

# **Report on the injurious effects of gas leakage on the street earth / by H. Letheby.**

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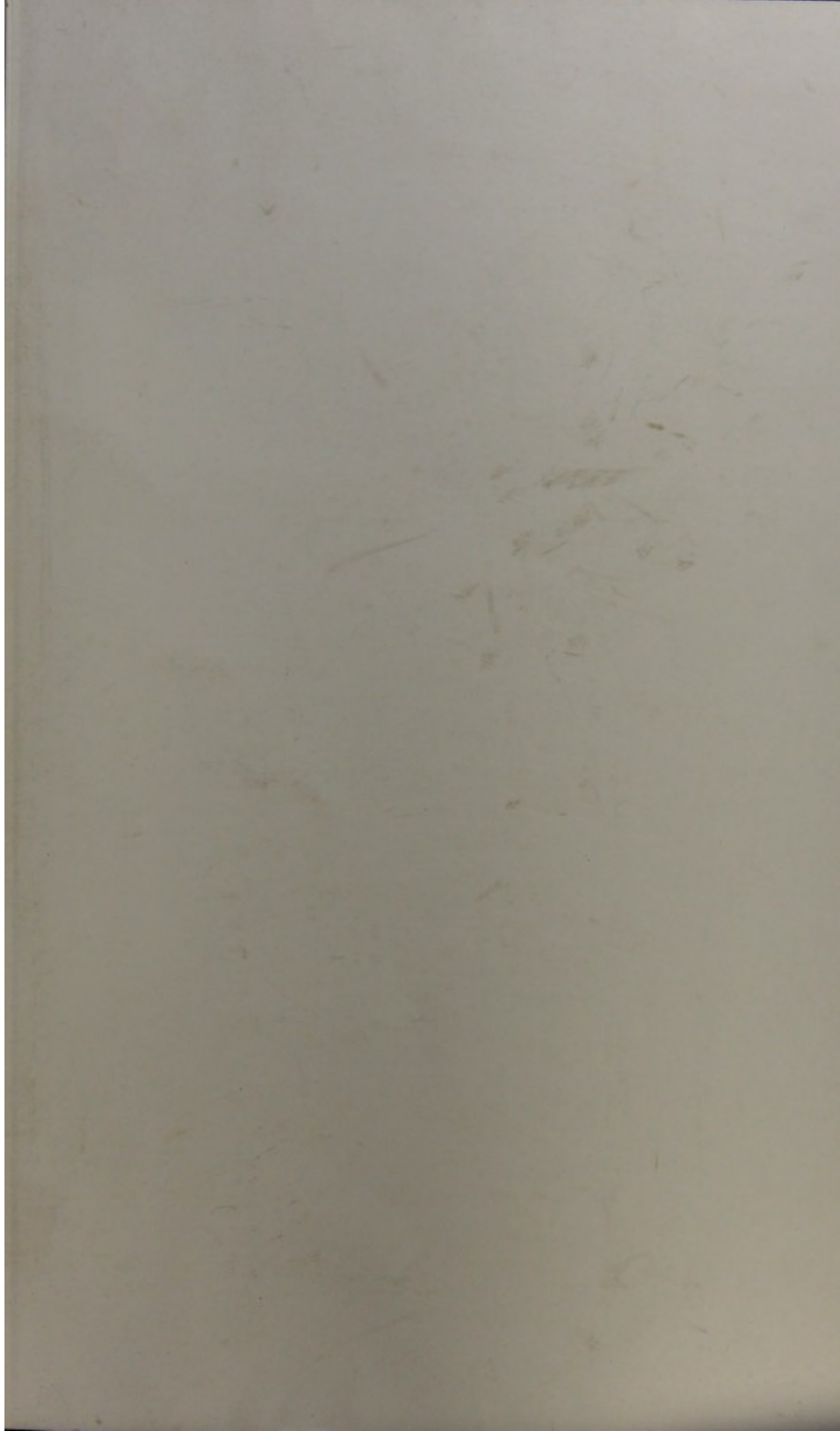
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REPORT

ON

THE INJURIOUS EFFECTS OF

GAS LEAKAGE

ON

THE STREET EARTH.

BY

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LONDON:

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1860.



REPORT

THE INJURIOUS EFFECTS OF

GAS LEAKAGE

THE STREET MARKET

H. FITZGERY, M.B., M.A., F.R.D., &c.

LONDON: TOWNSEND AND SON, 15, BUNYARD LANE, ST. MARK'S, CITY.

*At a Meeting of the Commissioners of Sewers  
of the City of London, at the Guildhall,  
on Tuesday, May 15th, 1860 :—*

WM. CHRISTIE, Esq., Deputy, in the Chair.

The Medical Officer of Health laid before the Court the following Report, which was ordered to be printed and a copy sent to every Member of this Court.

JOSEPH DAW,  
*Principal Clerk.*

REPORT

To the Honorable Commissioners of  
Sewage of the City of London  
At a Meeting of the Commissioners of Sewers  
of the City of London, at the Guildhall,  
on Tuesday, May 15th, 1860. —  
By the Hon. Charles Fox, Deputy, in the Chair  
of Gas Exchange on the right of the

For some time past the attention of the  
Honorable Officers of Health, and before the  
issue of the following Report, which was ordered to  
be printed and a copy sent to every Member of  
the Court  
with gas, and where the water is supplied  
black and foul, and which are so very  
to the satisfaction of London.

JOSPH DAW

Under Secretary  
Principal Clerk  
Printed in the year 1860  
and a copy of the Report  
to be sent to every Member of the Court  
into contact with the water of the

# REPORT.

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TO THE HONORABLE COMMISSIONERS OF  
SEWERS OF THE CITY OF LONDON.

GENTLEMEN,

I take this opportunity of referring to a subject which was brought under your notice by the New River Company at the close of the last month, and which you have requested me to examine and report upon. It is the published statement of that Company respecting the effects of Gas Leakage on the street earth.

For some time past the attention of the Company has been directed to the serious damage done to the street mains by the rapid corrosion of the iron, and its conversion into a soft plumbago-like substance. This change has been observed only in those localities where the soil has become tainted with gas, and where the earth has acquired those black and foetid qualities which are so well known to the inhabitants of London.

Under ordinary circumstances cast iron when buried in the earth, resists decay for more than a century; it becomes covered with an impermeable crust of oxide of iron, which protects it from further corrosion; but when the metal is brought into contact with the black soil of the metropolitan



streets, saturated with gas, it rapidly decays, and is, as it were, rotten in about ten years. The change takes place in the metal from without inwards, and is not in the nature of ordinary rust, but is due to the action of sulphur on the iron. Mr. Spencer, who has devoted much attention to the subject, is of opinion that the sulphur is derived from two sources—namely, the sulphuret of carbon in the coal gas and the gypseous constituent of the soil. His experiments and observations go to show that the hydrocarbons of coal gas decompose the sulphate of lime contained in common earth; and the sulphur compound thus set free, together with the ammonia and the fœtid constituents of the coal gas, form with the moisture of the soil an acrid alkaline liquid, which is in the highest degree offensive, and which rapidly discolours the iron of the soil and corrodes the metal of the street mains.\* It is

\* This kind of decomposition has long been a subject of observation. Kastner, Vogel, Döbereiner, Henry, Bischof, Daniell, Gmelin, and others have made especial inquiries into the matter, and have demonstrated by experiment that all kinds of decomposing organic matter will act in the alkaline and earthy sulphates, and cause the evolutions of sulphuretted hydrogen. This is often the source of that offensive gas in mineral and other waters. "In hot climates, as on the west coast of Africa, where the water of the rivers, highly charged with organic matter, mixes with the sea-water, which contains salts of sulphuric acid, the same decomposition takes place, extending sometimes to a distance of 27 miles from the mouths of the rivers. The water contains hydrosulphuric acid sometimes as much as six cubic inches in a gallon: hence it exerts a peculiarly rapid action on the copper sheathing of ships."—*Gmelin*, vol. ii. p. 191.

not alone that this concerns the water companies whose property is so seriously affected by it, but it also concerns the public, for it may soon become a dangerous nuisance. Even at the present time the condition of the subsoil of the streets, from the leakage of gas into it, is most offensive, but when we consider that the mischief is progressive, and, therefore, accumulative, it is not improbable that the soil may at last become so foul as to be dangerous to the public health.

I have already reported to you of the quantity of coal gas which escapes into the street earth; it amounts in this metropolis to not less than 386,000,000 of cubic feet per annum; and in the City alone it is as much as 25,000,000 of cubic feet in the year, or nearly 70,000 cubic feet a day. Mr. Spencer has calculated it at nearly twice this amount, for he says that the total loss by leakage into the streets is about nine per cent. of all the gas distributed, whereas I have set it down, on the authority of Mr. Wright, at only five per cent. In round numbers, therefore, according to Mr. Spencer, 630,000,000 of cubic feet of gas are annually absorbed into the street earth of this metropolis. In every way this is a nuisance, for it not only darkens the soil and makes it so offensive that the emanations from it can hardly be endured, but it also impregnates the atmosphere of the

sewers, and renders the basement rooms of houses uninhabitable from the poisonous action of the gas, and even dangerous from explosion: it likewise corrodes the iron of the street mains, and often taints the water with the filthy odour of gas. Even on the score of waste it is a matter for consideration, for at the rate of eighteen pence a thousand, the cost price of gas, it is a loss of more than £47,000 per annum. The remedy for the mischief is two-fold. First, the supply of gas freer from ammonia and sulphur compounds; and, secondly, the use of tighter joints. Already in some of the large towns of England, as in Liverpool, Manchester, and Leeds, the latter remedy has been applied. The ends of the pipes are turned and bored, and fitted into each other by grinding, like a stopper into a bottle, and thus the leakage from the joint has been prevented. I do not know how far your powers will permit you to act in this matter, so as to enforce or advise the use of a similar joint for all the gas pipes which may be hereafter laid in this City, but the subject is manifestly of sufficient importance to deserve your consideration, and even to demand the attention of gas companies.

I have the honor, GENTLEMEN,

To remain, your obedient Servant,

GUILDHALL,

HY. LETHEBY.

May 15th, 1860.



