Christians ...	Sufficient place more for interments.
„	Meersaib's Pettah ...	4	...	Mahomedans...	1 Sufficient place more, and 3 more place but close to houses and should be closed.
„	Temmpettah ...	1	...	Do. ...	Sufficient place but close to houses and should be closed.
„	Alwarpettah... ...	1	1	Hindoos ...	Objectionable on account of the smoke extending to houses in the vicinity.
„	Royapettah	4	...	Do. ...	Sufficient place more.
„	Do.	5	...	Mahomedans...	4 sufficient place more but close to houses and 1 almost full and close to public Road and Triplicane Dispensary.

Read again, in continuation of the above, letter No. 2,758, dated 6th August 1869, to the President, Municipal Commission, Madras, suggesting the desirability of enforcing the registration, in the Office of the Municipal Commissioners, of the names of all Private Medical Practitioners, (whether qualified or unqualified) of all Native doctors and hakeems and of all Midwives, whether European, East Indian or Native; and to require them under penalty to report to the Registrars of the District all births and deaths at which they may personally attend.

As directed, the above correspondence was submitted to Government in the Public Department, upon which Government in their order No. 1116, dated 11th August 1869, desired to be informed of the steps which the Municipal Commissioners, propose taking, with reference to the very useful remarks and suggestions of the Sanitary Commissioner on the subject.

---

199. Collection of Cholera Statistics from Collectorates.

Read the following letter No. 2,529, dated 5th July 1869, from the Secretary, Sanitary Commissioner, to the Secretary to the Board of Revenue, Madras, on the above subject :—

I have the honor by desire of the Sanitary Commissioner, and with reference to the order of Government, quoted in the margin, to solicit that the Board of Revenue will be good enough to instruct all Collectors to furnish me from 1st of January of the current year, with lists of every town and village in which deaths from Cholera may have occurred, in the several Districts, noting also the date of the first and last death in each monthly return.

* No. 4,261, of 30th October 1868, in the Military Department.

2. I may explain that this detailed information is required to enable the Sanitary Commissioner to prepare a map, referred to in the Proceedings noted, showing the movements of Cholera throughout each District of the Presidency, to accompany his Annual Sanitary Report.

3. I am also instructed to request that similar information may in future accompany each Monthly Abstract of deaths in the provinces.

A form of Return is enclosed.

Return showing the deaths by Cholera in the Towns and Villages, in the District of for the month of 1869.

Name of Town or Village.	Number of deaths by Cholera.	Date of		Remarks as to whether the disease has ceased or continues to prevail at the close of the month.
		First death.	Last death.	

The following are the Proceedings of the Board of Revenue, No. 5,626, dated 2nd August 1869, on the above :—

The Board have conferred with the Sanitary Commissioner on the subject of the above letter.

2. They learn from him that since the letter was written, a Commission has been appointed in Madras, and is at present sitting, to devise measures for giving effect to the Orders of the Home Government on the subject of collection of Cholera Statistics.

3. They learn, moreover, that orders have been received from the Supreme Government, calling on the Sanitary Commissioner for his opinion, in communication with the Board on a scheme of Returns of vital statistics proposed by Major Malleson, for adoption throughout India.

* Recorded in Minute No. 93, page 162 of these Proceedings.

4. In this is proposed a series of registration circles, and the adoption of such would, in the opinion of the Board, tend to improve the accuracy of the Returns. The Board concur with the Sanitary Commissioner, that the talooks of this Presidency should be divided into 2 or 3 such circles according to size, one being named after the Cusbah Station, and the others taking their name from the most important town they contain. It will be convenient to adopt the divisions of the Revenue Inspector, and make this Officer the Registrar and Tabulating Officer for the villages within his Range. Towns of 5,000 inhabitants and upwards would constitute separate circles, and Municipal towns would be classed by themselves; these towns, however, being in all cases as suggested by Major Malleson placed in juxta-position with the adjacent rural circle for facility of comparison.

5. In regard to Returns of Deaths from Cholera, the Board are of opinion, that it would not be possible, except at an enormous cost, to organize a system by which Returns should be prepared and transmitted with that promptitude which would be necessary in order to render them practically useful as enabling the authorities to take instant remedial measures.

6. In this particular class of Return, they are unanimously of opinion that the present Police organization provides the only efficient medium of collection.

7. The village establishment cannot be depended on to register deaths from day to day, nor have they the means of frequently transmitting their reports. But the Board understand that the rural Beat Constable visits all villages at short intervals when information on this subject may be obtained and brought up to the Station house, whence there is a daily report to Police Head-quarters which may be made to contain all such urgent information to be disposed of as the Government may direct.

200.

Inquiry into Cholera in India.

Read, with reference to Minute No. 140, recorded at page 301 of this volume, the following Proceedings of Government in the Public Department, No. 1,072, dated 3rd August 1869, on the report of the Committee assembled on the above subject, under the Orders of Government No. 731, dated 10th June 1869.:—

From the Committee for inquiry into Cholera in India, to the Chief Secretary to Government, Fort Saint George; dated Madras, 22nd July 1869.

We have the honour to submit our report, under the Order of Government in the Public Department, No. 781, of the 10th June 1869, as to the course to be pursued in conducting the inquiry, suggested by the Army Sanitary Commission, into cholera in India.

2. The opinion of the Committee is embodied in the following resolutions adopted at their meetings of the 8th and 12th instants:—

Resolution 1.—"The Committee resolve to recommend that authority be "granted to the Inspector General of the Indian Medical Department to print in "the Government Press sufficient copies of the Register for recording cholera "cases," and of the "Instructions for conducting an inquiry into cholera in "India for issue to all Commissioned Medical Officers, and that the Register do constitute one of the official records of every Military and Civil Hospital."

3. These Registers will require slight modifications to meet the requirements of Native Troops, prisoners in Jails, and Civil Hospitals and Dispensaries. Forms showing the proposed modifications which extend only to the first few columns of the "Register" are appended, and if approved by Government, the printing will at once be put in hand.

Resolution 2.—"Resolved that Mr. Ranking be requested to communicate "with the Board of Revenue, as to the practicability of adding 'bowel-complaints' "to the diseases by which mortality is now tabulated in the Provinces, in view to

"giving effect to the suggestions at page 4, (Section II., Statistics of Cholera and "Diarrhœa,) of the "Instructions," regarding a *daily* record of any evident "increase of bowel-complaints and fevers."

4. Subsequent to the meeting at which the resolution was adopted, Mr. Ranking in his capacity as Sanitary Commissioner received from the Chief Secretary to Government a scheme proposed by the Sanitary Commissioner with the Government of India, for registration of births, deaths, and marriages throughout India upon one uniform plan.

The tabular form A. by this scheme contains, we think, just the information required. It is a *daily* return. In the conference Mr. Ranking held with the Revenue Board he took their opinion upon the scheme referred to, which was quite favourable to the practicability of its adoption. We recommend that it be carried out in this Presidency, as meeting the requirements of this inquiry.

Resolution 3.—"That separate daily returns of deaths by cholera be rendered "by competent authority for all towns and villages at which cholera may prevail, "such daily returns to be continued throughout the prevalence of the epidemic."

5. Mr. Ranking took the sense of the Revenue Board also upon this point, and he was instructed to report that daily returns of this nature could be furnished through the agency of the Police for all large towns, but that there would be great difficulty in obtaining them from small villages.

We, therefore, recommend that daily returns of cholera deaths in all large towns, when cholera prevails, be transmitted by the Police to the Registrar General (Sanitary Commissioner) in the form given below:—

Return of Cholera deaths for the *day of* 1869.

Name of Town.	Population.		Cholera Deaths.			Date of first death.
	Males.	Females.	Males.	Females.	Total.	

The Police in large towns should be furnished with printed slips in this form for daily transmission by post, and it would be a convenience if they were printed in a form to admit of being folded into a letter superscribed *Cholera Report* so as to attract immediate attention.

The Sanitary Commissioner on receipt of these daily returns might tabulate the deaths by districts, and communicate the results to the Heads of the British and Indian Medical Departments for communication to Deputy Inspectors General of Divisions and Circles, who, in their turn, would communicate them to Medical Officers of Prisons, and other public institutions, as laid down at page 2 of the Instructions.

RESOLUTION 4.—"That provision be made in the Municipal Act (X. of 1865) "now undergoing revision for a census being taken of all Municipal towns, and "an accurate registration of all deaths by Cholera, Diarrhœa, Dysentery, and "Fevers."

6. The forms proposed by Colonel Malleson, referred to in paragraph 4 of this letter, will meet the requirements of this resolution :—

RESOLUTION 5.—"That a Medical Officer be selected and appointed for the "special inquiry contemplated in Section 5 of the "Instructions."

RESOLUTION 6.—"That a selected Medical Officer be attached to the Cholera "Hospital sanctioned in G. O. G., No. 720, of 31st May 1869, to carry out the "special investigations referred to in Section 6 of the said "Instructions."

7. In regard to Resolution No. 5, we are unanimously of opinion that the Medical Officer most likely to do justice to the special inquiry therein referred to, is Surgeon Cornish, whom we beg to recommend to Government for these duties.

8. In suggesting the above course of procedure to give effect to the order of the Right Honourable the Secretary of State in regard to the inquiry, we think it necessary to remark that the transmission of daily returns of deaths by cholera throughout the Presidency, will necessarily entail some additional expenditure both in the Provinces, and at the Office of the Sanitary Commissioner in the entertainment of additional Clerks.

9. We would further advise that circular orders be issued by the Heads of the British and Indian Medical Services, respectively, to all Medical Officers inviting them to contribute, as far as lies in their power, to the points of investigation noted in Section 4 of the "Instructions"—Movement of cholera—*reporting* the same to the Deputy Inspector-General of their Circle or Division, *in view* to that officer carefully registering all facts of that nature for transmission with his reports, as laid down in the "Instructions."

10. In regard to the agency through which the information to be collected shall be transmitted, it appears to be the intention of the Army Sanitary Commission as refers to the Army that it should be through the Medical Department as indicated in their Memorandum.

The reports drawn up by Medical Officers specially selected to carry out the local inquiries to be instituted, are also to be sent to their respective "Principal Medical Officers," by whom they would be forwarded to the Government for transmission to the India Office.

11. The labour of reducing the facts collected, and of determining what are, and what are not, the laws of the movement of the disease, it is the intention, we apprehend, of the Army Sanitary Commission to undertake themselves.

12. The instructions are so full and detailed in themselves, that when Medical Officers are in possession of the "Registers" and "Instructions"; when Officers have been selected for the special inquiries; and all Medical Officers, Civil and Military, have been invited to contribute as their opportunities may offer to questions referred to in Section 4; and when the new forms of Mortuary Returns proposed by the Government of India are adopted throughout the Presidency for Revenue Circles, Municipal Towns, and all large towns, every

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thing will have been done that it is in the power of the Committee to recommend to carry out the instructions conveyed in the Despatch No. 10, (Sanitary), of the 23rd April, from the Right Honourable the Secretary of State.

A.

FOR NATIVE TROOPS.

N. B.—Subsequent columns are as in original Register.

Number of case.	Name.	Age.	Caste.	Sex.		Date and hour of attack.	Patient attacked in Barracks, on Guard, in Hospital, or in Lines.	If in Barracks, number of Barrack; if in Lines, number of house.	If in Barracks, number of occupants and cubic and superficial space to each. If in Lines, number of people in house.
				Male.	Female.				
1									
2									
3									
&c.									

The above Register can be used for both Officers, Non-Commissioned Officers and families; European Officers and wives and children of the same to be entered in red-ink.

B.

FOR CIVIL HOSPITALS AND DISPENSARIES AND PUBLIC INSTITUTIONS.

Number of case.	Name.	Caste.	Sex.		Age.	Patient brought from (give name of town or village), or attacked in the Institution or Hospital.	If brought from village, give street and number of house.
			Male.	Female.			
1							
2							
3							
&c.							

N. B.—Europeans to be entered in red-ink.

C.

JAILS.

Number of case.	Name.	Caste.	Sex.		Age.	Class (convicted, under trial debtors).	Number of Block or Cell.	Number of occupants and amount of cubic and superficial space to each.	Ventilation, good or insufficient.
			Male.	Female.					
1									
2									
&c.									

ORDER THEREON, 3rd August 1869, No. 1,072.

His Excellency the Governor in Council approves of the proposed modifications of the "Register for recording cholera cases" necessary to render it applicable to Native troops, Jails, and Civil Hospitals, and directs the adoption of the registers as official records of every Civil and Military Hospital. The

Inspector-General of the Indian Medical Department, and the Inspector-General of Jails, will submit indents for the copies required for their respective Departments.

2. The Acting Inspector-General of Police and the Commissioner of Police, Madras, are requested to arrange for the transmission, to the Sanitary Commissioner, of the daily records of deaths from cholera according to the proposed form. The returns might be furnished from every Police Station in the Mofussil.

3. The fourth resolution passed by the Committee will be communicated in the Legislative Department, to the Honourable A. J. Arbuthnot, the Member in charge of the Bill for the revision of Act X. of 1865, (Madras.)

4. The Inspector-General of the Indian Medical Department is requested to select a Medical Officer to be attached to the proposed Cholera Hospital on the outbreak of epidemic. Dr. Mackenzie will also make arrangements for placing the services of Dr Cornish at the disposal of Government for the purpose of making the special inquiry contemplated in Section 5 of the Instructions; and the Government desire to receive a report of the places which may be chosen by Dr Cornish for his investigations.

5. With reference to paragraph 8 of the Committee's letter, the Sanitary Commissioner will report what expenditure for additional Clerks in his office for the reduction of the daily reports will be required. As the transmission of the reports from the Provinces is to devolve upon the Police, it does not appear that any expenditure beyond that for stationery and printing will be necessary in the Provinces. The Inspector-General of Police will report on this point.

6. The Inspectors-General of the British Medical Service and Indian Medical Department are requested to issue Circular orders, as suggested in paragraph 9, to Medical Officers under their control, with a view to enlisting their cooperation in collecting information on the points referred to in Section 4 of the "Instructions."

7. The Government concur in the suggestions and remarks contained in paragraphs 10 and 11. They observe that orders have been separately passed regarding the adoption of Colonel Mallam's forms for the registration of births, deaths, and marriages.

8. Copy of these Proceedings will be forwarded to the Secretary of State and the Government of India, Home Department, for their information.

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201. **Sanitary Survey of the Town of Madras**

Read the following letter, No. 2763 under date the 7th of August 1869, addressed by the Sanitary Commissioner, Madras, to the President of the Municipal Commission, suggesting the desirability of undertaking a detailed Sanitary Survey of the town of Madras and its suburbs :—

I have the honor to submit for your consideration the desirability of a detailed Sanitary Survey of the city of Madras, and suburban villages being undertaken. No survey of this nature has I believe been made, and comparatively little, I apprehend, is known of the Sanitary conditions of native dwellings, and of the courtyards attached to them.

2. Neither has any systematic Sanitary supervision of the premises of the resident gentry and of well-to-do people residing in "garden" houses ever been instituted. I have reason to know that objectionable accumulations of house refuse, stable manure, and night soil exist and that Sanitary precautions in connection with such accumulations are largely neglected. Far less is known of the condition of Native dwellings.

3. It is very desirable that a close Sanitary Survey should be made, and that the condition of drainage and water supply, the provision made for the disposal of night soil, the extent to which the Municipal Establishments are availed of for

removal from dwellings of all organic refuse, the existence of cess pits &c. &c. should be before the Commission in a reliable form.

In reply to the above, the President of the Municipal Commission, while fully concurring with the Sanitary Commissioner on the desirability, of undertaking a detailed Sanitary Survey of the city of Madras, stated that it will be a work of considerable cost and one necessary to make provision for in the Municipal Budget. Before submitting it for the consideration of the Commissioners, Colonel Denison solicited a conference with the Sanitary Commissioner on the subject, in company with his Executive Engineer and Sanitary Inspector.

The foregoing letter of the Sanitary Commissioner, No. 2763 of the 7th August, was also submitted for the information of Government and the whole subject is at present held in abeyance.

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202. **Expense attendant on the introduction of the Dry Earth System of Conservancy into Regiments and Cantonments.**

Read Proceedings of Government in the Military Department No. 2777 dated 29th July 1869, communicated under G. O. No. 1108 dated 11th August. 1869, in the Public Department, requesting His Excellency the Commander-in-Chief to cause the necessary measures to be taken for obtaining the information required by the Government of India in the following letter, regarding the probable extra expense which would attend on the introduction of the Dry Earth System of Conservancy into every Regiment and Cantonment in the Presidency.

From the Secretary to the Government of India, Military Department, to the Quarter Master-General ;

dated Simla, 29th June 1869, No. 635.

I am directed to acknowledge your letter, No. 1,636, dated 9th October 1868, forwarding reports on the working of the dry earth system of conservancy at the several stations where it has been applied in the Bengal Presidency, together with the valuable suggestion of His Excellency the Commander-in-Chief for the more economical method of giving effect to the system.

2 While giving full weight to His Excellency's suggestions, the Right Honorable the Governor-General in Council, I am to state, cannot view without some apprehension the possibly extended field of undefined expenditure on which the general introduction of the system may land the Government.

3. It seems, therefore, to His Excellency in Council, to be highly desirable that, before committing itself to the general adoption of the measure, it should be placed in possession of the most detailed estimate procurable of the possible expenditure. The conditions of labor and locality vary so greatly in the different provinces of India, that the Governor-General in Council does not consider the estimated expenditure for one station, though scrupulously accurate for that place, would be a sufficient guide whereon to form a general estimate for all India, or even for the Bengal Presidency, where, in each division, the local peculiarities may necessitate the adoption of different expedients and modes of procedure.

4. I am, therefore, to request that you will move His Excellency to issue a Circular to Officers Commanding the several divisions and districts of the Bengal Army, to prepare and submit estimates, in communication with the Medical and Departmental Officers in their command, of the probable extra expense which would attend the introduction of the system in respect of establishments, plant, operations by the Public Works Department, &c., in each command, or, where necessary, in each Cantonment in the command.

5. His Excellency will, doubtless, cause the officers to whom the Circulars may be addressed, to be placed in possession of His Excellency's views as to the actual requirements which the system entails, and the vital necessity for keeping in mind the importance of considering the matter in its economical aspect.

6. On the submission of these estimates, they will, doubtless, when forwarded to the Government of India with the opinion thereon of His Excellency the Commander-in-Chief, furnish sufficient data for arriving at a satisfactory conclusion on the question.

7. In the meantime, I am to request that the experiment may be continued under careful observation in the stations where it has been already tentatively introduced.

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203. Forms for the collection of Vital Statistics of the general population.

Read with reference to Minute No. 175 recorded at page 365 of this Volume, Proceedings of Government in the Public Department, No. 1,094, dated 5th August 1869, approving of the several arrangements proposed by the Sanitary Commissioner Madras, contained in his letter, recorded in the Minute No. 175 above alluded to, for carrying out in this Presidency the registration of births, deaths and marriages according to the forms prepared by the Sanitary Commissioner with the Government of India.

The Government concurred in the suggestion that a clerk should be allowed to each Civil Surgeon to aid him in the tabulation of the Talook Returns and considered that a salary of Rupees 20 per mensem should suffice to secure efficient men for these posts.

The Board of Revenue were requested to report what remuneration they considered necessary should be given to the village Registrars and Revenue Inspectors.

The Government were of opinion that the scheme cannot at present be extended to Zemindary tracts.

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204. Measures for the prevention of cholera in Madras.

Read, with reference to Minute No. 178 recorded at page 410 of this volume, the following Proceedings of Government in the Public Department, No. 1,117, dated 11th August 1869, passing orders on the success of the measures taken for the prevention of cholera in Madras :—

From W. MACKENZIE, Esq., M.D., Inspector General of the Indian Medical Department, to the Chief Secretary to Government, Fort Saint George; dated Fort Saint George, 5th August 1869, No. 294.

It is with much pleasure I have to report, for the information of Government, that the precautionary measures taken on the first appearance of cholera in Madras last month, with the view of preventing, if possible, the spread of the disease, have hitherto been most successful.

2. To the adoption of these precautions, which have ensured the promptest medical aid to all persons attacked and attention to the sanitary state of infected localities, it is, I believe, in a great measure owing that the disease has not yet assumed an epidemic form, and I trust that, by their continuance, this calamity may be entirely averted.

3. The carrying out of the arrangements referred to has, however, brought prominently to light the extremely unsatisfactory condition of the districts in which cholera has chiefly shown itself, viz. Chintadrepettah, the neighbourhood of Harris's Bridge, and opposite the Penitentiary.

4. In one of the pariherries in these districts, we found a few days ago by Dr. Duff there was no room drains: the house-drains were found in a most filthy and dangerous condition, and the inhabitants were using, for drinking and cooking purposes, water full of all kinds of impurities, not knowing apparently where, within a reasonable distance, good water could be procured.

5. In another place, the main and side drains were found about one-third full of the most fetid black fluid filth, giving out the rankest emanations," and accumulating day by day additions from the house-drains in the absence of any means of flushing.

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6. These facts have been brought to the notice of the Municipal authorities, and a very similar state of things existing in Moor Street, Black Town, has likewise been reported by the Health Officer of Madras. All that can be accomplished with the means available is, I believe, being done; but, without in any way reflecting on the Municipal Sanitary Inspector, I must express my conviction that the evil is too gigantic to be effectually dealt with by him alone, and it seems to me that the time has come when the Municipality should appoint a professional Health Officer to advise them in matters of sanitation.

7. In conclusion, I feel it to be due to Dr. Duff, on whom, in the absence of the Deputy Inspector General of the Division, the carrying out of preventive arrangements has devolved, to record my high sense of the energy and ability with which this duty has been performed.

ORDER THEREON, 11th August 1869, No. 1117.

His Excellency the Governor in Council learns with much satisfaction that the measures taken for preventing the spread of cholera in the town of Madras have been hitherto attended with success.

2. The letter of the Inspector General of the Indian Medical Department will be communicated to the President of the Municipal Commission, who is requested to lay before the Municipal Commissioners the suggestions made by Dr. Mackenzie, in which the Government concur, that a professional Health Officer should, as in the other capitals in India, be added to the Municipal establishment of the town of Madras.

3. The thanks of Government are due to Dr. Duff for the energy with which he has given effect to the arrangements devised by Dr. Mackenzie for preventing the extension of cholera.

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205. Rules for the Sanitary Management of Jails—Lower Provinces.

Read G. O. No. 1,323, dated 13th August 1869, communicating the following letter from the Inspector General of Jails, Lower Provinces, together with the Rules for regulating the Sanitary State of the Prisons of the Lower Provinces of the Bengal Presidency, approved of by the Government of India.

From F. J. MOUAT, Esq., M.D., Inspector-General of Jails, Lower Provinces, to the Secretary to the Government of Bengal, Judicial Department,—(No. 3333, dated Alipore, the 25th June 1869.)

SIR,

I HAVE the honour to transmit a copy of the Sanitary Rules, which I propose with the sanction of Government, to introduce in the Jails under my charge.

They embody most of the suggestions made in my Circular Orders from 1856 to the present time and I believe them to be in strict accord with the leading scientific views of the time in all points relating to cholera,—the only disease regarding which there is any considerable difference of opinion among medical men at the present moment.

In prophylactic or preventive measures this difference refers chiefly to the mode of origin and communication of that disease, points which are now undergoing careful scientific investigation. Until they are determined, the measures recommended in my rules are those which I believe to be most efficacious in checking the spread, mitigating the severity, and preventing the introduction of cholera into the jails under my control.

In the preparation of the rules, I consulted Doctors Fawcus, Lynch, Coates, N. Jackson, David Smith, and D. McLeod. From Dr. Jackson, I have received no reply, and that of Dr. Lynch reached me too late to profit by.

To all of the other gentlemen mentioned I am indebted for suggestions, most of which I have adopted. I alone, am however responsible for the rules, and as they are based upon an administrative experience of prisons in the Lower Provinces, extending over the last fourteen years, and of a professional knowledge of Bengal and its diseases of twenty-nine years duration, I trust they will meet with the approval of the Government.

I have made the rules as simple, concise and free from ambiguity as possible, and, in those matters in which discretionary power can safely be entrusted to individual Officers, I believe I have allowed sufficient freedom of action on all points in which it would not be right to fetter professional judgement too closely.

Rules for regulating the Sanitary state of the Prisons of the Lower Provinces of the Bengal Presidency.

The rules for the sanitary management of jails divide themselves naturally into two heads, viz., those which should be in operation at all times, and those which should be observed during the presence of epidemic and contagious disease, or when great and exceptional sickness of any kind prevails; that is to say, into general and special regulations.

CHAPTER THE FIRST.

GENERAL RULES FOR ALL TIMES.

The general rules refer to cleanliness of person and clothing, dietary, purity of air, purity of water and purity of soil, conservancy and the proper regulation of labour:—

SECTION 1.

Cleanliness of person.

1. All prisoners should be made to bathe regularly once in every twenty-four hours, at all seasons of the year. The hour of bathing is to be regulated partly by the season of the year, and in part by the labour on which the prisoners are employed. As a general rule, when prisoners are employed in work which is attended with the soiling of clothing and person, the bath should be taken when the work of the day is finished, just before the evening meal. At this time the prisoners should be made to change their clothing, so as to have a dry clean suit for the night, and to afford time for the soiled clothing to be lightly washed and dried before the work of the next day begins.

Care must be taken that the water used for ablution does not run into the wells or tanks of the jails.

The bathing at all seasons of the year must take place between sun-rise and sun-set: never before or after those times. Half an hour should be allowed daily for the bath, and for such rapid rinsing of soiled clothing as may be required to remove grosser impurities.

Washing and purification of clothing.

2. In addition to the daily cleansing of such clothing as is soiled by the work on which the prisoner is employed, the whole of the clothing should be throughly washed once a week, on Sundays. Instead of this operation being imperfectly performed, as it is at present in most jails, by each prisoner washing his own clothes, the clothing should be steeped in large gumlahs sunk in the ground, in water in which a sufficient quantity of *saji-mattee* has been placed, as at Hooghly, and afterwards be beaten and rinsed, or by the use of a special washing tub, such as was designed by the late Dr. A. Simpson, for the Lunatic Asylum at Dacca. Neither of these proceedings require men of the Dhobee or Washerman caste to work. It is essential that all impurities should be removed from the clothing whether caused by the natural excretions of the body, or by ordinary dirt.

The water used in the washing of clothing must be carefully removed.

The blankets and tát-bedding should be washed as often as the Medical Officer may consider necessary at his weekly inspection. To remove vermin, they should be steeped in boiling water.

All bedding and clothing not in actual use, should, at all times when the weather permits, be opened and exposed to the sun and air, without the wards, for at least half an hour daily.

When the weather does not permit, it should be hung on lines in the wards and freely exposed to the air for at least an hour daily, before being rolled up.

The weekly inspection of the Medical Officer on Sundays, should include a careful examination of the bodies as well as of the clothing of the prisoners, to note all appearance of skin diseases, falling off in condition, and indications of a scorbutic or anæmic tendency. It should not degenerate into a mere muster parade, as is too frequently the case at present.

The Inspection Report in the Medical Officer's register should state, specifically, the details of the examination and its results.

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SECTION 2.

Dietary.

The careful and constant observance of the existing rules in the Jail Code is all that is necessary under this head—the conditions to be observed being, that the food supplied is strictly according to scale; that each article in the dietary is good and wholesome of its kind; and above all, that it is properly cooked and served out. To imperfect cooking I am convinced that a great deal of the diarrhœa prevalent in jails is due.

To render peculation as difficult as possible, and to secure to each prisoner his full allowance of food, the rations should be weighed on the evening of the day preceding that on which they are to be consumed, and then removed to a small godown within the jail. Here they should be arranged in parcels for each mess, so that the Superintendent, the Medical Officer, or the Jailor, at any time from the weighment until the rations are removed to the cook house, may inspect them, and see that the full ration has been given. The cooks should be provided with measures holding exactly the ration of cooked rice for each person.

The jailor and the Naib must both be present, daily, during the issue of the cooked food, and the Medical Officer should examine and superintend the distribution of the rations of each meal once at least in every week, without giving notice of his intention.

A special record of this inspection must be entered in the Medical Officer's Journal.

As the Medical Officer has full authority to vary the rations, within the limits of weight allowed in the diet scale, he should do so as often as he has any reason to suppose that any particular article of the dietary disagrees with the prisoners, and to substitute an equivalent quantity of some other animal or vegetable food that is procurable in the local market, and known to be wholesome.

The substitution of duhee for fish or flesh in the hot weather, is a case in point.

SECTION. 3

Purity of air.

Purity of air is secured by ventilation—natural and artificial—and by the deodorization and removal of all matters susceptible of putrefactive fermentation.

The natural ventilation of nearly every jail in Lower Bengal is so defective, that it is additionally incumbent on all Officers in charge of Jails to see that no obstruction to the entrance and exit of air is permitted.

When the wards are not occupied, all doors, windows, gumlah ventilators, and openings of every kind in the walls should be kept freely open.

All panel doors should be perforated with circular apertures, placed as closely together as can be accomplished without injuring the strength of the doors.

At night, except in the cold season and when rain is blown directly upon the bodies of the prisoners, the doors only should be closed. The prisoners should be prevented from closing any of the other apertures by means of rags, bricks, or the other devices resorted to.

The artificial means of purification to be used are baskets of charcoal, and the keeping of the beds and walls with a thin layer of clay mixed with organic matters, the latter to a height of six feet from the floor.

This appears to absorb carbonic acid, and the other gaseous results of respiration and exhalation from the surface of the body, as well as to remove from the air most of the volatile products of putrefactive fermentation. Hence, the greatest attention should be paid to the careful performance of this process, and it should be repeated whenever the slightest bad smell is perceptible in the wards and cells.

All cobwebs, dust, and dirt of every description, should be carefully and constantly removed from the corners, ceilings, and other places to which they adhere.

As a general rule, the whole of the beds, wards, and latrines should be leeped on Sunday morning before washing and muster—and a note entered in the Minute Book of the Medical Officer to the effect that he has ascertained by personal inspection that this has been done.

The wards should be swept out every morning directly the prisoners leave them, and the privy-pans be removed at the same time, exposed to the sun during the whole day, and frequently tarred to deodorize as well as preserve them.

The Jailor should visit every ward after this has been done, note in his journal, and immediately bring to the notice of the Superintendent every case in which he finds that the duty has been neglected, or improperly performed.

Whenever any refuse matter or ordure—solid or liquid—has been spilt on the floors, the place should be carefully swept, and afterwards rubbed with dry-powdered earth. Water should never be used in the cleansing of such places.

All hollows in metalled jail enclosures in which water lodges, should immediately be filled up.

In addition to the above, the rules in the Jail Code, regarding sanitary arrangements generally, such as over-crowding, &c., from Rule 291 to 303, must be strictly carried out at all times.

SECTION 4.

Purity of water.

This is a matter of the greatest importance, and should, at all times, be carefully attended to.

If the rules in the Jail Code, 286—293, are carefully studied and carried out, purity of water will at all times be secured.

The examination of the water-supply for drinking and cooking, needs more than ordinary care and attention at the seasons of the year when epidemic diseases prevail, such as the commencement of the hot season, the beginning and the close of the rains.

The proper regulation of the water supply is of most importance when the water level is at the lowest in tanks and wells, and when all but the great water courses of the country are dried up.

A month before this time the tanks and wells, when they require it, should be cleaned out, and the former deepened as much as possible. All vegetation should be carefully removed from the sides of the wells, and every place be carefully repaired, through which the sub-soil water is seen to percolate.

It is too late to take these precautions when cholera or diarrhœa actually prevails in an epidemic form.

A rough analysis of the water can at any time be made by every Civil Surgeon, with a few simple re-agents; and this ought never to be neglected, when great and unusual sickness provails in a jail, or when cholera is epidemic. At such times, and, in a minor degree, at all times, it is important to ascertain which of the sources of water supply of the jail is the one to be preferred.

The microscopic examination of all sediments to detect the existence of organic growths or living infusoria will also be most useful.

River water contains the surface drainage of the districts through which the river runs; and as the banks of most Indian rivers, or their beds in the dry seasons, are the closes maxima of the towns and villages situated on their banks, the quantity of organic and putrescible impurities is considerably increased in the vicinity of large towns or cities. In most parts of Bengal, the dead bodies of men and animals are thrown into the rivers. The oxidation and destruction of these organic matters in a state of putrescence is a very slow process, and as water containing more than 1·5 grain to the gallon of dissolved organic impurities is considered by some authorities to be unfit for human consumption, the river water of Lower Bengal in the vicinity of all large towns should certainly be avoided during the dry seasons. Their filtration without boiling will not remove these impurities, and the boiling of water for large bodies of prisoners is simply impracticable.

There is another source of contamination of the rivers in Eastern Bengal, to which no particular attention has heretofore been paid, viz., the drainage into them of the great bheels at the end of the rains, when the whole of the surface water of the country begins to run off. At this time, the rivers are seen to be charged with masses of low forms of vegetation, studded with Desmidiæ and other infusoria.

Cholera very frequently appears about the same time in localities situated on the banks of these rivers. Whether as a mere coincidence, or as influenced by the state of the water-supply, is deserving of careful investigation.

The old, rough method of estimating the amount of organic impurity, by evaporating water to dryness, and burning the residue so as to destroy organic substances—the loss of weight being taken as representing organic substances—although chemically incorrect, would probably be sufficient to show whether it were prudent and proper to use such water for drinking and cooking. The permanganate of potash test is simple enough, and might be applied by most Civil Surgeons without difficulty. If the Medical Officer possesses the means of making a more and detailed exact chemical

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analysis, it should be done; for the immediate examination, chemical and microscopic, of water on the spot, is of far greater value than sending it to a distance for analysis.

Tank water, which is generally water stored from the rain-fall of the season, is usually sufficiently pure for domestic use, when the banks of the tank are carefully puddled and turfed; when the surface drainage and sewage are not allowed to run into it; and when bathing and washing of clothes are likewise prohibited.

Some aquatic plants possess the property of purifying water, such as the common lotus, and fish and water-fowl are believed also to consume some of the organic vegetable matters that are causes of impurity.

When the tanks begin to fall, the water should be carefully examined in the manner mentioned above.*

The water in wells would be the best and most wholesome to use, if the wells were dug to a sufficient depth to reach the permanent level of water-supply of the district, and if the sides of the wells were impervious to sub-soil moisture.

I am afraid that this is not the case in any single well now in use in the jails of Lower Bengal. Moreover, from the wells not being properly protected and covered in, dead leaves and other surface impurities are allowed to find their way into them. The injurious influence of such substances increases with the diminution of the water-supply, which is unfortunately the period of greatest sickness.

Hence the necessity of an occasional rough analysis of well water is even greater than in the cases of river and tank water.

The changes in the depth of the water in the wells, and the consequent distance of the surface from that of the ground, should be frequently and carefully ascertained—at least once a week at all times, and more often when they begin to dry up.

It is time that the indigenous system of the construction and management of wells throughout the country ceased, and that pumps and other contrivances for procuring pure, wholesome water, free from contamination, should be introduced. Should Norton's Tube Wells fail, other arrangements must be made to secure a supply of water of the nature above referred to.

In the meantime, measures should be taken in all districts in which the water supply is at present turbid from any cause whatever, to store a few days' supply in suitable vessels, and to purify it by settlement, by thrusting a red hot iron into it, or by the use of alum, the nut of the Strychnos Potatorum, &c. &c.

The intention of all this is to impress upon all Officers in charge of Jails, the urgent and absolute necessity of the closest attention to the water supply of the jail at all times and in all circumstances.

SECTION 5.

Purity of soil.

The first condition of purity of soil, is the removal of all rank and unwholesome vegetation; the careful sweeping away of all garbage and refuse matter; and the prevention of pollution of the soil by cattle or human beings. The most scrupulous cleanliness in all these matters is imperative, and should be strictly enforced. Garbage and refuse matters may be dried and burnt, or they may be collected in pits in the most distant corner of the jail garden, to form a compost for manuring.

Care must be taken that these pits are far removed from all sources of water supply.

The next, and probably more important condition is the thorough sub-soil drainage of the land on which the jail buildings stand, and of the garden ground surrounding the jail.

No opportunity should be omitted of bringing this matter to notice, and of consulting with the local Engineers as to the best means of introducing effective drainage, which under skilled supervision may be effected at small cost by means of prison labor.

The encroachment of huts and bazaars should be peremptorily prohibited—and the squatting of the jail subordinates near the prison walls be prevented.

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* I believe that the stagnation of water in small tanks with a limited surface exposed to the air may be prevented by artificial means, such as a water wheel worked by prison labour, not only to take from them the water required for the consumption of the jail, but to expose the whole of the water to the air by rapid agitation for an hour or two daily. Air forced into the tank near the bottom would probably produce the same effect. The mechanical contrivances required to effect these objects would be cheap and simple.

SECTION 6.

Conservancy.

The due and effective observance of the rules in the Jail Code is all that is really required on this subject. Dry earth in a fine state of division and containing organic matter, is the primary condition—thorough admixture before putrefactive fermentation has commenced and prior to burial, is the next and not less essential condition of success.

In the rains, the earth employed, should, if necessary, be dried artificially for each day's or week's supply, according to the size of the jail—and a simple Pugmill should be employed, worked by the sweepers, to secure perfect admixture.

One such mill is sufficient for the use of a thousand prisoners. The admixture is not complete if the resulting mass can be distinguished by the senses from ordinary garden mould.

Sand and clay must on no account be used alone—neither of them are deodorizers in the simple state.

A doubt as to the efficacy of dry earth has recently been raised in Germany by Professor Von Pettenkofer, and in England by Professor Rolleston.

Deodorization and disinfection are not convertible terms.

Deodorized earth should at once be used as manure for the gardens, when its rapid conversion into wholesome vegetable matter robs it permanently of all further changes likely to be injurious to health.

The result of the experiments carried on in Lower Bengal for the last four years on a scale which is scarcely practicable in Europe, and in conditions favouring putrefactive fermentation that are never seen in temperate latitudes, leads me to believe that those doubts are unfounded, if the deodorization is properly performed and the subsequent disposal of the deodorized earth carefully regulated.

Even as regards cholera excretions, subsequent fermentation appears to be effectually prevented, and the epidemic extension of that disease in the jails in which it finds an entrance is now much more easily controlled than it used to be when the old system of wet or water conservancy was in use.

In any case the gradual diminution of sickness and mortality in the jails of the Lower Provinces dates from the introduction of the dry earth system in 1864—omitting the exceptional year of famine 1866. The mortality is now thirty per thousand lower than that of the previous quarter of a century and the decrease is entirely in the zymotic class of diseases.

Hence, with every deference for the views of the eminent authorities above referred to, strict adherence to the effective working of the dry earth system is enjoined.

SECTION 7.

Labour.

The proper regulation of labour is likewise provided for in the Jail Code, and must be strictly enforced when the health of the prisoners individually or collectively, admits of it.

Whatever may be the sentence of the prisoner, at the time of conviction, he is on no account to be placed on labour which is likely to be injurious to him, or which is calculated to accelerate his death.

In the hot season, or when epidemic disease prevails, the hours of such labour as necessitates exposure to the sun must be carefully regulated by the Medical Officer of the jail.

The evil influence of labour is first exhibited in loss of weight, and can best be ascertained at the weekly inspection of the prisoners, and by noting the weight of the prisoners as they are released. If should be carefully watched, and its cause ascertained, when the appropriate remedy—change of task or of work—can be at once applied, a record of the fact being entered in the appropriate register.

Special Rules for observance when exceptional sickness exists, or during the presence of contagious or epidemic diseases.

CHAPTER THE SECOND.

SECTION I.

Rules for exceptional Sickness.

Exceptional sickness may be held to prevail when more than five per cent. of the daily average number of prisoners are in hospital.

This exceptional sickness is usually due to the prevalence of Fevers, Dysentery, and Diarrhœa—the three diseases that are of most frequent occurrence in the jails of Lower Bengal.

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When fevers are abnormally numerous, the drainage and water supply should be carefully looked to, and all discoverable causes of sickness from bad water and defective drainage be removed as far as practicable.

When diarrhœa and dysentery are usually frequent, the food in its raw and cooked state, overcrowding, insufficient protection from clothing, unsuitability of work, and the water supply, are the conditions that need careful study and regulation.

The first indications of a scorbutic taint, and of an anæmic condition generally, should be most carefully searched for; the gums and mucous membranes be examined frequently; and the condition of the liver and spleen be noted, together with all indications of dropsical effusions, general or local.

By a timely use of anti-scorbutics, and by counteracting by appropriate measures sudden changes of temperature and other conditions of exposure, the evil effects of the diseases above noted may be considerably diminished.

They are all zymotic diseases, in which preventive, are of greater importance than curative, measures. The latter, however, demand no less the greatest care and attention—and all plans of treatment which are found to be followed by more than the ordinary rate of mortality, should either be modified or abandoned.

Dr. Jackson of Deegah in 1868, found a particular plan of treatment, which is recorded at page cclxxxii of the Appendices to my report for 1868, to be so efficacious in the treatment of diarrhœa that was co-incident with cholera, that of eighty-three prisoners attacked, every one recovered.

Dr. Fawens, at the Alipore Jail, has found the milk cure to be remarkably successful in the treatment of œdema, anasarca, and dropsical affections occurring in broken down anæmic prisoners with enlarged spleens, and all the indications of general cachexia.

The use of butter-milk as an article of dietary, has, in various parts of India, been found to exercise an excellent influence in controlling scorbutic dysentery.

All these are matters that are recommended to the special attention of the Medical Officers connected with the Jails of the Lower Provinces.

Hereafter, the necessary steps to secure correct therapeutical statistics will be taken, and the results be embodied in the Jail Reports for general information. In the meantime the pathology and management generally of the two prison scourges—Dysentery and Diarrhœa—are recommended to the special study and observation of all the Medical Officers concerned. All special reports of interest and value on the subject of those diseases in particular, and of prison diseases in general, will be published in each year's report, and the names of the authors be brought to the special notice of the Government.

SECTION II.

Contagious Disease.

The only diseases that have yet proved to be contagious in the jails of the Lower Provinces, are Small-Pox and Hospital Gangrene. The other exanthemata are of rare occurrence, and none of the ordinary fevers of the country have heretofore shewn any tendency to propagation by contagion or infection in Lower Bengal.

Cholera is excluded from this category, as no sufficient proof has yet been afforded that it is contagious in the sense that Small-Pox and Typhus are contagious.

Small-Pox.

Small-Pox is always contagious, and every case should be placed in a separate ward, hut, or tent at a sufficient distance, when the disease finds its way into a jail.

The disease prevails generally in Bengal at certain seasons, and its prevalence is supposed to be due in some measure to the practice of inoculation.

At such times, all unprotected prisoners in the jail should be vaccinated, and as a general rule every prisoner sentenced for a long period, if found to be unprotected, should be vaccinated after being sentenced.

All cases of Varicella and Rubeola should be separated from the general body of prisoners.

Simple separation for a sufficient length of time is all that is necessary in the way of isolation, to prevent the spread of Small-Pox among the unprotected.

Hospital Gangrene.

This disease is now unknown in the jails of the Lower Provinces, as the causes on which it depends have all been removed, or have been so mitigated, that isolated cases when they do occur have not spread.

Cleanliness, pure air, the absence of overcrowding, and attention to the dressing of all sores and ulcers, are the best measures, in addition to the treatment specially enjoined, to adopt to prevent its extension.

Sloughing ulcers ought at all times to be carefully watched, and special precautions be taken that the purulent exhalations in these cases are not permitted to pollute the air of the hospital.

Such cases should at all times be removed, as far as possible, from cases of Dysentery, Diarrhœa, and similar diseases.

When a case of genuine Hospital Gangrene occurs, it should at once be separated from all other cases of sickness, and all clothing, dressings, &c., which have been in contact with the gangrenous surface be destroyed by fire.

Section III.

Epidemic Diseases.

Cholera.

For all practical purposes, Cholera is the only disease that needs exceptional management when it prevails in an epidemic form. Its incidence in Lower Bengal is usually so regular, that the time of its probable occurrence can be predicated with tolerable accuracy. At such times the observance of all sanitary rules is additionally incumbent on Medical Officers, so that should Cholera arise in the town or district, or be carried by bodies of pilgrims passing through, the jail and its inmates should be placed in the best possible sanitary condition for its reception. This is now generally acknowledged in Europe as of greater efficiency and importance than quarantine, or any similar means of interruption of communication.

That Cholera accompanies the migration of human beings, and that ships convey it is undoubted; but that it ever spreads in an epidemic or pandemic form in localities free from the insanitary conditions in which the disease thrives and takes root is equally certain. Hence, all the rules contained in Chapter the First should be enforced with the greatest exactness, and especial care be taken to ascertain the existence of Looseness or Diarrhœa among the prisoners. The prisoners should be encouraged to report themselves at once, and a sweeper should be placed over each of the day privies, with strict orders to report immediately every prisoner having lax or loose motions. At night, the duty of watching the state of health of the inmates of the wards should be entrusted to the wardmasters or mates, and they should at once remove any one attacked with looseness of the bowels to hospital.

In addition to this precaution, the wards should be patrolled at night by the Jailor or his Deputy, at least twice. The second visit should be about an hour before daybreak, when the electric tension, pressure of the atmosphere and temperature are usually at the lowest, and when remissions of severe and complicated attacks of fevers are, in my opinion, most likely to occur. This is stated by writers of authority, and is consistent with my own observation, to be the time at which attacks of Cholera very frequently commence. Hence, it seems to me to be of some interest, and may possibly prove to be of some importance, that the inmates of prisons, sick and well, should be seen at this time, when epidemic Cholera prevails.

It would be well also that the Medical Officers of Jails should make occasional night visits to both wards and hospital at such times.

The greatest care must be taken that all Cholera excreta and the culture of all prisoners suffering from Diarrhœa are completely disinfected or are at once removed before putrefaction can possibly occur, and are buried in the most remote corner of the garden, away from all sources of water supply.

Disposal of excreta.

Water must not on any account be brought into contact with them.

I myself consider dry finely-powdered earth containing organic matter to be the best deodorant and subsequent disinfectant that can be employed in this case. My view is fully borne out by the history of cholera in the jails of Lower Bengal since the dry earth system was introduced in 1864; with the exception of 1866, the disastrous years of the famine.

Eminent authorities in Europe, however, do not concur in this view; chief among them Professor V. Pettenkofer in Germany, and Professor Rolleston of Oxford. So long as there is any doubt on the subject, it is right to defer to the judgment of scientific men of so much weight, however much it may be opposed to the results of experience and observation in Bengal.

The sulphate of iron seems to be the substance most readily procurable at a reasonable rate at almost all stations. Medical Officers are at full liberty to employ this chemical agent in such quantities as they may find necessary or think proper, in the event of their having no confidence in dry earth.

Whatever disinfectant may be used, the chief object is to remove all Cholera excreta, whether by vomiting or purging, at once when fresh. The earthen vessels used for this purpose should be broken up and buried with the excreta.

Disposal of clothing, &c.

The clothing, bedding, and blankets of all prisoners who have died of Cholera, or which are fouled by Cholera evacuations, must be chemically disinfected or burnt. Boiling, unless under pressure, and at a higher temperature than 212° F., is insufficient for the destruction of such matters.

Evacuation of wards.

The evacuation of all wards and barracks in which a case of Cholera occurs is now usually considered to be an absolutely necessary proceeding.

It has never been found needful at Alipore or at the Presidency Jail, nor do I consider it to be so essential as to be at once resorted to when Cholera breaks out. If extreme cleanliness is observed, and over-crowding carefully avoided, it will seldom be requisite to remove the whole of the inmates of a ward. Should, however, the Medical Officer concerned be of a different opinion, he is at full liberty to empty the ward at once, and to subject it to thorough purification.

So far as my experience goes, I consider lime-washing to be useless, and fumigation of little real use.

Large fires may be burned in the wards, not for any supposed antiseptic virtues of green wood smoke, but to dry the walls and beds, and to remove dampness generally.

The prisoners removed from wards on evacuation should not be transferred to other wards or barracks, but be hutted either in the jail enclosure, or as near as possible to the jail gate, in any dry, well-drained, eligible spot that may exist in the vicinity.

Evacuation of the whole jail.

This is very seldom necessary, and should be never resorted to without the greatest consideration and deliberation. Cholera at the epidemic seasons is usually as prevalent without as within the jails, and few localities to which prisoners can be removed are so clean, well-drained, and well-cared for as the jail itself. Experience has shown at Alipore and elsewhere in Bengal, that epidemics are as easily checked and controlled without removing prisoners, as when they are sent away from the jail. Indeed, in many, if not in most cases, the sickness and deaths in camps have been greater than in jails.

The expense, discomfort, exposure, and other disadvantages of removal to camp in the hot weather and in the rains more than counterbalance any advantages resulting from the measure.

Should it, however, in any circumstances, be deemed by the Medical Officer to be *absolutely* necessary, it will be better to remove the inmates of the affected wards and barracks, and to thin the jail, than to hurry out the whole body of prisoners at once.

The utmost care regarding conservancy, water-supply, &c., should be observed at the camps, and they should never be placed so far from the jail as to be beyond the constant personal supervision of the Officer in charge.

In those districts in which camping can be practised, the camping grounds should be selected beforehand, and always kept in a clean and wholesome state. Their water-supply should also be carefully watched, as all wells, tanks, and other reservoirs in which water is stored are apt to become dirty and unwholesome from neglect.

There seems to be no good ground for supposing that the attendants upon the sick are exposed to greater risk of being attacked by Cholera than any other persons. Healthy strong prisoners should, therefore, be selected to attend upon their sick brethren, and should be encouraged to discharge the somewhat repulsive duties connected with such attendance, by extra rations of food, or a small allowance of tobacco. Such indulgences to be strictly confined to such attendants.

Attendants upon the sick.

Whenever epidemic Cholera exists in the town or district, of which intimation should at once be given by the Magistrate to the Officer in charge of the Jail, one of the wards or barracks of the prison should be set aside as an observation ward for all newly sentenced prisoners. The ward selected should be the one that can most easily be isolated from the rest of the jail, should the necessity for such isolation arise.

Observation ward.

All prisoners admitted to the hájut or under-trial ward should likewise be most carefully watched.

The time of observation must be entirely regulated by the Medical Officer, as the period of incubation of Cholera is altogether unknown.

As a rule, the precautions regarding Cholera should be in full force in Lower Bengal during the whole of the seasons at which Cholera is known usually to prevail in the several districts. Careful observation and record are still required to determine this point.

So far as I know at present, the months that demand special watchfulness are March, April, May, September, October, and November.

Cholera may, however, occur at any season, hence the rules contained in Chapter I. must never be relaxed. Special and careful records must be kept of all out-breaks of Cholera, and the exact time and circumstances of the occurrence of the first case should be noted with absolute accuracy if possible.

Cholera records.

Detailed instructions on this subject will be issued hereafter.

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206. Style of Lock Hospital Buildings.

Read G.O. No. 1,173, dated 20th August, in the Public Department, communicating the following correspondence on the above:—

From Colonel W. A. CROMMELIN, C.B., Royal Engineers, for Officiating Secretary to the Government of India, Public Works Department, to the Secretary to the Government of India, Military Department; dated Simla, 6th May 1869, No. 372M.

With reference to Military Department's memorandum, No. 595, dated 13th March 1869, requesting to be furnished with estimates and a plan to be adopted as a standard, of an inexpensive Lock Hospital for Cantonments, the Officiating Secretary, in the Public Works Department, is directed to forward, for consideration and orders, copy of a letter* from the Sanitary Commissioner with the Government of India, from which it will be seen that that Officer does not consider the issue of a standard plan of Lock Hospital at present called for, and that he suggests the provision of temporary shelter, on an arrangement proposed by him.

* No. 169, dated 20th April 1869.

From the Sanitary Commissioner with the Government of India, to the Inspector-General of Military Works; dated 20th April 1869, No. 169.

I have the honor to acknowledge the receipt of your letter, No. 8, dated the 22nd ultimo, with enclosures, herewith returned, regarding the preparation of a specimen plan of Lock Hospital.

2. In the present state of the question, I think it very undesirable that any standard plan of permanent building, such as that recommended in the papers which accompanied your letter, under reply, for the Cantonment of Bellary in the Madras Presidency, should be decided on. Before determining the extent of accommodation that ought to be provided, reliable data must be obtained regarding the average number of women, for whom hospital accommodation should be provided; and in this matter the experience of different Cantonments of similar size is extremely variable. The Committee appointed for framing rules to be passed under Section 19, of Act XXII. of 1864, in recommending the adoption of the rules now in force for the prevention of venereal disease among European troops, remarked:—"As the measures adopted will necessarily be, for some time to come, experimental, it would be unwise at present to incur expenditure in erecting new buildings for Lock Hospitals. The best temporary arrangements should be made, which, under the circumstances, are practicable, either by appropriating some Government building, or hiring a house, or otherwise. Arrangements which will answer the purpose sufficiently well for a time may be made, without the provision of a properly constructed Hospital."

Letter to Military Department, dated August 1865.

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3. These remarks are still applicable. In carrying out the rules for the prevention of venereal disease, the want of a suitable Lock Hospital is a very minor difficulty, and I would, therefore, recommend that, for the present, existing buildings should be made use of, even when, from their nature, they entail a certain amount of inconvenience. When no such buildings are available, a temporary Lock Hospital can be provided at small expense, by building a courtyard with huts on each side for the reception of the prostitutes, and with a dispensary and examination-room, Surgery and bath-room in the middle; the whole to be constructed of sun-burnt bricks, and roofed with tiles or thatch. The houses should be of a better description of native hut, and allow 100 superficial feet to each patient; the Surgery, examination and bath-room of the same dimensions as those shown in the Bellary plan, the size of the enclosure, and the number of huts varying with the proportion of women to be accommodated. Huts for the establishment could be built on either side of the entrance gateway.

Office Memorandum from the Secretary to the Government of India, Military Department, to the Public Works Department; dated Simla, 29th June 1869, No. 615.

With reference to Military Department memorandum, No. 595, of the 13th March 1869, and in reply to Public Works Department communications, noted in the margin, the Secretary, in the Military Department, has the honor to state that the Government of India concurs in the views of the Sanitary Commissioner, as expressed in his memorandum, No. 169, of 20th April 1869, regarding the inexpediency of incurring in the present stage of the venereal disease question, any heavy or general expenditure in the provision of Lock Hospitals.

No. 188A, dated 25th February 1869.
No. 188A, dated 19th May 1869.
No. 372M, dated 6th May 1869.

2. It must, as pointed out by Lieutenant-Colonel Malleson, be rare that some building is not procurable which will answer the purpose sufficiently for the time, or which cannot, at a slight expenditure, be altered by the Local Committees to fulfil the object.

3. Where this, however, cannot be done, there the construction of a building of the simple and inexpensive style, recommended by the Sanitary Commissioner, will suffice.

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207. Lock Hospitals in British Burmah.

Read with reference to Minute No. 74, recorded at page 127 of this volume, the following Proceedings of Government, in the Military Department, communicated under G.O. 1115 dated 11th August in the Public Department, in connection with the Establishment of Lock Hospitals at Rangoon, Tonghoo and Thayetmyo:—

From the Officiating Secretary to the Government of India, Military Department, to the Officiating Secretary to Government, Military Department, Fort Saint George; dated Fort William, 5th July 1869, No. 126.

With reference to the communications from your office, marginally noted, I am directed to acquaint you, for the information of the Right Honorable the Governor in Council, that the Government of India approves of the authority given by the Government of Fort Saint George, for the establishment of Lock Hospitals at Rangoon, Tonghoo and Thayetmyo, on the scale specified in the Proceedings of that Government, dated the 3rd August 1868.

No. 3039 dated 3rd August 1868.
No. 396 dated 27th January 1869.

2. I am to observe that in this Presidency, in some cases, available convenient premises have been hired for the purposes of Lock Hospitals, and in others, old Government buildings have been

Rock and this system has worked satisfactorily. In cases where no accommodation of the above description was procurable, resort has been had to the construction of suitable Native huts, but of an inexpensive description. As no building suitable for a Lock Hospital appears to be available at Rangoon and it is probable that the same want is felt at the other stations named, I am to request that His Excellency in Council may be moved in communication with the local authorities, to suggest such arrangements as may be most expedient, submitting a general estimate of the attendant expense for the consideration of the Government of India.

3. The strength of the European Force in British Burmah does not exceed 1,000 men, and the accommodation to be provided at the three stations specified must necessarily be comparatively limited.

4. The proposal to grant an increased allowance for the medical charge of the Lock Hospital at Rangoon, as a first-class one, is sanctioned.

5. A communication has been addressed to the Foreign Department of the Government of India, in regard to the introduction of the provisions of the Indian Contagious Diseases' Act into the province of British Burmah.

ORDER THEREON, 30th July 1869, No. 2836.

Communicated, with reference to the Proceedings of Government, marginally cited, to His Excellency the Commander-in-Chief, the Inspector General Indian Medical Department and the Controller of Military Accounts,—also to the Public Department for the information of the Sanitary Commissioner.

From of their No. 3009, dated 13rd August 1868.
" " 4013, 27th Nov. "
" " 398, 27th Jan. 1869.
" " 1001, 17th March "

2. The Government request to be favored with the views of the Commander-in-Chief, with reference to paragraph 2, on the subject of the accommodation to be provided for Lock Hospitals generally, and the arrangements His Excellency would propose for the stations in British Burmah.

3. Under the authority in paragraph 4, the Lock Hospital at Rangoon will be a first class charge.

4. The Government of India will be asked whether the scale of establishment now sanctioned supersedes that laid down in Proceedings of Government, No. 4633, dated 27th November 1868, and No. 1001, dated 17th March 1869.

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208. Sanitary Reports how to be drawn up.

Read the following letter from the Secretary to the Government of India, relative to the manner in which the results of Sanitary investigations should be recorded, referred, under docket dated 13th August 1869, by the Chief Secretary to Government, for any suggestions that the Sanitary Commissioner may have to offer for giving effect to the Orders of the Government of India:—

I am directed by the Governor General in Council to communicate for the guidance of Sanitary Officers the following observations as to the manner in which the results of sanitary investigations should be recorded.

2. As sanitary reports are every year increasing in number and enlarging in bulk, it is indispensably necessary that they should be as succinct as possible, and with this view any general dissertations on the causation of disease should be avoided, as well as lengthy quotations from other authors, unless absolutely requisite to elucidate the subject.

3. The main requirements of a sanitary report are to record the facts with as much brevity as shall be consistent with clearness, to state what conclusions appear to be warranted by these facts, and to recommend those measures which appear best suited to improve the health of the people in connection with the particular case under report. It would also prove of great assistance in the study of such narratives, if the facts so recorded were carefully summarized and digested. If, for example, malarious fever prevailed in any district or tract of country, it would be well to show how many of the villages chiefly attacked were on clay, how many on porous sand, how many on other soils; the relative proportion of villages on canals severely attacked, compared with those on running streams,

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on the banks of marshes or in other situations; the effect of the extent of the area of irrigation, of the particular class of crops, of particular kinds of jungle growth, and the influence of trees.

4. A careful statistical digest of these and all the other conditions which affect the health of the particular villages and districts visited, as well as a statement how far these circumstances appear to be modified in the case of individual castes and races, would prepare the way for arriving at some definite and legitimate conclusions, and enable the Government to compare the data collected from the different Provinces with accuracy and satisfaction.

The following is the reply of the Acting Sanitary Commissioner, to the above:—

From the Officiating Sanitary Commissioner for Madras; to the Chief Secretary to Government, Public Department, Fort Saint George; dated 18th August 1869, No. 2,869.

I have the honor to acknowledge the receipt of your memorandum referring to me for any suggestions I may have to offer, copy of letter No. 336, of 30th July 1869, addressed to you by the Secretary to the Government of India, on the main requirements of a Sanitary report.

2. It appears to me that it would be very inconvenient if all Sanitary reports were to be prepared according to one set of rules, and I do not think any purpose would be answered thereby. Documents written according to rules are apt to become mere forms. Unless the writer has the option to treat the subject in the way he thinks best, it will be very difficult for him to put it fairly or to the best advantage for the Government. If left unfettered he will be more likely to make original observations and this is what is most required.

3. The Secretary to the Government of India, says, that the main requirements of a report should be "to record the facts with as much brevity as shall be consistent with clearness, to state what conclusions appear to be warranted by these facts, and to recommend those measures which appear best suited to improve the health in connection with the particular case under report." This is, or at least should be, the aim of every report on any subject, and is, in fact, the principle upon which all men of science are supposed to work. First, to state the facts, second, to deduce the theory, and third to show its application. But however convenient a process this may generally be, I can conceive cases in which it might be advisable to break even this order, and I do not think the Government would be gainers by insisting that the sequence should be invariably followed. The writer is the best judge as to the manner in which each subject should be arranged, and the greater the liberty of treatment allowed him, the better in every respect ought to be his report.

4. If the tendency in the present day is for correspondence to swell to unreadable dimensions (and the prevention of this I take to be the object of the letter from the Secretary to the Government of India) the remedy seems to me to be in the hands of the Government. I am certain, reports will not be shorter because a particular arrangement of the subject is insisted on. While this will only hamper a man, in other respects it will in no way prevent him from writing as much as he might have chosen to write under other circumstances. When a report is too lengthy or not clearly arranged, the Government might simply draw attention to the subject, and this, in my opinion, ought to produce the desired effect.

209. Quarantine accommodation in Jails for new arrivals.

Read Proceedings of Government in the Judicial Department, under date the 13th of August, No. 1,325, communicating the following papers from the Government of India, on the subject of the provision of Quarantine accommodation in Jails for all new arrivals:—

REMARKS.

The question of the provision of quarantine accommodation in jails for fresh arrivals mainly resolves itself, like most other sanitary questions, into a matter of expense. It would doubtless be very desirable to have adequate quarantine wards in every jail and even in every lock-up, but the outlay would be very great.

2. It is certainly worth while to incur expense to ensure security when the number of persons newly sentenced is small in proportion to those who might be affected by diseases brought to the jail by prisoners from without, and this, in the view of the Home Department, is the best test of the expediency in each case of providing the necessary buildings. In Central Jails, the average number of admissions within the given period of fifteen days is small in proportion to the total number of prisoners, and, therefore, in Central Jails provision should be made for the temporary segregation of new arrivals.

3. But, instead of fresh arrivals being put in barracks calculated to hold six or eight persons, it would be far better to put each individual into a separate cell, so far as such a disposition may be practicable without serious expense.

4. From the return furnished by the Sanitary Commissioner, it appears that in the Lucknow Central Jail there are only twenty three admissions on an average every fifteen days to an average strength of 1464 prisoners. It would be easy to provide cells here; indeed, a sufficient number of cells would possibly be already available if, as is understood, the sanctioned number of seventeen per cent. are provided.

5. As in the larger District Jails the number likely to be affected is also large compared with the number of admissions, some rule for the provision of quarantine accommodation should obtain. In such cases, the time passed in jail pending the trial should, if in separate confinement, be reckoned as a part of the fifteen days' isolation recommended by Dr. Cuningham. The admission of such a principle in the calculation will very much diminish the amount of quarantine accommodation to be provided.

6. In smaller District Jails the necessity for the provision of such accommodation is not so urgent, but segregation may be carried out so far as is possible under existing arrangements. When new jails of whatever class, however, are hereafter built, the provision of observation wards will be easy, and, as the total number of prisoners held within their walls will be the same whether the wards be built or not, the additional expense of providing means of segregation should not be very great. But in all these cases, separate cells and not wards should be provided for the purpose.

From J. M. CUNINGHAM, Esq., M. D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Home Department; dated Simla, 14th June 1869, No. 451.

As directed in your letter, No. 185, dated the 8th February 1869, I have communicated with the Inspector General of Prisons in the North-Western Provinces and Punjab and with the Sanitary Commissioner of Oudh regarding the provision of quarantine in jails for all new arrivals; and, having at length received the necessary information, I have now the honour to submit the following observations for the consideration of the Government.

2. The proportion of fresh admissions which take place varies much in different jails. Assuming that fifteen days' isolation will be sufficient, half the average number admitted each month may be taken as the standard according to which quarantine accommodation should be provided, a slight excess being allowed to meet exceptional and extraordinary cases. In the annexed statement these data are given in tabular form with regard to a few of the jails in each of the provinces named. In these figures persons under trial and civil prisoners are not included.

Province.	Name of Jail.	Average strength.	Average number of admissions every fifteen days.
Oudh*	Lucknow Central Prison	1,464	23
	Do. District Jail	812	55
	Fyzabad Jail	882	56
	Seetapore	830	43
	Central Prisons.		
N. W. Provinces...	Meerut	...	56
	Bareilly	...	70
	Agra	...	34
	Futtehghur	...	29
	Allahabad	...	53
	Benares	...	37
	1st Class Jails.		
	Meerut	...	23
	Agra	...	45
	Futtehghur	...	33
	Allahabad	...	72
	Benares	...	54
	Allyghur	...	35
	Ghazeepore	...	41
	Goruckpore	...	53
	Jhansie	...	28
	Ajmere	...	33
	2nd Class Jails.		
	Saharunpore	...	25
	Shahjehanpore	...	58
	Cawnpore	...	62
	Jeanpore	....	43
	3rd Class Jails.		
	Mozuffernugger	...	23
	Boolundshuhur	...	21
	Muttra	...	29
	Humeerpore	...	23
Punjab	Lahore Central Prison		
	Rawul Pindee Jail	1,843	62
	Umballah	1,217	50
	Mooltan	821	44
	Shahpore	686	30
	... ...	328	24

It will be observed from the above that the number of new arrivals bears little relation to the size of the jail. In the Lucknow Central Prison, the average admissions are less than in any of the other jails of Oudh which are named. In the North-Western Provinces, the new arrivals in the first class District Jails often exceed those in the Central Prisons, while the additions every fifteen days to some of the second class jails are greater than those of the first. The numbers are in no case large, and quarantine quarters sufficient for from thirty prisoners in some jails to eighty in others would suffice.

3. In Oudh no buildings have been erected for quarantine; but in the Lucknow Central Prison and in the permanent District Jails of Lucknow, Fyzabad, and Seetapore, the carpenters' and blacksmiths' workshops have been appropriated for the purpose. They are detached buildings occupying an isolated position in one corner of the enclosure between the inner and outer walls, and appear to be very well suited for the purpose. I have suggested to the Sanitary Commissioner that the work-

* The Oudh returns include only male adult convicts, the women and boys being in separate quarters and practically isolated from the body of the prisoners.

shops should be provided for in one of the barracks in the block, and the buildings originally intended for the purpose permanently taken up for quarantine. This change could be carried out without any cost; but Dr. Smith raised objections, that the arrangement would bring formidable weapons in the midst of the prisoners, would cause risk of fire, and that, above all, it would cause overcrowding. Under existing arrangements it would appear that no buildings are available for the workshops in question, and it seems better to sacrifice industrial progress than to run the risk of crowding. The first two objections might be easily met by proper precautions, but it is feared that the total accommodation provided is insufficient. So long, however, as the buildings intended for workshops are used for isolating new prisoners, the requisite quarantine accommodation is provided without any expense.

4. Excepting in the Meerut Central Prison and at Allyghur, the officers in charge of jails in the North-Western Provinces have been obliged to do the best they can in segregating suspicious cases and prisoners arriving from unhealthy localities in any available detached buildings and tents. At Meerut, wards which were intended for debtors, boys and civil prisoners have become available, and at Allyghur a separate building has been assigned for new admissions.

5. With regard to the utilization of existing buildings for such a purpose, the Inspector General of Prisons in the North-Western Provinces states that there is not one of the jails under his charge in which this could be done with safety. In 1867 he proposed to erect new quarantine quarters between the inner and outer walls in the Central Prison and first class jails, and to provide tents for the remainder, a scheme the cost of which was estimated at Rupees 32,610. On comparing the proposed accommodation with those which would be sufficient for the average half-monthly admissions of both, I find that it would be altogether insufficient for all new arrivals and any plan of erecting cells for segregation must be considered as unnecessarily costly and inefficient.

6. In the Punjab quarantine is carried out in the Lahore Central Prison, and by a measure also in the Rawul Pindee Jail; but, with these exceptions, the new arrivals can hardly be said to be isolated. The fact is, that both here and North Western Provinces the original faulty construction of the jails and the manner in which the buildings are crowded together with prisoners, are, I am afraid, insuperably, to the difficulty of their rearrangement so as to set aside part of them for the separation of new admissions. For the District Jails it does not appear to be necessary to incur the expense of erecting special buildings for quarantine where the present accommodation is sufficient for the number of prisoners; but, when any enlargement or alterations shall be necessary, they should be made with a view of separating new admissions for a time.

7. As regards the Central Prisons the case is different. Here the extra accommodation required is very small, and I would strongly recommend that a quarantine, or, as I should prefer to call it, an observation ward, should be provided for all fresh admissions. It is extremely desirable that every precaution should be adopted to prevent the access of contagious disease among a large body of men who are placed in circumstances so favourable for its spread, and the trifling expense which such new buildings would cost will be small compared to the benefits which may be expected. In some of the Central Prisons which are still under construction, an altered arrangement of the jail barracks might secure what is desired without adding to the cost. With reference to this I may refer to my remarks on the Jubbulpore Central Prison, copy of which accompanied my letter, No. 181, of 21st April 1869.

8. In the case of all new jails the same observations hold good, and I would venture to suggest that standard plans should be decided on for Central Prisons and different classes of jails in which this very desirable requisite is provided for.

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210. Insanitary Condition of the Cooum River.

Read, the following Proceedings of Government in the Public Department, No. 1,170, dated 19th August 1869, communicating the following correspondence on the above subject, and directing the Acting Sanitary Commissioner, in communication with the Inspector General, Indian Medical Department, and the Physician of the General Hospital, to prepare a Report on the best means of alleviating the evils arising from Cooum River during seasons of drought.

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The Inspector General was requested further to report whether the symptoms of unhealthy Ulceration and Diarrhœa attributed to the exhalations from the Cooum manifested themselves in the upper or lower stories of the Hospital wards or in both, and whether they affected both European and Native patients.

From W. MACKENZIE, Esq., M.D., Inspector General of the Indian Medical Department, to the Chief Secretary to Government, Fort Saint George; dated Fort Saint George, 12th August 1869, No. 303.

I have the honor to forward, for submission to Government, the enclosed letter from Surgeon Major Duff, giving cover to a communication from the Physician, General Hospital, relative to the dangerous state of the Cooum river.

2. Dr. Smith's report is so complete in itself that it seems to me more desirable to submit it in its entirety than to offer any "summary" of it, nor have I anything to add except that, from personal observation, I can bear testimony to the correctness of Dr. Smith's statement regarding the atmosphere of the General Hospital.

3. The recent fall of rain has, it is true, covered the river bed, and thus, in a great measure, obviated immediate danger from that source; but it is not the less desirable that, in order to prevent that periodical recurrence of the conditions described by Dr. Smith, the question of the sanitation of the Cooum should be referred to the Engineer of the Division.

4. With respect to the quarters referred to in paragraph 8 of Dr. Smith's letter, I quite agree with him as to their unhealthiness and as to the necessity of providing other accommodation for the resident Medical Officer and the Assistant Surgeon doing duty at the hospital.

5. There are rooms in the central block of the main building, at present attached to the British Hospital, but unoccupied; and, if these are not required (as, I believe, they are not) by the British Medical Department, I would suggest that Dr. Hadaway be requested to make them over to this Department for the accommodation of the officers above named, who would thus be provided in the meantime with suitable quarters at little or no additional expense to Government.

From Surgeon Major C. M. DUFF, M.D., in charge of Office of Deputy Inspector General of the Indian Medical Department, Presidency Division, to the Secretary to the Inspector General of the Indian Medical Department, Fort Saint George; dated Madras, 2nd August 1869, No. 3441.

I have the honor to forward letter, No. 89, dated 18th ultimo, from Dr. Smith, Physician, General Hospital, regarding the very insanitary condition of the river Cooum which bounds the hospital grounds on the east and west.

2. It was my intention to have supported Dr Smith's letter more fully some time ago had many pressing daily duties not prevented me.

3. I find, however, that Dr. Smith, in another exhaustive letter on the subject, (No. 146 of the 30th ultimo,) also enclosed, anticipates my intention in nearly everything I could have wished to state on the subject.

4. As Surgeon in charge of the Penitentiary I beg to urge very strongly on the Inspector General of the Department that steps be taken to conserve also the banks of this river opposite this large jail.

5. Fortunately the rain which has fallen lately has covered to a considerable extent much of the foul banks of this most dangerous ditch; but in a little while, by the daily evaporation which goes on, the same will become exposed again, and greater evils may follow.

6. It is supposed that the conservancy asked for would cost a sum much too large even to think of—quite the contrary:—all that is needed is a sunk wall of say from two-and-a-half to three feet high with a foundation of two more, to be built in easy curves along each side of the river where it faces the General Hospital and Penitentiary, and fill in behind with the clean sand and silt from the bed of the river, not with the intention of deepening its bed, for that would be a most costly work, but to form behind the wall a gentle slope on which shrubs and trees might be planted, which of itself would form a pleasing feature to the neighbourhood.

7. I would nowhere narrow the banks of the Cooum except in a few places where it could be done to save the necessary masonry or to improve the appearance of the banks: water is one of the best absorbents of noxious emanations, and, the more we have of it here, the better. While these portions of the river are thus conserved, I would suggest that the work be executed, having in view the extension of it both above and below the Penitentiary and General Hospital.

8. It is not necessary that the wall should be of stone, brick-work would do very well as a face support and outline to the enclosed water; the earth behind would soon consolidate and form a sufficient support to a moderately thick wall of brick and chunam.

9. I have now further to suggest, to complete and perfect the whole idea, that all the waste water from the Spur Tank, when the fresh water-supply scheme from the Red Hills is completed, be allowed to find its way into the Cooum opposite the Observatory, to keep up, if possible, the water-level of the Cooum to a point well upon the sunk wall above specified.

10. To supplement this I have also to suggest that a system of simple syphons be placed near the iron screw pile bridge at the Marine Villa, so that the Cooum from this source alone could be always kept up to the level of the sea, by which means the dangers existing in the bottom of the Cooum might never see the light, or become injurious or even offensive.

From Surgeon Major G. SMITH, M. D., Physician of the General Hospital, to the Acting Deputy Inspector General of the Indian Medical Department, Presidency Division; dated Madras, 15th June 1869, No. 89.

I have the honor to solicit your attention to the present offensive condition of the Cooum and Canal at those points where they bound the hospital grounds, and to request that immediate steps may be taken to flood them with water, as I am apprehensive that the health-condition of the General Hospital may soon become seriously affected by the dangerous emanations.

From Surgeon Major G. SMITH, M.D., Physician of the General Hospital, to the Deputy Inspector General of the Indian Medical Department, Presidency Division; dated Madras, 30th July 1869, No. 146.

I have the honor to bring the following facts to your notice, bearing, as they do, more or less directly on the sanitary experience of this hospital.

2. During the months of April, May, June, and July, the high temperature gradually dried up the river Cooum, and the portion of canal which bounds the hospital enclosure on the western side, until little was seen beyond stretches of bare banks and drying beds of the two streams.

3. As desiccation proceeded and laid bare the beds of the river and canal, the effluvia emitted became more and more offensive, and, carried by the hot land-wind, were swept into the range of the contagious sheds, and were distinctly perceptible within the hospital building itself.

4. As early as May the health-state of the hospital began to deteriorate. Unhealthy ulceration made its appearance in the surgical, and waves of diarrhœa passed over the medical wards. On the 15th of May, the condition of the hospital, as regards health, appeared to be so critical, that as many patients as were in a state to be removed were discharged, and the crowded state of the native surgical wards was relieved by transferring some cases to unoccupied wards of the contagious range. The wards of the hospital were carefully fumigated.

5. Throughout May the temperature continued very high, and cases of malarious fever were common. The unhealthy state of the hospital, as shown by the erysipelatous condition of the patients, continued during the whole of that month. With the hot winds in June and July disease of a low type appeared, pyæmia, erythema, erysipelas, glandular affections, and phagedænic ulceration, many of which originated in the hospital itself. At that time the condition of the Cooum was positively insupportable to patients in the contagious wards, where the effluvia excited nausea and vomiting. These wards were temporarily abandoned as unnecessarily unhealthy. Recent floods, by bringing water over the exposed beds of the river and canal, have done somewhat towards arresting the unhealthy condition into which the hospital had fallen.

6. From the experience of the last three months I am satisfied that, in the present condition of the river and canal where they first the hospital compound, there exists a fruitful source of

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disease, which may at any time influence, not the hospital only but the whole town of Madras. The Cooum, which is, in reality, a huge ill-conditioned, ill-conserved, drain, contains doubtless within its foul bed the living germs of epidemic disease as well as the excreta of some portion of the population of this town. So long as these foul beds and ill-kept banks are covered with water to the depth of four or five feet, so long as fish and mollusca are present in numbers to consume the organic matter which so freely finds its way into the stream, so long will the unhealthy emanations be restrained; but when drought is present and the water diminishes, when the fish and mollusca die, when the bed of the stream becomes exposed, and hot desiccating winds raise and sweep the disgusting emanations over the hospital or towards the town, then must we be prepared to find the public health giving distinct evidences of a condition eminently receptive of the action of epidemic disease.

7. It appears to me that these dangers would be somewhat mitigated—

(*a*). By narrowing and deepening the river and canal, the latter process being effected by dredging under water.

(*b*). By securing that all parts of the bed of the river shall be constantly covered with water to a depth of four feet.

(*c*.) By cleansing and facing with masonry the banks of the streams near the hospital, and by securing their efficient conservation.

(*d*.) By levelling up all the ornamental tanks in the hospital and Medical College enclosures, these pieces of water being at present but unauthorized receptacles for excreta.

(*e*.) By placing a fringe of thick hedge near the casuarina trees along the banks of the canal to the west of the hospital.

(*f*.) By giving up all projects of erecting quarters for Medical Officers between the hospital and the river or canal.

8. In immediate connexion with this subject I would solicit your attention also to the insanitary state of the quarters at present occupied by the resident Medical Officer and by the Assistant Surgeons doing duty at the hospital. When the range of buildings occupied as a female hospital, &c., was demolished, the unoccupied quarters of the Regimental Surgeon of Her Majesty's Regiment in Fort Saint George were obligingly placed at my disposal by the Inspector General of Her Majesty's British Medical Service for the use of the resident Medical Officer. Since then the quarters have been occupied by that officer, and, generally also, by two junior Assistant Surgeons. The health of the resident Assistant Surgeon has suffered seriously from the unhealthiness of the quarters, and three out of four Assistant Surgeons, who have resided there within the last six months, have suffered from sickness apparently attributable to the same cause.

9. It appears from the statement of Dr. Barclay, formerly Surgeon of Her Majesty's 43rd Regiment, and now Deputy Inspector General, Bangalore, that these quarters have been regarded as very unhealthy for many years past. Two of his Assistants were attacked, the one with dysentery, the other with serious fever, while occupying these quarters, and Dr. Barclay, with his whole family, subsequently suffered from asthenic erythematous fever, from diarrhœa, and from ophthalmia, culminating, in the cases of two members of his family, in attacks of small-pox.

10. The unhealthiness of these quarters appears to be due—(1), to their position westward of the Medical College; (2), to the proximity of the river; (3), to the dampness and imperfect ventilation of the ground-floor of the building; (4), to the proximity of the Regimental cook-room; (5), to the neighbourhood of a foul ill-conserved tank partially filled with débris; and (6), to the defective sanitary arrangements of the immediate neighbourhood.

11. On sanitary grounds alone, and passing by altogether the great inconveniences connected with the occupation of these quarters, I have arrived at the opinion that they and the adjoining quarters occupied by the Hospital Sergeant should be abandoned and altogether removed, and that accommodation for the resident Assistant Surgeon, for the junior Assistant Surgeons, and for the Hospital Sergeant, should be found elsewhere, either in the hospital itself or in quarters erected close to, but not within, the hospital enclosure, except in the case of the Hospital Sergeant, the position of whose quarters I have indicated elsewhere.

12. I have to request that this letter may be considered in connexion with my communication to your address, No. 63, dated 14th June 1869.

Analysis of Potable Waters.

Read, with reference to Minute No. 15, recorded at page 12 of this volume, Proceedings of Government, No. 1,169, dated 19th August 1869, communicating the following Despatch from the Secretary of State, and Memorandum by the Army Sanitary Commission on Analyses of Indian Waters, and requesting the Inspector-General, Indian Medical Department, and the Sanitary Commissioner, to furnish a joint report on the best means of obtaining reports on potable waters in the Madras Presidency, in accordance with the recommendations of the Army Sanitary Commission:—

Despatch from the Right Honorable the Secretary of State for India to His Excellency the Right Honorable the Governor in Council, Fort Saint George, dated India Office, London, 21st July 1869, No. 12. (Sanitary.)

I forward, herewith, for the information of your Excellency in Council and for the consideration of such measures as may be deemed expedient, copy of a Memorandum by the War Office Sanitary Commission, relative to three reports on analyses of potable waters of Cantonments, Bengal, by Dr. Macnamara.

2. I also forward copy of a paper of remarks placed at the disposal of the Commission by Dr. Angus Smith, with a view to its communication to the officers employed in these analyses in India.

3. I desire that your Excellency in Council will issue the necessary instructions for obtaining reports on potable waters in the Presidency of Madras, in accordance with the recommendations of the Army Sanitary Commission.

Memorandum by the Army Sanitary Commission on Analyses of Indian Waters.

The Royal Commission on the sanitary state of the Indian Army recommended that a careful analysis should be made of Indian waters, and these reports on Bengal waters are the first instalment of the results of this inquiry.

1. Reports on Water Analysis in Bengal, 1867.
2. Report on Analysis of Organic Waters of Cantonments in Bengal (Lucknow), 1868, by F. N. Macnamara, M.D.
3. Third Report on Analysis of Potable Waters of Stations in Bengal Cantonments, by F. N. Macnamara, M.D.

The examinations have been generally properly conducted, and have afforded, for the first time, a true insight into the condition of water supply in India, and into the relation of source and quality of water to the health, both of troops and of civil population.

It may give some idea of the magnitude and importance of the work to state that, within little more than a year, the principal water-sources of thirty-eight cities, towns, and stations, extending from Calcutta north-westward as far as Peshawur, have been examined, some of them at different seasons; and that nearly 400 water-sources have been analyzed, and the results tabulated for use.

Of the water samples analyzed—

65 were taken from tanks.
4 " " canals.
26 " " rivers.
9 " " lakes.
2 " " springs.

The remainder were from wells, with few exceptions, of shallow depth, most of them dug in cities or within the boundaries of Cantonments.

The general plan of the analyses may be stated as follows:—

Physical properties of filtered water.
Reaction, alkaline, or neutral.
Hardness, permanent, or removable.
Proportion of oxygen per 1,000 for destroying readily oxydizable organic matter (the most injurious to health.)
Amount of ammonia, phosphoric, nitrous, and nitric acids.
Total solids, fixed and volatile, with their approximate nature.
Soluble salts, and their nature.

The results of each inquiry are given under these heads, and they possess high scientific interest apart from their bearing on the public health. We shall, however, confine our remarks solely to questions of health, and these, as we shall presently see, are of great importance.

The plan of analysis is based on Dr. Angus Smith's "Estimation of Organic Matter in Water, with reference especially to Sanitary Purposes," which was printed and circulated extensively among Army Medical and other Officers in India, at the request of the Army Sanitary Commission. In this paper, Dr. Smith gives simple and efficient rules whereby the nature and probable sources of noxious organic matter in water might be ascertained, and he lays down certain general principles, by which the effect of impurities on health may be approximately estimated.

This can now be done for nearly every one of the waters submitted to analysis in India. But, before proceeding to state what are the results arrived at, it will be necessary to enumerate briefly the general principles referred to.

Besides ascertaining the precise nature and amount of saline matters in water, and their probable effect on health, the plan of analysis enables us to ascertain the proportion in any given water of rapidly oxydizable organic matter, together with its origin, in some cases with certainty, in others with probability; whether it is of animal or vegetable origin; whether it is in a decomposing condition, and consequently more or less of a poisonous character at the time it is drawn for use; whether the organic matter enters into this dangerous state after the water is kept a short time; and, lastly, whether the organic matter is of recent origin, or of old date.

The class of organic matter, most important in a sanitary aspect, is that which proceeds from decomposing animal debris, and the test which enables the chemist to distinguish this, with an almost certainty, is the co-existence of organic matter in water with certain salts and saline bodies. These are, ammonia, nitrates, nitrites, and common salt. The last of these is, perhaps, the most important, for if its presence cannot be traced to sea water, spray, or salt deposits in the soil, it can have but one of two other origins; it must proceed from certain processes of manufacture in which salt is employed, or it must have passed through the bodies of men and animals, in other words, it must proceed from sewage. As Dr. Angus Smith gave every needful caution for avoiding error in estimating the source of common salt, when analyses are given without assigning the salt to any natural source, we must conclude that the common salt in these waters, in all probability, proceeds from old or recent sewage impregnation, with which the soil yield water to the well has become charged.

The ammonia has, for the most part, a similar origin.

Nitrites mark the existence of organic matter undergoing decomposing changes. Nitrates indicate the change completed.*

As an illustration of the test for organic matter, Dr. Smith gives the result from four natural waters examined by him.

First.—The water supplied to Manchester contains, in every 1,000 grains, as much readily decomposable matter as requires 25-millionths of a grain of oxygen to decompose it.

His sample, No. 2, required 500-millionth parts of a grain for the same purpose.

Sample, No. 3, required 2200-millionths of a grain, and No. 4 required 8800 millionths of a grain to destroy, not all the organic matter it contained, but only the readily oxydizable matter, which, as already stated, is the most dangerous to health.

He shows that, as regards organic matter readily decomposable, the waters contain the following relative proportions:—

Manchester Water, No. 1	1
Sample, No. 2	20
" No. 3	88
" No. 4	220

But without the other tests mentioned, it would be impossible to arrive at the origin of these amounts of organic matter. Here the amount of chlorides becomes of importance. After stating that, in England, it is almost universally the case that the presence of much chlorine in water indicates drainage from animal matter, Dr. Angus Smith states that one grain of common salt per gallon is too much, and is in many places to be suspected of being caused by impure drainage,

* In estimating the probable origin of saline matters of this class in India, it must, however, be borne in mind that over large parts of the North-West Provinces the natural soil is impregnated with salts, including an appreciable proportion of common salt, as, for instance, in districts where "Reh" exists, and that there are tracts where the nitre of commerce is found, and manufactured from the soil. A probable origin of part, at least, of these saline matters in certain districts of country is the former occupation, and sewage pollution of the ground by populations which have long since removed from it.

and, further, that if chlorides and nitrates are found in water in which easily decomposable organic matter is also indicated by the usual tests, "the presence of animal matter, or injurious gases, or nitrates may be assumed."

"Nitrites may be considered as hurtful as organic matter until their effect is better known. Their presence is suspicious, and their company bad."

Dr. Smith states his opinion, that water which requires 50 millionth parts of a grain of oxygen to decompose the organic matter in 1000 grains of water is sufficiently free from organic matter, but the quantity beyond this, which can be borne without danger, is not known. It is a question of degree to be determined by experience.

If we assume the Manchester water as a practically attained standard, the quantity of oxygen will be 25-millionth parts of a grain.

Bearing these principles in mind, let us now see what is the condition of these Indian waters, as given in the reports before us.

As a general rule, water samples taken from Indian rivers, mountain streams, mountain lakes, and similar unpolluted natural waters, do not afford those indications of sewage impurities to which we have referred.

They all contain readily oxydizable organic matter in a greater proportion than Manchester water; but as this is accompanied neither by an excess of chloride of sodium, (common salt,) nor by ammonia, nitrites, or nitrates, the organic matter is most probably of vegetable origin and innocuous. But when waters of this class are taken near groups of population, or when they are conducted along open channels, exposed to the risk of impurities, they give sufficient evidence of deterioration to show the necessity of filtration and covered storage, and of improving the means of distribution.

The water supplied by tanks, provided the tanks are carefully kept, stands next in order of purity. Tank waters generally contain a considerable amount of rapidly decomposable organic matter, from 50-fold to 100-fold or more, the amount of organic matter in Manchester water. The amount of chlorides is generally small, and there are only traces of nitrates. The organic matter may, therefore, be considered as mainly of vegetable origin. But when natives deal with tank waters as they choose, of course the entire character of the impurities undergoes a marked change. The presence of sewage matter is then obvious enough.

The worst of all the northern Indian waters are those on which both troops and Native population depend mostly for their supply, namely, water from shallow wells.

With very few exceptions, these waters show a considerable degree of pollution by organic matter in all the stages of it recognised by chemical analysis, and of those impure well waters, in which the organic matter has been so far oxydized as to form nitrates, the physical qualities are good.

The proportion of readily oxydizable matter often exceeds that of the Manchester standard 40, 50, and 100-fold,* while the presence of common salt to the extent of several grains per gallon, sometimes to the extent of between 70 and 80 grains per gallon, indicates that the organic matter is most probably of animal origin. A large proportion of these well waters contain ammonia due to fresh sewage, and also nitrous acid and its accompanying phosphates indicating the presence of sewage matters undergoing oxydization in soil. In many cases, the greater part of the readily oxydizable organic matter has been already oxydized in the soil, and appears in the well as nitric acid compounds, often to the extent of several grains per gallon.

Depth of well, as shown by the reports, is no safeguard against impurities, if foul matter is allowed to enter at the well's mouth, or if the immediate surface yields foul water to the well. There are instances given in these reports of wells, 90 and 100 feet deep, yielding both ammonia, nitrous, and nitric acids, in addition to organic matters.

In most cases there is no difficulty in tracing these impurities in well waters to their source in the foul-neglected state of the ground round the well's mouth; to the method of drawing and of sloping

* With reference to these quantities, Dr. Angus Smith, in his paper afterwards referred to, makes the following remarks—

"The permanganate (the re-agent made use of for oxydizing putrescent organic matter) does not seem to have borne so much fruit in India as I expected. I should have expected more striking results . . . If it does not show greater amounts of putrid matter in some of the waters, it will, of course, surprise me." Dr. Smith points out that this result is probably due to the water having stood some time before being tested.

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the surface by which foul water is thrown directly back into the well; to the proximity of latrines, cook-houses, stables, and dwellings; to the long use and occupation of the surface in which the well is dug, and to similiar causes.

It may be stated here that in a number of instances filtered waters, which had passed through the ordinary barrack and hospital filters, were found to have benefited very little by the process. In some instances, indeed, filtered water contained more organic matter derived from the filter than was contained in unfiltered water, a result which has been observed when filters, especially small filters, are used too long without cleansing or removal.

It may be remarked that water impurity may be increased by natural processes of vegetation in water impure enough for the purpose. Thus, when the organic matter is in solution, it is not always perceptible, but when growth begins it is taken out of solution and seems to increase. Thames water at London, if allowed to stand in the sun, used to take an appearance of solidity; so abundant were the green weeds in it and within the whole vessel.

The reports being intended to give the chemical constitution of the waters, do not enter specially into their influence on health of troops and civil population. But, nevertheless, there are notices here and there which sufficiently indicate what the influence probably is. Take, for example, the case of Peshawur, a station which has been scourged by Cholera and Fever to so great an extent, and which suffered so severely from Cholera in 1857.

This station is supplied partly by feeders from the river Barra, and partly from wells. The artificial channels traverse every street; they are simply open ditches carried above the level of foundations of barracks and houses; there are miles of them in Cantonments; they are filthy, and frequently choked up with mud; secondary streams supply the regimental tanks. It is notorious that these streams are polluted, in consequence of the careless and disgusting habits of the natives.

Native houses are built close to the main stream, and cattle are kept close to it. Natives wash their bodies and utensils in it. A native was seen to be taken ill with vomiting within a few feet of the bank of the main stream in the 42nd lines.

The Artillery well is only 11½ feet deep. There are old graves all round the well, and the place is a favourite resort of washermen.

Dyeing processes are carried on round the mouth of the jail well, and the dye-water is allowed to stagnate on the surface, and emits a most offensive odour.

The water is stated to be so bad that the prisoners should not be compelled to drink it. The fort water is so saltish and bad that it is used only by native workmen.

These few facts, mentioned incidentally in the reports, show that, so far as concerns its water-supply, Peshawur has been simply made a nest of epidemic diseases, resembling the south of London in the days of open ditches and bad water; and they indicate clearly what ought to be done. So long as these ditches are left in existence, and so long as the water-supply is such as it is described to be, there is little hope for improved health among troops stationed at Peshawur. A competent Sanitary Engineer would very soon detect and remedy the evils.

Take another example, Delhi: Some time ago the Commission reported to the India Office that there was reason to believe that the sanitary state of Delhi, including the condition of its water-supply, was a cause of the "Delhi sore."

Delhi is supplied with water from wells dug in the nitrous soil of the city. This nitric acid appears to be the result of a continuous impregnation of the soil in houses and compounds, with urine and feculent matters. In proof of this, Dr. Sheppard shows that, while water taken from a well dug in the old Cantonment, at a distance from houses, gave "not the minutest portion of nitric or nitrous acid or ammonia," a sample of earth taken within the city, from a locality formerly occupied by houses, yielded "an immense amount" of these sewage products.

Part of the water of Delhi is supplied from the river Jumna.

Dr. Sheppard gives the following facts in relation to the "Delhi sore," and the quality of water, but he also attributes part of the susceptibility to this disease to the impure air of the city.

Jumna water contains twice the amount of readily oxydizable matter existing in Manchester water. But it contains only eight-tenths of a grain of common salt per gallon, and affords no trace of ammonia, phosphoric, nitrous, or nitric acids.

This water was used by the right wing of Her Majesty's 98th Regiment, among whom there were 15·6 per cent. attacked with "Delhi sore" during the first year's residence, and 10·7 per cent. during the second year. The decrease was 4·8 per cent.

There are two wells which supplied water to the 25th Native Infantry, namely, the Delhi gate well, and the Khyrattee gate well. The former contains 137 grains of solid matter per gallon, of which apparently only a minute quantity consists of readily oxydizable matter. But instead of this, there are no less than fifteen grains of nitric acid, 41·3 grains of common salt, and 33·7 grains of sulphate of soda per gallon.

The Khyrattee gate well contains more organic matter, 10 grains of nitric acid, 29 grains of common salt, and 19 grains of sulphate of soda per gallon. Its total solid constituents exceed 92 grains per gallon.

The regiments using these waters yielded 8·5 per cent. admissions from "Delhi sore" during the first year, and 23·9 per cent. during the second year of residence, showing an increase of 15·4 per cent.

The Purthar Ghatti well, used by the Royal Artillery, contains three times the amount of readily oxydizable organic matter that there is in the Manchester standard. It contains ammonia, 1½ grains of nitric acid, and above 4½ grains of common salt per gallon. It contains a considerable amount of inflammable nitrogenous organic matter.

The Royal Artillery, using this water, afforded 15·6 per cent. admissions from "Delhi sore" during the first year's residence, and 4·3 per cent. during the second year, showing an increase of nearly 27½ per cent.

Dr. Sheppard further calls attention to the non-development of "Delhi sore" in former years among British Officers and Native Troops, who lived in the purer air, and used purer water of the old Delhi Cantonments, and to the absence of this sore in Meerut, where the water-supply is purer.

The possible influence on the skin of these highly nitrogenized waters, when used for ablution, has likewise not escaped attention.

Dyspepsias and Diarrhœas have also been traced to their use.

One illustration more will suffice. Many of the wells in Oudo are so bad that Assistant-Surgeon Orton, who visited the Cholera districts of the province in 1867, reports that, in every instance without exception, the drinking water was filthy, or, as the Natives themselves expressed it, putrid. A glass of it would produce Diarrhœa at once in a person unaccustomed to partake of it. It is loaded with sulphates, chlorides, nitrates, and organic matter. Mr. Orton further states that, where Cholera prevailed among troops, the water-supply was similarly objectionable.

On the other hand, he mentions that, at the Hawalet, where the water is bad, Fever, Diarrhœa, and Dysentery, were invariably the prevailing diseases, till the use of the water was prohibited by an order of the Magistrate, and he says that since this was done scarcely a single case has come under his notice.

As a general rule, the well water supplied to sick in hospitals appears to be even more impure than the barrack supply.

It will be seen that this, as yet partial examination of Indian waters, has opened up an entirely new chapter of the disease causes in India.

Suspicion, which formerly prevailed, as to the efficient operation of this cause of ill-health among troops and civil population, has become so strongly confirmed, that the only question is what should be done.

First.—In the first place, it is evident that these chemical examinations should be continued all over India, and that especial attention should be devoted to waters used in localities where Cholera, Dysentery, and Fevers are endemic. And in estimating the source of the saline constituents in water, it might be well to analyze samples of soils and sub-soils at different depths and in different localities, with a view of ascertaining whether these salts are due to the geological conditions, or to old or recent impregnation of the soil with sewage impurities.*

* Dr. Angus Smith, with whom we have communicated regarding the results of his plan of analysis, already referred to, has placed at our disposal a paper of remarks, a copy of which we have appended, with the view of its being sent to the chemists engaged in this work.

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Secondly.—There are the practical questions of water-sources and means of distillation. In regard to these points, there is nothing indicated in these reports which has not occurred elsewhere. Like evils require like remedies. In former days, London, as well as other cities and towns at home, suffered from precisely similar water impurities, arising from similar causes. London was formerly drained into cesspits, and derived its water-supply partly from the impure river at London Bridge, and partly from wells among the cesspits. We have no chemical account of these waters, but we can form a very good idea of their nature by analyzing the existing wells, even after the metropolis has been drained. This has been done, and not a single well is fit for drinking purposes. During epidemic seasons, many are poisonous like the well in Oude.

London was formerly scourged with Fevers and Dysenteries, just as India is, and yielded an enormous death-rate.

The practical solution of the water question for India is the same as it was for London.

All old wells among groups of population in cities, villages, bazaars, and the like, which afford such waters as the wells submitted to analysis have done, should be rendered impervious to any infiltration of surface water by careful puddling, or other methods. It has been stated, for instance, that an impure well at Bangalore was purified from foul surface drainage water by so simple and inexpensive an expedient as digging and removing the soil round the well's mouth to a distance of six feet from the tube, and about the same depth from the surface, and filling the space with clean sand.

After cutting off the surface drainage, the true deep sub-soil water should be tested, and, if good, may be used; but if bad, then the well should be filled up and closed, with as little delay as possible. Wherever these waters show readily oxydizable organic matter, requiring an amount of oxygen exceeding 0,000,050 of a grain per 1,000 grains of water, together with a grain or two of common salt per gallon, or wherever there is ammonia present, or nitrites in any quantity, or organic matter, nitrates, and common salt, it may be considered certain that the water is unsafe during epidimic periods, and that its constitution cannot be depended on.

Thirdly.—The best available sources of water in India, as shown by these examinations, are rivers, streams, and lakes, and in some places impounding reservoirs might be advantageously constructed. Properly constructed tanks, which are a species of impounding reservoir, would answer in localities where the requisite facilities existed for their construction, provided due care were exercised in protecting the water from pollution, and in sand filtering it before us.

The roof water of buildings, if filtered and stored under cover in places where it would not become impure by soakage of foul surface or sub-soil drainage, would form, in many cases, an important source of supply for drinking and cooking purposes at military stations.

Wherever new wells must be depended on, they should be sunk in the cleanest ground available, and at a distance from dwellings, and from all sources of impurity. The top should be built up and covered, and care should be taken to cut or puddle off the immediate sub-soil water from the well.

Fourth.—It would be very desirable to improve the means of raising, conducting, and distributing water, so far as it might be practicable to do so, at stations where the present methods of distribution are found to add to the impurity of the water-supply.

In conclusion, we would beg to suggest that the whole subject of these water-sources may at once be taken up in India, with the view of devising some practical method for providing troops and civil population with pure water.

ARMY SANITARY COMMISSION, WAR OFFICE,
April 12th, 1869.

NOTES by DR. R. A. SMITH, *with reference to the Analytic Examination of Waters in Northern India, described in Dr. Macnamara's Report.*

16th February 1869.

I send a few notes after thinking over the analyses. They add a little to what was said, and may be of use if taken in good part by the analysts.

I am inclined to increase the number of questions relating to water. The value of many methods lies in the fact that there are many varieties of waters. I have put down, therefore, one or two more divisions of organic matter. Each may be useful in its way. Glad I am to see that the work is good, but naturally one feels inclined to wish always for more.

(Signed) R. A. SMITH.

When we seek an analysis of water, we merely desire such a full description as will enable us to see at once its character, and, therefore, we require something of its natural history. With this in our minds, we may consider if the late analyses of Indian waters satisfy every demand.

On looking over the work, I consider that a good idea of the waters is obtained, and that the results will be of immense value. As it is difficult to be perfect, I may be allowed to draw attention to some questions, (rather, I ought to say, according to request I do so).

In all analyses of water I look on the organic matter as the most important point. I can imagine a very satisfactory investigation into the quality of the water where nothing but organic matter was spoken of. Instead of one or two columns, I would give many to this point.

First, the description of the water.

It seems to me not to be very full, unless it be that there is uniformly little to observe. The same fault is found in analyses made here. Having a fellow-feeling with chemists, I do not wish to see them burdened; it would, however, be well, if they gave themselves a little experience in examining the organisms in the water as soon as collected and later. A little of the deposit taken up and examined by a small microscope,* with a half-inch power, would give a valuable experience, even without the scientific names of the bodies seen.

After the water had stood, protected from air, for some days, in our climate (Great Britain) a week or so, it could be examined again. This will show if there is much vegetable or animalcular life.

So far as I know, there is no such examination published, as will distinguish (by the animal life) good and bad water. Forms of all kinds are generally shown together, and the time of careful distinction has not come. It does, however, seem to me that fleshy or gelatinous forms are the most hurtful, as they also are the most disgusting. They seem to abound according as the water becomes worse, until a stage comes which destroys even them, bringing putrefactive gases and vapours.

It would be easy for the chemist to indicate these forms, and observe without much detail. I should not complain of waters, at the bottom of which were deposited many of the forms of diatoms or desmidiaceæ, or in which were swimming even the larger entomostraca, if carefully removed, unless they indicated something worse, although not readily seen, whilst I should fear water in which were floating the beautiful volvox or the euglena. If there did not exist material for the formation of these creatures, they could not be found, and the material for the latter is hurtful.

This mode of developing them at a proper temperature, and then observing them, is the simplest of all modes of examining water, and can be managed by any one. It is of value even without a microscope, but of more value with one. I wish simply to reduce into a scientific form the common and approved modes of observation, as our first step. One or two microscopes might be sent as a commencement, to see if they bear fruit.

There are cases in which gases are found as the results of decomposition, and in such cases, by the usual modes of analysis, they are entirely lost; the amount of organic matter, in weight, gives no idea whatever of the state of the water. Indeed, as a rule, the amount of organic matter in weight is of little value. Although I have often said this, and first said this, I see I am quoted with a very different meaning.

This putrid state is the only one which the permanganate was proposed for measuring. No other method does measure it, or even pretends to measure it. The permanganate does not seem to have borne so much fruit in India as I expected. I should have expected more striking results. There seem to be different modes of reading off. In one case there is sulphuretted hydrogen; even that has only slightly affected the permanganate.

Possibly greater quantities of water ought to be used. For example, it would be better, when possible, to use 100, or, still better, 1,000 centimeters, and reduce afterwards to any standard amount.

In order to diminish the fractions, it would be better to change the decimal place, and to say "oxygen required for one million parts of water." This would do either for grains or cubic centimeters, and avoid the conflict of measures. It is merely a change of the decimal point three figures to the right. Still its results have been valuable, although no one has gone with interest into the details of the use of the permanganate. If it does not show greater amounts of putrid matter in some of the waters, it will, of course, surprise me. It certainly may happen that the gases leave the water in warm

* A Stanhope lens might be used for such purposes.

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countries sooner than with us, but then they are formed more rapidly. The test, however, is delicate, and it requires some time to know its peculiarities. It has been objected to it here that it is acted on by iron and nitrites. That is surely no real objection to a chemist, who will estimate these separately.

One reason why it has done less good, is seen on a remark that the water was allowed to stand twenty-four hours before using permanganate, as it took up less then.

That fact shows that the test was right, but the gas having escaped during the twenty-four hours, it could not be measured. However, a valuable piece of information was gained by this, namely, that putrefaction was not forming new gases. If it is common to use the water only after standing that time, then also Dr. Macnamara had the most practical view of the case, but not its history.

Delicate as this is, it tells us nothing of the solid matters undecomposed, and nothing of the growths that may take place when it is used cold, in the way which Forchammer devised, and which I simply followed with details.

If we want to know the amount of matter containing nitrogen, we must use it heated, and along with soda or potash, as Mr. Wanklyn has shown. His mode of first removing the ammonia, by boiling with carbonate of soda, and keeping the distilled product, testing that then for ammonia by Nessler's test, is very instructive. When this is done, it is again boiled, after adding caustic soda and permanganate; the ammonia then collected and estimated as before. It seems to me well to use this test also as an indicator of the nature of the organic matter. Some chemists will probably take to one more than to the other; I do not well see that we can dispense with any of them when the work is to be done for a great national purpose, and when we may expect the analyses to be models for the world, as they certainly may be expected to be, when done by a great nation for another, in many respects greater.

The advantage of Wanklyn's process being added to the others, will be felt very strongly in cases where there are nitrates. Then the process by burning causes a loss both of organic matter and nitric acid. This loss is put down as organic matter frequently, and the true organic matter is never seen. Wanklyn's process will find it by showing the nitrogen. As it does not show the putrefactive power of water or its organisms, it must not be used alone, since it may give alarm when there is really no danger. On the other hand, it will not fail to give alarm when there is danger of putrefactive matter.

The cold permanganate reaches the matter which may become decomposed, the hot process that which may decompose. It is well to add new processes, they always give more knowledge. I certainly would recommend a fuller examination of the organic matter. These are the most important methods of doing so.

It is, perhaps, well to give, along with the hardness as a whole, the permanent and removable, but it is not of great importance in India at present, where it is not probable that Clark's process of softening will be adopted. I should prefer to see stated the amounts of sulphate of lime and the amount of carbonate. These results are distinct, definite, and of value for future time, and have a more scientific meaning, in other words, a value of wider application, the mere softening or hardening has a relation only to empirical processes of limited use.

Volatile matter is important. It is, however, good to state if the matter is entirely organic. If, for example, there is much nitric acid, the organic matter is oxodized by the acid, and both go off, leaving a very white ash.

The magnesia water has been mentioned as being considered hurtful. If there is any suspicion of this, the amount of the base ought always to be given in the analysis in full; indeed, it is better to have the analysis full under any circumstances. We know, however, that no injury arises from three or four grains of carbonate of magnesia in a gallon in England. At least we infer this, as that amount is so common.

Of silica we know little, in a sanitary point of view. It is probable that no amount will be injurious. I generally find from a third to half a grain in a gallon. It is well to give it in those cases in which the analysis is carried so far as to bring it easily into the hands, but not to evaporate much for the purpose.

Of the inorganic substances, none have been so capable of indicating the quality of a water as the chlorine. The chlorides, or, we may say, "common salt," is almost universally found in bad waters, showing sewage. The attention to this substance has been successful. I always take abundant care that no inorganic sources of this salt will mislead. There ought, however to be some waters which give little chlorine, and which are still hurtful, viz., marshy waters. It would be well to give

some attention to this subject, it is new and unknown; such water has bad qualities, of a vegetable origin wholly, as I suppose.

As to the mode of retailing the analysis, a little license, of course, must be allowed, since there are various ideas, but as much uniformity as possible ought to be sought. I should prefer to see the words "permanent" and "removable hardness" replaced by a careful statement of the carbonic and other acids, with all the bases. The most complete way is the statement of the salts, but some theoretical difficulties prevent it being fully carried out. These might be got over if we could estimate the potash precisely, but that is a very troublesome operation, at least chemists generally avoid it. If any objection is made to it, it might be left out, and soda allowed to stand for the alkalies. In this country the amount of potash in waters is extremely small, and is generally omitted in analysis; it is, however, always present in the waters. In a country comparatively new to these inquiries, it would be well to inquire if there are any waters with a considerable amount of this alkali. I do not see it mentioned.

The question may be asked, "Is it well to make the examination with the greatest minuteness at once, or to leave the fuller inquiry to a future time?"

I am inclined to think that attention to organic matter ought to be given first for all specimens, whilst selected specimens are examined with all the minuteness which chemistry can give.

There is a want of *peculiarities* among the waters. I should have expected in India something not the same as here, but this may be groundless fancy.

Careful examination for rare bodies would be of great value. Such examinations of inorganic bodies as Fresenius makes of the bath waters of Germany, which would occupy a chemist many weeks. An analyst might have one of these continually on hand, whilst going on with the less minute and more practical inquiries on other specimens.

The following headings might be given, or a selection according to circumstances:—

When the water is collected.

1. Physical properties.
2. Vegetable and animal life visible to the naked eye.
3. Vegetable and animal life seen by the miscroscope.

When the water has been kept a week.

a. Physical properties.
b. Vegetable and animal life visible to the naked eye.
c. Vegetable and animal life seen by the microscope.
d. Appearance.
e. Reaction.
f. Hardness, permanent and removable, if desired.
g. Oxygen required by a million parts of water.
h. Nitrogen from nitric acid, old organic matter.
i. Nitrogen from nitrous acid, recent organic matter.
j. Nitrogen from ammonia, recent organic matter and rain.
k. Nitrogen by Wanklyn's process, present organic matter. (Boiling with caustic soda and permanganate.)
l. Organized organic matter by description.
m. Probability of much animal matter.
n. Probability of much vegetable matter.
o. Gases from organic matter decomposing cold permanganate.

We cannot expect one analysis to go over all the ground, but I think we have in the preceding list a certain goal to which we may attain, sometimes perhaps when a water must be perfectly examined, filling up actually every space.

There may be added also as a mode of comparison—

1. The best Indian waters take of oxygen.
2. The best Indian waters give of ammonia.

The ammonia got by boiling with the carbonate of soda consists of that which is inorganic, the rest has been formed by the boiling process from organic substances containing nitrogen. Every one of ammonia is equal to ten of albumen.

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I think it would be better to introduce a decimal amount of water instead of the partially decimal gallon; the French introduce 1,000. This gives rise to too many fractions. I have been using a million for air for some time, and whenever it is decided to abandon the gallon, I think it will be better to take *a million parts*. Continental nations will then find it more convenient to read our analysis than their own.

It was my intention to send a specimen of the full analysis. At present I am not ready, and am considering modes of shortening the work considerably, whilst at the same time the results are increased.

Frankland's process for nitrogen is unnecessary when Wanklyn's is used. I could not recommend the first for India, as it is complicated. I know the second to be valuable; time will show the extent of its accuracy.

I do not consider it necessary to divide the organic matter in all cases into such a great number of portions, but in all cases, one or more of these portions are wanted, and there may be cases which are worth such a full examination that all will be taken into account.

The inorganic analysis follows.

Some day, the relation of the oxygen to the nitrogen of the air in the water must be added as a regular part of the analysis. There is a good deal before us in perfecting and shortening the work.

(Signed) R. A. S.

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212. Report on the Working of the Contagious Diseases' Act, Madras.

Read Proceedings of Government, in the Public Department, No. 1,162, dated 19th August 1869, reviewing the following Report on the working of the Contagious Diseases' Act XIV. of 1868, in Madras, during the first six months of its introduction:—

From H. Stanbrough, Esq., Health Officer, Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 15th April 1869.

In obedience with the instructions of Government, communicated to me when furnished with the rules for my guidance, I have the honour to submit a Report upon the working, for six months, since its introduction, of Legislative Enactment, No. XIV. of 1868, styled the "*Indian Contagious Diseases' Act.*"

2. This Act became law, within the Municipal limits of the City of Madras, on the 15th October 1868. My sketch will, therefore, commence from that date.

3. The Act divides itself into four parts:—Prophylactive or preventive, detective, punitive, and sanative.

4. The operations under the first head have been carried on by means of registration and personal examination.

5. Considerable difficulty at first presented itself in respect to the first of these sections of operations.

6. In a city with a numerous population, professing as numerous creeds, having as numerous social distinctions and religious prejudices, and among whom concubinage is viewed with leniency, if it be not an established and recognized institution, it was found difficult to ascertain exactly the classes on which the law impinged. In fact, as the subsidiary rules framed on the law then stood, some of them appeared to the Government of India to go beyond the law. It was, therefore, found necessary to have the rules* revised, and among other modifications the word "*common*" was prefixed to that of "*prostitute*," wherever the latter occurred in the rules, so as distinctly to define, limit, and specify the class of women to which the Act and Rules were intended to apply; and I have endeavoured in carrying out these modified rules, and which have made the duty less complicated and difficult, to exercise, in accordance with the wishes of Government, the utmost caution, especially in reference to "dancing-girls attached to pagodas."

* Proceedings of Government, No. 1,333, dated 22nd October 1868.

7. To obviate any misunderstanding among the Hindoo community in particular, in respect to this class of women, who are generally common prostitutes, I at once put myself in communication

with the Dhurmacurthas or Wardens of the several pagodas within the Municipal limits, and obtained certified lists of the dancing-girls belonging to these pagodas, of which there are twenty-seven in number. From these lists it appeared that, although on an average, there are not more than one or two of these "dancing-girls" required at a time for daily ceremonies, yet there are upwards of forty on each pagoda list, all of them living in a state of concubinage with respectable members of the Hindoo community, (Malabars, Gentoo, Chetties, Mahrattas, Rajputs, &c.,) or in common prostitution. Four or five girls reside together in a house, under the superintendence or protection of a retired "dancing-girl," who is styled the mother, and, in fact, is considered so by them all; she adopts them generally when very young; instructs them in dancing and singing; they perform funeral ceremonies for each other, and add the gains of their prostitution to the general fund for their mutual support. The number of prostitutes of this description exceeds 1,200.

8. In addition to these, there are many "dancing-girls" residing within the Municipal limits, but attached to pagodas distant from Madras about forty or fifty miles.

9. All these classes of women escape from the operation of the Act, in consequence of their being shielded by the designation "dancing-girls attached to pagodas."

10. There is another class of common prostitutes which escapes registration. A woman who has passed her life as a "dancing-girl," or better class of prostitute, and who has acquired some money, takes a house and rents out apartments to other Hindoo females, who live in a state of concubinage, each being kept by one man; *but in the same house* are other females to whom apartments are hired out. *These carry on common prostitution.* The subordinates of the Health Office have experienced the greatest difficulty in serving these last-named women with notices for registration; for, as soon as it becomes known that inquiries are being made about them, the "girls" are sent out of the way, and actions for trespass are brought against the subordinates of this department by the men who keep concubines in the house.

11. A fourth class of prostitutes, who escape the infringement of the law, are found among Mahomedans. The Mahomedan population is very large, especially in Triplicane, and a great many of them have private zenanahs, where prostitution is carried on to a very great extent, especially among a class of menials, known under the designation of "slave girls," but the law is unable to touch them, in consequence of the clandestine character of the prostitution, likewise the Mahomedan dancing-girls, who, however, do not exceed fifty in number; these latter are not in any way attached to religious houses, and are, in fact, a better class of prostitutes, hiring themselves out for wedding, and other Mahomedan ceremonies. These should not claim exception on account of caste prejudices, for they are simply engaged at nautches, &c., &c., in singing and dancing. In fact, a Mahomedan dancing-girl may have been at birth, a Pariah, East Indian, or any other caste, taken in childhood into Mahomedan families, and who afterwards adopts the Mahomedan religion.

12. The Act to be truly effectual should include the clandestine, as well as the common prostitutes; and I would beg to suggest that it be intimated to the Dhurmacurthas or Wardens, that the dancing-girls should furnish a monthly certificate of health to the Health Officer. This certificate can be obtained from any respectable medical practitioner they choose; but failing to do this, they should become liable to an official visit from the Health Officer, or any officer of the department he may select for the duty. It is not so much fear of the registration or of examination that prevents the above class of women from bringing themselves under the operations of the Act, but it is the dread of being sent to, and confined in, the Lock Hospital with all classes of low-caste females. In framing the Rules under Sections 5, 11, and 21 of the Act, the Committee, in their letter,* considered that it was at present unsuitable to draw up Rules under Section 17. It is my opinion that if that section were permitted to be brought into operation, many of the "dancing-girls attached to pagodas" and caste-women would gladly avail themselves of it. This would, of course, throw more work upon the Officers of Lock Hospitals.

* 23rd July 1868.

13. Should Government hereafter deem it necessary to remove the Lock Hospital from Black Town to larger premises elsewhere, I would suggest that the premises be retained as an experiment for the admission of caste-women, and I have little doubt that the Hindoos will readily assist with funds the humane intentions of Government. The lowest of the common prostitutes having no abode, and registered as such, are to be found prowling about in the dark for their prey in the neighbourhood of the Esplanades, General Hospital, and the Evening Bazaar. These are most diseased, and are the only class which *voluntarily* avail themselves of the provisions of the Act.

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14. For the purposes of the Act, Madras has been divided into five* districts, which coincide with the Municipal Divisions, and Health Offices have been established in each of these districts. All the premises occupied are the property of private individuals, and the rents paid aggregate, for the five offices,† Rupees 148 per mensem. The Vepery Police Office not being at the time required by Government, it was placed at my disposal for my Head Office. Here all common prostitutes had at first to attend for purposes of registration and examination; but it was soon ascertained that it was not sufficiently central, and the women could not be got to attend without occasioning them much inconvenience and expense. I, therefore, arranged to attend daily from 11 A.M. to 4 o'clock P.M. at each of the Health Offices in turn.

* Triplicane, including Saint Thomé.
Chintadrepettah.
Vepery.
Black Town.
Royapooram.

	Rs.
† Vepery	35
Triplicane	30
Chintadrepettah	35
Black Town	25
Royapooram	23
Total	148

15. A board has been fixed in a prominent place at each of the Health Offices in the several districts, with notices in the various vernacular languages painted thereon, intimating to those requiring the information, the day and hour when the Health Officer is present to receive application for registration. The several Commissioners of Police have been duly informed of this arrangement, and copies of the notices have been furnished to them. The plan has been found to answer admirably well, and the women give, comparatively speaking, little trouble; considering that prostitution and concubinage are considered no very great degradation among the people of this country, but as a mark of wealth and affluence among the men, and among the women as an easy way of earning a remunerative livelihood.

16. Seven Goomastahs are attached to each district. Their duty is to seek out brothels and other places of resort by prostitutes; to see that all common prostitutes in their district do register themselves, and to bring before the Health Officer all cases of unregistered public prostitution.

17. Strict injunctions have been laid upon the Goomastahs, that, in the exercise of their duties, they are to use no coercion or intimidation, but gentle persuasion; failing this, a printed notice in the vernaculars is served, requiring the person to attend at the Health Office upon a certain day; and should the notice not be attended to, a complaint is laid before the Magistrate, and summons issued for their appearance at the local Police Office. But there have been very few cases, indeed, in which it was found necessary to resort to Magisterial aid; and kindness and tact have been found to be more effective in inducing the common prostitutes to avail themselves of the merciful provisions of the Legislative enactment. There have been twenty-one prosecutions for non-registry and refusing to attend regularly, and nineteen convictions.

18. In my selection of Goomastahs, I was careful to entertain men past the meridian of life, and who could produce a good recommendation from respectable persons; but, notwithstanding this care in my selection, I have had occasion summarily to dismiss some of them for corruption. I should have handed them over to the Police authorities, but the evidence adduced was not sufficient to convict them legally. I was, however, morally convinced of their guilt.

19. The number of Goomastahs is that fixed by the Committee and approved by Government;* but after an experience of six months, I am of opinion, that the strength of the Goomastahs should be increased, and this will become all the more necessary if a Health Office is to be opened at Saint Thomé.

Proceedings of Government, No. 903, dated 29th July 1868, Tabular Statement attached thereto.

20. I would, therefore, beg to propose a re-classification of this portion of the establishment under my charge, and I would suggest that the following be adopted:—

	Inspectors.	Goomastahs, 1st Class.	Goomastahs, 2nd Class.
Royapooram	1	1	4
1st Division, Black Town	1	1	3
2nd do. do.	1	1	3
Vepery	1	1	5
Chintadrepettah	1	1	5
Triplicane	1	1	3
Total	6	6	23

	New Rates.	Old Rates.	Increase.	Remarks.
	RS.	RS.	RS	
6 Inspectors at 25	150			
6 1st Class Goomastahs at 20	120	575	40	Total increase 47 Rupees.
23 2nd do. do. at 15	345			
5 Apothecaries at 50	250	250		
5 Officers...	200	200		
1 Sweeper at 6	6	26		
4 Do. at 5	20			
3 Peons at 7	21	14	7	
1 Writer at 30	30	30		
1 Do. at 15	15	15		
Contingencies	25	25		

21. The Health Office at Saint Thomé should at once be opened without any further delay, and I beg to recommend the following establishment :—

	Rs.
1 Apothecary	50
1 Inspector	25
2 Second Class Goomastahs, at 15	30
1 Sweeper	5
1 Office	30
1 Peon	7
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22. I beg respectfully to submit to Government that the extra duty put upon the Head Write of the establishment, who has to be present at one of the Health Offices daily, involves an expense which has not been anticipated, and I trust, therefore, that he be allowed horse or carriage allowance of Rupees 15 per mensem.

23. With regard to the examination, I have to report that the speculum vaginæ has always been used, without which many contagious diseases would escape detection.

24. No female is submitted to an examination until it has been satisfactorily proved that she is a "common prostitute." It is only after this has been established, or after a female has declared herself to be a common prostitute, that the personal examination is proceeded with.

25. The examinations take place separately, and are conducted with the greatest delicacy and kindness. A room is specially set apart for the purpose, and two Apothecaries have been appointed examiners. The Health Officer only interferes when there is any difference of opinion. No complaints have been made by the females, who have been examined, of any harshness or indelicacy in the examinations, and it is satisfactory to know that the value of these examinations is beginning to be appreciated by the poor unfortunates for whose benefit they are intended.

Caste.	Number Registered.	Number sent to Hospital.	Number sent to Hospital 2nd time.	Total sick.
East Indians and Europeans	48	31	14	45
Hindoos	562	217	45	262
Mussulmans	119	67	20	87
Pariahs	297	218	26	244
Total...	826	533	105	638

26. In the margin is entered a Memorandum, showing the total number of registrations that have been made up to 15th April, and the number sent to the Lock Hospital.

27. The total number of registrations aggregates 826, and the total number found on examination diseased in terms of the Act, 638; the latter being 77·23 per cent. of the former, which is a very large proportion.

28. Among the various classes the highest percentage of sick during the period under review was among the European and East Indian prostitutes, being 93·75 per cent. of those registered. The Pariahs come next, being 82·15 per cent. diseased of the number who presented themselves for registration. The Mussulmans stand third, the proportion of diseased to those registered being 72·85, while the Hindoos are the lowest, there having been 72·37 found diseased among those whose names have been brought on the books.

29. The reason of the high figure of disease among European and East Indian prostitutes is attributable to the circumstance, that European soldiers and sailors resort to them in preference to the other classes; and it is an acknowledged fact, that the sailors belonging to coasting vessels and steamers spread the greatest amount of disease amongst these unfortunates; this is proved by what occurred when Her Majesty's Ships *Spiteful* and *Octavia* recently visited Madras. These vessels had been cruising about the Indian Ports, and on arrival at Madras, sent most of the European and East Indian prostitutes into the Lock Hospital, although the stay of the ships was very short in the Madras Roads.

30. But the evil thus produced will be arrested by the Legislative Enactment that has lately come into operation, viz., the "Merchant Shipping Act" 1867, Chapter CXXIV., paragraph 10.

31. This Act relates almost entirely to the sanitary condition of merchant seamen, and provides that the local Marine authorities of any port may appoint a Medical Inspector, and that such Medical Inspector may be called upon to examine any seaman at the request of the Master, Owner, or Agent. Under the provisions of this Act, therefore, the Master Attendant at Madras may be authorized to direct Commanders of Ships carrying a Surgeon, to furnish on arrival a clean Bill of Health before any of the men are permitted to land. In cases of ships having no Medical Officer, that the Commanders, Owners, or Agents of such ships should not allow the men to quit the vessels until declared free from contagious diseases by a Medical Inspector; and with regard to Her Majesty's ships, their Commanders or Agents should furnish the Master Attendant with a like certificate of health.

32. I cannot, I feel, too strongly dwell on these measures, for preventing the introduction of contagious disease. There cannot be doubt as to the certainty of contagious diseases being augmented through the above causes, and the immense amount of evil and physical suffering that is occasioned to the European and East Indian prostitutes who disseminate the diseases far and wide, and that it must be impossible to keep the city free from contagious disease if such restrictions on vessels arriving in the Madras Roads are not enforced. For the six months ending 15th April 1869, 132 vessels, including steamers anchored in the Madras Roads, carrying 3,118 Europeans and 5,764 Native sailors, showing a total of a migratory population of 8,882 souls, exclusive of Native sailors in Dhonies. In Calcutta and Bombay every merchant or trading vessel arriving, is compelled by law to provide the ship with a medical man during its stay in port; and thus the men have the means of immediately obtaining medical advice, or being sent to hospital, which unfortunately is not the case at Madras.

33. But irrespective of the medium of sailors, disease is communicated by the male inhabitants of the city who suffer from it secretly, and who communicate it to the courtesans they visit. It is difficult to get at these. The law cannot touch them, and it seems useless to attempt to deal with diseased females only. It is like building up a small breach in the city walls, and leaving the gates wide open to the enemy. It is true that in Gosport, Devonport, Plymouth, and other places, when the Contagious Diseases' Act came into force, great change at once became apparent; until eventually there was scarcely a single case of disease, but this cannot be effected in Madras, simply under the operation of the Act XIV. of 1868. The English towns named above are large Naval and Military stations, and under Naval and Military law, but it is not the case in Madras, and at first sight it looks as if it were a hopeless task to attempt anything in respect to the male inhabitants of Madras. I would, however, beg to observe that, from inquiries, I have ascertained that cases of Syphilis have been on the increase in Madras, since the abolition of the District Dispensaries and Hospitals, which compel the diseased, who cannot afford to employ private practitioners, either to resort to the General Hospital, or the Monegar Choultry, or to suffer in secret the effects of the disease. In the smaller Government Dispensaries and Hospitals, persons suffering from disease could come and obtain advice, and go away almost without observation, but a sense of shame prevents persons thus afflicted from availing themselves of the services of such large medical institutions as the General Hospital and the Monegar Choultry, there to be exposed to the gaze of a large establishment of medical subordinates and pupils, and to feel that they are the subjects of mocking observation and humiliating jokes. Whilst, on the subject, I would beg to point out that the Health Officer, appointed under this Act, should not only be for registering and examining prostitutes, but he should be in the fullest acceptation of the term, the Health Officer of the City of Madras. In discharging the duties devolving on him under the Act, he is carried over almost every part of the city, so that he knows all the sanitary defects and requirements necessary to protect the public health, and he is brought in contact with the darkest features of the various communities constituting its inhabitants and yet he cannot compel the Municipality to clean a drain, or order a single hut to be removed, which may be found infected with contagious disease. I would respectfully urge upon Government the consideration of this important point, and solicit early measures be taken. The failure

of rain threatens the country with famine and sickness amongst the poorer classes. The utmost attention should be paid to the sanitary condition of the city, and it is to the interests of the public good, I humbly offer the present suggestion. The Health Officer under Act XIV. of 1868 may be made Health Officer of the town of Madras and Inspector of Shipping on a consolidated salary.

34. The Government of India has fixed the scale of the Health establishment, including the salary of the Health Officer, at Rupees 1,935. Rupees 194 will be required for the extra establishment and new office at Saint Thomé.

35. The number of common prostitutes registered is small, compared with the supposed population of Madras.

36. If all the common prostitutes, who shield themselves under the designation of "dancing-girls attached to pagodas," were brought under the law, the number of registered prostitutes would be greatly augmented. It is undoubtedly true that these women are common prostitutes, and it is equally undoubtedly true that they are the cause of much physical suffering among almost all classes of the Hindoo community, by the dissemination of venereal disease in all its ugliest and deadliest forms, and I would strongly urge upon Government the consideration of the case of these women.

37. The population of Madras is undoubtedly very large, and, irrespective of the dancing-girls, the number of common prostitutes must be greater than that at present registered. However, considering the short time the Act has been in operation, six months, and the many difficulties it has had to contend with, the results have not been unsatisfactory. It is, therefore, clear that the strength of the detective at my disposal must be augmented, as already suggested, until the maximum number of common prostitutes shall have been registered, when the detective element may be reduced to a minimum.

38. There are no actual brothel-keepers among Hindoos and Mussulmans, or those living on the gains of a brothel; and up to the present time, but few houses have been registered as such, and those only among Europeans and East Indians.

39. In the houses of ill-fame inspected by me in Black Town, I saw no sanitary precautions. All the laws of sanitation are set at defiance in the abodes of these unfortunates. The houses in the Second Line Beach and the neighbourhood are located in narrow lanes, reeking with the fœtid odour of decayed animal and other substances; ill-constructed, ill-ventilated, they have all the defects that must render them unhealthy, and the healthiest person who may be so unfortunate as to sleep in these dens of iniquity and disease for a night cannot escape contamination, and cannot but become predisposed to be inoculated with venereal virus.

40. Some law appears necessary to regulate the number of persons occupying each house.

41. The drainage, on the other hand, is very defective. There are no means at hand for speedily carrying off the horrible filth that is produced within these houses. The drains that run through the courtyards are open, and are conveyed through the length of these hovels. They taint the air in every part with the abominable exhalations, which must be pregnant with disease. No deodorizers or antiseptics are used, and it is, indeed, a wonder that sickness and disease are not more frequent in this great plague-spot of the city. Most courtyards have a small well of brackish water used for culinary and washing purposes, into which the soldiers and sailors frequently urinate. The substances which permeate to the wells must, therefore, poison the water, which is utterly unfit for culinary purposes. The fresh water scheme should, among other things, have in view the supply of water for courtyards of native houses, so that the open drains in them may be abundantly flushed and thoroughly cleansed for public urinals, and for flushing and cleansing sewers.

42. Drinking water is sold by the Bheasties at three pies for two small chatties-full, or the same quantity contracted for at eight annas a month equal to six rupees a year. Vehar water in Bombay costs eight rupees per annum delivered on the premises through an inch-piping, and, as far as quantity is concerned, may be kept running all day. The Company provide and lay down the piping, &c., free of cost.

43. The report of the curative portion of the operation of the Act will rest with the Medical Department; but I may here mention that no female is allowed to have a clean ticket, simply because she has been dismissed the Lock Hospital. Every one dismissed the Lock Hospital undergoes a thorough re-examination at the Health Office of the District to which she may belong, and if found not thoroughly cured is returned for further treatment. In fact, no one is allowed to be at large, except a clean ticket of health can be given by the Health Office.

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44. The number of casualties in the Lock Hospital has been seven, and three in their own houses. The cases were those of women in the most wretched condition of poverty, and who died more from want of food, or of proper food; the diseases being consumption and dysentery. There are many of these women who would be glad to abandon a course of life which has brought upon them so much pain, suffering, and distress. Europeans and East Indians find a home in the Magdalene Asylum, but the poor out caste native has no home, no hope of reclamation. She leaves the Lock Hospital, only to undergo the torments of the terrible destiny that has fallen to her lot, and she soon returns to the Lock Hospital the victim of augmented disease and misery, her last state always worse than the first, until death affords final relief.

Names of Diseases.	Number of diseases treated.	Remarks.
Gonorrhœa	378	In the six months from 15th October 1868 to 15th April 1869, 638 common prostitutes were admitted into the Lock Hospital with 759 contagious diseases, 478 were sent out cured, and 160 remained under treatment in Hospital on 15th April 1869.
Chancre... { Hard or infecting	125	
Chancre... { Soft or non-infecting	113	
Secondary or tertiary complications	28	
Non-venereal affections, as Leucorrhœa or simple ulceration of os or cervix uteri	35	
Bubo	15	
Ulceration of labia	48	
Thickening of labia	8	
Venereal warts	6	
Ulceration of Nates...	2	
Syphilitic Rheumatism	1	
Total...	759	

45. The following cases were taken off the registry, and their tickets withdrawn:—

Dancing-girls	2
Left Madras to join their relations up-country	6
Married	20
Proved to be in keeping	8
Transferred to the Magdalene Asylum	1
Total ...	37

From H. STANBROUGH, Esq., Health Officer, Madras, to the Chief Secretary to Government, Fort Saint George; dated 20th January 1869, No. 98.

I have the honour of acknowledging the receipt of your letter, No. 14, dated 18th instant, requesting, for the information of Government, the total number of prostitutes registered in the Health Office since the enforcement of the Contagious Diseases' Act, and the per centage of diseased to the examined.

Patients in Lock Hospital, Black Town	96	
Do. do. do. Vepery	73	
20th January 1869...	169	

2. From the 15th October 1868 to 20th January 1869 (three months), 578 common prostitutes have been registered, from which number 418 have been sent diseased into the Lock Hospital, making a total of cases equal to 72⅓ per cent.

3. Thirty-four (34) have been sent a second time into Hospital for treatment, making a grand total of 451 cases sick, equivalent to 78 per cent.

From the Inspector General of the Indian Medical Department, to the Chief Secretary to Government, Fort Saint George; dated Fort Saint George, 26th January 1869, No. 26.

With reference to your Memorandum, No. 13, of the 18th instant, I have the honour to submit, for the information of Government, a Statement showing the average daily number of women in the Lock Hospitals in Popham's Broadway and Vepery, since they were opened.

Statement.

		Average daily Number.	
		Europeans.	Natives.
Black Town ...	From 16th to 31st October 1868	10	34
	" 1st to 30th November "	8	68
	" 1st to 31st December "	10	91
Vepery	" 1st to 22nd January 1869	14	73
	" 15th to 31st December 1868	...	58
	" 1st to 22nd January 1869	...	70

From H. STANBROUGH, Esq., Health Officer, Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 5th February 1869, No. 112.

I have the honour of acknowledging the receipt of your letter of 4th instant, requesting, for the information of Government, the total number of prostitutes registered in the Health Office since the enforcement of the Contagious Diseases' Act, (15th October 1868), and the per centage of diseased to the examined up to date.

2. From 15th October 1868 to 5th February 1869, 649 common prostitutes have been registered, of which number 379 have been sent into Hospital diseased, making a total of new cases equal to 58 per cent.; 99 have been sent a second time into Hospital for treatment, making a total of 478 cases treated, equivalent to 73½ per cent.

From H. STANBROUGH, Esq., Health Officer, Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 11th May 1869.

Sir Adam Bittleston, Puisne Judge, in summing up a case of perjury before him, at the High Court, on the 5th instant, arising out of the working of Act XIV. of 1868, (Contagious Diseases' Act), informed the Jury "that the Health Officer had no right to summon any person who was not a registered prostitute. Besides that the summons appeared to have his name lithographed or stamped upon it. So it seemed that these summonses could easily be procured by any subordinates wishing to oppress any person."

2. I have the honour of laying before Government the manner in which I have carried out the registration of the common prostitutes of Madras under Act XIV. of 1868.

3. The first prosecution brought before a Magistrate was dismissed, because it was ruled that a verbal request to the prostitute, to come up to one of the Health Officers for registration and examination, was not sufficient evidence, and that a notice must be served on the woman by delivery. In communication with the Commissioner of Police (Major Drever) Form A. was suggested. This, however, was never given, unless after two or three verbal requests the woman refused to attend; if she did, then the notice was served, which failing, a summons was issued out for her appearance before a Magistrate.

4. His Lordship evidently mistook the *notice* for a *summons*. It is in no way binding upon the woman to attend unless she liked.

5. I must say, however, it has had a great effect in causing prostitutes to come up for registration, and thereby lessening the prosecutions which otherwise would have been required. I beg here to remark that, in the six months of the working of the Act, ending 15th April last, only 91 prosecutions had been laid before the Magistrates, 18 of which were convicted, and 2 warned to attend the Health Office. Thinking (perhaps erroneously so) that I was carrying out the wishes of Government, I refrained as much as possible availing myself of the assistance of the Police, and, without in any way disparaging their services, I conscientiously believe the Act has worked well without them.

6. I believe no question of doubt can be raised against Public Officers stamping official papers. All Police summonses, and even bank-notes are so stamped. No notices to prostitutes are ever given without my sanction, and stamping them with my name, and the stamp is never left about for subordinates or others to make use of. The remark of His Lordship, that stamped summonses could easily be procured for the purposes of oppression, was uncalled for.

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7. The day after the proceeding in Court, I put myself in communication with the Magistrates of Madras, requesting their opinion with regard to the rules for carrying out the provisions of the Act, copies of which opinions I beg to append; they differ so much from each other, that I consider it necessary respectfully to request that the Government will either revise the rules, or give me further instructions.

MEMORANDUM.

The Indian Contagious Diseases' Act.

Under Act No. XIV. of 1868, it is evident that the Government has power to make such rules as they may deem necessary to carry out the provisions of the Act—*vide* sections in the margin.

Sections 3, 11, 21.

It is clear from the wording of Section 24 that the notice should be either a written or printed one, else it could not "be *served* by delivery thereof either to the woman (prostitute) personally, or to some person for her at her usual place of abode;" and under Clause 1 of the Rules, it appears to be the duty of the Health Officer to cause such notices to be served; although it is not quite clearly expressed in the Rules, as it might have been, yet the service of the notice is evidently the preliminary step to registration, notwithstanding it has been laid down by the Puisne Judge, that the Health Officer had no right to summon an unregistered prostitute.

In the event of the woman neglecting to attend to such notice, it is then the duty of the Police to apprehend her, and have her conveyed to the hospital.

Under Rule 5, it appears to be the duty of the Commissioner of Police to license the residence in town of all common prostitutes "*wishing* to obtain permission;" and under Section 6 of the Rules, to send all licensed prostitutes to the Health Officer for the purpose of being registered; but there appears to be no provision either in the Act or Rules to oblige the prostitutes to seek a license, she might urge that she is unwilling to obtain permission; true this is met by the penalty provided in Section 14 of the Act; but cases of this nature involve such minute investigation, as sometimes to subject family women to great exposure.

The Commissioner of Police to license in the first instance, and the Health Officer to register afterwards.

Under Section 40 of the Rules, the Police have the power to arrest any woman, not registered as a common prostitute, found *publicly* soliciting, &c.; they can interfere so far, but no further; they have no right to enter *houses* of ill-fame, with the view to sending the prostitutes before the Health Officer. A notice must, in the first instance, be served on the woman.

She can be prosecuted by the Commissioner of Police, or Inspector, or the Health Officer, or any subordinate specially deputed by them.

In the Proceedings of Government, dated 29th July 1868, 35 Goomastahs have been assigned to the Health Officer, for the purpose of collecting information regarding prostitutes, who are apparently required to act independently of the Police as detective agents, the Police merely acting as a check on them.

The above has reference to the points now under consideration.

The printed notice now in use, and served under the signature of the Health Officer to common prostitutes, appear to be quite legal.

Vide Section 14 of the Act.

In default of attendance, it is the duty of the Police to apprehend the woman, and convey her to the hospital.

It is evident that the Act and Rules, and the Proceedings of Government, constitute the Health Officer the chief agent to carry out the provisions of the Act, for which purpose he appears to be armed with ample power; and the duties of the Police appear to be in the licensing and sending such prostitutes for registration, in the apprehending of defaulting prostitutes, and sending them before the Health Officer, or prosecuting them when necessary.

As to Public Officers stamping official papers with their names, no question of doubt can be raised on this point, as it has been long since determined in the affirmative.

(Signed) T. G. CLARK,

7th May 1869.

Senior Magistrate.

ACT XIV. of 1868.

The power of Government to frame Rules consistent with the Act is unquestionable; and I take it there is also no question as to the propriety of printing or writing such notices as are required for service under the Act.

2. The Act deals with two classes of prostitutes, "Registered and Unregistered."

3. The practice now is, I am informed, that, when the Health Officer has reason to suspect any woman to be a common prostitute, and she is not registered as such, a notice (Form A) is served on her. When in obedience to this notice she attends at the Health Office, she is registered as a common prostitute, unless she can satisfy the Health Officer that she is not such. If a woman, on whom a notice (A.) has been served, is suspected of being diseased, she is served with an order (B) to proceed to the Lock Hospital; should she fail to do so, a requisition for her arrest (Form C) is sent to the Police, and she is thereupon taken into custody.

4. Assuming that the woman has unwillingly attended in obedience to the summons (A.) and has thereupon been registered, it appears to me that the whole of the foregoing procedure is illegal. I regret I am unable to agree with Mr. Clark that "the service of a notice is evidently the preliminary step to registration." The sections empowering service of notices on women are Sections 14, 17, and 20; and the words of the Act could not be more clear. In each instance, it is expressly provided that such notices are to be given to *registered women*. No where in the Act is provision made for service of any notice on a woman not previously registered under the Act.

5. It appears to me clear that, except for the purpose of pursuit on under Section 4, the Health Officers have no power to interfere with any woman not registered under the Act, and not registered in the manner prescribed by the Act, namely, at the request of the woman herself, unless she has been convicted, and thereupon registered under Rule 42.

6. The preliminary step in registration should be taken before the Commissioner of Police, to whom every prostitute, wishing to reside within the town of Madras, is to apply for permission so to reside (Rule 6), and, on this permission being granted, the applicant is referred to the Health Officer for the purpose of being registered. The Commissioner of Police takes no part in the actual registration; he merely sanctions the residence of the woman as a condition precedent to her being allowed to exercise her profession. I do not quite understand what Mr. Clark means by there being no provision in the Act or Rules to oblige prostitutes to seek a licence. They cannot carry on the business of prostitute without first obtaining a license to reside, and completing their registration, and it is obligatory on them to apply for such license and registration without any notice from the Police or Health Officer.

7. Rule 41 gives power to any of the officers mentioned in Rule 4 to commit for trial any woman charged with publicly soliciting or practising common prostitution, and not being a duly registered woman; and by Rule 40, the Police are authorized to arrest any such woman found publicly soliciting, or found in the act of prostitution. To enable them to act under this latter Rule, the party arrested must, at the time of arrest, be found in the act of committing the deed. It is the only instance in which non-registered women can be summarily dealt with.

8. The three forms (A., B., C.) in use by the Health Officer are, in my opinion, applicable only to women *duly registered* under the Act.

9. In the case of non-registered women practising prostitution, the mode of proceeding is by prosecution under Section 4, Act XIV. of 1868.

10. Prosecutions may be instituted by the Commissioner of Police, or by the Health Officer. The Committee, in their Report to Government (vide Proceedings, dated 23rd July 1868), recommended that to the *Health Officer* should be intrusted "the important duty of discovering and prosecuting all cases of clandestine prostitution, and of breaches of the rules."

8th May 1869.

(Signed) T. WELDON,
Magistrate.

From H. STANBROUGH, Esq., Health Officer, Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 6th July 1869, No. 38.

I have the honour of forwarding copies of judgments, given by Captain Weldon, Magistrate at the Royapettah Court, upon two common prostitutes, taken before him, for neglecting to appear for medical inspection on 4th January 1869, and 11th January 1869, at the Vepery Health Office; the place entered in the tickets delivered to them in disobedience of the rules made by the local Government, under Section 11 of Act XIV. of 1868.

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2. The cases are as follow:—On the 16th November 1868, the two defendants, Thoyee and Meenatchee, carrying on prostitution with another woman in Choolay, named Nagamah, were brought to the Health Office in Vepery for registration. The usual questions were put to them, and evidence taken as to their mode of living, &c., &c. Sufficient proof having been established as to their carrying on common prostitution, they were registered in the book kept for the purpose, underwent the required examination, and tickets of registration were given to them. Nagamah being found diseased was sent into the Lock Hospital, where she remained for 28 days. No objection was made at the time of registration by any of them. There can be but little doubt, one of their number being sent into the Lock Hospital deterred the other two from appearing before me in December. In January, upon their still refusing to come to the Health Office, application was made for summonses against them at the Royapettah Police Court, for disobeying the rules of the Act; not answering to the summonses, warrants were issued, and although they have been frequently seen about the neighbourhood, and one of them was known to have left Choolay and gone to Tondiarpet, yet the Police until pressed by the Magistrate for a return of the warrants, some seven months were permitted to elapse before arresting them.

3. Captain Weldon writes, that the registration was not a *voluntary* registration, and by their not complying, as shown by their continued declining to appear, they were registered only by the arbitrary act of the Health Officer.

4. When the Act first came into force in Madras, viz., 15th October 1868, for certain reasons I was instructed to work, as much as possible, without the assistance of the Police, and in a letter from the Committee appointed under the Contagious Diseases' Act to the Chief Secretary to Government, dated 23rd July 1868, "a certain number of Goomastahs are recommended, whose duty it would be to discover and report all clandestine prostitution. There will be an advantage in separating this detective agency from the ordinary Police; the latter will act as a check on these agents, &c." The consequence has been, that the Commissioner and Deputy Commissioner of Police, unless called upon by me for assistance, have abstained, as much as possible, in interfering in any way in the carrying out of the Act, and by leaving me uncontrolled have, in a great measure, assisted the working of it.

5. In rules for my guidance under Sections 5, 11, and 21 of the Act, paragraph 6, common prostitutes should first appear in person before the Commissioner of Police, to obtain permission to reside within the limits of Madras, and should then proceed to the Office of the Health Officer for the purpose of being registered. In the framing of these rules, the difficulties, of late, met with were never anticipated, nor could the Act have intended that *complying* with the rules meant *voluntarily doing so*, as read by the Magistrate.

6. There are two classes of prostitutes—one comprised of the women who voluntarily submit to registration under the Act, and the other comprises those who, without having been registered, practise prostitution as a calling, are prosecuted by me, and after conviction are compulsorily registered, and liable to all the penalties presented by the rules as those who voluntarily present themselves.

7. The two women in the present case, before the Magistrate, belong to neither of the two classes, not having been convicted before a Magistrate, they are not of Class 2; the Magistrate declares they are not of Class 1, as they did not consent voluntarily.

8. In my humble opinion they are common prostitutes; for in November, when registered, they were living with a third prostitute, who was diseased (also been sent a second time into the Lock Hospital), and when asked by me whether they had anything to say in their defence, replied they had not. If the decision of the Magistrate rules as a precedent, I can only say there is no prostitution in Madras, inasmuch as no woman will *voluntarily* register herself, and that about 1,000 women registered by me in the books of the Health Office, and who have received tickets as common prostitutes, are not so, as they have not complied with the Act in *voluntarily* registering themselves, and receiving permission from the Commissioner of Police to reside in Madras.

9. I, therefore, respectfully submit such modification be made in the rules under Sections 5, 11, and 21 of Act XIV. of 1868, as may be considered necessary by the Right Honourable the Governor in Council, in order that greater power may be given to the Health Officer in the registration of common prostitutes, and that, when registered, their names cannot be removed from the register, unless a suit be instituted against the Health Officer, in accordance with paragraph 25, Act XIV. of 1868.

In the Rotapet Police Court.

Calendar Nos. 247 *and* 248 *of* 1869.

Health Officer of Madras, *versus* Thoyee and Meenatchee.

Judgment.—In these cases, defendants are charged for that they being common prostitutes duly registered under Act XIV. of 1868, (Contagious Diseases' Act,) neglected to appear for medical inspection on 4th January 1869, and 11th January 1869 at Vepery, the place entered in the tickets delivered to them, in disobedience of the rules made by the local Government under Section 11 of the said Act.

Defendants admit non-attendance, but dispute the validity of their registration and their liability under the Act.

It appears from the evidence that, some time in November 1868, a Goomastah of the Health Office served on defendant *Thoyee*, who resides in the same house as defendant *Meenatchee*, a formal notice or summons, in which both the defendants' names were entered, requiring them to attend at the Health Office on a certain day. On the 16th November 1868, the defendants accordingly attended at the Health Office, when they were registered as common prostitutes. The defendants never subsequently attended for medical inspection, as it is contended for the prosecution, they were bound to do.

On the 16th January 1869, the Health Officer lodged information and obtained warrants for the arrest of defendants, who were not apprehended till the 19th June 1869; and on the 21st June 1869, their cases were heard upwards of seven months subsequent to their alleged registration.

Defendants allege that they attended at the Health Office under compulsion on 16th November 1868; that the Health Office Goomastahs, acting on information imparted by some persons who bore them ill-will, procured a notice or summons from the Health Officer, which was served on them; that they then protested, and have ever since protested against being registered as prostitutes, but that the Goomastahs threatened them that, if they failed to obey the summons, they would be fined 25 Rupees and sentenced to a month's imprisonment, and told them they might represent the case to the gentleman, (Health Officer); that fearing the consequences of disobeying this summons, they did attend at the Health Office where they again protested, and that they were then told they might go away; that they are not prostitutes, and never consented that they should be registered as such.

The Goomastah, who served the Health Office summons on the defendants, denies that they made any objection either then or when they appeared before Dr. Stanbrough, but he admits that he did tell them that they could state to the Health Officer anything they wished to say about the matter, and subsequently he admits that he was not in the room when they were registered by Dr. Stanbrough. Defendants produced evidence to show that they did protest at the time the Health Office summons was served, and that, in fact, *Thoyee*, to whom it was tendered, refused to receive it, but that the Goomastah threw it down warning them of the consequences. On the whole, I am of opinion that the defendants did protest.

With regard to what passed at the Health Office, there is the evidence of *Mr. Pope*, the Head Goomastah. This witness states that the defendants were brought before Dr Stanbrough, who questioned the Goomastah about them. That "defendant was then asked what she had to say in her "defence, she said nothing, and was thereupon registered, and received a ticket." He (witness) "did "not hear defendant make any objections to being registered. The practice is that all the prosti- "tutes are asked what they have to say in their defence, and if they say nothing they are registered. "Cannot say if the defendant received permission from the Commissioner of Police to reside in "Madras. Defendant did not apply to be registered."

According to this evidence, the practice is to place women suspected of prostitution on their trial before the Health Officer, and unless they can show that they are not prostitutes, they are adjudged to be prostitutes, and thereupon, willing or unwilling, registered as such.

In the present case I come to the conclusion that the defendants are registered prostitutes only in so far that their names are entered in the Registers of the Health Office, but that such registration was not a voluntary registration of themselves by defendants, but the arbitrary act of the Health Officer.

I do not suppose it will be disputed that, if a prostitute is not registered under the Act (XIV. of 1868), she is not liable to punishment for a breach of the rules framed under Section 11 of that

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Act for the due examination of registered women. Section 5, Clause 2, in unmistakeable terms, defines who are to be deemed as registered under this Act, viz., every woman and every brothel-keeper *complying with the rules made by the* local Government for the registration of common prostitutes and brothel-keepers. No where either in the Act or in the rules framed thereunder is power given to the Health Officer to register a woman against her will, or even without her consent, except in the sole instance of a woman who has been convicted before a Magistrate of soliciting publicly, or practising common prostitution without being registered. (Rule 42). The terms of this rule clearly point to the course to be pursued if a non-registered woman is accused of being a common prostitute. She should be prosecuted under Section 4 of the Act, and if convicted, she will then be registered without reference to her wishes in the matter. The Health Officer now claims a power to register unwilling women as prostitutes without any formal trial and conviction. I am of opinion that he does not possess that power.

Holding then as I do that the defendants in these cases are not duly registered as common prostitutes, in accordance with the provisions of the Contagious Diseases' Act, I must also hold that they are not liable to punishment for disobedience of the rules framed under Section 11 of that Act, and they must accordingly be discharged.

(Signed) T. WELDON,
Magistrate of Police.

22nd June 1869.

From the Accountant-General, Madras, to the Chief Secretary to Government, Fort Saint George; dated Fort Saint George, 2nd June 1869, No. 707.

Examiner of Claims' Department.

I have the honour to request that I may be informed, with reference to the letter addressed to you by the Secretary to the Government of India, No. 1,672, dated 10th April last, whether I am at once to discontinue paying Dr. Brockman his salary as Medical Officer in charge of the Lock Hospitals, Madras.

From the Secretary to the Government of India, Home Department, (Public,) to the Chief Secretary to Government, Fort Saint George; dated Simla, 10th April 1869, No. 1,672.

I am directed to acknowledge the receipt of your letter, No. 250, dated the 25th February last, and, in reply, to state that His Excellency the Governor-General in Council does not object to the appointment of a Commissioned Medical Officer to the charge of the Lock Hospitals at Madras, provided that his salary and all other additional charges on his account defrayed from local, and not from Imperial funds.

Proceedings of the Government of India, Financial Department, dated Simla, 30th June 1869, No. 1673.

Read endorsement by the Home Department, No. 2658, dated 8th June 1869, on a letter from the Government of Madras, soliciting confirmation of its sanction to the entertainment of the following establishments for the Lock Hospitals in Black Town and Vepery.

Lock Hospital, Black Town, Madras.

		Rs.	
Establishment not interfered with...	...	478	
One Native Nurse	...	30	
One second-class Hospital Assistant	...	40	
Total ...		557	Rs. 70. Increase per month.

Lock Hospital, Vepery, Madras.

		Rs.	
Establishment upon the above scale	...	557	
Total ...		627	

RESOLUTION.—The Governor General in Council desires that, with reference to Financial Order No. 2495, dated 16th September 1868, the Government of Madras may be asked, why the proposed additional charge of Rupees 627 monthly should not be paid by the Municipality of Madras.

ORDER.—Ordered, that the above be communicated to the Home Department, with reference to Financial Resolution of 16th September 1868, and with a request that the necessary inquiry may be made of the Government of Madras.

(Signed) R. H. HOLLINGBERY,
Assist. Secy. to the Govt. of India.

No. 3199.

Copy forwarded to the Government of Fort Saint George (with reference to letter thence, No. 564, dated the 1st of May last), with a request that the desired information may be supplied.

By order,
(Signed) J. GEOGHEGAN,
Under Secy. to the Govt. of India.

HOME DEPARTMENT, PUBLIC,
SIMLA, 10*th July* 1869.

From the Inspector General of the Indian Medical Department, to the Chief Secretary to Government, Fort Saint George, dated Fort Saint George, 22nd December 1868, No. 403.

I have the honour to bring to the notice of Government, that in the Civil Budget Estimate of this department, for the year 1869-70, recently submitted, a sum of nearly Rupees 20,000 was provided on account of the Lock Hospital in Black Town, including the salaries of the medical and menial establishments, and all other expenses connected with the institution.

2. This provision was made for about fifteen European and forty Native patients, or fifty-five in all. This number has already doubled in Black Town, and an additional Hospital has been opened in Vepery, which contains at present forty-five patients, and will have many more as soon as tents have been provided for their accommodation; so that in course of the year, to which the budget refers, the number of patients treated in these institutions will very greatly exceed that originally contemplated, and will probably not be less than 200 at any time. It becomes necessary, therefore, that supplementary provision of funds should be made, corresponding to the probable wants of these Hospitals; and I have accordingly the honour to recommend that the Accountant General may be instructed to provide an additional sum of Rupees 50,000 by a supplemental estimate.

From the Inspector General of the Indian Medical Department, to the Chief Secretary to Government, Fort Saint George; dated Fort Saint George, 4th June 1869, No. 221.

Adverting to my letter, No. 403, of the 22nd December 1868, soliciting that the Accountant General may be authorized to apply for a supplemental grant of Rupees 50,000, on account of the increased number of patients received into the Lock Hospitals at Madras, I have the honour to bring to the notice of Government, that the Accountant General has intimated to this department, that the Government of Indian have sanctioned the sum of Rupees 14,944 on account of the Madras Lock Hospital.

2. This amount was the sum originally budgetted for by this department for the Lock Hospital at Black Town alone, calculated for fifteen Europeans and forty Natives. I have not been informed that any application has been made to the Government of India for increased provision, as suggested in my letter, quoted in paragraph 1, on account of the greatly increased number of patients in the Black Town Lock Hospital, and the patients treated in the Vepery Branch Establishment, since submission of my Departmental Budget.

3. In his letter noted in the margin, the Examiner, of Medical Accounts says: "The only Lock Hospital mentioned in you list (of budget grant) is that in Popham's Broadway. I shall feel obliged by your informing me, whether the amount apportioned to it is intended to cover the charges incurred in the Vepery Lock Hospital also, if not, how they are to be met. The total sum sanctioned is Rupees 14,944, while the compilation statement already forwarded to you, shows that, during the few months of the past year that these institutions were in existence, the expenditure was Rupees 15,529-5-0." I have the honour, therefore, respectfully to solicit the instructions of Government in reference to the question put by the Examiner of Medical Accounts.

No. 399 of 31st May 1869.

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4. I think it right, at the same time, to bring to the notice of Government, that there is no prospect of any considerable saving on the general grant of the Department, which may be made available towards meeting the increased expenditure on account of the Lock Hospitals. The Budget grant for 1868-69 was Rupees 1,57,932, and the expenditure, Rupees 1,54,371, leaving but a small balance of Rupees 3,561. The subsequent Budget for 1869-70 has been constructed with a strict regard to the actuals of the preceding year, and is not likely to leave a balance even to the extent of last year. It is, therefore, in my opinion, absolutely necessary to procure from the Government of India an additional grant to the extent recommended in my letter, on account of Lock Hospital patients, in excess of the number originally contemplated by Government to be treated in the Hospital at Black Town, viz., fifteen Europeans and forty Natives only.

* * * * *

(Here was read letter, No. 781, dated 15th March 1869, from the Sanitary Commissioner, Madras, to the Chief Secretary to Government, on the over-crowded state of the Vepery Lock Hospital, recorded in Minute No. 59, page 95 of these Proceedings).

ORDER THEREON, 19th August 1869, No. 1,162.

In the first of the papers above recorded, Mr. Stanbrough, the Health Officer appointed under the Indian Contagious Diseases' Act XIV. of 1868, submits a Report on the results obtained under the provisions of the law during the first six months since the Act has been in operation.

2. The town of Madras has, for the purposes of the Act, been divided into the five districts marginally noted, which are coincident with the Municipal divisions; and in each of these, Health Offices, for the registration and examination of common prostitutes, have been established. Seven Goomastahs are attached to each of the divisions, and to them is assigned the duty of obtaining the information necessary regarding the brothels and residences of prostitutes within their respective divisions.

Triplicane, including St. Thome.
Chintadrapettah.
Vepery.
Black Town.
Royapooram.

3. On this information being obtained, a printed notice, under the signature of the Health Officer, is issued to each brothel-keeper and prostitute, requiring them, in accordance with the provisions of the Act, to attend at the Health Office, on a special date, for the purpose of registration and examination. In the event of the notice being disobeyed, information against the defaulters are laid before a Magistrate, and summonses are obtained, enforcing their appearance at the Police Office.

4. After registration and examination, the prostitute, if found free from disease, has a registration ticket issued to her, is required to appear weekly for medical examination, and the results of these examinations are recorded on the ticket, which is in the form of a book, with sufficient space to admit of the record of six months' examination. In the case of a prostitute being found diseased, she is sent to one of the Lock Hospitals. There are two of these Hospitals, one in Vepery, the other in Popham's Broadway, Black Town.

5. When prostitutes are convicted of disobeying the rules regarding registration and examination, they are, if sentenced to imprisonment, examined on the expiration of their term of imprisonment, and their registration is completed.

6. The Health Officer reports, that, for the six months under report, this system has, with certain exceptions to be hereafter noted, worked satisfactorily.

7. There has been little overt resistance to the law, the treatment of the women at the Lock Hospitals has been kind, and has removed much of the apprehension felt on the first introduction of the system, and there has been already a sensible progress made in the reduction of venereal disease, by the sequestration of the class of prostitutes most resorted to by the European population of the town.

8. The table marginally given exhibits the total number of registrations, the total number sent to hospital originally and for a second time, and the total number of sick.

Caste.	Number registered.	Number sent to Hospital.	Number sent to Hospital 2nd time.	Total sick.
East Indians and Europeans ..	48	31	14	45
Hindoos	362	217	45	262
Mussulmans ...	119	67	20	87
Pariahs	297	218	26	244
Total...	826	533	105	638

9. The total number of registrations has been 826, and the total number of prostitutes found to be diseased 638, exhibiting a ratio of sick to total number registered of 77-23. During the short period that the Act has been in force, and with the necessity of introducing the law cautiously, it has not

been possible to embrace in the registration anything like the whole of the various classes of prostitutes, but sufficient evidence is afforded by these figures of the deplorable prevalence of venereal disease, and of the necessity of gradually but firmly extending the working of the law.

10. Among the various classes, the highest per-centage of disease was among the European and East Indian prostitutes, namely, 93·75 of those registered. The Pariahs come next, being 82·15 per-cent.; the Mahomedan prostitutes stand third in the list, the proportion of diseased to those registered being 72·85, while the Hindoos are lowest, the proportion of diseased to registered being 72·37.

11. Mr. Stanbrough explains the high rate of disease among the European and East Indian prostitutes, by the circumstance that they are frequented almost exclusively by European Soldiers and Sailors, and he brings prominently to notice the constant introduction of venereal disease into Madras by the European Sailors belonging to the coasting steamers and vessels.

12. The short visit paid by Her Majesty's Ships *Spiteful* and *Octavia* produced a similar result, rendering it necessary to sequestrate in the Lock Hospital almost all the European and East-Indian prostitutes of the town.

13. The Health Officer points out that much of the benefit to the public health, contemplated by the introduction of the Contagious Diseases' Act, must be frustrated, if this sea-faring and migratory class cannot be controlled. He shows that, for the six months prior to the 15th April 1869, 132 vessels carrying 8,118 Europeans and 5,764 Native Sailors, making a total of 8,882 males, exclusive of Native Sailors of Dhoneys, visited Madras, and largely contributed to the dissemination of venereal disease in the town of Madras. The Health Officer is of opinion that the provisions of the Merchant Shipping Act, 1867, Chapter CXXIV., paragraph 10, can be applied to these persons. It seems doubtful, however, whether the Health Officer is correct in supposing that this Act can be applied in the manner indicated by him.

14. It is, however, possible that the crews of ships visiting the port of Madras, other than ships of the Royal Navy, might be subjected to medical inspection under the Port Rules now undergoing revision, and that the Commanders of Ships belonging to the Royal Navy may be induced to prevent their men landing without previous medical inspection. The question will be referred to the Advocate-General, for his opinion, on the question raised by the Health Officer, and as to the addition above indicated being made to the Port Rules.

15. The Health Officer suggests that increased facility should be afforded for the treatment, as out-patients, of men suffering from venereal disorders, and who are unwilling to resort to the General Hospital or the Monegar Choultry, owing to the publicity involved in attending at such public institutions.

16. The necessity of affording other means for the treatment of these out-patients, than are at present available, will be referred to the Inspector-General of the Indian Medical Department.

17. The Health Officer brings to notice the defective sanitary condition of those portions of the town in which brothels and prostitutes' houses are situated, and suggests that some additional powers should be conferred upon him for the suppression of nuisances. The Government are unable to comply with this suggestion. The proper course is for the Health Officer to bring to the notice of the President of the Municipal Commission cases of nuisance, of defective drainage, and of overcrowding. They feel confident that Colonel Denison will lose no time in enforcing the provisions of Act IX. of 1867, which are sufficient to meet the cases mentioned by the Health Officer.

18. Dr. Stanbrough, in paragraphs 7 to 11 of his Report, brings to notice certain classes of women who, although practising prostitution, escape the action of the law. These are—

(1.) Dancing-girls, who although not regularly borne on the list of the Temples, are occasionally employed to dance and sing there, but who are in reality common prostitutes. These number, it is stated, 1,200.

(2.) Women who live on the same premises as kept-women, but who are themselves common prostitutes.

(3.) Women who are designated as "slave-girls," and who are attached to the zenanas of Mahommedans, and practise common prostitution.

(4.) Mahommedan dancing-girls.

(5.) Women who after sunset solicit in the neighbourhood of the Esplanades, General Hospital, and the Evening Bazaar.

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19. The Government observe that, although in the instructions issued to the Health Officer, he was desired carefully to distinguish between concubinage and prostitution, the Act is applicable to any woman against whom there is evidence that she is a common prostitute, and that no exemption is extended to dancing-girls, if such evidence is forthcoming against them.

20. It will, therefore, be the duty of the Health Officer to enforce the law against all the classes above enumerated. The attention of the Commissioner of Police is drawn to the statement contained in paragraph 12, regarding the class of prostitutes who solicit on the public highway after sunset. The action of the Police should be directed to the prevention of offences against public decency, and the Police should actively assist the Health Officer in the detection of common prostitutes who have not registered in accordance with the rules framed by Government under the Contagious Diseases' Act.

21. In his letter, No. 58, dated 6th July last, above recorded, the Health Officer submits copies of judgments given by the Magistrate of the Royapettah Court, in which the prosecution against two registered prostitutes, for not appearing for medical examination, broke down in consequence of the Magistrate holding that the registration was not voluntary.

22. The practice has been, it appears, that on information being given by his Goomastahs to the Health Officer, that a woman is a common prostitute, for him to serve her with a notice, requiring her to attend at his office for inspection and registration, and pointing out the penalties to which a common prostitute renders herself liable for non-registration. If the woman fails to attend, an information is laid before a Magistrate, charging the woman with practising common prostitution without having complied with the provisions of Act XIV. of 1868, regarding registration. These notices are issued by the Health Officer to induce prostitutes to comply with the provisions of the law, without undergoing a trial before the Magistrate, and incurring the punishment provided for failure to register. In the great majority of cases, these notices serve to show the women that they are known as common prostitutes, and they at once attend at the Health Office for registration and medical examination.

23. In the cases tried before the Magistrate, the prostitutes had appeared in consequence of being served with notices, and their names were registered, but they failed subsequently to attend for the regular medical examination.

24. When before the Magistrate, they pleaded that their registration was not voluntary, and the Magistrate considered this plea valid, not as it would appear from evidence that they had been compelled to attend further than by the service of the notice, or by the proof that they were respectable women who should not have been served with a notice, but on the ground that the Health Officer had exceeded his powers by the issue of the notice, and on their appearance, deciding that they were common prostitutes, and as such registering their names.

25. The Government do not consider it necessary to pronounce any opinion on the cases brought to notice by the Health Officer, but they are satisfied that, unless it is shown that the course hitherto followed is illegal, the issue of notices by the Health Officer should be continued. It is not desirable that every common prostitute, who neglects to come forward for registration, should forthwith be subjected to a criminal prosecution. The notice, showing her that she is known to the Health Officer, and informing her of the penalty to which she renders herself liable by not complying with the provisions of the law, is generally effectual, and is a more lenient method of dealing with an ignorant class than by prosecution before a Magistrate. The Government resolve to take the opinion of the Advocate General upon the question raised by the Magistrate of the Royapettah Court, and to request him, in communication with the Health Officer, to propose such additions to the Rules framed under the Contagious Diseases' Act as may appear necessary.

26. In paragraph 19 of his Report, the Health Officer recommends a re-distribution of his establishment, involving an increase of Rupees 47 per mensem, and that his head writer, who has to visit the several Health Offices, should be granted an allowance of Rupees 15 per mensem.

He also recommends that an additional Health Office should be opened at St. Thomé, involving a monthly increase of Rupees 147.

The total increased charge will amount of Rupees 194 per mensem.

27. The Government are satisfied that these additions are necessary for giving effect to the Contagious Diseases' Act, and sanction this increased expenditure in anticipation of the approval of the Government of India.

28. With reference to the letter from the Accountant General, dated 2nd July last, above recorded, and to the letter from the Government of India, dated 10th April last, No. 1672, in which sanction is accorded to the appointment of a Commissioned Medical Officer to be in charge of the Lock

Hospitals of Madras, provided that his salary and all other additional charges on his account are defrayed from Local, and not from Imperial Funds, His Excellency in Council resolves to authorise the Accountant General to continue the payment of Dr. Brockman's salary, pending a further reference to the Government of India, in which it will be explained that the only Local Fund which could furnish aid to the Lock Hospitals, is that derived from Municipal taxation; and that the financial condition of the Madras Municipality is not such as to render it possible for the Municipality to contribute to the cost of the Lock Hospitals at present, even if the Government had authority to require such a contribution.

29. The absolute necessity of an additional provision in the Medical Budget, to meet the increased charge on account of the Lock Hospitals at Madras, which is explained in the letter of the Inspector General of the Indian Medical Department, dated 4th June 1869, above recorded, will also be represented to the Government of India; but previous to making this representation, His Excellency the Governor in Council requests Dr. Mackenzie to forward a detailed estimate of the monthly cost of the Lock Hospitals in Black Town and Vepery, and an exact statement of the addition required to meet the increased charges on account of the great increase in the number of patients in these Institutions.

30. It is observed that Dr. Mackenzie has roughly estimated this increased charge at 50,000 Rupees.

31. Pending the receipt of the sanction of the Government of India, the Accountant General is authorized to pass these charges upon bills countersigned by the Inspector General of the Indian Medical Department.

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Adoption of uniform Vaccination Returns.

Read the following letter from the Sanitary Commissioner with the Government of India, referred by the Under Secretary to Government in the Public Department, recommending the advisability of introducing uniform Returns of Vaccination in the three Presidencies:—

From J. M. CUNNINGHAM, Esq., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Home Department, No. 467, dated Simla, the 19th June 1869.

I have the honor to suggest, for the consideration of the Government, the advisability of introducing an uniform series of statements for the purpose of registering vaccination in the different provinces. These returns now very much, and it is, in consequence, difficult to draw any comparison between the results shown in them.

2. The information which is now furnished is in some cases extremely meagre, and in nearly all there is an absence of definite data regarding the extent and cost of the establishments. Such details are of great importance in connection with the results attained by the department, and they would be extremely useful for reference when proposals, regarding increase or re-arrangement of expenditure, are submitted for sanction. A recent reference of this nature, which was forwarded for opinion, was the occasion of bringing to my notice the defective and varied nature of the annual statements now in use.

3. I have, therefore, the honor to submit the enclosed forms for the consideration of the Government, and would suggest that they should be introduced with any additions or modifications that may be thought desirable from the commencement of the ensuing year. The forms are simple, and any explanations that appear to be required have been given for the sake of convenience as foot notes.

4. In some provinces, the results of the calendar year are now reported on; in others, the vaccination season is taken as the standard. There are great advantages connected with taking the latter as the period for annual report; and I would, therefore, recommend that the Vaccination Returns should be for the period embraced by the financial year, which corresponds very nearly with the time during which vaccination can be successfully carried out in most parts of India.

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A.

Statistics of Vaccination for the year ——.

VACCINE DEPARTMENT.

Statement No. I., showing the Localities in each Circle of Superintendence in which Vaccinations were performed in the —— *Provinces (or Presidency) during the year* ——.

Circle of Superintendence.	Name and rank of Superintendent.	Name of portion of District or Town in which Vaccinations were performed.	Name of District.	Total number vaccinated.	Results. Successful.	Unsuccessful.	Doubtful.	Unknown.	Total.	Average per-centage of successful cases.
Circle. *	*	†								
		Total...	*							
Circle.										
		Total...								
		Grand Total...								

* Where the Province or Presidency is not divided into Circles of Superintendence, these columns would be left blank.

† The portion of district should, if possible, correspond with the Registration Circle adopted for mortuary statistics, as it is of great importance to test the local effects of vaccination on Small-pox.

Statement No. II., showing the Monthly Numbers and Results of the Vaccinations performed in each Circle of Superintendence in the —— *Provinces during the year* ——.

Circle of Superintendence.	Months.	Districts in which operations were chiefly conducted in each month.	Number vaccinated.	Results. Successful.	Unsuccessful.	Doubtful.	Unknown.	Total.	Average per-centage successful.
Circle.	January								
	February								
	March								
	April								
	May								
	June								
	July								
	August								
	September ...								
	October								
	November ...								
	December								
		Total...							
Circle.	January								
	February								
	March								
	April								
	May								
	June								
	July								
	August								
	September ...								
	October								
	November ...								
	December								
		Total...							
		Grand Total...							

Statement No. III., showing Age, Sex, Caste, &c., of those vaccinated in each Circle of Superintendence in the _____ Provinces during the year _____.

Circle of Superintendence.	District.	Total number vaccinated.	Re-vaccinations.			Age.			Sex.			Caste.			
			First vaccinations.	Re-vaccinations.	Total.	Under 1 year.	Above 1 year.	Total.	Males.	Females.	Total.	Christians.	Mahomedan.	Hindoos.	Total.
—Circle.															
	Total...														
—Circle.															
	Total...														
	Grand Total...														

Statement No. IV., showing Expenditure of the Vaccine Department in each Circle of Superintendence in the _____ Provinces during the year _____.

		Sanctioned.			Expended.			Remarks.
		Rs.	A.	P.	Rs.	A.	P.	
	A.—Paid by Government.							
Supt. Genl.	Salary, at Rs. per mensem							
	Office Establishment, at Rs.							
	Travelling expenses							
	Contingencies							
	&c., &c.							
—Circle.	Superintendent's salary, at Rs. per mensem...							
	Native Superintendent, at „ „ ...							
	Vaccinators, at „ „ ...							
	Vaccinators, at „ „ ...							
	Assistant Vaccinators, at „ „ ...							
	Office Establishment							
	Travelling Allowances							
	Contingencies							
	&c., &c.							
—Circle.	Superintendent's salary ...							
	...							
	...							
	...							
	...							
	...							
	...							
	&c., &c.							
	Total paid by Government...							
	B.—Paid by Municipality.							
	1 Vaccinator, at Rs.							
	1 Do., at „							
	&c., &c.							
	Total paid by Municipality...							
	C.—Paid by Local Funds.							
	1 Vaccinator, at Rs.							
	&c., &c.							
	Total paid by Local Fund...							
	D.—Paid by Native Chiefs or Landlords.							
	1 Vaccinator paid by							
	&c., &c.							
	Total paid by Native Chiefs or Landlords...							
	Grand Total.....							

Taking the grand total of Rs. expended, the cost of each successful case has been.

N. B.—Every item expended by the Department should be included.

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Statement No. V., showing Results of the year _____ as compared with those of each of the previous four years in the _____ Province.

Year.	Total number of persons vaccinated.	Number of successful cases.	Ratio per cent. successful.	Number of Vaccinators.				Cost of Vaccine Establishment.	Cost of Travelling Allowances and Contingencies.	Total cost.	Cost of each successful case.
				Paid by State.	Paid from other sources.	Total.	Number previously employed as Inoculators or Native Practitioners.				
1864 ...											
1865 ...											
1866 ...											
1867 ...											
1868 ...											

B.
DISPENSARY VACCINATIONS.

Statement No. VI., showing Number and Results of Vaccinations performed at Dispensaries in the _____ Province during the year _____.

Station.	Number of Vaccinators employed.	Number of months in which Vaccination was carried on.	Total number of persons vaccinated	Results.					Average per-centage successful.
				Successful.	Unsuccessful.	Doubtful.	Unknown.	Total.	

On the 2nd of August, the Sanitary Commissioner, in communication with the Inspector General, Indian Medical Department, obtained the opinion of the Superintendent General of Vaccination on the subject, and intimated to Government that there was no objection to the adoption in the Madras Presidency, of the forms submitted with the foregoing letter, with the view to render the Vaccine Returns of the three Presidencies uniform.

This was communicated to the Government of India, by the Chief Secretary to Government, under date the 14th of August 1869.

214. Measures to test Pettenkofer's Theory of Cholera.

Read G. O. No. 1,136, dated 13th August 1869, communicating the following letter No. 321, dated Simla, 21st July 1869, from the Secretary to the Govern-

ment of India, together with its enclosures, and requesting the Sanitary Commissioner to state the measures which he would propose for testing Professor Pettenkofer's theory, regarding the origin and propagation of Cholera, and to name the civil stations at which the investigation should be conducted.

Copy of a letter from the Sanitary Commissioner with the Government of India, No. 521, dated 29th June, with enclosures.

I am directed to forward the papers noted in the margin, relative to measures to be adopted for testing Professor Pettenkofer's theory regarding the origin and propagation of Cholera, and to request, that under the orders of His Excellency in Council, steps may forthwith be taken for the institution of experiments, as suggested, in selected Civil Stations in the Madras Presidency; and that a Statement of the recorded results of the experiments, up to the 31st of December next, may be submitted for the information of Government, the observations being continued after that date pending further instructions.

From Surgeon J. M. Cuningham, Esq., M.D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Home Department. No. 529, dated Simla, the 29th June 1859.

I have the honour to forward copy of a letter to the Military Department, No. 521, dated 26th instant, and also 100 copies of memorandum, on the mode of testing Pettenkofer's theory regarding the circumstances under which Cholera is propagated therein referred to.

2. I have the honour to propose that the required apparatus should be provided at a few selected civil stations in each Local Government and Administration, and daily observation recorded at them after the manner suggested for military cantonments. The selection might be made on the recommendation of the local Sanitary Commissioners.

From Surgeon J. M. Cuningham, Esq., M.D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Military Department, No. 521, dated Simla, the 26th June 1859.

One of the most important points to be investigated by the two medical officers, who were specially selected for conducting an enquiry into the origin and propagation of Cholera, is the particular view advanced on the subject by Professor Pettenkofer of Munich.

2. Arrangements have, I understand, been made in Calcutta, with a view to test the truth of Pettenkofer's ideas; but as Cholera is always present there in a greater or less degree, the circumstances are not so favourable for the inquiry as they are in many other parts of India.

3. It appears, moreover, that observations on the level of the sub-soil water can be easily made, without any scientific acquaintance with the subject; and it is evident that the wider the area over which such observations are carried on, the more important will be information likely to be obtained.

4. Under these circumstances, I requested Drs. Cuningham and Lewis to prepare a concise memorandum, shewing, *first*, what Pettenkofer's theory is, and, *secondly*, what are the best measures for putting it to the test. They have accordingly prepared the memorandum, copies of which are herewith forwarded; and I have the honour to suggest that one or two should be forwarded to each military cantonment, through whatever channel the Government may think best, so that the required data may be carefully collected. The necessary apparatus is inexpensive, and might be erected without delay. One well in each military cantonment will be sufficient, and the only precautions which appear to be advisable are to select a well as much isolated as possible from other wells, constantly in use, to protect the top from direct rain-fall, and to record the levels at least once daily.

5. As Cholera is already widely spread, and threatens to become generally epidemic in the Upper Provinces during the present year, the necessary instructions should be issued without delay. A daily register in some such form as the following should be kept, and copies of these registers forwarded at the end of six months, so that they may ultimately reach Drs. Cuningham and Lewis. On examination of the data so collected, those gentlemen will be able to institute additional inquiries on the subject, and, if necessary, to visit the places in which the phenomena appear to require further elucidation.

6. It will be understood that the observations are not to be confined to the time during which Cholera may be present, but should be kept up continuously every day.

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DIAGRAM OF APPARATUS
SUGGESTED FOR OBSERVING
VARIATIONS IN THE LEVEL
OF THE
SUB SOIL WATER

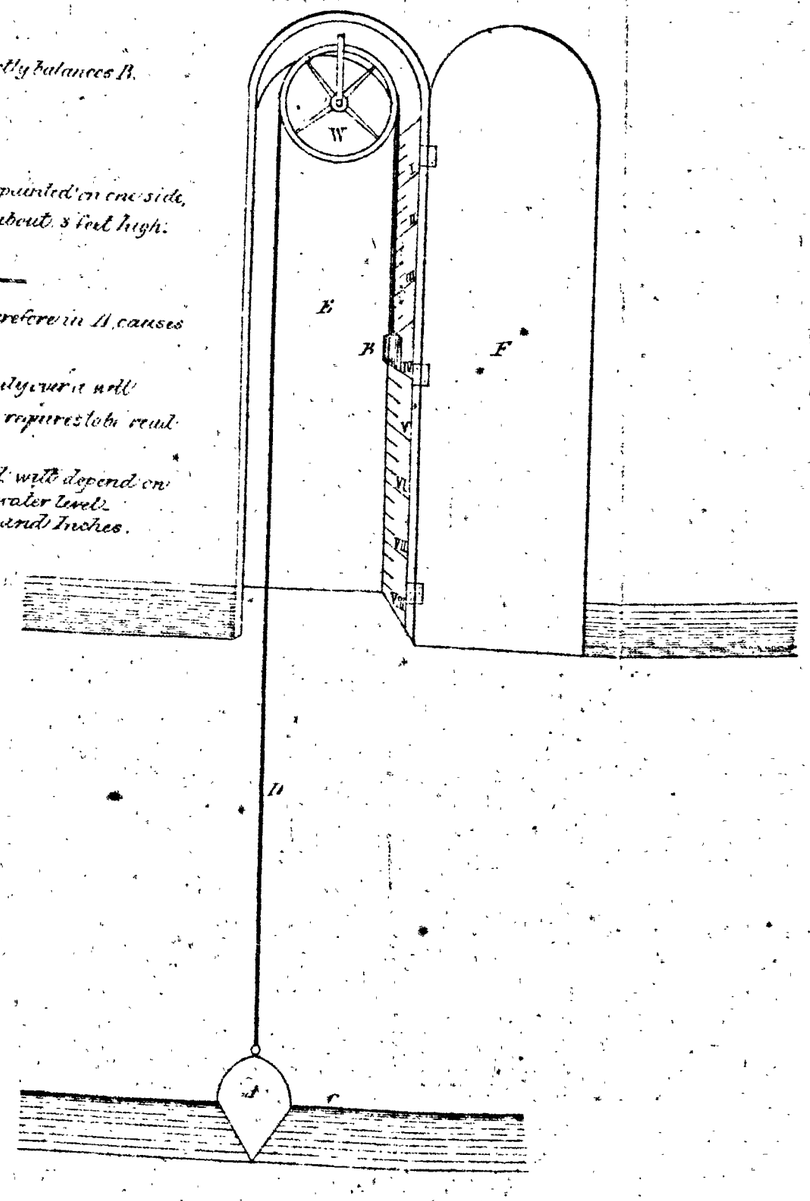
Reference

A Float which when in water, C exactly balances B.
B Weight connected with A by D.
D Cord passing over W.
W Easy running wheel.
E Box containing B. W & C, with scale painted on one side, against which B. hangs, Box here about 8 feet high.
F Hinged door of E.

Any change of level in C and therefore in A, causes corresponding change in B.

The apparatus is to be fixed firmly over a well kept for the purpose and then only requires to be read at intervals.

The height of the Box required will depend on the variations to be expected in the water level. The scale should be divided into Feet and Inches.



DRAWN ON TRANSFER BY SWAMIRAJA MOODLIY
LITHOGRAPHED AT THE GOVERNMENT LITHOGRAPHIC PRESS FORT ST GEORGE MADRAS 1860.

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Form of Register.

Date.		Distance level of sub-soil water from surface of ground.		Fall of Rain.		Number of cases of Cholera reported.			
						Europeans.	Native Troops.	Cantonment Bazaars.	Jail and Civil Population.
Month.	Day.	Feet.	Inches.	Inches.	Tenths.				

7. A copy of this letter will be forwarded to the Home Department, with the suggestion, that similar investigations should be conducted at some selected civil stations in each Province.

Memorandum by Drs. CUNINGHAM *and* LEWIS, *regarding* PETTENKOFER'S *theory of the mode in which Cholera is propagated, and the means to be employed for testing it.*

A.—PETTENKOFER'S THEORY—

1. *The infecting matter* of Cholera is developed from a germ, which, as long as it remains a germ, is not capable of producing the disease.
2. *This germ* is developed into infecting matter in the subsoil, if this affords a suitable nidus.
3. *After development* (if the superincumbent layers be permeable) the infecting matter ascends and produces the disease.
4. The infecting matter may enter water and render it poisonous; but
5. *The germ* is not capable of undergoing development in water.
6. The conditions in the subsoil rendering it a suitable nidus for the germ, are—

(a) a certain degree of moisture.—A soil may be either too dry or too wet to favour the development of the germ, so that an increase of moisture in the former, and a decrease in the latter case, will produce a like result.

(b) the presence of organic matter.—In any permeable soil, it almost necessarily results that organic impurities are washed down through it, and accumulate in the subsoil water, or, in other words, over the first impermeable layer.

B.—POINTS TO BE OBSERVED IN TESTING THE THEORY—

These are various, comprising the nature of the soil, &c., but the most important is the following, *viz.* :—

The association of the occurrence of Cholera in any locality with a change in the amount of subsoil moisture. Is the development and decline of an outbreak coincident with alterations in the amount of sub-soil moisture, and, if so, what are these alterations?

C.—METHOD OF CONDUCTING OBSERVATIONS ON SUBSOIL MOISTURE—

The level of the water in wells, kept exclusively for the purpose, is the best means of estimating the amount of subsoil moisture.

The variations of water level in such wells can be most satisfactorily observed by means of an apparatus, of which the accompanying diagram is a representation.

[The Sanitary Commissioner, on the 23rd of August, in anticipation of the orders of the Government of India on this subject, obtained the sanction of Government for an advance of 100 Rupees, to enable him to sink a well in the compound of his office, and to set up the required apparatus.]

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215. Health of the Sea ports in the Madras Presidency, for June and July.

Read, with reference to Minute No. 156, page 321, the following letter No. 2,880, dated 31st August, from the Sanitary Commissioner, Madras, to the British Delegate to the Board of Health at Constantinople, reporting on the public health at the Sea ports of the Madras Presidency, during the months of June and July :—

In obedience to the instructions conveyed to me by the Madras Government in their Proceedings, No. 676, of the 20th May last, I have the honor to report, for your information, that I have received intimation, that the sea-ports named in the margin were free, during the months of June and July, from Cholera and other epidemic diseases.

Mangalore.
Calicut.
Cannanore.
Tellicherry.
Cochin.

2. In certain parts of Madras, however, Cholera prevailed in an epidemic form. Five deaths occurred in the month of June and 80 in July from this disease.

3. I beg to enclose the Reports* received in this office from the several ports for the months of June and July.

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216. Registration of Deaths in the Cantonment of Madras, (G. O. C. C. No. 4, of 6th January 1869.)

Read the following correspondence with the Officer Commanding Centre Division and the Adjutant-General on the above :—

From the Sanitary Commissioner for Madras, to the Officer Commanding Centre Division, No. 2,678, dated 23rd July 1869.

I have the honor to bring to your notice that I have not received Annual Sanitary Reports under the provisions of G. O. C. C. No. 146, of the 12th November 1868, for any of the Troops garrisoning Madras.

I am aware that Madras scarcely comes under the designation of a Cantonment, but it is advisable that I should receive Reports from Fort Saint George and Native Regiments, and I have to solicit that you will be good enough to instruct Officers Commanding Regiments to submit an Annual Report, in future, in the form I did myself the honor to transmit to them through you.

2. I have also reason to believe that the order for the Registration of Births and Deaths in Military Cantonments and Public Institutions, sanctioned under G. O. C. C. No. 4, of 6th January 1869, and G. O. No. 1,439, of 3rd December 1868, is not understood, or acted upon by Officers Commanding Regiments and Batteries at Madras. The order for registration in Military Cantonments provides for intimation being given to the Cantonment Magistrate or Station Staff Officer; but as Officers of this designation do not exist at Madras, I shall feel obliged if

* These Reports, containing nothing important, are not printed here.

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you will instruct Commanding Officers to direct Medical Officers under their orders to report to my office direct every birth or death occurring amongst all classes of persons under their Medical charge, whether Officers, Soldiers, their wives or children; and, in the case of Native Infantry Regiments, birth and deaths amongst the families of Sepoys in Regimental Lines.

3. The accurate Registration of Births and Deaths has recently been earnestly insisted upon by the Right Honorable the Secretary of State, and I, therefore, solicit your assistance to render it as perfect as possible amongst the Troops under your Command, by directing Officers Commanding Regiments to give such orders as may be necessary to ensure every birth and death being communicated to me, irrespective of any Returns made to Registrars entertained by the Municipality of the City.

From the Sanitary Commissioner, Madras, to the Adjutant-General, Fort Saint George, No. 2,730, dated 4th August 1869.

Madras not being a Military Cantonment, the povisions of G. O. C. C. No. 4, of 6th January 1869, requiring the Registration of Deaths amongst the Troops and followers have not hitherto been acted upon.

2. On the 23rd ultimo I addressed the Officer Commanding the Centre Division, soliciting that Officers Commanding Regiments might be instructed to cause all deaths to be reported to my office direct ; but, on reconsideration I, think it will be better to adhere strictly to the General Order, and the instructions drawn up under it, and that I should refer the question for the consideration of His Excellency the Commander-in-Chief.

3. I apprehend that there is no Officer at Madras holding the position of "Station Staff Officer" under the order, unless the Brigade-Major be so considered. If so, I would suggest that he be constituted the registering officer, and that all deaths, whether amongst Troops or followers and families of Sepoys in Regimental Lines, be reported to him for registration, and that he should furnish me with the "Returns" required under the order.

Or perhaps His Excellency may consider it more advisable to conduct the registration regimentally, by constituting the Quarter-Master "Registrar."

4. I respectfully solicit that His Excellency may be pleased to determine which course is to be adopted, and to issue the necessary instructions.

5. When I am made aware of the decision, His Excellency may arrive at upon the question, whether registration shall be effected through the Brigade-Major, or Regimentally, I shall be happy to put myself in communication with the Officer to whom the duty is assigned, and arrange for the provisions of the General Order being duly carried out, by explaining in person the working of the system.

In reply to the above, the Officiating Deputy Adjutant-General, on the 18th August, observed that, as the Sanitary Commissioner had already addressed the Officer Commanding Centre Division on the subject, the Commander-in-Chief considered that that would be sufficient to effect the object in view ; but that, should it fail to do so, His Excellency will support any other measure that may be proposed.

217. Proposed Civil Dispensary at Trichinopoly.

Read, with reference to Minute No. 176, recorded at page 408 of this volume, Proceedings of Government, No. 1,155, dated 18th August 1869, communicating the following order of Government on the above :—

ORDER THEREON, 18th August, No. 1,155.

In October 1866, the Committee for the Management of the Civil Dispensary at Trichinopoly resolved to assign a sum of Rupees 3,000 from the funded capital towards the erection of a suitable Dispensary at that station if the Government would make a grant in-aid equivalent to the amount assigned. The Government, in Order, dated the 14th November 1866, No. 1168, expressed their readiness to do so.

2. After a careful consideration of the actual requirements of the district, the station, and its immediate neighbourhood, the Committee submitted, on the 22nd April last, a plan and estimate, the latter amounting to Rupees 20,000, for a new Dispensary to be erected on the high and open ground behind the District Jail. They stated that they had resolved on assigning a sum of 10,000 rupees, and requested that the Government would be pleased to supplement the assignment by a similar grant.

3. The Committee have since submitted a less expensive plan of a Dispensary, with the requisite out-buildings, estimated to cost Rupees 19,700; but omitting therefrom the cost (Rupees 1280) of the Dressers' quarters, which are stated not to be absolutely necessary at present, the outlay proposed to be incurred is reduced to Rupees 18,420.

4. The Sanitary Commissioner, to whom the plan was submitted, has embodied his comments thereon in his letter, dated the 29th July last No. 2707. A copy of this letter will be furnished to the Managing Committee of the Civil Dispensary, with a view to their giving effect to the suggestions it contains.

5. The Government regret that the state of the finances will not admit of their making so large a grant as that solicited by the Managing Committee. But, as the institution is intended solely for the benefit of the inhabitants of the town of Trichinopoly, the Government are of opinion that the Municipal Commissioners of that town should contribute a portion of the necessary outlay for the purpose. According to the estimate last sent in, the outlay required is Rupees 18,420. Taking it in round numbers at Rupees 18,500 the Government are of opinion that the Municipal Commissioners should contribute a sum of Rupees 4,625, equivalent to the proportion which will be allotted by Government in the Public Works Budget for the ensuing year 1870-71.

6. In the meantime arrangements might be made with the funds at the disposal of the Committee for commencing the building of the new Dispensary.

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218. Outbreak of Cholera at Kamptee.

Read the following extract of the Report on the outbreak of Cholera in the Royal Artillery at Kamptee, by Surgeon E. M. Sinclair, M. D., 20th Brigade, Royal Artillery.

Extract.

'Formerly Cholera was said to break out annually at the station of Kamptee, if it were not actually looked upon as endemic to the place, (see Report of Sanitary Commissioner of 1868), and was no doubt brought into the station and neighbourhood by the crowds of pilgrims who used to pass 'en route' to the shrine of Mahades in the Puchmerrie Hills.

Cholera formerly frequent in Kamptee.

During the (nearly) 4 years I have been stationed at Kamptee, Cholera has attacked the European Troops 3 times, viz., in 1866, 1868, and 1869; but on no occasion can it be said to have been epidemic amongst the Europeans. The pilgrimage before alluded to was stopped by the Chief Commissioner in 1866, and since the line of Cholera has apparently been down the road from Jubbulpore On this road large gangs of coolies have been frequently at work, and in 1868 suffered so severely from Cholera, that they were dispersed for a time. In the large Native city of Nagpore, in all the 3 years before-mentioned, when cases occurred amongst the Royal Artillery here, there were many Cholera cases, as also in the bazaar of Kamptee, but what number of cases so called, were *true Cholera*, and in what proportion the deaths stood to recoveries, I am unable to give any idea; in fact, from these

people not being under any Military control, it is extremely difficult to determine any satisfactory data. From common report it appears a frequent practice, during any Cholera visitation, to attribute all sudden deaths amongst natives, many perhaps from questionable causes, to Cholera! Kamptee, though about 800 feet above the sea, is placed in a low site; almost the whole of Cantonment is on damp, black, loose soil, and is decidedly malarious at certain seasons of the year.

The cases of Cholera, which have occurred in the Royal Artillery during the last 4 years, have always been between April and August, while the season for Agne and Malarious Fevers is from about middle of September to middle of November; during the 'drying up' in fact after the rains, and never in my experience, either at Kamptee or in other parts of Central Provinces have I (during 9 years) seen Cholera cases occur in this season of prevalence of endemic malarious form.

Season of prevalence.

A case of Cholera has never occurred during the year from 1866 to 1869, or before that I have been able to ascertain at Kamptee, amongst the European Troops, in the first instance. Cholera had in every instance been prevalent for a considerable time in the bazaars before any case occurred amongst the Europeans.

Never commenced with Europeans.

In 1866 at Kamptee, from July to beginning of September, there were about 200 cases in the bazaars. Cholera was also said to be raging in the city of Nagpore 10 miles distant. Diarrhœa to a slight extent prevailed, and one death from Cholera took place in the Royal Artillery in a man of C. Battery D. Brigade Royal Horse Artillery, who was seized when a prisoner in the Guard-room, having a short time previously been reduced from a Serjeant for intemperance, and been again made a prisoner for drinking.

1866

In 1867 there were no cases of Cholera at Kamptee that I am aware of, nor any Diarrhœa to speak of.

1867.

In 1868 Diarrhœa cases were numerous, both amongst Europeans and Natives, and Cholera was prevailing to an epidemic extent amongst the natives in the bazaar in June, July, and August. Three cases amongst the men occurred in the Royal Artillery, a woman and child also were attacked and died; but no two cases were seized in the same barrack or building. The disease seemed to travel right through the station, passing as it were from one barrack or building to the next in regular rotation.

1868.

This year 1869, Diarrhœa was not prevalent to any extent, nor were the cases in the bazaar nearly so numerous as in the former two years referred to. The Artillery this year suffered more than the Infantry, strength being taken into consideration. The position of the Royal Artillery Barracks has doubtless something to do with this. On the north side, contiguous to the lines are :—

1869.

1*st*.—The horse-keepers and grass-cutters' lines.

2*nd*.—A large native bazaar with Commissariat cattle lines; on the west side are the horse-keepers' lines, &c., of the Horse Artillery and another bazaar; on the south side come the Barracks of the European Infantry; while to the east is the large "European" bazaar, with behind it the river. The Artillery are thus, as compared with the Infantry, brought much more in contact with natives by proximity of location, and also, by having to mix in their lines with numerous horse-keepers and other native followers, who are thus often the means of communication from an infected locality.

Position of Royal Artillery Barracks.

Communication with Natives.

This year Cholera cases occurred in the bazaar from early in April to the beginning of June, and first appeared from the direction of Jubbulpore. There was, however, no sudden break out of Diarrhœa, nor was this disease prevalent to any great extent. One man only was attacked with Cholera in the Barracks.

Outbreak of 1869.

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219. Privilege Leave to the Sanitary Commissioner.

On the 7th August 1869, Dr. J. L. Ranking reported having delivered over charge of the Office of Sanitary Commissioner to Captain H. Tulloch, R. E., who was appointed to act for him during his absence on privilege leave granted under G. O. No. dated

Publications, &c., received.

(1) copy of Hand-book of Vaccination by Edward C. Seaton, M.D., 1868.

(1) copy of Thirtieth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England (abstracts of 1867.)

(1) copy of a printed "Letter addressed to the Secretary of the Bombay Association" by the Health Officer of Bombay.

(1) copy of Proceedings of the Sanitary Commissioner with the Government of India for the month of May 1869.

(2) copies of Proceedings of the Sanitary Commissioner for Bombay for the month of May 1869.

(2) copies of Proceedings of the Sanitary Commissioner with the Government of India for the month of June 1869.

(2) copies of Bombay Health Officer's Report for the 2nd quarter ending June 1869.

(2) copies of the Annual Report of the Municipal Commissioners for the City of Bombay for 1868.

J. L. RANKING, Surgeon-Major,
Sanitary Commissioner for Madras.

PROCEEDINGS

OF THE

SANITARY COMMISSIONER

FOR MADRAS,

DURING THE MONTH OF AUGUST

1869.

Printed by H. Morgan, at the Government Press.

H 1/2351

No. C/6.

OFFICE OF SANITARY COMMISSIONER,

Madras, 21st May —— 1878.

From

The Sanitary Commissioner
for Madras.

To

The Secretary to Government
Public Works Department.

Sir,

Enclosures.

Referring to Proceedings of Government No. 1,699 W. of 4th April 1878 (Pub. Works), I have the honor to state for the information of His Excellency in Council, that registers of the level of sub-soil water have been kept for some years past in the places marginally noted, and the results are recorded in the Annual Reports of the Sanitary Commissioner.

Madras
Coimbatore
Negapatam
Madura
Calicut.

2. These observations were undertaken with the view of testing a theory of Professor Von Pettenkoffer of Munich, that outbreaks of cholera bore a direct relation to the level of subsoil water.

3. My object in writing is merely to point out the utility of the apparatus employed for registering the level of subsoil water, and to suggest that if experiments on this point are to be continued by the Public Works Department, that Pettenkoffer's apparatus is both simple and cheap, and well suited to yield accurate results.

4. A full description of the apparatus and

P. W. D. 12/235

Letter from the Sanitary Commissioner for Madras, No. 6/6, dated 20th May 1878.

For Orders with reference to the proposal to use Patten Kofferis apparatus in tracing subsoil water levels.

Secy: to Govt.
P.W.D.

27th May 1878.

GO. 1699 w.d. 478.

From

The Sanitary Commissioner for Madras.

To

The Chief Secretary to Govt.
Public Works Department.

Dated 20th May 1878.

Despatched

Received

No. 6/6.

Enclosures.

Patten Kofferis apparatus may be used for tracing the subsoil water levels

Jas.

Your most obedt. servt.
Sanitary Commissioner for Madras

Ci. 27.5.78 Rtd. 31.5.78.
To. 24.5.78.

Penl. Stock

No 2357 W of 31 May 1/2

Recorded. The
Application is not adapted
for use in the localities
where observations have
been ordered to be taken.

607 21/5

The Secretary Commissioners
Sept 13 1848

Archives 1—10,008—6-10-76.

5912. ☆

Govt. of [1878] Madras.

PUBLIC WORKS.

Nos.

Petenkoffer's apparatus for recording Sub-soil water levels

Letter from the Sanitary Commissioner recommending the use of —, recorded with remarks.