

**Preliminary reports... 1. On the deoderisation of sewage in the metropolitan sewers 2. on the deoderisation of sewage at the outfalls / by Henry E. Roscoe.**

### **Contributors**

Roscoe, Henry E. 1833-1915.  
London. Metropolitan Board of Works.  
London School of Hygiene and Tropical Medicine

### **Publication/Creation**

[London] : [H.M.S.O.?], 1888.

### **Persistent URL**

<https://wellcomecollection.org/works/d84t5j2d>

### **Provider**

London School of Hygiene and Tropical Medicine

### **License and attribution**

This material has been provided by This material has been provided by London School of Hygiene & Tropical Medicine Library & Archives Service. The original may be consulted at London School of Hygiene & Tropical Medicine Library & Archives Service. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
[E\\_library@wellcomecollection.org](mailto:E_library@wellcomecollection.org)  
<https://wellcomecollection.org>

H

Printed for the use of Members only.

P. 12123

Withd. 3421

sm 810

Metropolitan Board of Works.

10

# PRELIMINARY REPORTS

BY

Enfield

Sir HENRY E. ROSCOE,

F.R.S., D.C.L., LL.D., M.P.

1833-1915.

1.

ON THE DEODORISATION OF SEWAGE IN THE  
METROPOLITAN SEWERS.

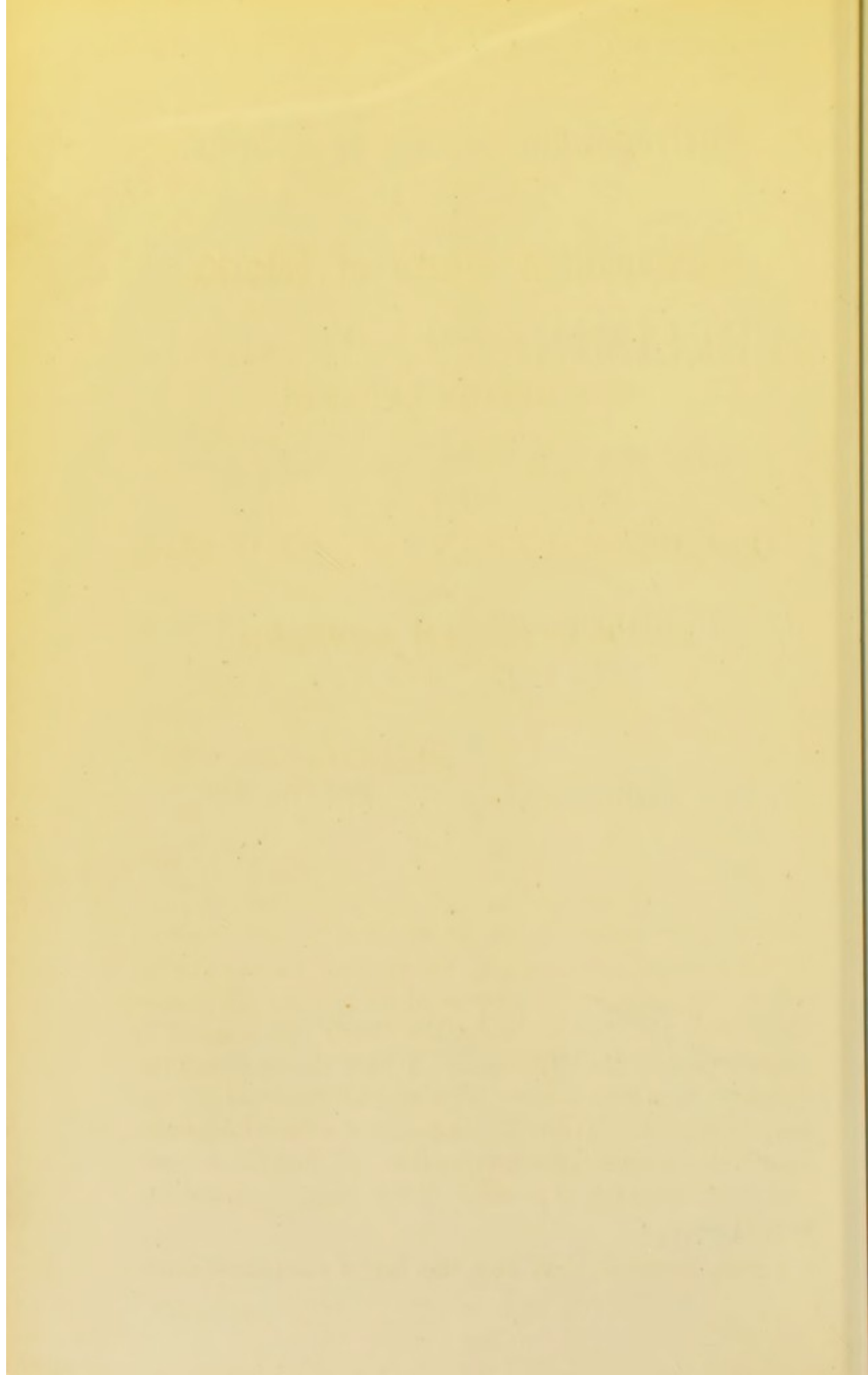
2.

ON THE DEODORISATION OF SEWAGE AT THE  
OUTFALLS.

---

*Ordered to be printed by the Works and General Purposes Committee  
(27th February, 1888), for circulation among the Members of  
the Board only.*

(No. 1,276.)



# Metropolitan Board of Works.

---

## PRELIMINARY REPORTS

(1)

ON THE

## DEODORISATION OF SEWAGE

IN THE

## METROPOLITAN SEWERS.

---

64, QUEEN'S GATE, S.W.,  
*May 16th, 1887.*

SIR,

I have read through the pamphlets and other documents forwarded by you on March 30th, with reference to the question submitted to me by your Board as to the use of chemicals for the purpose of disinfecting the emanations from the Sewers under the Board and situated in various parts of the Metropolis. I have also inspected the Pimlico Pumping Station with special reference to the employment of a mixture of manganate of soda and sulphuric acid for the purpose of destroying the smell from the Sewers, and I witnessed the application of the same as carried out at that place.

I have, moreover, read over the list of complaints about



smells, furnished me by Sir Joseph Bazalgette. It appears that the number of complaints were as follows :

In 1883	there were	64	complaints
In 1884	„	65	„
In 1885	„	41	„
In 1886	„	28	„

The employment of manganate was commenced in 1885, and hence a decrease of something over half the complaints has followed the use of manganate.

The cost of chemicals thus employed from May 17th to September 30th, 1886, amounted to £33,325 exclusive of labour, so that I may put the annual cost of this mode of deodorising the Sewer emanations to the extent carried out, at, say, £40,000.

The questions which I understand were addressed to me are :—

1. Does the manganate deodorisation process effect the required end ?
2. Is the result attained by the use of the manganate commensurate with the cost incurred ?
3. Is there any cheaper and equally efficacious process which can be adopted for the same end ?

With respect to question 1, I am of opinion that the manganate process does effect a certain deodorisation of the Sewer emanations. I judge that this is so from my own observations, and from the fact that the complaints of smells have diminished from about 65 to about 30 since the employment of the method.

So far, however, as the chemistry of the process is concerned, I agree with the conclusions arrived at by Mr. E. Rider Cook, and printed in a pamphlet dated 18th December, 1886 ; that is to say, I am of opinion that the quantity of manganate used in the Sewers cannot affect the nature of



the Sewage at the outfall, and also that, although undoubtedly there is a considerable diminution of the smell when the manganate is used, the quantity added is quite insufficient to oxidise even a small part of the putrescent ~~fecal~~ matter which gives rise to the emanations.

As regards the second of these questions, I cannot, after much deliberation, bring myself to consider that an expenditure of over £40,000 a year is commensurate with the results obtained. No medical evidence has, so far as I know, been brought forward to show that illness, much less that any outbreak of an epidemic has been traced to the Sewer emanations which are complained of. So that in order to diminish to one-half sixty-five complaints of bad smells, the Board has spent more than £40,000 per annum.

With respect to the third question, I should wish to point out that if it be determined to disinfect the Sewers at all, it may prove possible to do so as effectually and more cheaply by the use of other chemicals than manganate of soda and sulphuric acid.

Thus, for example, bleaching powder, and sulphurous acid would be cheaper, and probably as efficacious as the manganate, and I am not aware that the disinfecting power of the these substances upon the Sewer emanations has been satisfactorily tested by the Board.

I would, therefore, suggest that full experiments with these two disinfectants should be made either in place of or in addition to the manganate for the purpose of comparison. I propose to report again and more fully when the matter has been further investigated; meanwhile, I do not consider that the expenditure of so large a sum as that referred to for the purpose of the manganate deodorisation process is justifiable.—I am, yours truly,

HENRY E. ROSCOE.

J. E. WAKEFIELD, ESQ.

*Clerk of the Metropolitan Board of Works.*



64, QUEEN'S GATE,

*June 10th, 1887.*

SIR,

In reply to your letters of the 28th of May and the 2nd of June, in which you express the desire of the Committee that I should give an opinion as to the quantities and respective proportions in which bleaching powder and sulphurous acid should be used in the Sewers, I beg to make the following statement:—

1. In the observations contained in my preliminary report of May 16th, when suggesting that experiments should be made with the above-named chemicals, I did not intend to indicate that these should be applied to all the twenty-six stations mentioned in the Report of your Engineer and Chemist, dated October 4th last, but rather, that at a few of these stations, namely, those near to the localities where complaints had recently been made, should be selected for this purpose.

2. I understand from the reports that have been placed in my hands, that experiments upon deodorisation, by means of sulphurous acid, were carried out some years ago under the superintendence of the late Mr. Keates (in 1870-71), and that these experiments had been so far successful. I also find that similarly successful experiments were carried out with chlorine gas (probably bleaching-powder solution) in 1873. I have not been able to ascertain why these experiments, which appear to have cost only £100, were discontinued, and I have come to the conclusion that they should at once be recommenced.

3. I do not feel myself able to give the precise quantities either of sulphurous acid or of bleaching solution, which ought to be used at each of the experimental stations; this must depend upon the amount of Sewer emanations passing up into the air, and can therefore only be ascertained by



experiments made on the spot. The method formerly adopted of dropping the solution on to a cloth suspended in the ventilating shaft appears to me likely to prove effective.

4. In making the above suggestions, I desire especially to point out that the object which, in my opinion, is to be aimed at, is simply to deodorise the Sewer emanations and not to disinfect the Sewage itself, and I may be allowed also to add that by far the most effective method of accomplishing this is, wherever practicable, to dilute the Sewer emanations with fresh air by means of suitable ventilation.

I am, Sir,

Yours truly,

H. E. ROSCOE.

J. E. WAKEFIELD, ESQ.,

*Clerk of the Metropolitan Board of Works.*

---

PRELIMINARY REPORT  
(2)  
ON THE  
**DEODORISATION OF SEWAGE**  
AT  
**THE OUTFALLS.**

---

64, QUEEN'S GATE,

LONDON, S.W.,

*August 7th, 1887.*

DEAR SIR,

In accordance with the request of the Board dated June 27th, that I should state the results of a month's trial of deodorisation at the Outfalls with chloride of lime (bleaching powder), I beg to report as follows :—

A stock of bleaching powder was delivered at Crossness on July 2nd enabling operations to be begun, whereas at



Barking a further delay of four days took place owing to non-delivery. At both stations a commencement was made at the rate of three grains of bleaching powder per gallon of Sewage, this being the number of grains equal in oxidising power to five grains of manganate, the average quantity of this substance previously employed. At this rate the total quantity of chloride of lime added amounts to about 17 tons per diem at Barking, and to rather more than 13 tons per diem at Crossness. This treatment was continued, with a day or two interruption, owing to the stock running out, until the afternoon of July 23rd at Barking and on July 26th at Crossness, at which time enough stock was on hand to render it possible to add a quantity sufficient to entirely deodorise the effluent, viz., about five grains per gallon at each station. Since the above dates the process of complete deodorisation has continued without interruption up to the present, and this will be carried on until the stock of bleach is exhausted, at about the end of the first week in September.

The Board is aware that owing to the reconstruction of the Barking reservoirs, a quantity of the Sewage, amounting, according to Sir Joseph Bazalgette's estimate, to about one-sixteenth of the whole quantity discharged into the river, has to be sent out during the flood tides. This portion, however, is subjected, as regards deodorisation, to a similar treatment as that which is sent out during the ebb, and thus the risk of annoyance from this source is minimised.

In order, however, to attempt to effect a local purification of the River above the outfall, I have thought it advisable, considering the exceptional state of the weather, to make the experiment referred to in my note to the Board of the 2nd inst.; and on Friday, Saturday, and Sunday last, the addition of manganate in the Deptford sewer has been carried out; 140 tons of 25 per cent. manganate having been added. I trust that the effect of this addition will be salutary in that portion of the River.



In reply to the letter of the Engineer and the Chemist, dated July 29th, forwarded to me by you on the 3rd August, on the subject of the deodorisation at the Outfalls, I have to say that I consider the experiment of using chloride of lime for the deodorisation will have continued long enough to enable me to judge of its efficacy. I would, therefore, advise the Board not to purchase any further quantity of this material, but to give an order for the purchase of enough manganate and sulphuric acid to be employed after the date on which the bleach is expected to be finished, viz.: from the 3rd to the 10th of September, for a period long enough for me to form an estimate of the relative value of the two materials; the quantities named by the Engineer and Chemist would in my opinion be sufficient.

I wish further to add that in my opinion the daily analyses of the Thames water as made by the Chemist, should be regularly continued, as it is only by a systematic determination of the chemical conditions of the water, that a true conclusion can be arrived at as to the action of the deodorants. I am also of opinion that it would be advisable if possible, for the Board to obtain daily returns of the quantity of fresh water passing Teddington Lock.

I am carrying out other experiments with a view to ascertain more exactly the relative value of the two deodorants, and shall report to the Board again when the experiment with the manganate is completed.

Should the temperature become lower and the rainfall continuous during the recess, and should the condition of the River be thereby improved, I would advise the Board to order the diminution or discontinuance of the addition of the deodorant.

I am,

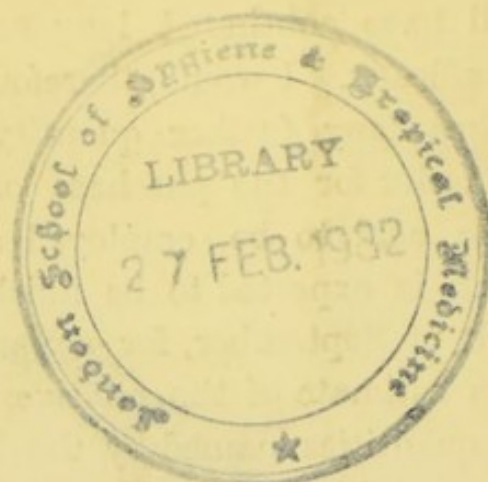
Yours truly,

HENRY E. ROSCOE.

TO J. E. WAKEFIELD, ESQ.

*Clerk of the Metropolitan Board of Works.*





Yours truly,  
LESLIE H. FORBES

To J. B. WATKINS, Esq.  
Chief of the Malaria Section, U.S. Army  
Wash., D.C.