

**General report on the sanitary condition of the Belgrave sub-district,  
parish of St. George, Hanover Square, and on the quality of the waters  
used therein / by C.J.B. Aldis.**

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GENERAL REPORT

ON

THE SANITARY CONDITION

OF THE

BELGRAVE SUB-DISTRICT,

PARISH OF

St. George, Hanover Square,

AND ON THE

QUALITY OF THE WATERS USED THEREIN.

BY

J. B. ALDIS, M.D., M.A., F.R.C.P.,

ONE OF THE MEDICAL OFFICERS OF HEALTH.

PRESENTED TO THE VESTRY JANUARY 6, 1869.

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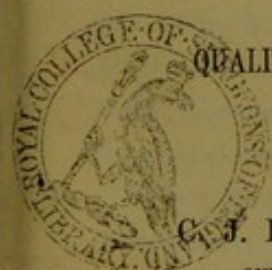
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PRESENTED  
by the  
AUTHOR

*Sanitary  
Report  
St George  
Westminster  
1857-60*

(4)



# GENERAL REPORT

THE EASTERN DISTRICT

1878

BEVERLY H. B. DISTRICT

1878

ST. JOHN'S BAPTIST CHURCH

1878

REPORT TO THE BOARD OF CHURCH

BY THE BOARD OF CHURCH

1878

REPORT TO THE BOARD OF CHURCH

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MAP OF PIMLICO IN 1814.

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Map of London in 1851

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## R E P O R T.

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MY LORDS AND GENTLEMEN,

In preparing the following Report, I have carefully considered the responsibilities and importance of the office to which you have appointed me, in order to carry out that essential doctrine of sanitary law, viz., the prevention of disease in your district.

The Metropolis Local Management Act has invested you with the power, whereby you are rendered the Guardians of the Public Health, as well as the Trustees of the Parochial Rates. The high death rate of some of the large towns, in comparison with country districts, produced great attention to the preventible causes of disease, which has destroyed more individuals than the sword. The poor of different populous districts are surrounded by an impure atmosphere, loaded with exhalations from sewers, cow-yards, and noxious manufactories; while they pay more in proportion for their miserable dens than others in a higher position, and yet are frequently deprived of the decencies of life. When we reflect that, in addition to these evils, the water they drink is polluted by animal refuse, the food they eat is adulterated with unwholesome ingredients, the houses they occupy are often over-crowded, and that the air they breathe is contaminated, need we be surprised that so many become victims of epidemic diseases, or of consumption, which causes about



one death in seven, or fifteen per cent., of the mortality; or that so many succumb to fever, the expense of which alone, in one year, amounted to £2467 16s., in the parishes of Bethnal Green and Whitechapel; or to the cholera, which, in 1853-4, cost this parish £1500 in six months, being at the rate of £3000 per annum? So that, in a financial point of view, prevention is better than cure. Such an epidemic not only destroys a great number of persons, but it leaves many with shattered constitutions, to sow seeds of disease—to contaminate future generations.

The question, then, of preventive medicine is one not only of financial interest, but of solemn obligation; and it will be my earnest endeavour to assist you in carrying out such measures as may enable the poor to maintain sufficient health,—that staple commodity for their self-support.

Having premised these remarks, I have the honour to submit to your notice a Report on the sanitary condition of the Belgrave Sub-District, or Out-Wards, of St. George's, Hanover Square, a very important part of your parish in reference to that subject—inasmuch as it is much more productive of zymotic\* disease than the In-Wards, and, therefore, requires constant supervision, in order to counteract the preventible causes of sickness and mortality.

According to the Census of 1851, the population of St. George's, Hanover Square, was as follows:—

Sub-Districts.	Males.	Females.
Hanover Square 20,216	8,782	11,434
May Fair . . 12,980	5,478	7,502
Belgrave . . 40,034	17,660	22,374
Total, 73,230	31,920	41,310

\* The term zymotic is derived from a Greek word, signifying to ferment, and refers to a morbid poison, which is supposed to act primarily on the blood, and may be transferred into the system either through a tainted atmosphere, or by inoculation.

By this calculation it appears that, in 1851, there were 4714 more females than males in the Belgrave sub-district, and that its population exceeded the Hanover Square and May Fair sub-districts by 6838; while it is evident from the following table, that the difference of area is only one statute acre.

Sub-districts.	Area in statute acres.	Number of inhabited houses, 1851.	Number of inhabitants, 1851.	Number estimated, 1856.	Ratio of persons to inhabited houses, 1851.	Persons to an acre, 1851.	Elevation above high-water mark.	Estimated No. of persons to an acre, 1856.
1. Hanover Sq.	445	2184	20,216				64	
2. May Fair	136	1611	12,980				56	
3. Belgrave	580	4997	40,034				12	
Total	1161	8792	73,230	78934	8.1	60.0		67.9

On examining the comparative mortality of different parts of the same town, from authentic data, a marked discrepancy has been found to exist between their mortality.

Town Districts.	Deaths in 10,000 inhabitants.	Or one in
( St. George, Hanover Sq.	166	60
London { St. George, in the east	210	34
( All Souls, Marylebone	357	28

Or if a similar examination be made into the comparative mortality of the city of York, it will be found that in the well-drained and not-crowded parts, that the deaths in the same number of inhabitants amounted to 185, or 1 in 54; while in the badly-drained and crowded parts they were 312, or 1 in 32; and so with regard to Edinburgh, and other large towns, clearly showing that the mortality of the poorer districts nearly doubles those of the wealthier, and that bad drainage, imperfect ventilation, and deficient supply of water occasioned this dreadful sacrifice of human life.



In the parish of Kensington, the mortality exceeds that of St. George's, Hanover Square, by only one death in a 1000 persons; but in one deplorable spot, called 'the Potteries,' notorious for the number of its piggeries, the average age at death, for a period of 3 years, was only 11 years and 7 months, which created a greater sensation than the loss of 28 years of existence among the operatives of Liverpool and Manchester, owing, for the most part, to removable disease. Again, if we limit our inquiry even to different parts of the same parish, a disparity will be observed; for in the monthly reports of the medical officers of health, made to this vestry, the mortality returns exhibit an increase of deaths from zymotic disease in the Belgrave sub-district, when compared with the other two; or if reference be made to former epidemics, that occurred in this parish, a similar result will be produced.

1849.—Deaths from cholera and diarrhœa, St. George's, Hanover Square, extracted from the Registrar-General's report, 1848-9, page 7, part ii.

Population, 1851.	Cholera.			Total of Cholera and Diarrhœa.	Diarrhœa.		
	Males.	Females.	Total.		Total.	Males.	Females.
66,552.	59	72	131	200	69	34	35

Deaths from cholera, in 1849, to 10,000 inhabitants, in Hanover Square and May Fair sub-districts, were 8, while in the Belgrave they amounted to 28. In the three sub-districts, Hanover Square produced 4 deaths, May Fair, 15, Belgrave, 26, with the same number of inhabitants. The report of the Medical Council, General Board of Health, page 98, table iv., shows the total number of deaths from cholera and diarrhœa, from July 1, 1853, to December 31, 1854, both inclusive, to be as follows—

District.	Registrar's Sub-District.	Cholera.	Diarrhœa.	Total.
St. George, Hanover Square.	Hanover Square	21	26	47
	May Fair	32	13	45
	Belgrave	250	91	351

And supposing the 64 deaths, which occurred in St. George's Hospital, were deducted from the 341 in the Belgrave sub-district, 277 would remain, giving a majority of 249; but it must be obvious that many of the fatal cases were admitted into the hospital from that locality, so as to increase the mortality from those two diseases.

It also appears, from the annual summary of the Registrar General's weekly returns, 1855, that typhus destroyed in the Hanover Square sub-district, 5; Mayfair, 6; Belgrave, 55! But then it may be asked, how many died in St. George's Hospital? Dr. Rogers, the Medical Registrar, returns only 17 cases that proved fatal there, some of which, no doubt, came from Belgravia; but, without adding the latter, there would still be a majority of 27, over the other sub-districts.

The following note appears in the Registrar General's Quarterly Returns, ending June 30, 1854, page 36:—"St. George, Hanover Square: Belgrave:—Small-pox has prevailed. Scarlatina has been prevalent, and of the malignant type. There has been a considerable amount of measles and whooping-cough." Another note for the quarter ending December 31, 1854, also states that "low fever has prevailed somewhat more than usual, and the furunculoid form of boil has continued to prevail in a marked degree, in the same dittrict."

I can verify this statement from my own personal experience in dispensary practice; and such facts lead, I think, to the irresistible conclusion, that sanitary improvement was absolutely required in the out-wards, which many, who admire the more favoured spots, and do not penetrate into



the houses of the poor, have thought to be quite unnecessary. In calculating the deaths from all causes, during 25 weeks, ending October 18, 1856, I find that, although 18 per 1000 represents the annual mortality of the whole three sub-districts, an excess, or 22 belongs to one; while a lesser number, or 14, belongs to the two others. Hence, the relative mortality of the Belgrave, or Out-wards, to the Hanover and May Fair, or In-wards, would be equivalent to 3 to 2 per annum, exclusive of the deaths of non-parishioners in St. George's Hospital. This result is important; for, while it shows an increase in the number of deaths in the Out-wards, it also proves a diminution to 14 per 1000 in the In-wards, which is even much less than the deaths of 17 persons per 1000, considered by the Registrar-General, in our present imperfect state, as natural deaths—nevertheless, the whole district, according to the evidence of Dr. William Farr, is as healthy as Hampstead, Hastings, and Sevenoaks.

In 1853, the excess of births over deaths was 300 in Belgravia; in Hanover Square, 153; Mayfair, minus 19.

It is desirable then, not to be misled by the deception of averages, but to localize disease as much as possible; so that the generally-favourable condition of a district may not tend to give the infected parts too good a name, as we know that Kensington does, in regard to 'the potteries;' where, as previously stated, for a period of three years, the average age at death was 11 years and 7 months.

It should also be remembered that the attacks of cholera have happened, at that season of the year, when nearly all the aristocracy were out of town, some of whom might have fallen victims to that fearful scourge; for it extended, in 1854, to Eaton Place and Belgrave Square, after having carried terror into the houses of the poor;<sup>1</sup> hence the

<sup>1</sup> The two first fatal cases occurred on the same day, July 25th, 1854, one in Brewer Street, the other in Stromboli Cottages—the word *stromboli* meaning—singularly enough—eruption.



salubrity of the district is a matter of interest to all, high and low, rich and poor; <sup>1</sup> and, although we must yield to the dispensations of Providence, nevertheless, we are endowed with active, as well as passive, qualities, to enable us to sweep away those secondary causes which foster epidemic disease, and prevent, as much as possible, Belgravia from rivalling the swamps of Jessore.

After three warnings, in 1847-8, 1848-9, 1853-4, an immediate remedy was demanded; and it must be highly gratifying to the philanthropist to observe the activity evinced during late years to remove those sanitary evils which had hitherto existed. The duties, then, of the medical officers of health, are essentially practical, although writers have acknowledged the distinction between public health and *hygiène*. Both have a common aim, viz., to render life more easy—more comfortable—and of longer duration; but the former is more practical, and the latter more scientific; both, however, must engage their attention. *Hygiène* occupies a more extended field; it embraces all subjects, which, far or near, affect the human organization, keeping in view those external influences which can affect it for good or for evil. Public health pertains in preference to those agents which are inconvenient, hurtful, or dangerous; and, especially, studies those causes which alter the normal constitution of the atmosphere; and transforms, into a kind of poison, the air, which sustains the life of man. <sup>2</sup>

#### TOPOGRAPHY AND GEOLOGICAL FEATURES OF THE BELGRAVE SUB-DISTRICT.

The Belgrave Sub-District, situate at the south-western extremity of the metropolis, is bounded on the north-west

<sup>1</sup> "Æque pauperibus prodest, locupletibus æque  
Consilium."—HORACE.

<sup>2</sup> *Traité de la Salubrité, dans Les Grandes Villes.* Paris, 1846.

by Hyde Park, on the south-west by Chelsea, on the north-east by the Green Park and St. James's Park, and on the south-east by the Thames. In some of these respects the locality is advantageous, in comparison with many other London districts; its vicinity to the Parks, its large and open squares freely communicating with each other, the gravelly nature of the soil—which, being of a porous nature, readily absorbs the surface water—are features calculated to improve the health of the inhabitants.

It extends from Apsley House, Hyde-Park Corner, down Grosvenor Place, obliquely across the Palace Gardens, from about opposite Chester Street, including the greater portion of the Palace, obliquely from the Palace to the chapel at the end of Charlotte Street; from thence along the north side of Elliott's Brewery, including Cutmore Buildings, Brewer Street, back of Allington Street, to the 'Royal Standard' public-house, Vauxhall Road—along the line of the King's Scholars' Pond Sewer, back of Bedford Place, York Place, and Pembroke Place, down Tachbrook Street, including the west side to the River Thames, east of the Equitable Gas-works—along the banks of the Thames, to the Ranelagh Sewer—along this, as the boundary line, to the French Ambassador's, at Albert Gate—along the south side to the Park, back again to Apsley House; the houses situated on the east side of the Ranelagh Sewer, therefore, being in the district, including Commercial Road to the end of Grosvenor Row, within one or two houses of Union Street, &c., to the end of Westbourne Place—back of Chesham Street and Lowndes Street, to Gunter's, corner of Motcomb Street, and then behind the east side of Lowndes Square, to Albert Gate, as before-named. This sub-district formerly consisted of fields and market-gardens, which had existed for upwards of a century. All the superficial clay has been dug up and made into bricks, and the space filled



with hard brick rubbish; and the foundations of the houses generally stand on a thick bed of concrete, resting on gravel. The sewers were then constructed, and communications made between them and the houses by drains; the roads were subsequently filled up with hard brick rubbish, their surfaces being covered with flint and gravel,

The stratification is quite level and uniform in thickness, from the Grosvenor Canal to the Thames—so much so, that the accompanying section, taken from a boring made at St. George's Bridge, which crosses the Grosvenor Canal, serves for the whole sub-district.

Prior to 1725, St. Margaret's, Westminster, St. Martin's-in-the-Fields, and St. George's, Hanover Square, were united. In a map of London, Westminster, and Southwark, published in 1777, in 'Harrison's London,' the only places shown on that part, which now comprises a portion of the Belgrave sub-district, are St. George's Hospital, Knightsbridge, Grosvenor Place, Chapel Street, the Lock Hospital, Pimlico, at the lower end of Grosvenor Place, King's Road, Five Fields, Chelsea Road, the rest consisting of fields. For the annexed section I am indebted to Mr. Ward, formerly in the employment of the late Mr. Thomas Cubitt; and for the map of Pimlico, 1814, to Mr. A. H. Renton, C.E.

Belgrave Square, Eaton Square, Lowndes Square, and the adjoining streets, were fields formerly known by the name of 'The Five Fields;' the sub-soil is clean, bright gravel, of various degrees of firmness, with sand, and, in some parts, mild clay over-lying the gravel—very similar to that delineated in the section, only in some places the clay was absent altogether. The gravel was not dug up in any case except where excavations were made for building purposes, and there it was generally used on the spot.

The immense quantity of brick rubbish, required for this great undertaking, came from all parts of London, and was



paid for, per load, by the late Mr. Thomas Cubitt. This method of building has raised the surface of the sub-district about 8 or 9 feet, and in some places more, from the original surface of the land. The removal of the clay, the elevation of the surface, and the substitution of brick rubbish, supposing no organic impurities to have been mixed with it, would tend to improve the health of the district by rendering it much drier.

In no part of Belgrave Square, and the adjoining squares and streets, is the London clay nearer the surface than 30 feet.

#### ELEVATION.

The mean elevation of the Belgrave sub-district above Trinity high-water mark, is 12 feet; but as there is an obvious difference between some parts of the district and others, in regard to this point, I have carefully examined the ordnance maps, surveyed and engraved in 1848, in order to ascertain the levels in different portions. It must, however, be remembered, that the elevations in these maps were taken in accordance with the ordnance datum, which is 12·50, or 12 feet 6 inches below high-water mark at London Bridge.

Surface level, St George's Hospital, at the gas column, ...	...	54·38
Belgrave Square, by Grosvenor Crescent, ...	...	33·68
Wilton Street ...	...	34·47
Chester Square ...	...	25·95
Westbourne Place, by Westbourne Street, ...	...	22·92
Eaton Square, near St. Peter's Church, ...	...	24·58
Whitaker Street ...	...	22·29
Union Street, lowest end, by Grosvenor Row, ...	...	19·92
'The Three Compasses' ...	...	22·18
Avery Farm Row, by Girdler's Mews, ...	...	24·45
Commercial Road ...	...	17·09
Ditto South ...	...	14·84
Belgrave Terrace, by Flask Lane, ...	...	15·69
Upper Belgrave Place, by Elizabeth Street, ...	...	19·49
Lower Belgrave Place, by Eccleston Street South, ...	...	18·35
Ditto by Belgrave Street South, ...	...	16·88

Lower Belgrave Place, by Wilton Road, ... ..	17.53
Victoria Road, by Eaton Lane North, ... ..	17.40
Ditto, by Victoria Square, ... ..	18.75
Palace Boundary, near Buckingham Gate, ... ..	18.80
Vauxhall Road, opposite the 'Windsor Castle,' ... ..	14.61
Ditto, by Gillingham Street, ... ..	13.73
Tachbrook Street ... ..	17.15
Warwick Street, by Denbigh Street, ... ..	19.41
Ditto, by St. George's Road, ... ..	20.08
Lupus Street ... ..	19.46
St. George's Square ... ..	20.52
Thames Bank, by ditto, ... ..	17.81
Turpentine Lane ... ..	13.95
St. George's Row, top of ditto, ... ..	15.82

The influence which elevation exercises upon the public health, is exhibited in the following remarks, taken from the Registrar-General's Reports for 1848-9, page 95—"The fact—striking, practical fact—which the inquiry into the mortality of cholera in England has elicited, is the influence of slight degrees of elevation. In the population of London it is rendered evident. In the part of the parish of Lambeth near the level of the Thames, the cholera, in 10,000 inhabitants, destroyed 163; at Kennington, 8 feet high, 90; at Brixton, 56 feet high, 55; and, finally, in Norwood, the highest sub-district of the parish, where the inhabitants are at least 128 feet above the river, only 5 in 10,000; and this was not accidental. Elevation within these moderate limits operated with the regularity of a general law; and influence of elevation has been felt all over the kingdom."

"But low level, in itself, is not enough to localize disease, for the sub-district of St. Peter's, Hammersmith, averages only 4 feet above high-water level; that of St. Olave's, Southwark, 2 feet higher; yet among the former, and worse placed of these two populations, the cholera mortality was only 18 per 10,000; while among the latter, and better placed, it rose to 196—multiplying nearly eleven times the minor phenomena of a lower level."<sup>1</sup>

<sup>1</sup> Simon's Reports.



## SEWERAGE.

This subject is closely allied to the elevation of different parts of the district above the level of Trinity high-water mark. The rapid and complete removal of all refuse, by efficient sewage, is of essential importance to the health of the community; without it, human aids for the prevention of disease would be futile; and, therefore, it becomes necessary for the medical officer of health to inquire into the extent, construction, course, and distribution of the sewers over his district. It is well known that the fœtid gases from sewers, in a concentrated form, will cause immediate death by asphyxia; in fact, several persons died instantaneously, in 1849, upon entering the sewer in Kenilworth Street, now called Cambridge Street, and situated in this sub-district. Some scavengers had entered the sewer in Warwick Street, and walked to the above spot, where a 'head wall' was opened to snatch them from premature death; and Mr. Wells, a medical gentleman, entered to succour them, but suddenly expired.

Several complaints having been made regarding the very offensive state of the gullies in Upper Ebury Street, which were untrapped, I brought them before the notice of the Sanitary Committee, September 9th, 1856; and also reported that the sewer was an elongated cesspool, for it commenced with a *cul-de-sac* in Ebury Square, taking its course along Little Ebury Street to Coleshill Street, where it is intercepted, having no communication with the branches of the Ranelagh or Victoria Sewers, which have 'blocks,' or 'head walls;' it then proceeds along Upper Ebury Street to the Ranelagh Sewer, where the opening is not sufficiently large to admit a man: so that no entrance having been effected for a considerable period, the gases become fouler than in other sewers, from stagnation and want of thorough ventilation. The sewer was entered by order of the Com-



mittee of Works, with a view to remedy some of these evils, and several loads of black, gritty matter, saturated with sewage water, were removed from it, and traps supplied to all the gullies. The extent of the sewers belonging to the parish is computed to be 30 miles, 18 of which form subterranean channels in the Belgrave sub-district.

The three main trunks for draining the latter, are the Ranelagh sewer, situated at the south-western boundary; the King's Scholars' Pond sewer, at the south-eastern extremity; and the Victoria sewer, extending along Victoria Street.

With regard to the construction of the sewers, some are oval, with the narrower part downwards; others have inverted arches at the bottom, upright walls at the sides, with semi-circular arches at the top, some are flat at the lower part, such as the Eaton Street and Ranelagh Street, but they are very few in number, and are exceedingly offensive. The largest sewer, excepting the Ranelagh, is situated in the Belgrave Road, and is six feet in height, and four in width, for a short distance. Their general dimensions are five feet six inches, by three feet. The intermediate size is three feet nine, by two feet six; and the smallest is two feet, by three.

The Ranelagh sewer. That portion belonging to the sub-district commences at Gunter's, corner of Motcomb Street, and passes along Lowndes Street, Chesham Place, Chesham Street, across Eaton Place, behind Eaton Terrace, crosses King's Road, proceeds at the back of Westbourne Street, by Whitaker Street, to Grosvenor Row, by Nell Gwynne Cottages, direct to the side of Commercial Road, South, where it forms a curve, and runs by Chelsea Hospital into the Thames. This sewer—six feet in diameter—has been recently covered over from the King's Road; before that, it was a constant source of disease, by contaminating

the air, causing, also, death to several children, who fell into it; and cholera prevailed extensively in the vicinity. At No. 6, in Whitaker Street, almost adjoining the then-open Ranelagh sewer, the late Dr. Manson attended a puerperal case, and fell a victim in consequence, as well as the patient, with one of the nurses.

I attended the other nurse who was attacked with fever, and recovered. Two cases of cholera, with one of fatal and secondary confluent small-pox, after vaccination, in an elderly female, occurred in the same house; thus rendering it a complete pestilential residence. A cow-yard stood nearly in front of the house, another on the opposite side of the sewer, with a row of piggeries, containing about forty pigs—in Chelsea Parish.

This sewer receives all the drainage from St. George's Hospital, taken, as a point, to Wilton Street, Eaton Square, south side, to Eaton Place, to the end of Coleshill Street, where it is blocked; the sewage from the houses between Ebury Street and Upper Belgrave Place, to Eccleston Street and Commercial Road.

The King's Scholars' Pond Sewer. That part of it belonging to the district, commences near Buckingham Gate, and extends along the south-side of the Palace, turns into Charlotte Street, and passes by Elliott's Brewery, and crosses the top of Victoria Street, along the back of Trellick Terrace, across the Vauxhall Bridge Road, to Tachbrook Street, along its centre, to the Thames, by the Equitable Gas Works; where, I regret to say, it remains uncovered. It receives all the sewage of Buckingham Palace, and, after joining a branch of the Ranelagh Sewer, opposite Wilton Street, from the remainder of Grosvenor Place, Arabella Row, Princes Row, Vauxhall Bridge Road, part of Wilton Road, and South Belgravia; but the sewage of Grosvenor Street West, the south side of Eaton Square, including Chester Square,



Burton Street, and Ebury Street, from Coleshill Street, Eccleston Street South, Belgrave Road, part of Wilton Road, falls into the Victoria Sewer, which empties itself into the Thames by Scotland Yard, having passed under the King's Scholars' Pond Sewer near the top of Victoria Street. In draining from the houses into the sewers, tubular earthen pipes are used in all cases, of different sizes, according to the class of house.

In reference to deficient sewerage, it appears that in parts of the district no sewers are delineated on the map; so I thought it desirable to particularize these spots, which are indicated below. It is, however, probable that they may have been constructed in some of these situations since the publication of the maps; indeed, there are such instances, and I have already reported Eaton Lane North as being without a sewer, which has been recently completed under the superintendence of Mr. Richman. I would also recommend, that all parts of the sub-district, at present without sewers, should be supplied with them.

1. Avery Farm Row is without drainage through the whole extent.
2. Ebury Place.
3. Girdler's Mews.
4. Belgrave Cottages.
5. Grosvenor Cottages.
6. Gregory Street.
7. New Grosvenor Place.
8. Middleton's Cottages.
9. Neathouse Buildings.
10. Belgrave Street South; an 8-inch barrel drain was found here, but it is unknown where it extends to.
11. Eaton Lane South.
12. Eaton Lane North, partly drained.
13. Eaton Court, and Roger's Court.
14. Ebury Mews, half drained.

There remains only one more point connected with the sewage, to which I wish to advert; it refers to what are



technically called 'head walls,' or 'blocks,' which are *culs-de-sac*, or terminal extremities of the sewers. I have counted no less than 27 of them, exclusive of such as could not be prevented. This appears to be important, because they impede a free and thorough circulation of air throughout the sewers, rendering their gullies more offensive from the stagnant air contained in them.

The following is an analysis of 100 grains of washed sandy deposit from the sewage in Newland Street, which was very black, with a slight odour.

Water	...	...	...	15.46.
Organic matter	...	...	...	4.00.
Inorganic matter	...	...	...	80.54.
Total				100.00.

It is very requisite that the sewers be periodically cleansed of such accumulations, and the sewage driven forward by the force of water; for even large ones have become reservoirs of sewage, and emit during warm weather, from decomposition of animal and vegetable refuse, the most noxious gases through the water-closets into the houses, and through the gullies into the streets. Most persons must have experienced bad effects from the foul gases evolved on raising the plug of a water-closet, especially after it has not been used for some little time. This has been obviated by inserting a  $1\frac{1}{2}$  inch pipe into the soil pipe above the drain, and carrying it to the top of the house, taking care to keep the eduction end as far as possible from the windows above.

#### BATHS AND WASH-HOUSES.

22, Lower Belgrave Place.

The object of these establishments has been to encourage cleanliness among the labouring classes, by providing means for bathing, and for washing and drying linen at the lowest

expense, thus enabling them to enjoy luxuries, which have hitherto been confined to the rich.

The present building was opened April 2, 1855, and comprises—

First and Second-class Baths,  
Washing Compartments,  
Separate Horse in Drying-chambers,  
Ironing Compartments,  
Large Plunge-bath,

Boiling-room, engineer's workshop and dwelling-rooms, occupied by the superintendent—Mr. Thomas Englefield.

During the first month there were of bathers—

Men.	Women.	Total.
3317	710	4027.

and the number of washers amounted to 664.

From April 2nd, 1855, to Lady-day, 1856—

Bathers.	Washers.
77,486.	20,549.

In April, 1856, there were of bathers—

Men.	Women.	Total.
5126.	943.	6069.

in the same month there were 2181 washers.

During five weeks ending September 1st, 1856, there were of bathers—

Men.	Women.	Total.
13,726.	2042.	15,768.

washers, 1045.

Such figures should reconcile every one to the great advantages accruing to the inhabitants from this institution. It saves the poor woman's time and a great expense in coal; and, by improving the physical condition of the industrious classes, is calculated to lessen the rates for maintaining the poor, and for comforts during sickness. Moreover, should any person be sceptical on this subject, let him visit the plunge-bath on Saturday evening, in warm weather, and



witness the delight and avidity with which poor boys seek the watery element, and acquire fresh vigour to their limbs. On Saturday, August 2nd, 1856, there were no less than 1804 bathers.

#### ST. GEORGE'S WORKHOUSE, LITTLE CHELSEA.

Although this building is not situated in the Belgrave sub-district, nevertheless, it is erected upon land belonging to the parish, and embraces so much that is requisite for the sanitary condition of the poor, who are obliged to seek refuge within its walls, that it deserves a special notice.

It should be visited to be thoroughly appreciated, and such inspection will suggest to the mind many points of interest. The house is erected on the site of a mansion, formerly occupied by the Earls of Shaftesbury, and in the tool-house, now standing in the garden, Locke wrote a great portion of his "Essay on the Human Understanding." The arrangements are made for 1200 inmates, which will ultimately include the male paupers now residing in Mount Street, after the present lease has expired. The school accommodates 300 children; it is lofty and spacious, being used also for a chapel. The sanitary features are excellent, in reference to airing grounds, lavatories, bath-rooms, and ventilation, the cubic space allowed corresponding to the maximum scale of the poor-law commissioners. The aged and sick-wards are ventilated by steam-batteries, giving a constant supply of seven cubic feet of fresh air, per minute, for each person. There is also a department for twelve aged married couples, exceeding sixty years, who are enabled to descend the hill of life together. They have a library, which might be increased with advantage by benevolent persons, a large sitting-room, with corridor and garden, well-planted. It is impossible to mention here all that deserves notice, as it would occupy too much room; but, in concluding the present part of my subject, I cannot help alluding to the first excursion, made last summer, a short distance into the country, by

the children, under the auspices of the Rev. H. Howarth and the Vestry, hoping that it may be continued annually.

#### MODEL LODGING-HOUSES.

It would have afforded me great pleasure to have mentioned the existence of model-lodging houses for the labouring classes, in this part of the parish, but there is no opportunity of doing so at present. I know, however, that a private scheme is on foot for the erection of a mass of lodging-houses, for families, in distinct dwellings, in the poorest part of the sub-district ; which, practically, would be an excellent arrangement.

#### SANITARY ORGANIZATION.

##### SOURCES OF DISEASE AND THEIR REMOVAL,

A Sanitary Committee for the Belgrave sub-district, was formed on June 4th, 1856, to which I present, every fortnight, Returns of Sanitary Inspections, made by the Inspector of Nuisances and of Existing Nuisances, verified by myself, with recommendations thereon, including a Report. These are considered, and immediate steps are taken to remedy existing evils. In emergencies, I have power to call the Committee together to adopt such measures as may be deemed expedient. A complaint-book is kept at 43, Lower Belgrave Place, which, with the Returns and Reports, display a larger amount of disorder in Belgravia than can be compressed within the limits of this Report.

A notice book is also used ; minutes kept, and various forms necessary to enforce sanitary regulations, when required ; but, I am happy to say that this is the exception, for the first or friendly notice, suffices in nearly every case, for the suppression of nuisances. The inspector continues his surveillance until the work is finished. But as I do not wish to make this statement an Encyclopædia of Cesspools, or to dilate upon the pestiferous Thames, or the ground



near it reeking with malaria ; or dirty residences, out of repair, without water and privy accommodation, the rain penetrating them, being unfit for human habitation ; or the Grosvenor Canal and Basin, consisting of rather more than 13 acres, emitting in warm weather its gaseous bubbles ; or the filthy cow-yards ; or wretched families prostrated by preventible disease, even in this aristocratic neighbourhood—numerous instances having been already narrated to the proper quarter, I would rather refer to remedial measures, which have been carried into effect ; some of the worst places have been greatly improved, particularly the south side of Robert Street, where the houses had become wretched dens, or rather “little hells,” as they were appropriately called before. It is very gratifying to observe the great improvements that have been effected in some of the worst houses in Belgravia, owing to the recommendations issued by the local authority. Only a short time ago, they were filthy places, but now they are converted into cleanly and decent habitations. The nuisances reported in the Outward alone, between the 13th of July, and the 31st of December, 1856, amounted to 435, in 400 of which the work has been done, and the nuisances satisfactorily abated. The notices have been prepared, and issued by Mr. Butt, and served by the Inspector, Mr James Grant.

#### WATER SUPPLY.

The Belgrave sub-district derives its waters from three sources, viz., the Thames, Surface wells, and the Artesian well in Orange Street. The first supplies the whole of Belgravia, and some tanks at Buckingham Palace to be used in case of fire ; but water is also received there from the tank in Orange Street, supplying the high service, while the low service is obtained from a reservoir, filled by the same works, and situated at Constitution Hill, facing St. George's Hospital.

The Out-ward of the Parish has continued to be supplied

with water from the Chelsea Company, from their new source at Seething Wells, above Kingston-on-Thames, since July last. The water from the river there, is conveyed into subsiding reservoirs, and subsequently passed through filter-beds, and forced by powerful pumping machinery along main pipes to the large, covered reservoirs, on Putney Heath, which are at an elevation of 170 feet above the Thames; the company have, also, an open reservoir on Putney Heath, which contains water for street-watering, sewer flushing, and other similar purposes.

The water is conveyed from the reservoirs on Putney Heath, through two lines of twenty-four inch diameter pipes; which, with a separate main for street-watering, &c., cross an iron aqueduct over the Thames, from Putney to Fulham, and thence convey the supplies of water to the districts of Brompton, Chelsea, Pimlico, and Westminster.

The new works, throughout, are of a comprehensive character, and were constructed purposely with a view to the entire abandonment of the old works at Thames Bank, Chelsea Reach. The area of the subsiding reservoirs at Seething Wells, is three acres; and the area of the filters, two acres; the thickness of the several layers of filtering medium, being as follows:—

	Feet	Inches.
Fine sand,	2	9
Coarse sand,	0	7
Shells,	0	2
Fine gravel,	1	6
Coarse gravel.	3	0

The sand is previously washed, by means of a cylindrical apparatus, allowing jets of water to be transmitted through it. Charcoal, however, enjoys pre-eminently the power of abstracting organic matter from solution, to a far greater extent than other porous media<sup>1</sup>. The steam engines, which

On Porous Media, Sand and Charcoal.—By Henry M. Witt, F.C.S.



work the pumping machinery, are in duplicate, and together, are equal to 650 horse power. The covered reservoirs on Putney Heath, contain 15,000,000 gallons of water, and the elevation of them, affords most powerful means of the water acting by gravitation, on all parts of the district. The present average daily supply, is about 6,000,000 gallons, and the Company have purchased land, at Seething Wells, and on Putney Heath, to be applied for enlarging the works, whenever the increased demand for water in the district may render such a step advisable.

I must here be allowed to express my thanks to Mr. James Simpson, the eminent engineer, who kindly accompanied me from town, to the works, at Seething Wells, having stopped at intermediate places, to let me have an opportunity of seeing the water as it passed through the mains at Putney Heath, of examining the works, and hearing a detailed account of their operation.

Perfectly pure water is extremely rare, rain water distilled and melted bright ice, being approximations; but, were we to repeat the operations of distillation, or freezing water, and then melting the ice, we should, according to Professor Clark, obtain water that, for all practical purposes, is pure.

The impurities of water, are inorganic and organic.

The former, are composed of clay, particles from roads, and fields, carbonates of lime, soda, potash and magnesia, sulphate of lime; the nitrates, the chlorides and ammonia. Now, water, containing lime and magnesia, curdles soap when it is said to be hard, either alone, will produce this effect. Professor Clark has adopted an excellent plan, for reducing the hardness of water, at Plumstead, by lime; chalk, in fact, being expelled by lime on the following principle. Chalk is held in solution, in the water, in the form of bicarbonate of lime, but, when lime is added, one proportion of the carbonic acid of the bicarbonate unites with it, forming a carbonate, and the carbonates of lime, or chalk, subside.

The organic impurities, are animal and vegetable, which contaminate water much more than mineral substances, the sewage, for instance, mixing with the Thames is much more to be dreaded than inorganic matter. Filtration will not separate it, nor will it subside; and even inorganic matter is sometimes so adhesive, as to defy the same process. Decaying vegetable matter of a peaty nature, will render water very injurious. The Thames water is supposed at the temperature of 60°, to produce diarrhoea and cholera, by contaminating the surrounding air, for as the water declines from this temperature, so do the above diseases.<sup>1</sup>

Soon after my appointment as Medical Officer of Health, in April, 1856, I caused an analysis to be made of the water supplied by the Chelsea Company, prior to its removal to Seething Wells. An imperial gallon was taken from a cistern, May 6th, 1856, and when evaporated to dryness, gave of solid matter, 11.18 grains, from which there was removed by incineration, 1.5 grains of organic matter.

My attention was afterwards, often given to the state of the water in the St. George's Baths and Wash-houses, Lower Belgrave Place, and in July last, I reported to the commissioners that a considerable number of animalculæ, such as the cyclops, &c., and vegetable productions, with gritty matter, had been visible to the naked eye; and more so, of course, when submitted to microscopic observation; but that it was justice to the Chelsea Company to say, that these impurities occurred during warm weather, when the water-works were in a transition state, and some of the new pipes had burst. Moreover, the tanks of baths and wash-houses are generally situated over the roofs, exposed, in summer, to considerable light and solar heat, without covers, favouring the production of animal and vegetable life. I would recommend covers to be placed over them, and the tanks to be made without flanges internally, with perfectly

<sup>1</sup> Registrar General's Report upon Cholera in England in 1848-9.



smooth surfaces, just as the water-companies construct their receptacles; for, no doubt, they clog the interior, and prevent it from being thoroughly cleansed. The plunge-bath is rather a severe test of the appearance of water, from the whiteness of the tiles and the vigilance exercised in case of any discoloration; which, with the animalculæ, considerably diminishes the number of bathers, as well as the income derivable from this most healthy recreation. Since the new works of the Chelsea Company have been completed at Seething Wells, its clearness has given great satisfaction.<sup>1</sup> The tank is cleansed once a fortnight, in summer, under the direction of the superintendent.

When the new supply of water was distributed to Belgravia, I recommended the inhabitants, through the *Times*, to have their cisterns cleansed, in consequence of the impurities which I have observed in them, as well as in the boilers. This brought me information of their existence to a far greater extent than I could have imagined. It is a common thing for persons to occupy a house for 10 or 12 years without the cisterns being cleansed; many do not think of them at all, without attention is drawn to their condition by some accident. The water in under-ground tanks is liable to become contaminated by organic matter, particularly when they are out of repair.

Examination of water supplied by the works at Seething Wells, and taken from a tap communicating with the main, in Chapel Street, Belgrave Square, July 31st, 1856—

		Grains.
Solid Matter in one Gallon	...	16.4.
Organic ditto	...	1.37.
		Degrees.
Hardness, by Clark's Scale	...	11.0.
Hardness after Boiling	...	6.2.

From the old supply, according to the Report of Messrs

<sup>1</sup> It became turbid again in December, after the above was written owing to a most serious and unusual flood in the river.

Graham, Miller, and Hoffman, the degrees of hardness were 14.44. in the year 1851, at the Red House, Battersea.

Water taken from a dirty cistern, without a cover, in a warm kitchen of the same house, where the above sample was obtained, at the same time presented numerous animalculæ, seen by the naked eye; while that from the main was clear, cool, very palatable, and without trace of animal or vegetable matter. The infusoria soon appear when vegetable substances are left in water; and I have had occasion to report upon the quantity of small red-worms, annelidæ, observable in the water in Robert Street and St. George's Place, the butts being dirty, and without covers, out of repair, and lined with green conferva. The occupier of the house in Chapel Street had taken out three dead mice from his cistern; sometimes rats, soot, grit, and other impurities, are found, rendering it advisable that the water receptacles in every house should be periodically cleansed.

Nothing varies more than Thames water. Mr. Oersted showed me a table of monthly examinations made by him for a year and a half, since July, 1855. The water was supplied by the Southwark and Vauxhall Company; and the inorganic matter varied from 13 to 18 grains, while the difference in organic matter, was from 2 to 5 grains. The total residue, 7th July, 1855, was 84.94, under the old supply; but that from the new supply, July 26th, 1856, was no more than 15.2. Water taken from opposite sides of the Thames, will vary in the quantity of its products.

The pump waters of the district contain generally much inorganic and organic impurity, as may be seen on reference to the annexed tabular statement. The residue of the waters taken from Mr. George Thompson's yard, actually exploded three times during two examinations, from the presence of nitrates. When families have been out of town for some time, the water from the pump, for want of use occasionally, presents



a scum on the surface, becomes turbid, and smells offensively when first drawn, rendering it necessary to pump for half an hour, or more, before drinking it again, until it becomes bright, clear, and free from smell, which is a very wise precaution. Some of the land springs, above the clay, have been deteriorated by the infiltration from sewers and cess-pools; others contain an excess of sulphate of lime.

The nitric acid and nitrates arise from the decomposition of animal matter, and the earth, according to Mr. Alfred Taylor, possesses great power of depriving the water that percolates it, of any animal matter held in solution, by virtue of its oxydizing power;<sup>1</sup> nearly all the waters were remarkably bright, when first drawn, and palatable, notwithstanding the impurities they contained.

The springs in the sand immediately above the chalk, and in the chalk itself, contain a considerable quantity of carbonate of soda, as well as chloride of sodium, or common salt; and many persons are of opinion, that the saline properties of the waters of these springs probably arise from their being fed from the sea-water entering the strata, where the river traverses the out-crops, below Blackwall.

Buckingham Palace is supplied with water by the artesian well in Orange Street, as before stated, and by the St. James's conduit in Hyde Park, which receives a supply from the well on the north-west side of the Serpentine river—the well being fed by the springs in the old deer park, behind the Royal Humane Society's receiving-house and the Guard-house, and are collected by a barrel drain, which enters into it. These again receive a considerable supply of water from the overflow of springs at Bayswater—the greatest portion of which has been intercepted and cut off by the construction of new sewers, and the railway. The St. James's conduit, also, receives water from the three covered

<sup>1</sup> Simon's Reports, page 172.

wells, sunk in the gravel and sand strata southward of a line between the statue of Achilles and the Serpentine.

The royal table at Buckingham Palace is supplied by this source, excepting after much rain, when it becomes turbid. Water is then used from the pump in the Royal Mews, but that from the artesian well is employed for other purposes.

The Messrs. Thompson have kindly sent me the following note, which I insert, as it refers to the present subject.

Eccleston Street East,

Pimlico, November 17, 1856.

"The land springs in Pimlico are generally abundant, particularly so near the river, where wells are affected by the tide, as for instance that sunk by us at the white-lead works, Thames Bank, some years since. The springs in Pimlico do not appear to have suffered by the formation of recent sewers, as they have in other parishes on higher grounds. Most of the wells for street watering, in St. Giles and St. George, Bloomsbury, were formerly copiously fed, but by the formation of new sewers, at a lower depth, made during the improvements carried out in these parishes, the springs were much drained, and the wells had to be enlarged, and sunk to some depths into the blue clay under the gravel yielding the spring, and thus to serve as reservoirs to collect the weakened supply.

"We have annexed the particulars of a land-spring well, sunk by us in April, 1845, at the late wood-carving works, Eccleston Place, formerly the bronze foundry of Sir Francis Chantrey, deceased, which will give the general character of the strata and the strength of the springs in the immediate locality. This well was sunk to supply a 16-horse, high-pressure steam-engine, used for driving the carving machinery, which has since been sold off. The strata passed through was as follows—



	Ft.	In.
Made ground	5	0
Gravel	2	6
Loam Sand	1	0
Gravel	0	6
Yellowish (quick sand)	8	0
Dark Sand	1	9
Total depth of Well	18	9.

"The water appeared at 13 feet depth from the surface, and rose 9 inches higher. The well was made 8 feet diameter in the clear of the brick steening, and sunk as above, to the depth of 18ft 9in from the surface, at which depth it was found impossible to sink it lower without additional pumps, as the spring gained on two 7inch pumps, which were kept continually worked for some considerable time. As the supply was deemed sufficient for the use of the works, the sinking was discontinued, and the strength of the spring was then tested, by measuring the rise of the water, when the pumps were stopped. It rose  $4\frac{3}{4}$  inches, in the first two minutes yielding by calculation 3720 gallons of water per hour, and this multiplied by 10, as the average working hours, gives 37,200 gallons, to which is to be added the contents of the well, 2034 gallons, which collect in the night, forming altogether, a daily supply of 39,234 gallons, for 10 hours' working; a quantity which was found more than adequate, to the requirements of the manufactory. The land-spring wells towards the river, appear to be of a more gravelly nature, containing iron, and occasionally conglomerate, or pudding stones.

(Signed) G. THOMPSON & SONS, Engineers."

The usual complaints against hard water, are the furring of the vessels, caused by a deposition of earthy matter, leading to their more rapid destruction, and rendering it more difficult to cleanse, so that the flavour and odour of the various substances cooked in them, are not readily removed. More fuel is also required from the non-conducting power of

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assistance in the  
isolated to Mr.  
the death-regist  
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Chelsea Company  
It may be in  
Henry Smith, is  
Distillery, in the  
I have

L. Chester Terrace  
January

the earthy crust.<sup>1</sup> Earthy salts are likely to be mixed with the food, and soap, wasted by decomposition.

Some of these waters ought not to be used for drinking, in consequence of the impurities contained in them—others, however, are good, as that for instance, at No. 26, Eaton Square. On reference to the tabular statement, the different degrees of impurity may be ascertained, but, I candidly confess, that no case has come under my notice, in which any of them have produced mischief; at the same time, I cannot generally recommend them, after the present examinations, especially in cases of indigestion, or in persons with calculous diathesis, or disposed to gravel. A pint of water alone, from the pump in Ebury Mews East, yielded 15.73 grains of impurity.

In concluding this Report, I have to return my sincere thanks to Dr. R. D. Thompson, for permitting me the use of chemical apparatus, at St. Thomas's Hospital, as well as to Messrs. Oersted, and W. Higgs, for their extremely kind assistance in the analysis of the water. I am also greatly indebted to Mr. T. B. Chappell, for allowing me to examine the death-registers of the Parish, and Mr. James Simpson, for the annexed plan of an Artesian well, belonging to the Chelsea Company, and situated at Thames Bank.

It may be interesting to mention, that Mr. Octavius Henry Smith, is now engaged in forming another one at his Distillery, in the same locality.

I have the honor to be

My Lords and Gentlemen,

Your faithful Servant,

C. J. B. ALDIS, M.D.,

MEDICAL OFFICER OF HEALTH.

1, *Chester Terrace, Chester Square,*

*January 1st, 1857.*



# TABULAR STATEMENT

SOURCE OF WATER.	Degree of Hardness.		Grains of Solid Matter in an Imperial Gallon of Water.			REMARKS.
	Before Boiling.	After Boiling.	Inorganic Impurity.	Organic Impurity.	Total Solid Matter.	
Tap from the main, Chapel-st. Belgrave-sq. (Chelsea Company after filtration), Oct. 20, 1856	12.6	10.3	16.08	4.08	20.16	No trace of nitric acid.
Pump in Messrs. Robinson's and Cottam's yd., Lower Belgrave-place, Oct. 22, 1856	46.98	43.86	78.32	7.60	85.92	Contains nitric acid.
Pump in Mr. Thompson's yd., Eccleston-st. East, Oct. 22, 1856	56.0	45.6	52.08	30.16	82.24	Contains nitric acid. 3 explosions took place while incinerating the residue.
Pump in Ebury Mews, Oct. 25, 1856	28.2	26.3	48.88	8.40	57.28	No trace of nitric acid.
Artesian Well, Orange-st. Works, Oct. 27, 1856	5.25	5.2	55.84	2.24	58.08	No trace of nitric acid.
Pump in Mr. Wilkinson's shop, 44, Coles-hill-st., Oct. 29, 1856	37.8	36.6	101.12	8.16	109.28	No trace of nitric acid.
Pump in Ebury Mews East, Oct. 30, 1856	61.8	60.1	110.56	15.28	125.84	No trace of nitric acid.
Pump in Chester-place Mews, Oct. 30, 1856	49.4	45.6	56.24	9.20	65.44	Contains nitric acid.
Pump in Mr. Dexter's yd., Kinnerton-st., Oct. 31, 1856	63.2	61.5	80.76	16.60	97.36	Contains nitric acid.
Pump in Mr. Holland's yd., Ebury-st., Nov. 4, 1856	43.2	38.7	82.48	15.36	97.84	Abundance of nitric acid.
Pump in Mr. Vokins's 3 stall stable, Wilton-rd., Nov. 6, 1856	18.1	17.9	17.44	2.98	20.40	Slight trace of nitric acid.
Pump in Mr. Pearl's yd., Lower Eaton-st., Nov. 6, 1856	39.2	36.4	80.88	9.84	90.72	Contains nitric acid.
Pump in Mr. Gover's Stables, 26, Eaton Mews South, Nov. 8, 1856	15.6	14.2	17.44	2.56	20.00	No trace of nitric acid.
Pump in Barrack-yd., Nov. 8, 1856	23.4	22.5	74.72	7.60	82.32	Very slight trace of nitric acid.
Pump in Belgrave Mews North, Nov. 8, 1856	78.6	72.0	87.84	18.32	106.16	No trace of nitric acid.
Pump in the Rev. J. H. Hamilton's yd., 47, Chester-sq. Nov. 14, 1856	39.8	37.9	69.24	8.52	77.76	No trace of nitric acid.

OF THE

SOURCE OF WATER.

Pump in Mr. Octavius H. Smith's Battery, Chelsea Park, Nov. 14, 1856  
Pump in the Royal Mews, used at Her Majesty's table, Nov. 14, 1856  
Tap at Buckingham Palace, from Tank in Green Park, supplied by Adamson Well, and used at Her Majesty's table, Nov. 14, 1856  
Tap S., in Buckingham Palace, from James's Coach, Hyde Park, Knightsbridge, used at Her Majesty's table, Nov. 14, 1856  
Pump in the Zoo, and Nov. 2, during a party to Greenwich Common, Nov. 25, 1856  
From Kennerly, supplying Wells, where King's Arms, Indian Restaurant, supplied by Chelsea Company, Nov. 30, 1856  
Pump in Lord George Russell's yard, 46, Chester-square, Dec. 10, 1856

# OF THE QUALITY OF THE WATERS.

SOURCE OF WATER.	Degree of Hardness.		Grains of Solid Matter in an Imperial Gallon of Water.			REMARKS.
	Before Boiling.	After Boiling.	Inorganic Impurity.	Organic Impurity.	Total Solid Matter.	
Pump in Mr. Octavius H. Smith's Distillery, Thames Bank, Nov. 15, 1856 .....	30.25	28.5	39.60	4.08	43.68	{ Contains nitric acid.
Pump in the Royal Mews, used at Her Majesty's table, Nov. 19, 1856 .....	37.8	36.3	59.64	4.92	64.56	
Tap at Buckingham Palace, from Tank in Green Park, supplied by Artesian Well, not used at Her Majesty's table, Nov. 19, 1856...	5.5	5.3	56.64	2.96	59.60	{ No trace of nitric acid.
Tap S., in Buckingham Palace, from St. James's Conduit, Hyde Park, Knightsbridge, used at Her Majesty's table, Nov. 19, 1856 .....	37.5	35.4	50.72	4.48	55.20	
Pump in the Hon. and Rev. F. Baring's yard, 9, Grosvenor-crescent, Nov. 25, 1856 .....	60.8	55.5	106.32	10.08	116.4	{ Contains nitric acid.
From Reservoir, Seething Wells, above Kingston, before filtration, supplied by Chelsea Company, Nov. 30, 1856 .....	14.8	12.8	17.28	2.80	20.08	
Pump in Lord Cosmo Russell's yard, 66, Chester-square, Dec. 11, 1856 .....	33.1	28.3	45.0	8.7	53.7	{ Strong trace of nitric acid.

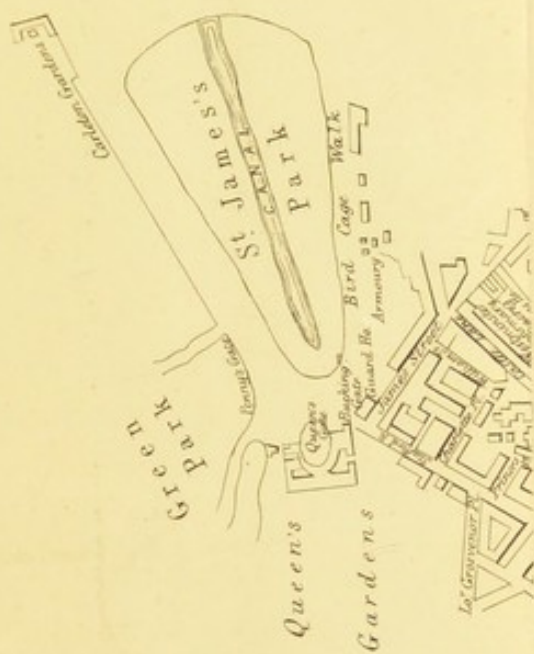


# OF THE COUNTY OF YORK

NAME OF THE LAND		ACRES		ROBOTS		TAXES	
1. The land of the Lord of the Manor of		100		100		100	
2. The land of the Lord of the Manor of		100		100		100	
3. The land of the Lord of the Manor of		100		100		100	
4. The land of the Lord of the Manor of		100		100		100	
5. The land of the Lord of the Manor of		100		100		100	
6. The land of the Lord of the Manor of		100		100		100	
7. The land of the Lord of the Manor of		100		100		100	
8. The land of the Lord of the Manor of		100		100		100	
9. The land of the Lord of the Manor of		100		100		100	
10. The land of the Lord of the Manor of		100		100		100	

CHARLES BEVAN AND SON, PRINTERS, CHAPEL STREET, GROSVENOR SQUARE.

PIMLICO IN 1814.



22

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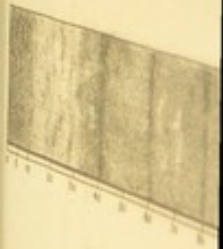
Clay

21.

22



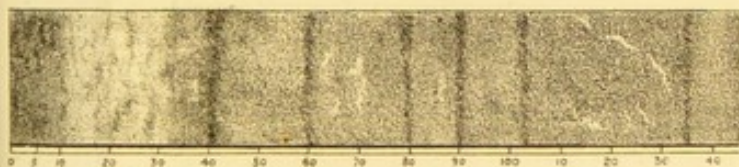
Level of Spring Rock: Water in the New Thames  
Land, Spring Water  
Sand and Gravel containing a powerful supply of Water



LONDON CL

*Level of Trinity High Water in the River Thames  
Land Spring Water*

*Sand and Gravel containing a powerful supply of Water*



LONDON CLAY

*State containing Water which rose within 30 feet of the surface/  
Water hard and unfit for use*



