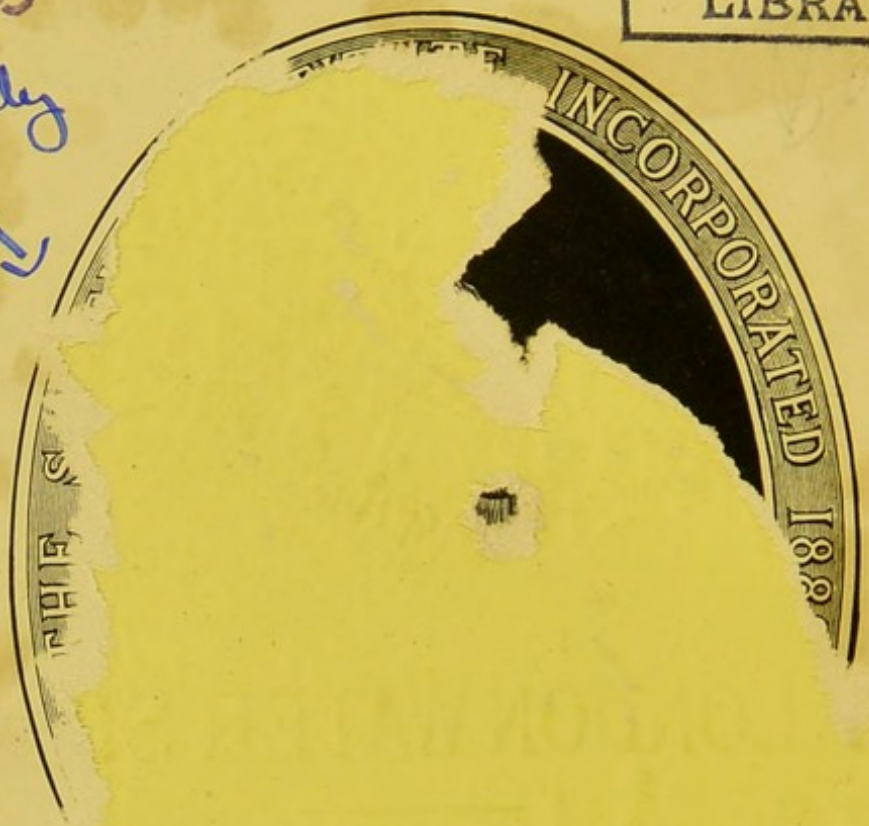
The London water supply : being a report submitted to the Society of Medical Officers of Health on the quality and quantity of the water supplied to the metropolis during the past ten years / by Charles Meymott Tidy.

THE LONDON WATER SUPPLY.

DR. MEYMOTT TIDY.



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FOR THE

THE LONDON WATER SUPPLY:

BEING

A REPORT SUBMITTED TO THE SOCIETY OF MEDICAL OFFICERS OF HEALTH,

ON

THE QUALITY AND QUANTITY OF THE WATER SUPPLIED TO THE METROPOLIS DURING THE PAST TEN YEARS.

BY

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&c., &c., &c.

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TO THE

PRESIDENT, COUNCIL AND MEMBERS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

48, Queen Anne Street,
Cavendish Square, W.,
January, 1878.

Gentlemen,

I submit to you herewith my annual report on the quality and quantity of the water supplied to London by the eight Water Companies entrusted with that duty. The analysis of the water of each Company has as usual been made monthly, and duly reported to you.

Circumstances have occurred during the past year that render such a record of more than usual importance. This is scarcely the place for me to discuss the schemes suggested by the Metropolitan Board of Works, or how far the public will, in my opinion, benefit, or be losers thereby. Feeling, however, that at this juncture grave issues are at stake, I have considered it my duty carefully to arrange and to tabulate the very large number of analyses of London water in my possession, made partly by my predecessor (Dr. Letheby) and partly by myself, during the past ten years. I purpose, in this report, placing the whole of these facts before you, in order to assist you, as far as I can, in judging a righteous judgment on so vital a sanitary question. Further, let me say I desire that my report should be essentially a record of facts. It is of primary importance that our conclusions, as health-officers, should not be the result of mere sentimentalism, but formed after a serious and anxious investigation into all the facts. It is easy enough to draw a frightful picture of river pollution, and thereby to arouse popular prejudice. To adopt such a course, however, for the purpose of carrying a measure, is, in my humble judgment, an unjust and unscientific

COMPOSITION AND QUALITY OF THE METROPOLITAN WATER DURING THE YEAR 1877.

The quantities of the several constituents are calculated in grains per imperial gallon (70,000 grains).	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime.	Magnesia	Chlorine.	Sulphuric Anhydride.	Hardness on Clark's Scale.	
	Saline.	Organic.								Before Boiling.	After Boiling.
Thames Water Companies.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Degrees.	Degrees.
Grand Junction	0·000	0·007	0·129	0·068	19·85	8·150	0·816	0·89	1·568	12·9°	3·3°
West Middlesex.....	0·000	0·007	0·132	0·064	18·81	7·973	0·364	0·90	1·450	13·0°	3·6°
Southwark and Vauxhall	0·001	0·008	0·125	0·076	19·60	8·168	0·375	0·88	1·537	13·0°	3·5°
Chelsea	0·001	0·008	0·134	0·064	19·40	8·102	0·374	0·81	1·519	13·2°	3·1
Lambeth	0·000	0·008	0·156	0·067	20·27	8·437	0·446	0·94	1·694	13·8°	3·5°
Other Companies.											
Kent	0·000	0·002	0·351	0·005	28·06	11·248	0·718	1·45	3·328	19·1°	5·6°
New River	0·000	0·006	0·134	0·040	19·02	8·246	0·386	0·88	0·166	13·3°	3·3°
East London	0·000	0·007	0·123	0·052	19·30	8·007	0·408	0·99	1·647	12·9°	3·4°

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours, and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

method of procedure, a play on fancy rather than an appeal to fact—treating the public like children, and not like men. Let me urge, therefore, that the question we have to decide is this: *Is the water at present supplied to London pure and wholesome?* To answer it, fancy and prejudice must give way to the sober facts of analysis and statistics. If it be wholesome, the huge expenditure of public money suggested is a grievous wrong; if it be not wholesome, then can the existing supply be improved? and if it can, improve it. If, of course, nothing can be done, the public must be taxed and the source must be changed.

I place in a table on the opposite page the averages of the analyses of the several samples of water taken from standpipes supplied by the various Companies, examined by me during the year 1877. The details of which these numbers are the mean, will be found under the heads of the several Companies further on in the report.

Grand Junction.—The *total solid* matter obtained by evaporation to dryness ranged from 17·00 grs. per gallon in July, to 22·90 grs. in March. The *nitrogen* as nitrates, etc., ranged from 0·090 gr. per gallon in August, September and October, to 0·195 gr. in March. The *oxygen* required to oxidize the organic and other matters ranged from 0·024 gr. per gallon in August, to 0·135 gr. in January.

West Middlesex.—The *total solid* matter ranged from 17·10 grs. per gallon in July, to 20·70 grs. in February. The *nitrogen* as nitrates, etc., ranged from 0·090 gr. per gallon in August and October, to 0·180 gr. in February. The *oxygen* required to oxidize the organic and other oxidizable matters ranged from 0·042 gr. per gallon in November, to 0·133 gr. in January.

Southwark and Vauxhall.—The *total solid* matter ranged from 16·70 grs. per gallon in August, to 20·80 grs. in April. The *nitrogen* as nitrates ranged from 0·097 gr. per gallon in October, to 0·198 gr. in March. The *oxygen* required to oxidize the organic matter, etc., ranged from 0·050 gr. per gallon in July, to 0·138 gr. in January.

Chelsea.—The *total solid* matter ranged from 17·4 grs. per gallon in July, to 21·30 grs. in February. The *nitrogen* as nitrates, etc., ranged from 0·090 gr. per gallon in June and July, to 0·180 gr. in February. The *oxygen* required by the organic matter, etc., ranged from 0·021 gr. per gallon in August, to 0·120 gr. in January.

LAMBETH.—The *total solid* matter ranged from 17·00 grs. per gallon in July, to 21·10 grs. in April. The *nitrogen* as nitrates, etc., ranged from 0·120 gr. per gallon in July and December, to 0·210 gr. in January and February. The *oxygen* required to oxidize the organic matter, etc., ranged from 0·047 gr. per gallon in October, to 0·094 gr. in January.

KENT.—The *total solid* ranged from 26·10 grs. per gallon in October, to 31·00 grs. in May. The *nitrogen* as nitrates, etc., ranged from 0·300 gr. per gallon in July, to 0·450 gr. in June. The *oxygen* required to oxidize the organic matter, etc., ranged from 0·001 gr. per gallon in February, to 0·015 gr. in July.

NEW RIVER.—The *total solid* ranged from 16·10 grs. per gallon in September, to 21·70 grs. in February. The *nitrogen* as nitrates, etc., ranged from 0·100 gr. per gallon in November, to 0·216 gr. in January. The *oxygen* required to oxidize the organic matter, etc., ranged from 0·017 gr. per gallon in September, to 0·094 gr. in January.

EAST LONDON.—The *total solid* matter ranged from 14·90 grs. per gallon in December, to 22·70 grs. in January. The *nitrogen* as nitrates, etc., ranged from 0·090 gr. per gallon in June and July, to 0·180 gr. in February. The *oxygen* required to oxidize the organic matter, etc., ranged from 0·028 gr. per gallon in May, to 0·079 gr. in January.

Having thus briefly dealt with the analyses of the London waters for the past year, I proceed to consider in detail the results obtained by our monthly examinations of the water of the several Companies during the ten years from 1868 to 1877 inclusive.

I should wish in the first place to make one or two general observations.

I. I have stated in these analyses *the quantity of ammonia* obtained from the organic matter by distilling it with an alkaline solution of potassic permanganate (*albuminoid ammonia* of Wanklyn), as well as the *quantity* of *oxygen* required to oxidize the organic and other oxidizable constituents of the water, determined by the action for three hours of a standard solution of potassic permanganate. I am desirous that my reasons for stating the results by these processes should not be misunderstood. To the permanganate process, as it is called, *when properly conducted,* I adhere, every year's experience only confirming, to my mind, its accuracy as a qualitative test. In the albuminoid ammonia process, as it is called, as a test of water

purity, my faith is very small. With respect to Dr. Frankland's combustion process, the experience of the past two years compels me to speak more favorably than I have done on previous occasions. My reason for not including the results by this process in the tables, is that Dr. Frankland himself gives them in his monthly report. I may add this, however, that the results obtained by the permanganate and by the combustion processes closely agree, whereas the results obtained by Mr. Wanklyn's process seldom correspond, and are often at direct variance, with both the permanganate and the combustion processes. I purpose, however, dealing with this matter on another occasion, when I shall have a large number of comparison analyses to place before chemists in proof of what I say.

II. As regards the *turbidity* recorded in many cases, I should wish to note that the test to which the water is subjected is a severe one. A glass tube two feet long, having a glass bottom, is filled with the water to be examined. A powerful light is then reflected through the two feet stratum of water from a white surface. If a single particle of suspended matter is noted, the water is recorded as "*very slightly turbid*" (v. s. t.), the terms "*slightly turbid*" (s. t.) and "*turbid*" (t.) expressing degrees of turbidity. This turbidity, however, it must be understood, would be quite unobserved by an ordinary observer, and is invariably due to the presence of a very minute quantity of finely-divided clay derived from the bed of the river. The quantity has always been too small for actual determination; but when seen under the microscope it has been found to consist chiefly of amorphous mineral matter, with minute fragments of vegetable tissue, and a few filaments of fungoid and confervoid growths, together with an occasional animalcule of a diatomaceous character. These appearances are observed in the sedimentary matters of all rivers, whether they receive sewage or not. Dr. Letheby remarks that in the pure water of the Nile, very many miles above Cairo, the same appearances are visible, and to a very much greater extent than in the Thames water. Subsidence and effective filtration will entirely remove it, as shown by the difference in the quality of the water at the intake of the West Middlesex Company's works and the same water after filtration. It is thus evident that a perfectly bright and clear water may be obtained by subsidence and filtration from a very turbid water, the turbidity itself being in no respect an indication of pollution or unwholesomeness.

III. The samples of water from the mains of the several Companies have of late been taken by myself, the Companies having no knowledge of

the day when, or the place where, the samples are taken. The samples from the works have been kindly forwarded to me by the engineers of the several Companies, at my request.

IV. The results throughout this report are stated in grains, per imperial gallon of 70,000 grains. They can be brought to parts per 100,000 by dividing by 7 and moving the decimal place one further on.

V. As regards the records I have quoted of the quantity of water supplied by the various Companies, I believe that these quantities are given on the gross capacities of the pumps, and that they are therefore subject to a deduction of about 10 per cent. to arrive at the net quantities.

THAMES WATER.

I.—GRAND JUNCTION WATER COMPANY.

The district supplied by this Company is "north of the River down to "Kew, whence its southern boundary is the edge of the West Middlesex "district to the south of it, north of which it extends as far as the Great "Western Railway, and as far east as the Edgware Road."

The Company supplies an estimated population of 339,147 people, residing in 37,683 houses (Nov., 1877). No houses within its district are supplied on the constant service.

The intake of the Company is from the Thames at Hampton, close to the pumping station of the West Middlesex Company. There are at present four subsiding and storage reservoirs for unfiltered water (the construction of others being contemplated), occupying an area of seven acres, and capable of holding 19,500,000 gallons, and three reservoirs for filtered water capable of holding 18,000,000 gallons. There are four filter-beds, occupying an area of 7·75 acres. They consist of a layer 5-ft. 6-in. in thickness, and are made up from above downwards of, Harwich sand (2-ft. 6-in.); hoggin or a coarse sand (6-in.); fine gravel (9-in.); coarse gravel (9-in.); boulders (1-ft.). The average rate of filtration during 1877 was 1·96 gallons per hour for every square foot of filtering surface.

The analysis of the water taken from the Company's mains, made by Dr. Letheby and myself, is given month by month, from 1869 to 1877 inclusive, in the following tables:—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	s. t.	—	—	—	23·17	—	15·0°	4·0°
February	s. t.	—	—	—	—	—	14·0°	4·0°
March	s. t.	—	—	—	20·80	—	14·0°	4·0°
April	s. t.	—	—	—	22·33	—	14·5°	4·5°
May	s. t.	0·003	0·090	0·086	20·67	0·965	13·0°	3·5°
June	c.	0·001	0·056	0·088	16·70	0·965	11·8°	2·8°
July	c.	0·000	0·075	0·064	16·83	0·764	12·0°	2·5°
August	c.	0·010	0·065	0·071	18·13	0·959	11·5°	2·5°
September	c.	0·002	0·068	0·082	18·33	—	12·0°	3·0°
October	c.	0·001	0·105	0·080	19·04	1·086	13·0°	4·0°
November	s. t.	0·001	0·150	0·090	21·43	1·456	13·5°	3·4°
December	c.	0·002	0·174	0·130	22·77	1·250	15·8°	4·1°
Average	.....	0·002	0·098	0·086	19·93	1·063	13·3°	3·5°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	s. t.	0·001	0·255	0·158	20·77	1·116	14·8°	5·2°
February	c.	0·010	0·210	0·153	20·93	1·152	14·6°	3·8°
March	c.	0·002	0·195	0·086	21·63	1·025	14·0°	3·8°
April	c.	0·002	0·172	0·060	21·17	0·904	14·5°	3·8°
May	c.	0·000	0·067	0·113	19·60	0·849	14·9°	3·5°
June	c.	0·000	0·090	0·077	19·33	1·092	14·5°	3·7°
July	c.	0·000	0·066	0·069	19·20	1·152	14·0°	3·4°
August	s. t.	0·001	0·091	0·071	19·47	1·019	13·8°	3·9°
September	c.	0·000	0·076	0·074	19·37	1·019	13·5°	3·2°
October	c.	0·001	0·049	0·072	17·63	1·019	13·2°	3·2°
November	c.	0·004	0·051	0·036	19·19	1·019	14·6°	3·4°
December	s. t.	0·002	0·018	0·098	19·10	1·007	14·8°	3·6°
Average	.....	0·002	0·112	0·089	19·78	1·031	14·3°	3·7°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·066	0·113	20·03	1·019	15·0°	4·6°
February	v. s. t.	0·002	0·066	0·111	23·90	1·116	15·0°	4·9°
March	c.	0·001	0·068	0·106	19·87	1·019	15·0°	4·2°
April	c.	0·001	0·092	0·050	17·97	0·995	14·8°	3·8°
May	c.	0·001	0·075	0·054	18·73	0·861	14·6°	3·8°
June	c.	0·001	0·023	0·079	17·00	1·019	13·0°	3·5°
July	c.	0·002	0·075	0·080	16·57	0·934	12·8°	3·3°
August	c.	0·001	0·075	0·069	15·97	1·001	13·0°	2·8°
September	c.	0·001	0·083	0·083	15·73	1·001	12·6°	3·0°
October	v. s. t.	0·004	0·091	0·049	16·97	1·073	13·8°	3·2°
November	c.	0·005	0·091	0·050	19·23	1·025	14·9°	3·4°
December	c.	0·005	0·110	0·089	20·33	1·140	15·4°	4·2°
Average	.....	0·002	0·076	0·078	18·53	1·016	14·2°	3·7°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·006	0·010	0·110	0·070	21·61	1·067	15·9°	4·1°
February ..	v. s. t.	0·007	0·006	0·125	0·115	21·83	1·007	16·0°	4·2°
March	v. s. t.	0·005	0·008	0·125	0·105	20·93	1·092	15·4°	4·1°
April	v. s. t.	0·001	0·008	0·184	0·057	18·73	1·140	15·0°	4·1°
May	c.	0·004	0·008	0·131	0·136	20·13	1·140	15·0°	4·3°
June	c.	0·003	0·005	0·126	0·073	18·29	1·098	14·1°	3·6°
July	v. s. t.	0·002	0·006	0·120	0·107	18·33	1·285	13·8°	3·6°
August	v. s. t.	0·002	0·006	0·125	0·109	18·47	1·285	14·0°	3·5°
September..	v. s. t.	0·002	0·005	0·125	0·127	16·57	1·140	13·2°	3·3°
October	v. s. t.	0·003	0·005	0·112	0·179	18·33	1·140	13·9°	3·5°
November..	c.	0·003	0·008	0·128	0·103	—	1·140	14·8°	3·8°
December ..	v. s. t.	0·003	0·007	0·124	0·048	21·97	1·140	16·2°	3·8°
Average..	.....	0·003	0·007	0·128	0·102	19·56	1·139	14·8°	3·8°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·008	0·008	0·126	0·094	21·57	1·213	15·1°	3·8°
February ..	v. s. t.	0·005	0·006	0·124	0·135	20·61	1·176	14·3°	3·4°
March	c.	0·003	0·005	0·127	0·085	20·23	1·140	14·6°	3·8°
April	v. s. t.	0·004	0·005	0·149	0·117	18·41	1·001	14·6°	3·8°
May	c.	0·002	0·005	0·111	0·070	18·17	1·067	14·6°	3·6°
June	c.	0·003	0·008	0·147	0·097	17·90	1·140	14·5°	3·9°
July	c.	0·002	0·005	0·147	0·104	18·13	1·213	13·7°	3·4°
August	—	—	—	—	—	—	—	—	—
September..	—	—	—	—	—	—	—	—	—
October	—	—	—	—	—	—	—	—	—
November ..	—	—	—	—	—	—	—	—	—
December ..	—	—	—	—	—	—	—	—	—
Average..	.....	0·004	0·006	0·133	0·090	19·29	1·135	14·5°	3·8°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·003	0·007	0·166	0·134	20·30	1·182	15·0°	3·8°
February ..	v. s. t.	0·002	0·007	0·144	0·084	21·90	1·140	17·0°	4·2°
March	v. s. t.	0·002	0·006	0·128	0·104	20·21	1·225	15·8°	3·8°
April	v. s. t.	0·002	0·006	0·123	0·069	20·30	1·140	15·4°	3·8°
May	v. s. t.	0·002	0·006	0·115	0·051	18·93	1·086	14·4°	3·6°
June	v. s. t.	0·001	0·008	0·115	0·046	18·40	1·073	14·6°	3·3°
July	v. s. t.	0·002	0·005	0·147	0·068	18·33	1·073	14·6°	3·2°
August	—	—	—	—	—	—	—	—	—
September..	—	—	—	—	—	—	—	—	—
October	—	—	—	—	—	—	—	—	—
November ..	v. s. t.	0·002	0·008	0·129	0·051	17·73	1·140	14·0°	3·3°
December ..	c.	0·003	0·008	0·131	0·047	20·93	1·140	16·0°	3·6°
Average..	.....	0·002	0·007	0·133	0·073	19·67	1·122	15·2°	3·6°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·002	0·005	0·146	0·034	20·13	1·140	15·6°	3·6°
February ..	v. s. t.	0·003	0·009	0·114	0·096	22·25	1·140	16·5°	4·0°
March	s. t.	0·002	0·008	0·114	0·083	20·83	1·140	15·8°	4·0°
April	s. t.	0·002	0·005	0·124	0·040	19·23	1·086	14·9°	3·8°
May	s. t.	0·002	0·004	0·097	0·051	17·11	1·073	14·3°	3·3°
June	s. t.	0·002	0·008	0·086	0·066	17·17	1·037	14·0°	3·3°
July	s. t.	0·002	0·008	0·098	0·073	16·50	1·025	13·0°	3·4°
August	s. t .	0·001	0·006	0·115	0·071	16·97	1·001	13·6°	3·3°
September..	v. s. t.	0·001	0·007	0·146	0·057	16·67	1·001	13·8°	3·3°
October	v. s. t.	0·002	0·008	0·115	0·048	17·33	1·073	14·0°	3·3°
November..	—	—	—	—	—	—	—	—	—
December ..	t.	0·002	0·010	0·104	0·135	18·87	10·86	14·0°	4·1°
Average..	.....	0·002	0·007	0·114	0·069	18·46	1·072	14·5°	3·6°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·003	0·008	0·147	0·091	21·02	1·019	14·8°	4·2°
February ..	t.	0·003	0·007	0·147	0·092	21·30	1·073	15·2°	4·2°
March	s. t.	0·002	0·007	0·165	0·085	19·31	1·164	14·0°	4·2°
April	t.	0·001	0·005	0·157	0·043	19·67	1·116	14·3°	3·8°
May	s. t.	0·000	0·006	0·169	0·059	18·67	1·086	13·5°	3·8°
June	s. t.	0·001	0·005	0·131	0·051	18·23	1·019	14·0°	3·3°
July	s. t.	0·001	0·006	0·130	0·056	17·90	1·031	13·9°	3·3°
August	s. t.	0·002	0·007	0·147	0·144	20·27	1·073	15·4°	4·0°
September..	s. t.	0·001	0·005	0·147	0·064	19·00	1·025	15·2°	3·4°
October	t.	0·002	0·010	0·167	0·094	19·63	1·073	15·4°	3·3°
November..	t.	0·002	0·010	0·115	0·173	21·03	1·001	16·5°	4·2°
December ..	s. t.	0·002	0·008	0·128	0·060	21·37	1·007	16·5°	4·2°
Average..	.....	0·002	0·007	0·146	0·084	19·78	1·057	14·9°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl.)	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	t.	0·001	0·005	0·165	0·051	22·53	—	—	1·013	—	15·9°	3·8°
February..	s. t.	0·002	0·006	0·172	0·059	22·23	—	—	1·067	—	15·6°	4·2°
March	s. t.	0·001	0·005	0·168	0·100	19·70	—	—	0·980	—	14·3°	3·3°
April	s. t.	0·001	0·006	0·120	0·071	19·67	—	—	—	—	14·3°	3·3°
May.....	s. t.	0·001	0·007	0·090	0·072	19·60	—	—	—	—	14·3°	3·0°
June	s. t.	0·000	0·007	0·105	0·040	20·30	—	—	—	—	14·8°	3·3°
July.....	c.	0·000	0·005	0·105	0·060	18·00	—	—	0·864	—	12·1°	2·4°
August ..	c.	0·000	0·007	0·110	0·046	19·80	—	—	1·110	1·133	13·2°	2·0°
September..	s. t.	0·000	0·006	0·105	0·032	17·02	7·112	0·432	1·010	1·030	12·1°	3·3°
October ..	c.	0·000	0·008	0·135	0·084	20·40	8·288	0·396	0·940	1·800	13·8°	2·4°
November..	c.	0·000	0·007	0·120	0·048	20·31	8·231	0·432	1·010	1·412	14·3°	4·2°
December..	s. t.	0·003	0·009	0·165	0·128	20·76	7·670	0·540	0·940	2·130	13·2°	3·8°
Average..	.....	0·000	0·006	0·130	0·066	20·02	7·825	0·450	0·908	1·501	13·9°	3·2°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl.)	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	s. t.	0·001	0·007	0·120	0·135	18·90	7·390	0·288	0·87	2·060	13·2°	3·8°
February..	v. s. t.	0·000	0·006	0·165	0·073	21·30	7·840	0·360	0·86	1·666	13·2°	2·4°
March	t.	0·001	0·008	0·195	0·053	22·90	9·180	0·720	0·94	1·740	13·7°	4·2°
April	c.	0·000	0·009	0·129	0·064	20·80	8·960	0·460	0·94	1·860	14·3°	3·7°
May.....	v. s. t.	0·001	0·007	0·135	0·049	20·50	8·550	0·468	0·80	1·670	13·2°	3·3°
June	t.	0·001	0·008	0·129	0·050	18·40	7·504	0·360	0·94	1·660	11·0°	4·2°
July.....	v. t.	0·001	0·007	0·120	0·052	17·00	7·392	0·432	0·94	1·200	11·0°	2·8°
August ..	c.	0·000	0·007	0·099	0·024	18·40	7·560	0·360	0·94	1·133	12·1°	3·0°
September..	c.	0·001	0·009	0·090	0·100	20·80	8·960	0·396	0·86	1·333	13·7°	3·3°
October ..	s. t.	0·000	0·005	0·090	0·043	18·90	8·456	0·216	0·87	1·365	12·6°	3·3°
November..	c.	0·000	0·007	0·156	0·046	21·10	8·568	0·432	0·94	1·400	14·8°	3·0°
December..	s. t.	0·000	0·008	0·120	0·134	19·20	7·450	0·504	0·87	1·733	12·6°	3·7°
Average..	.....	0·000	0·007	0·129	0·068	19·85	8·150	0·816	0·89	1·568	12·9°	3·3°

In the following table I have stated the quantity of water supplied by the Grand Junction Water Company, from 1869—1877 inclusive, giving the average, the maximum and the minimum supply for each year :—

		Gallons per diem.	Houses Supplied.
1869	Average	10,146,080	30,453
	Maximum (July).....	11,409,952	30,509
	Minimum (December)	9,257,767	30,929
1870	Average	10,734,368	30,929
	Maximum (July)	12,056,092	30,929
	Minimum (March)	9,610,811	30,929
1871	Average	11,125,555	31,647
	Maximum (September)	12,193,223	31,820
	Minimum (February)	10,291,949	30,929
1872	Average	11,216,000	32,960
	Maximum (July)	12,441,291	33,013
	Minimum (November)	10,507,073	33,500
1873	Average	11,543,521	34,176
	Maximum (August)	12,733,808	34,243
	Minimum (February)	10,373,591	33,500
1874	Average	10,580,750	35,037
	Maximum (August)	12,802,981	35,144
	Minimum (December)	10,219,346	35,144
1875	Average	10,883,958	35,663
	Maximum (June)	12,524,217	35,709
	Minimum (November)	8,580,495	36,063
1876	Average	11,130,159	36,290
	Maximum (July)	13,290,561	36,036
	Minimum (February)	10,078,371	36,036
1877	Average	11,244,517	37,545
	Maximum (July).....	12,793,963	37,683
	Minimum (November)	10,554,803	37,683

II.—WEST MIDDLESEX WATER COMPANY.

"The district supplied by this Company is situate between the River "and a line from Kew to Kensington, and between the Great Western Rail- "way line and the district of the New River Company, eastward of Prim- "rose Hill, and southward below Regent's Park as far as Oxford Street."

The Company supplies 375,487 people, residing in 50,065 houses, 2,090 of which are supplied on the constant service. This system, moreover, they are fully prepared to extend (Nov., 1877). The Company's intake is from the Thames at Hampton. There are three subsidence and storage reservoirs for unfiltered water, occupying an area of 20·5 acres, and capable of holding 56,950,000 gallons. The Company avoid taking water in during the time of flood. There are three reservoirs for filtered water, their capacity being 10,922,000 gallons. There are six filter-beds, occupying ten acres, each being 5-ft. thick, and made up of Harwich sand (1-ft. 9-in.); Barnes sand (1-ft.); and gravel (2-ft. 3-in.). The average rate of filtration for 1877 was 1·12 gallons per hour per square foot of filter surface.

I place before you the results of the examinations made by Dr. Letheby and myself of the water from the Company's mains monthly, from 1868 to 1877 inclusive :—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	—	0·091	23·50	—	15·0°	4·0°
February	c.	0·002	—	0·116	20·83	—	13·0°	3·0°
March	c.	0·002	—	0·036	21·00	—	14·5°	4·0°
April	c.	0·002	—	0·060	22·67	—	14·5°	4·5°
May	c.	0·002	0·012	0·072	21·07	0·861	13·0°	4·0°
June	c.	0·001	0·048	0·084	14·78	0·965	11·7°	3·4°
July	c.	0·001	0·024	0·047	16·00	0·867	11·5°	2·5°
August	c.	0·000	0·017	0·076	17·30	2·440	11·0°	2·5°
September	c.	0·000	0·057	0·068	18·16	—	12·0°	3·0°
October	c.	0·002	0·036	0·056	16·01	1·134	12·5°	3·5°
November	c.	0·000	0·090	0·055	19·63	1·309	13·0°	3·3°
December	c.	0·001	0·156	0·027	20·97	1·164	14·6°	3·3°
Average	.....	0·002	0·055	0·065	19·32	1·248	13·0°	3·4°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·004	0·204	0·167	20·37	1·019	14·6°	5·3°
February	c.	0·001	0·244	0·107	21·57	1·013	14·9°	4·1°
March	c.	0·002	0·262	0·114	20·90	1·249	13·9°	3·4°
April	c.	0·001	0·203	0·098	20·93	0·995	14·0°	3·6°
May	c.	0·000	0·083	0·070	18·07	1·019	13·8°	3·5°
June	c.	0·004	0·096	0·065	17·83	1·019	14·1°	4·1°
July	c.	0.002	0·030	0·069	17·81	1·164	13·6°	3·4°
August	c.	0.000	0·078	0·041	17·17	1·019	13·8°	3·3°
September	c.	0·000	0·066	0·062	17·40	0·873	13·4°	3·4°
October	c.	0·000	0·049	0.064	16·89	1·019	12·6°	3·0°
November	c.	0·000	0·049	0.057	18·04	1·019	14·0°	3·3°
December	c.	0·000	0·024	0·031	18·97	0·995	14·3°	3·6°
Average	.....	0·001	0·116	0·079	18·83	1·033	13·9°	3·6°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·001	0·066	0·117	20·57	1·019	14·3°	4·2°
February	c.	0·000	0·091	0·051	22·21	1·164	14·9°	4·6°
March	c.	0·001	0·100	0·066	20·23	1·019	15·0°	4·2°
April	c.	0·000	0·110	0·050	19·63	1·019	15·0°	4·1°
May	c.	0·000	0·109	0·033	17·37	1·019	13·7°	3·8°
June	c.	0·001	0·020	0·034	17·40	1·019	13·6°	3·6°
July	c.	0·000	0·091	0·050	17·13	1·001	12·9°	3·3°
August	c.	0.000	0·110	0·049	16·87	0·861	13·9°	3·3°
September	c.	0·000	0·091	0·033	15·60	1·001	12·1°	2·9°
October	c.	0·001	0·132	0·045	16·40	1·140	13·3°	3·2°
November	c.	0·002	0·110	0·039	18·57	1·025	14·6°	3·6°
December	c.	0·001	0·110	0·065	19·17	1·140	15·0°	3·6°
Average	.....	0·001	0·095	0·053	18·43	1·035	14·0°	3·7°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·003	0·003						
February	c.	0·002	0·004	0·110	0·052	22·29	1·140	16·2°	4·4°
March	c.	0·001	0·004	0·125	0·082	19·53	1·140	15·0°	3·8°
April	c.	0·000	0·003	0·190	0·026	19·10	1·140	15·2°	4·0°
May	c.	0·001	0·003	0·136	0·021	18·87	1·140	14·2°	3·6°
June	c.	0·000	0·005	0·114	0·024	17·97	1·128	13·8°	3·6°
July	c.	0·001	0·004	0·118	0·070	17·10	1·080	13·2°	3·3°
August	c.	0·000	0·003	0·091	0·044	17·79	1·237	13·9°	3·3°
September	c.	0·000	0·003	0·112	0·030	16·53	1·067	13·3°	3·3°
October	c.	0·000	0·005	0·112	0·041	17·27	1·019	13·6°	3·3°
November	c.	0·000	0·006	0·139	0·018	18·97	1·086	15·0°	3·5°
December	c.	0·001	0·004	0·118	0·028	20·40	1·001	15·4°	3·6°
Average	.....	0·001	0·004	0·124	0·040	18·71	1·098	14·4°	3·3°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·119	0·034	20·27	1·140	15·3°	3·3°
February ..	c.	0·002	0·005	0·121	0·049	19·11	1·213	14·8°	3·6°
March	c.	0·001	0·005	0·124	0·055	20·17	1·213	14·9°	3·8°
April	c.	0·001	0·004	0·135	0·075	19·20	1·140	15·0°	4·1°
May	c.	0·000	0·004	0·147	0·039	17·93	1·128	15·1°	4·0°
June	c.	0·001	0·004	0·131	0·070	19·00	1·213	15·5°	4·6°
July	c.	0·002	0·005	0·147	0·079	18·53	1·067	13·8°	3·9°
August	c.	0·000	0·005	0·131	0·055	17·70	1·001	13·7°	3·3°
September..	c.	0·001	0·005	0·147	0·043	17·97	1·001	14·0°	3·3°
October	c.	0·000	0·003	0·147	0·031	16·67	1·067	13·0°	3·3°
November ..	c.	0·002	0·006	0·131	0·105	18·93	1·213	14·8°	4·2°
December ..	c.	0·001	0·006	0·131	0·032	19·93	0·794	15·0°	3·9°
Average..	.....	0·001	0·004	0·134	0·056	18·78	1·099	14·6°	3·8°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·147	0·077	20·67	1·182	15·4°	3·8°
February ..	c.	0·001	0·005	0·146	0·053	21·40	1·140	16·0°	4·0°
March	c.	0·001	0·005	0·147	0·048	20·77	1·188	15·6°	3·9°
April	c.	0·000	0·005	0·131	0·046	19·91	1·140	15·1°	3·6°
May	c.	0·001	0·006	0·125	0·031	17·67	1·031	14·0°	3·0°
June	c.	0·000	0·004	0·126	0·029	17·10	1·037	14·1°	3·0°
July	c.	0·000	0·004	0·147	0·016	18·20	1·073	14·3°	3·2°
August	c.	0·001	0·003	0·125	0·010	17·33	1·001	13·6°	3·0°
September..	c.	0·001	0·004	0·098	0·034	17·03	1·073	13·5°	3·4°
October	c.	0·001	0·004	0·086	0·018	17·11	1·073	13·8°	3·3°
November ..	c.	0·001	0·004	0·164	0·038	17·63	1·086	14·0°	3·3°
December ..	c.	0·001	0·005	0·181	0·025	20·43	1·073	15·8°	3·6°
Average..	.....	0·001	0·004	0·135	0·035	18·77	1·091	14·6°	3·4°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·130	0·001	20·50	1·073	15·8°	3·6°
February ..	c.	0·001	0·006	0·130	0·046	21·53	1·140	16·0°	4·0°
March	c.	0·001	0·006	0·130	0·060	20·90	1·073	15·8°	4·6°
April	c.	0·001	0·005	0·129	0·044	17·91	1·067	14·5°	4·0°
May	c.	0·000	0·005	0·131	0·049	16·97	1·001	14·0°	3·3°
June	c.	0·001	0·005	0·098	0·051	16·73	1·007	14·0°	3·3°
July	c.	0·001	0·005	0·099	0·038	16·37	1·001	13·0°	3·3°
August	c.	0·000	0·004	0·131	0·042	16·53	1·001	13·5°	3.3°
September..	c.	0·000	0·005	0·147	0·026	16·27	1·001	13·2°	3·2°
October	c.	0·000	0·005	0·116	0·030	16·50	1·013	13·4°	3·0°
November ..	c.	0·000	0·004	0·115	0·029	17·23	1·031	13·6°	3·3°
December ..	c.	0·000	0·005	0·147	0·049	18·31	1·051	13·8°	3·6°
Average..	.....	0·000	0·005	0·125	0·039	17·98	1·068	14·2°	3·5°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·005	0·147	0·062	20·67	0·989	14·3°	4·4°
February ..	c.	0·001	0·004	0·162	0·059	20·93	1·067	14·8°	4·2°
March	c.	0·001	0·005	0·165	0·056	20·06	1·098	14·2°	4·1°
April	c.	0·001	0·004	0·155	0·027	19·03	1·080	14·0°	3·8°
May	c.	0·000	0·004	0·137	0·036	18·87	1·001	13·8°	3·8°
June	c.	0·000	0·004	0·151	0·044	18·07	1·001	14·0°	3·3°
July	c.	0·000	0·004	0·136	0·034	17·51	1·001	13·4°	3·0°
August	c.	0·000	0·004	0·147	0·041	18·03	1·019	14·0°	3·3°
September..	c.	0·000	0·004	0·137	0·032	18·87	1·001	14·0°	3·3°
October	c.	0·000	0·005	0·131	0·046	19·43	1·001	15·0°	3·3°
November ..	c.	0·000	0·006	0·135	0·057	20·17	0·995	16·0°	3·3°
December ..	c.	0·000	0·005	0·147	0·031	20·23	1·001	16·1°	3·8°
Average..	.....	0·000	0·004	0·146	0·044	19·32	1·021	14·5°	3·6°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·000	0·005	0·147	0·053	22·13	—	—	1·001	—	15·6°	3·8°
February..	c.	0·000	0·006	0·157	0·049	21·93	—	—	0·958	—	15·4°	3·8°
March	c.	0·001	0·006	0·146	0·090	20·23	—	—	0·958	—	14·3°	3·3°
April	c.	0·001	0·007	0·095	0·053	19·93	—	—	0·966	—	14·3°	3·3°
May.....	v. s. t.	0·000	0·007	0·105	0·047	19·10	—	—	0·958	—	14·0°	3·0°
June	c.	0·000	0·007	0·120	0·051	18·70	—	—	0·950	—	14·0°	3·0°
July.....	c.	0·000	0·007	0·150	0·036	18·70	—	—	0·864	—	12·1°	2·4°
August ..	v. s. t.	0·000	0·008	0·090	0·050	17·50	—	—	1·130	1·070	13·2°	2·4°
September..	c.	0·002	0·006	0·096	0·032	17·50	7·672	0·360	0·860	0·960	12·7°	2·6°
October ..	c.	0·000	0·008	0·135	0·082	20·41	8·064	0·468	1·010	1·660	13·8°	2·4°
November..	c.	0·001	0·006	0·165	0·048	19·84	8·624	0·468	0·940	1·584	14·3°	3·3°
December..	v. s. t.	0·006	0·009	0·165	0·100	22·61	8·960	0·540	0·940	2·130	14·3°	4·6°
Average..	.....	0·001	0·007	0·131	0·058	19·88	8·330	0·459	0·958	1·471	14·0°	3·1°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·000	0·008	0·150	0·133	18·40	7·560	0·252	0·94	1·86	13·2°	3·8°
February..	s. t.	0·000	0·007	0·180	0·077	20·70	8·960	0·360	0·86	1·60	12·6°	3·8°
March	s. t.	0·001	0·006	0·168	0·073	21·40	9·290	0·500	0·94	1·36	14·3°	4·6°
April	c.	0·001	0·009	0·120	0·057	19·80	8·190	0·340	0·87	1·63	13·2°	3·3°
May.....	s. t.	0·000	0·007	0·150	0·059	20·20	8·540	0·468	0·87	1·67	13·2°	4·2°
June	c.	0·000	0·007	0·129	0·054	17·70	7·280	0·324	0·94	1·60	12·6°	3·3°
July.....	s. t.	0·000	0·007	0·105	0·053	17·10	7·280	0·216	0·94	1·33	11·8°	3·3°
August ..	c.	0·001	0·007	0·090	0·048	16·00	6·440	0·252	0·94	1·20	12·6°	3·0°
September..	c.	0·000	0·009	0·110	0·048	17·30	7·280	0·324	0·86	1·20	12·6°	3·0°
October ..	c.	0·000	0·008	0·090	0·043	19·00	8·568	0·438	0·86	1·30	13·7°	3·3°
November..	c.	0·001	0·008	0·160	0·042	19·40	8·349	0·396	1·01	1·23	13·7°	4·2°
December..	c.	0·001	0·008	0·135	0·083	19·80	7·950	0·504	0·87	1·46	13·2°	4·2°
Average..	.....	0·000	0·007	0·132	0·064	18·81	7·973	0·364	0·90	1·45	13·0°	3·6°

I now place before you the analyses at different times of the water from the River Thames at Hampton, where the intake of the Company is situated.

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	—	—	—	—	—	—	—	—	—
February ..	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	—
May	s. t.	0·001	0·006	0·129	0·051	17·13	1·073	14·4°	3·4°
June	t.	0·003	0.005	0·110	0·077	17·63	1·098	14·5°	3·3°
July	t.	0·002	0·007	0·098	0·100	17·23	1·086	14·2°	3·3°
August	t.	0·002	0·008	0·125	0·096	16·98	1·019	13·8°	3·3°
September..	c.	0·002	0·008	0·121	0·097	16·99	1·007	13·8°	3·3°
October	t.	0·002	0·008	0·124	0·068	17·13	1·019	14·1°	3·3°
November ..	t.	0·003	0·008	0·147	0·134	19·62	1·140	15·0°	4·2°
December ..	v. t.	0·004	0·009	0·115	0·161	19·90	1·073	14·6°	4·0°
Average..	.....	0·002	0·007	0·121	0·098	17·83	1·064	14·3°	3·6°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·002	0·008	0·136	0·093	21·40	1·001	15·4°	4·6°
February ..	v. t.	0·003	0·010	0·157	0·127	21·17	1·073	15·2°	4·5°
March	v. t.	0·003	0·009	0·187	0·150	21·21	1·104	15·1°	4·8°
April	t.	0·002	0·005	0·141	0·088	19·88	1·128	15·0°	4·2°
May	t.	0·002	0·007	0·139	0·082	19·29	1·043	14·2°	3·6°
June	s. t.	0·002	0·006	0·131	0·071	18·48	1·025	14·8°	3·3°
July	t.	0·002	0·008	0·134	0·083	18·04	1·007	14·0°	3·3°
August	s. t.	0·002	0·008	0·131	0·156	19·20	1·001	15·0°	3·3°
September..	s. t.	0·002	0·006	0·131	0·079	19·30	1·013	14·3°	3·4°
October	t.	0·002	0·008	0·132	0·096	20·13	1·019	15·4°	3·3°
November ..	t.	0·002	0·010	0·131	0·173	21·27	1·001	16·5°	3·8°
December ..	t.	0·002	0·009	0·147	0·091	21·70	0·971	16·8°	3·8°
Average..	.....	0·002	0·008	0·141	0·107	20·09	1·032	15·1°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	t.	0·002	0·008	0·168	0·091	22·70	—	—	1·073	—	16·0°	3·8°
February..	t.	0·002	0·008	0.147	0·074	22·80	—	—	1·025	—	16·1°	3·9°
March	—	—	—	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	—	—	—	—
May.....	—	—	—	—	—	—	—	—	—	—	—	—
June	—	—	—	—	—	—	—	—	—	—	—	—
July.....	—	—	—	—	—	—	—	—	—	—	—	—
August....	t.	0·001	0·009	0·090	0·050	17·50	—	—	1·130	—	14·3°	2·4°
September..	—	—	—	—	—	—	—	—	—	—	—	—
October ..	—	—	—	—	—	—	—	—	—	—	—	—
November..	—	—	—	—	—	—	—	—	—	—	—	—
December ..	—	—	—	—	—	—	—	—	—	—	—	—
Average..	.....	0·001	0·008	0·135	0·071	21·00	—	—	1·076	—	15·4°	3·3°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. t.	0·001	0·008	0·165	0·181	20·10	7·220	0·576	0·87	1·930	12·7°	3·8°
February..	v. t.	0·001	0·009	0·150	0·084	21·00	8·394	0·468	0·86	1·733	13·2°	3·3°
March	v. t.	0·003	0·010	0·150	0·119	21·50	8·684	0·468	0·87	1·460	14·3°	4·2°
April	v. t.	0·003	0·008	0·150	0·164	19·40	8·020	0·360	0·72	1·520	13·2°	4·2°
May.....	v. s. t.	0·000	0·009	0·150	0·056	17·50	7·840	0·432	0·94	1·460	13·2°	3·3°
June.....	v. s. t.	0·003	0·008	0·135	0·073	18·20	8·176	0·360	0·87	1·400	13·2°	3·3°
July.....	v. s. t.	0·001	0·009	0·090	0·075	17·60	7·916	0·324	0·94	1·000	12·7°	2·4°
August....	v. s. t.	0·002	0·009	0·090	0·091	19·50	8·568	0·324	0·94	0·812	13·2°	3·3°
September..	s. t.	0·006	0·012	0·090	0·148	21·00	8·624	0·360	0·79	1·333	14·3°	3·3°
October ..	c.	0·003	0·011	0·165	0·061	19·90	8·736	0·360	0·79	1·433	14·8°	3·7°
November..	t.	0·009	0·015	0·133	0·107	20·00	8·960	0·360	0·94	1·333	14·8°	3·3°
December ..	v. t.	0·007	0·017	0·120	0·149	22·20	8·680	0·439	0·87	1·660	13·7°	3·7°
Average..	.....	0·003	0·010	0·132	0·109	19·82	8·319	0·402	0·86	1·422	13·6°	3·4°

The comparison of the unfiltered Thames water at Hampton, or "*the raw water*," as it is called by the Rivers Pollution Commissioners, and the water after filtration is exceedingly instructive. I arrange in the following table the average analyses for the past year of the monthly samples from the Thames and from the Company's mains :—

Grains per imperial gallon.	Appearance.	Free and Saline Ammonia.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime.	Magnesia.	Hardness on Clark's Scale.	
							Before Boiling.	After Boil ing.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
R. Thames at Hampton	v. t.	0·003	0·109	19·82	8·319	0·402	13·6°	3·4°
West Midx. Co.'s Mains	c.	0·000	0·064	18·81	7·973	0·364	13·0°	3·6°

It would thus appear that the turbid water after filtration becomes perfectly bright and clear, the total solid matter in solution decreasing to the extent of a grain per gallon, that is from 19·82 grains per gallon to 18·81 grains per gallon, and the initial hardness being rendered less by 0·6 degree. Further, the ammonia is decreased from 0·003 gr. per gallon to nil, whilst the oxidizable organic matter is so much lessened that the filtered water requires little more than one-half the quantity of oxygen to oxidize it than is required by the unfiltered water; 0·064 gr. of oxygen being all that is required to oxidize what in the somewhat unmeasured language of the Rivers Pollution Commissioners is described as "the soluble filth with which it," the water of the West Middlesex Company, "is polluted" (Sixth Report, p. 269).

I may note here that in 120 analyses the water of the Company was only found very slightly turbid on seven occasions.

The average supply of water by the Company during the years 1869 to 1877 is stated in the following table, the average maximum and minimum supply for each year being noted :—

		Gallons per diem.	Houses Supplied.
1869	Average	8,193,405	39,645
	Maximum (July)	9,501,568	39,720
	Minimum (March)	7,507,928	39,242
1870	Average	8,814,045	40,887
	Maximum (June)	10,131,094	40,852
	Minimum (January)	7,749,424	40,359
1871	Average	9,352,010	42,216
	Maximum (August)	10,520,511	42,502
	Minimum (January)	8,510,508	41,472
1872	Average	9,480,800	43,570
	Maximum (July)	10,578,091	43,715
	Minimum (December)	8,705,355	44,199
1873	Average	9,401,316	44,811
	Maximum (July)	10,786,739	44,920
	Minimum (February)	8,599,461	44,330
1874	Average	9,532,340	42,605
	Maximum (July)	11,079,436	46,117
	Minimum (December)	8,634,746	46,404
1875	Average	9,775,550	46,942
	Maximum (July)	10,768,138	47,039
	Minimum (February)	8,869,168	46,480
1876	Average	10,203,068	47,701
	Maximum (July)	11,962,451	48,278
	Minimum (February)	9,226,178	47,506
1877	Average	10,022,265	49,435
	Maximum (June)	11,993,538	49,372
	Minimum (December)	8,913,001	50,135

III.—SOUTHWARK AND VAUXHALL.

The district of this Company "lies along the whole southern margin of "the River, from Teddington to Southwark, the boundary at that point "between this district and that of the Kent Waterworks Company lying "to the east of Camberwell, the Grand Surrey Canal and Peckham and the "southern boundary line lying north of Kingston, Balham, Tulse Hill, and "Dulwich."

The Company supplies an estimated population of 490,000 people, residing in 79,320 houses, 450 of which are supplied on the constant service (Nov., 1877).

The Company's intake is from the Thames at Hampton, immediately below the intake of the Grand Junction. The Company has six reservoirs for unfiltered water, occupying an area of 17·5 acres, and capable of holding 66,000,000 gallons. There are nine filter-beds, having a total area of 14·5 acres. The filtering material is 5-ft. 6-in. thick, and consists of Harwich sand (3-ft.); hoggin, a coarse sand (1-ft.); fine gravel (9-in.), and coarse gravel (9-in.). The average rate of filtration for the year 1877 was 1·5 gallons per square foot of filtering surface.

The Company is engaged in a considerable extension of their works, and improvements in those already existing.

The following represent the analysis of the water taken from the Company's mains by Dr. Letheby and myself monthly for the past ten years:—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	—	—	—	0·100	22·99	—	14·0°	4·0°
February	—	—	—	0·141	22·83	—	13·5°	3·5°
March	—	—	—	0·138	20·50	—	14·0°	3·5°
April	—	—	—	0·080	20·30	—	14·5°	4·5°
May	c.	0·005	0·099	0·055	21·33	—	13·0°	4·0°
June	t.	0·002	0·105	0·117	22·13	—	12·0°	3·5°
July	c.	0·005	0·030	0·055	16·85	1·740	12·0°	2·5°
August	c.	0·001	0·080	0·062	18·17	1·206	12·0°	2·5°
September	c.	0·001	0·093	0·136	21·83	—	14·0°	3·5°
October	—	—	—	—	—	—	—	—
November	c.	0·002	0·095	0·069	20·10	1·164	13·7°	3·8°
December	c.	0·001	0·180	0·072	22·53	1·309	14·9°	4·5°
Average	.....	0·004	0·097	0·093	20·87	1·354	13·4°	3·6°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	t.	0·007	0·219	0·198	21·93	1·164	14·6°	5·2°
February	t.	0·008	0·240	0·190	22·13	1·164	14·9°	4·8°
March	c.	0·002	0·240	0·187	23·27	1·146	15·9°	4·7°
April	c.	0·003	0·165	0·064	22·39	0·904	14·2°	3·4°
May	c.	0·004	0·105	0·108	17·04	0·873	14·0°	3·3°
June	c.	0·001	0·038	0·077	17·93	1·164	14·2°	3·3°
July	t.	0·000	0·060	0·061	18·07	1·140	13·8°	3·3°
August	t.	0·001	0·076	0·079	17·83	1·092	13·3°	3·0°
September	c.	0·001	0·076	0·055	17·63	1·019	13·4°	3·1°
October	c.	0·000	0·069	0·079	18·23	1·019	14·1°	3·3°
November	c.	0·000	0·050	0·031	18·83	1·019	14·3°	3·4°
December	c.	0·001	0·013	0·031	18·97	1·007	14·5°	4·0°
Average	.....	0·002	0·113	0·095	19·52	1·059	14·3°	3·7°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·004	0·050	0·133	19·87	1·164	15·0°	4·3°
February	c.	0·002	0·076	0·145	21·03	1·164	14·6°	4·5°
March	c.	0·002	0·091	0·083	20·19	1·092	15·4°	4·4°
April	c.	0·002	0·079	0·046	18·47	1·019	15·0°	4·0°
May	c.	0·002	0·080	0·054	17·13	0·965	13·5°	3·6°
June	c.	0·005	0·023	0·066	17·98	1·019	13·7°	4·1°
July	c.	0·001	0·060	0·080	17·83	0·861	13·5°	4·0°
August	c.	0·006	0·075	0·073	16·95	1·001	13·9°	3·3°
September	c.	0·001	0·065	0·060	15·33	0·928	12·6°	3·4°
October	c.	0·002	0·075	0·057	16·60	1·073	13·6°	3·2°
November	c.	0·004	0·091	0·053	19·60	1·140	14·9°	3·5°
December	c.	0·004	0·100	0·073	19·47	1·140	15·0°	4·0°
Average	.....	0·003	0·073	0·077	18·37	1·047	14·2°	3·9°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·003	0·005	0·110	0·063	20·72	1·140	16·0°	4·2°
February	c.	0·004	0·005	0·110	0·074	21·63	1·140	16·0°	4·2°
March	c.	0·008	0·008	0·110	0·085	21·11	1·140	15·8°	4·8°
April	c.	0·001	0·006	0·161	0·085	20·27	1·140	15·4°	4·4°
May	s. t.	0·003	0·006	0·118	0·124	19·57	1·213	14·6°	4·1°
June	c.	0·002	0·003	0·114	0·079	18·63	1·200	14·2°	4·0°
July	c.	0·005	0·007	0·110	0·092	17·23	1·285	13·6°	3·4°
August	c.	0·002	0·005	0·091	0·096	18·03	1·237	13·8°	3·3°
September	c.	0·002	0·008	0·111	0·077	16·27	1·140	13·6°	3·3°
October	c.	0·005	0·010	0·110	0·173	18·63	1·001	14·0°	3·6°
November	c.	0·005	0·010	0·112	0·071	20·33	1·140	15·8°	3·7°
December	c.	0·002	0·006	0·122	0·050	20·80	1·140	15·5°	3·6°
Average	.....	0·003	0·007	0·125	0·089	19·44	1·159	14·8°	3·8°

1872.	Appearance.	Ammonia.		Nit rogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before B oiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	s. t.	0·008	0·006	0·119	0·115	20·77	1·140	15·0°	3·8°
February ..	c.	0·005	0·006	0·120	0·116	20·83	1·140	14·5°	3·8°
March	s. t.	0·003	0·006	0·121	0·079	20·33	1·140	14·8°	3·8°
April	s. t.	0·003	0·008	0·141	0·155	18·83	1·001	14·8°	3·9°
May	s. t.	0·003	0·006	0·120	0·074	18·50	1·067	15·0°	4·0°
June	t.	0·003	0·008	0·131	0·102	19·13	1·140	15·6°	4·0°
July	c.	0·003	0·007	0·147	0·109	17·93	1·140	14·0°	3·3°
August	c.	0·003	0·007	0·111	0·085	17·13	1·001	13·8°	3·3°
September..	c.	0·003	0·009	0·128	0·097	17·37	1·001	13·5°	3·4°
October	s. t.	0·003	0·007	0·101	0·067	17·83	1·001	14·0°	3·8°
November ..	s. t.	0·003	0·008	0·111	0·117	18·17	1·068	14·3°	3·6°
December ..	t.	0·003	0·010	0·147	0·123	20·87	1·140	15·0°	4·0°
Average..	.....	0·004	0·007	0·125	0·103	18·97	1·081	14·5°	3·7°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c,	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·004	0·010	0·146	0·141	20·13	1·182	15·0°	3·8°
February ..	c.	0·002	0·008	0·130	0·088	21·63	1·140	17·0°	4·2°
March	s. t.	0·003	0·008	0·121	0·100	20·70	1·225	15·9°	3·8°
April	c.	0·002	0·008	0·118	0·079	21·23	1·219	15·8°	3·8°
May	s. t.	0·002	0·007	0·128	0·050	18·93	1·073	14·4°	3·6°
June	c.	0·001	0·006	0·104	0·043	18·10	1·037	14·2°	3·4°
July	c.	0·001	0·005	0·166	0·056	18·53	1·116	14·8°	3·2°
August	s. t.	0·001	0·006	0·086	0·043	18·00	1·073	13·8°	3·3°
September..	s. t.	0·002	0·006	0·106	0·039	17·10	1·073	13·5°	3·3°
October	s. t.	0·002	0·008	0·093	0·053	17·97	1·073	14·0°	3·3°
November ..	s. t.	0·002	0·008	0·126	0·074	19·84	1·073	15·0°	3·8°
December ..	v. s. t.	0·002	0·008	0·134	0·041	20·70	1·140	15·9°	3·6°
Average..	.....	0·002	0·007	0·122	0·067	19·41	1·119	15·0°	3·6°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·008	0·130	0·066	20·23	1·140	15·8°	3·3°
February ..	v. s. t.	0·002	0·008	0·130	0·096	22·66	1·140	16·5°	4·2°
March	s. t.	0·005	0·008	0·114	0·071	20·63	1·073	15·8°	4·2°
April	s. t.	0·002	0·008	0·123	0·075	18·73	1·073	14·5°	3·9°
May	t.	0·002	0·006	0·115	0·053	17·07	1·001	14·0°	3·4°
June	c.	0·002	0·007	0·086	0·056	17·53	1·025	14·3°	3·8°
July	s. t.	0·002	0·007	0·086	0·066	17·00	1·019	13·5°	3·3°
August	t.	0·001	0·009	0·147	0·086	16·91	1·007	13·6°	3·3°
September..	s. t.	0·001	0·006	0·115	0·055	17·43	1·001	13·9°	3·3°
October	v. s. t.	0·002	0·008	0·128	0·086	17·16	1·055	14·0°	3·3°
November ..	s. t.	0·002	0·008	0·118	0·061	19·40	1·086	14·8°	4·1°
December ..	s. t.	0·002	0·007	0·127	0·104	18·53	1·080	14·0°	4·0°
Average..	.....	0·002	0·008	0·119	0·071	18·61	1·058	14·6°	3·7°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·003	0·006	0·140	0·086	21·30	1·073	14·9°	4·2°
February ..	t.	0·003	0·008	0·167	0·119	21·07	1·104	15·0°	4·2°
March	s. t.	0·002	0·006	0·165	0·095	19·89	1·213	14·2°	4·3°
April	t.	0·002	0·006	0·161	0·055	19·93	1·019	14·8°	3·8°
May	s. t.	0·001	0·007	0·156	0·054	19·20	1·073	13·8°	3·6°
June	s. t.	0·001	0·005	0·144	0·052	18·83	1·067	14·0°	3·3°
July	s. t.	0·001	0·005	0·132	0·051	17·36	1·025	13·4°	3·0°
August	—	—	—	—	—	—	—	—	—
September..	—	—	—	—	—	—	—	—	—
October	s. t.	0·002	0·008	0·166	0·064	18·92	1·001	14·8°	3·3°
November..	s. t.	0·002	0·009	0·131	0·169	20·87	1·019	16·5°	4·2°
December ..	v. s. t.	0·002	0·010	0·149	0·078	21·53	1·007	16·8°	4·2°
Average..	.....	0·002	0·007	0·151	0·082	19·89	1·060	14·8°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	s. t.	0·001	0·007	0·168	0·057	22·23	—	—	—	—	15·7°	3·8°
February..	v. s. t.	0·001	0·007	0·170	0·070	21·43	—	—	—	—	15·4°	4·0°
March	c.	0·001	0·007	0·121	0·094	19·93	—	—	—	—	14·3°	3·0°
April	s. t.	0·001	0·007	0·105	0·107	19·35	—	—	—	—	14·3°	3·3°
May.....	s. t.	0·001	0·008	0·120	0·054	19·50	—	—	—	—	14·3°	3·3°
June	c.	0·000	0·006	0·111	0·051	18·20	—	—	—	—	15·4°	2·4°
July.....	c.	0·001	0·007	0·135	0·048	18·30	—	—	0·864	—	12·1°	2·4°
August ..	v. s. t.	0·001	0·006	0·108	0·039	17·60	—	—	0·990	1·200	13·2°	2·0°
September..	c.	0·000	0·006	0·098	0·046	18·30	7·840	0·396	0·940	1·098	13·2°	3·0°
October ..	s. t.	0·001	0·008	0·105	0·050	20·20	8·232	0·468	1·010	1·530	13·8°	2·3°
November..	c.	0·001	0·008	0·120	0·058	20·42	8·512	0·468	0·940	1·271	14·8°	3·7°
December ..	s. t.	0·002	0·008	0·150	0·114	21·14	8·120	0·540	0·940	2·061	14·3°	4·6°
Average..	.....	0·001	0·007	0·122	0·065	19·71	8·176	0·468	0·944	1·432	14·2°	3·1°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. t.	0·001	0·006	0·105	0·138	19·00	7·500	0·252	0·87	1·730	13·2°	3·8°
February..	v. s. t.	0·001	0·007	0·180	0·077	20·60	8·790	0·360	0·86	1·633	13·2°	3·8°
March	c.	0·001	0·007	0·198	0·071	20·50	9·070	0·430	0·87	2·120	14·3°	4·6°
April	t.	0·001	0·009	0·120	0·067	20·80	8·560	0·360	0·87	1·920	13·2°	4·2°
May.....	c.	0·001	0·008	0·150	0·052	19·60	8·490	0·469	0·87	1·680	13·2°	3·3°
June	c.	0·001	0·009	0·108	0·064	18·90	7·728	0·360	0·87	1·730	12·6°	3·0°
July.....	v. t.	0·001	0·008	0·090	0·050	20·70	7·952	0·360	0·87	1·266	12·1°	2·8°
August ..	v. s. t.	0·000	0·007	0·105	0·052	16·70	6·832	0·288	0·94	1·066	12·1°	2·4°
September..	c.	0·002	0·010	0·118	0·110	19·70	8·400	0·432	0·79	1·200	13·2°	3·3°
October ..	t.	0·002	0·010	0·097	0·058	19·50	8·736	0·324	0·87	1·266	13·7°	3·7°
November..	c.	0·000	0·008	0·100	0·053	20·50	8·349	0·360	0·94	1·133	13·7°	3·3°
December ..	c.	0·001	0·009	0·135	0·127	18·70	7·610	0·504	0·87	1·700	12·1°	4·2°
Average..	.....	0·001	0·008	0·125	0·076	19·60	8·168	0·375	0·88	1·537	13·0°	3·5°

The following table represents the average and also the maximum and minimum supply of water by this Company during the years 1869 to 1877 inclusive :—

		Gallons per diem.	Houses Supplied.
1869	Average	14,408,992	73,129
	Maximum (October)	15,260,382	72,596
	Minimum (February)	13,638,569	72,292
1870	Average	15,622,730	77,076
	Maximum (November)	16,501,270	77,272
	Minimum (January)	14,765,114	76,685
1871	Average	16,427,386	78,308
	Maximum (October)	16,438,726	78,621
	Minimum (January)	16,391,400	77,277
1872	Average	16,454,100	78,898
	Maximum (September)	16,460,125	78,985
	Minimum (January)	16,400,166	78,683
1873	Average	18,275,892	79,332
	Maximum (December)	18,989,166	79,155
	Minimum (January)	16,460,515	79,116
1874	Average	18,514,470	79,694
	Maximum (September)	18,973,822	79,786
	Minimum (December)	17,160,000	79,856
1875	Average	18,542,380	80,108
	Maximum (September)	19,275,500	80,230
	Minimum (January)	16,159,500	79,888
1876	Average	18,963,810	80,509
	Maximum (August)	19,850,000	80,570
	Minimum (December)	17,820,000	80,705
1877	Average	18,309,000	78,406
	Maximum (August)	19,400,000	78,720
	Minimum (March)	17,200,000	77,880

IV.—CHELSEA WATER COMPANY

The district supplied by this Company has an area of about five square miles, and is situate between the River and the West Middlesex and Grand Junction Companies' service, including Fulham, Chelsea, Brompton, Kensington, and Belgravia.

The Company supplies a population of 210,000 people, residing in 28,555 houses, 100 of which are supplied on the constant service (Nov., 1877).

The intake of the Company at the present time is entirely confined to the Thames at Molesey, thereby avoiding the turbid water from the River Mole formerly collected when the works were at Ditton. The new and costly works at Molesey are now, and have been since November, 1877, in full operation. Four new reservoirs for the storage of unfiltered water are now in use, occupying an area of 40 acres, and of an aggregate capacity of 140,000,000 gallons. There are two reservoirs for the filtered water, their total capacity being 11,000,000 gallons. There are seven filter-beds, having an area of 6·75 acres each, being eight feet in depth, and consisting of Thames sand (3-ft. 3-in.); shells (3-in.); gravel (4-ft. 6-in.). During the year 1877 the average rate of filtration has been two gallons per hour per square foot of filtering area.

The following tables represent the analyses made by Dr. Letheby and myself of the filtered water from the works of the Company during the past four years:—

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	—	—	—	—	—	—	—	—	—
February ..	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—
April	s. t.	0·003	0·005	0·115	0·034	19·07	1·073	14·8°	3·8°
May	v. t.	0·002	0·004	0·117	0·042	17·17	1·001	14·4°	3·4°
June	t.	0·002	0·006	0·086	0·080	17·43	1·013	13·6°	3·3°
July	s. t.	0·002	0·006	0·104	0·058	16·71	1·007	13·7°	3·3°
August	c.	0·001	0·005	0·131	0·053	16·80	1·013	13·6°	3·3°
September..	c.	0·002	0·005	0·131	0·053	17·17	1·001	13·8°	3·3°
October	c.	0·001	0·008	0·115	0·070	17·33	1·037	13·7°	3·3°
November ..	c.	0·006	0·007	0·116	0·073	17·61	1·031	14·0°	3·3°
December ..	c.	0·007	0·007	0·119	0·116	19·30	1·092	14·3°	4·2°
Average..	.....	0·006	0·006	0·115	0·072	17·62	1·027	14·0°	3·5°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	s. t.	0·003	0·009	0·146	0·116	19·57	1·001	14·0°	4·2°
February ..	t.	0·003	0·006	0·147	0·096	20·57	1·073	15·2°	4·2°
March	v. s. t.	0·002	0·007	0·204	0·087	19·67	1·219	14·3°	4·4°
April	v. s. t.	0·000	0·004	0·186	0·038	19·53	1·213	14·3°	4·0°
May	s. t.	0·000	0·005	0·146	0·049	18·27	1·025	13·6°	3·3°
June	c.	0·001	0·005	0·148	0·058	18·23	1·086	14·0°	3·3°
July	s. t.	0·001	0·006	0·147	0·094	17·81	1·019	13·7°	3·3°
August	c.	0·002	0·006	0·149	0·096	19·73	1·007	15·4°	3·8°
September..	c.	0·001	0·005	0·131	0·046	19·33	1·001	15·0°	3·7°
October	s. t.	0·001	0·008	0·147	0·060	19·47	1·007	15·4°	3·5°
November ..	v. s. t.	0·001	0·008	0·168	0·127	21·33	1·001	16·0°	4·0°
December ..	v. s. t.	0·001	0·008	0·146	0·063	21·40	1·007	16·2°	4·2°
Average ..	.....	0·001	0·006	0·155	0·078	19·58	1·054	14·8°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	s. t.	0·001	0·006	0·147	0·045	22·37	—	—	1·073	—	15·8°	4·0°
February..	c.	0·001	0·005	0·168	0·048	22·27	—	—	1·025	—	15·4°	4·2°
March	—	—	—	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	—	—	—	—
May.....	—	—	—	—	—	—	—	—	—	—	—	—
June	c.	0·001	0·007	0·129	0·072	18·70	—	—	0·861	—	12·1°	2·4°
July.....	c.	0·001	0·007	0·120	0·060	18·90	—	—	0·854	—	15·4°	3·3°
August ..	c.	0·000	0·008	0·102	0·048	18·70	—	—	0·934	0·931	13·2°	2·0°
September..	c.	0·001	0·006	0·096	0·050	17·43	7·840	0·324	0·934	1·098	12·7°	2·4°
October ..	c.	0·001	0·008	0·130	0·100	20·59	8·121	0·468	1·001	1·800	13·8°	2·1°
November..	c.	0·001	0·007	0·053	0·053	20·10	8·400	0·576	0·934	1·341	15·4°	2·8°
December ..	c.	0·004	0·010	0·080	0·139	20·00	7·504	0·648	1·176	2·000	13·2°	4·2°
Average..	.....	0·001	0·007	0·138	0·067	19·89	7·966	0·504	0·976	1·434	14·1°	3·0°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	s. t.	0·002	0·006	0·165	0·135	17·80	7·050	0·360	0·87	1·810	12·1°	4·6°
February..	v. s. t.	0·000	0·008	0·150	0·063	20·95	8·490	0·360	0·86	1·480	13·2°	3·8°
March	c.	0·001	0·009	0·135	0·077	21·90	8·460	0·432	0·94	1·866	13·7°	3·7°
April	c.	0·001	0·009	0·135	0·094	18·60	7·220	0·320	0·72	1·600	12·1°	3·3°
May.....	c.	0·001	0·006	0·090	0·045	18·20	7·500	0·360	0·94	1·670	13·2°	3·3°
June	c.	0·001	0·008	0·096	0·052	18·80	7·952	0·360	0·94	1·200	12·6°	2·8°
July.....	c.	0·000	0·008	0·120	0·053	18·60	7·860	0·363	0·94	1·200	12·1°	3·0°
August ..	c.	0·001	0·008	0·105	0·059	17·90	7·672	0·288	0·87	1·333	12·1°	2·4°
September..	c.	0·001	0·008	0·180	0·093	20·40	8·064	0·324	0·79	1·400	14·3°	3·3°
October ..	v. s. t.	0·000	0·009	0·116	0·053	18·00	7·952	0·396	0·79	1·330	13·2°	3·7°
November..	c.	0·002	0·009	0·120	0·039	19·10	7·950	0·324	0·87	1·100	13·2°	3·3°
December ..	c.	0·002	0·011	0·150	0·085	20·80	8·510	0·393	0·87	1·330	13·1°	3·7°
Average..	.....	0·001	0·008	0·130	0·070	19·25	7·890	0·356	0·86	1·443	12·9°	3·4°

The following are the analyses made by Dr. Letheby and myself of the Chelsea Company's water, taken from the mains supplied by the Company during the ten years 1868 to 1877 :—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	deg.
January	c.	0·003	—	0·071	22·41	—	14·0°	4·0°
February	c.	0·002	—	0·180	22·50	—	13·5°	3·5°
March	c.	0·006	—	0·162	20·50	—	14·0°	3·5°
April	c.	0·002	—	0·079	20·33	—	14·5°	4·5°
May	c.	0·005	0·075	0·073	21·67	—	13·0°	5·0°
June	c.	0·002	0·106	0·075	17·86	1·577	11·8°	2·4°
July	c.	0·001	0·103	0·064	18·16	0·740	12·0°	2·5°
August	c.	0·010	0·089	0·067	17·93	2·286	11·5°	2·5°
September	c.	0·002	0·060	0·072	18·98	—	13·0°	3·5°
October	c.	0·000	0·150	0·076	20·00	1·019	13·0°	4·0°
November	c.	0·003	0·150	0·070	19·97	1·309	13·5°	3·5°
December	t.	0·004	0·165	0·400	26·13	1·170	16·1°	16·4°
Average	.....	0·004	0·112	0·115	20·54	1·350	13·5°	3·7°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	t.	0·008	0·168	0·173	21·03	1·019	14·8°	5·3°
February	t.	0·010	0·372	0·157	21·97	1·164	14·8°	4·6°
March	t.	0·004	0·238	0·196	21·47	1·019	14·6°	3·9°
April	c.	0·003	0·198	0·064	21·13	0·946	14·9°	3·5°
May	c.	0·006	0·120	0·103	18·03	0·873	14·8°	3·7°
June	c.	0·000	0·128	0·082	18·10	1·092	14·0°	3·3°
July	c.	0·000	0·030	0·061	18·17	1·164	13·9°	3·3°
August	t.	0·001	0·091	0·091	17·93	1·043	13·4°	3·6°
September	t.	0·001	0·091	0·079	17·47	0·873	13·3°	3·4°
October	c.	0·002	0·123	0·069	17·37	1·019	13·4°	3·3°
November	c.	0·001	0·091	0·036	18·93	1·031	14·4°	3·4°
December	t.	0·001	0·023	0·102	19·13	1·019	14·6°	4·0°
Average	.....	0·002	0·139	0·101	19·23	1·021	14·2°	3·8°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	v. t.	0·002	0·066	0·102	21·43	1·164	15·6°	5·0°
February	t.	0·001	0·091	0·164	23·17	1·019	15·0°	4·8°
March	s. t.	0·001	0·091	0·099	19·03	1·092	15·0°	4·1°
April	c.	0·001	0·067	0·054	18·53	1·019	15·0°	4·0°
May	c.	0·001	0·066	0·050	18·57	0·873	14·2°	3·8°
June	c.	0·002	0·023	0·086	18·07	1·019	13·9°	3·8°
July	c.	0·000	0·080	0·053	17·10	1·001	13·2°	3·6°
August	c.	0·001	0·091	0·091	16·90	1·001	13·8°	3·0°
September	c.	0·002	0·075	0·069	15·70	1·001	12·8°	3·1°
October	c.	0·004	0·091	0·064	16·93	1·001	13·8°	3·3°
November	c.	0·004	0·110	0·050	19·27	1·001	14·9°	3·5°
December	v. t.	0·005	0·110	0·144	19·40	1·067	14·9°	4·0°
Average	.....	0·002	0·080	0·085	18·67	1·021	14·3°	3·8°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	s. t.	0·005	0·008	0·125	0·073	22·67	1·219	16·4°	4·4°
February ..	s. t.	0·005	0·005	0·136	0·096	21·13	1·067	16·0°	4·1°
March	s. t.	0·004	0·006	0·191	0·084	21·25	1·140	16·0°	4·3°
April	c.	0·001	0·008	0·191	0·051	18·27	1·140	15·0°	4·1°
May	c.	0·004	0·008	0·117	0·141	19·13	1·140	14·4°	4·0°
June	c.	0·003	0·004	0·114	0·076	17·67	1·098	14·0°	3·6°
July	s. t.	0·003	0·007	0·110	0·111	17·93	1·140	13·8°	3·5°
August	s. t.	0·002	0·007	0·143	0·121	18·23	1·140	14·0°	3·3°
September..	t.	0·002	0·005	0·125	0·081	16·80	1·140	13·4°	3·3°
October	t.	0·004	0·008	0·130	0·151	17·63	1·140	13·8°	3·4°
November..	c.	0·005	0·008	0·129	0·076	21·17	1·188	16·1°	3·8°
December ..	s. t.	0·003	0·005	0·120	0·049	21·83	1·067	16·0°	3·7°
Average..	.....	0·003	0·007	0·136	0·093	19·48	1·134	14·9°	3·8°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·004	0·008	0·120	0·098	21·43	1·140	15·4°	3·9°
February ..	t.	0·004	0·008	0·121	0·134	21·03	1·176	14·8°	4·0°
March	c.	0·003	0·008	0·124	0·079	20·49	1·140	14·8°	3·8°
April	t.	0·005	0·007	0·138	0·151	17·93	1·001	14·4°	3·6°
May	t.	0·002	0·006	0·147	0·079	18·37	1·140	14·8°	4·0°
June	s. t.	0·002	0·006	0·166	0·093	18·07	1·140	14·6°	4·0°
July	s. t.	0·003	0·006	0·131	0·100	18·37	1·140	13·9°	3·9°
August	—	—	—	—	—	—	—	—	—
September..	—	—	—	—	—	—	—	—	—
October	—	—	—	—	—	—	—	—	—
November ..	—	—	—	—	—	—	—	—	—
December ..	—	—	—	—	—	—	—	—	—
Average..	.....	0·003	0·007	0·135	0·105	19·38	1·125	14·7°	3·9°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·004	0·008	0·146	0·130	19·40	1·182	15·0°	4·8°
February ..	s. t.	0·002	0·006	0·062	0·146	21·90	1·140	17·0°	4·2°
March	t.	0·003	0·008	0·115	0·112	20·49	1·140	15·6°	3·8°
April	s. t.	0·001	0·007	0·129	0·071	20·31	1·140	15·4°	3·8°
May	t.	0·001	0·007	0·147	0·067	18·87	1·025	14·5°	3·5°
June	v. s. t.	0·002	0·006	0·115	0·042	17·70	1·073	14·0°	3·3°
July	c.	0·001	0·005	0·145	0·069	18·52	1·092	15·0°	3·3°
August	c.	0·001	0·005	0·120	0·083	18·81	1·031	15·1°	3·3°
September..	c.	0·001	0·005	0·119	0·044	18·38	1·052	14·7°	3·3°
October	v. s. t.	0·001	0·005	0·121	0·061	18·85	1·073	15·3°	3·3°
November..	t.	0·002	0·005	0·107	0·098	17·53	1·140	14·0°	3·3°
December ..	c.	0·002	0·005	0·148	0 028	20·67	1·140	14·9°	3·6°
Average..	.....	0·002	0·007	0·123	0·079	19·21	1·102	15·0°	3·6°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·002	0·008	0·124	0·062	19·90	1·140	15·6°	3·6°
February ..	v. s. t.	0·002	0·008	0·130	0·088	22·50	1·140	16·5°	4·0°
March	t.	0·003	0·008	0·114	0·071	21·23	1·073	15·8°	4·2°
April	v. s. t.	0·002	0·007	0·104	0·051	17·07	1·067	14·0°	3·4°
May	v. s. t.	0·001	0·005	0·129	0·051	17·13	1·001	14·4°	3·4°
June	t.	0·002	0·007	0·098	0·082	17·31	1·001	13·5°	3·3°
July	v. s. t.	0·001	0·007	0·115	0·051	16·63	1·001	13·0°	3·1°
August	t.	0·002	0·008	0·130	0·074	16·93	1·019	13·6°	3·3°
September..	v. s. t.	0·001	0·006	0·113	0·053	17·07	1·013	13·8°	3·3°
October	v. s. t.	0·001	0·006	0·124	0·041	17·43	1·031	13·7°	3·3°
November ..	c.	0·002	0·006	0·115	0·049	19·37	1·134	14·8°	4·0°
December ..	v. t.	0·002	0·009	0·124	0·125	18·57	1·073	14·0°	4·2°
Average..	.....	0·002	0·007	0·118	0·067	18·43	1·057	14·4°	3·6°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. t.	0·003	0·008	0·131	0·084	20·07	1·073	14·1°	4·2°
February ..	s. t.	0·003	0·006	0·131	0·088	20·63	1·116	15·3°	4·0°
March	s. t.	0·001	0·007	0·187	0·083	19·71	1·225	14·3°	4·3°
April	t.	0·001	0·005	0·194	0·062	19·87	1·200	14·3°	3·9°
May	s. t.	0·000	0·006	0·115	0·041	18·53	1·019	13·8°	3·6°
June	s. t.	0·001	0·005	0·167	0·056	18·33	1·025	14·0°	3·3°
July	v. s. t.	0·001	0·006	0·104	0·043	17·83	1·037	13·8°	3·3°
August	s. t.	0·002	0·008	0·167	0·163	20·17	1·073	15·8°	3·8°
September..	s. t.	0·001	0·006	0·115	0·073	18·83	1·007	14·9°	3·5°
October	s. t.	0·001	0·006	0·131	0·056	19·33	1·031	15·4°	3·4°
November ..	t.	0·001	0·010	0·131	0·126	20·70	0·995	16·0°	4·0°
December ..	v. s. t.	0·002	0·008	0·136	0·052	21·03	1·001	16·5°	3·8°
Average..	.....	0·001	0·007	0·420	0·077	19·57	1·066	14·8°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·001	0·006	0·157	0·056	22·07	—	—	1·067	—	15·6°	3·8°
February..	s. t.	0·002	0·007	0·165	0·063	21·53	—	—	1·025	—	15·0°	4·0°
March	s. t.	0·001	0·008	0·146	0·100	19·80	—	—	1·006	—	14·3°	3·3°
April	s. t.	0·001	0·006	0·075	0·085	19·57	—	—	1·001	—	14·3°	3·3°
May.....	s. t.	0·000	0·007	0·120	0·083	19·75	—	—	1·001	—	14·8°	3·0°
June	c.	0·000	0·007	0·108	0·055	19·40	—	—	0·940	—	15·4°	2·4°
July.....	c.	0·001	0·007	0·129	0·072	18·70	—	—	1·005	—	12·1°	2·4°
August ..	c.	0·000	0·008	0·102	0·043	18·70	—	—	1·130	1·400	13·2°	2·0°
September..	c.	0·001	0·007	0·090	0·035	18·00	8·120	0·360	0·940	1·030	12·7°	3·3°
October ..	c.	0·000	0·007	0·120	0·077	20·90	8·344	0·468	1·010	1·730	13·8°	3·8°
November..	s. t.	0·000	0·006	0·168	0·039	20·80	8·688	0·576	1·010	1·071	14·3°	2·8°
December..	s. t.	0·006	0·000	0·135	0·132	19·18	7·110	0·504	0·940	2·400	12·1°	4·6°
Average..	.....	0·001	0·007	0·126	0·070	19·70	8·063	0·477	1·006	1·526	13·9°	3·2°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·007	0·009	0·150	0·120	18·80	7·160	0·180	0·94	1·860	13·2°	2·9°
February..	v. s. t.	0·000	0·006	0·180	0·066	21·30	8·680	0·396	0·86	1·700	13·2°	3·3°
March	c.	0·000	0·008	0·165	0·054	21·20	8·740	0·468	0·87	1·740	14·3°	3·0°
April	c.	0·000	0·008	0·150	0·071	20·80	8·450	0·320	0·87	2·000	13·7°	3·7°
May.....	c.	0·000	0·007	0·135	0·052	20·10	8·210	0·504	0·94	1·740	13·2°	3·3°
June	c.	0·002	0·009	0·090	0·076	18·80	8·008	0·360	1·01	1·330	13·2°	3·3°
July.....	t.	0·000	0·007	0·090	0·057	17·40	7·448	0·324	0·87	1·200	12·1°	2·4°
August ..	v. s. t.	0·000	0·009	0·133	0·021	18·60	8·890	0·324	0·94	1·330	13·2°	3·0°
September..	v. s. t.	0·001	0·009	0·105	0·092	21·00	8·176	0·360	0·79	1·466	14·3°	3·3°
October ..	c.	0·002	0·009	0·165	0·054	18·10	7·840	0·434	0·87	1·366	13·2°	3·7°
November..	c.	0·001	0·008	0·110	0·042	17·90	7·672	0·432	0·94	1·233	13·2°	2·8°
December..	c.	0·001	0·010	0·135	0·068	18·90	7·950	0·393	0·87	1·266	12·6°	3·3°
Average..	.....	0·001	0·008	0·134	0·064	19·40	8·102	0·374	0·81	1·519	13·2°	3·1°

In the following table is stated the average, the maximum and the minimum quantity of water daily supplied by the Chelsea Water Company, from 1869 to 1877 inclusive:—

		Gallons per diem.	Houses Supplied.
1869	Average	8,559,300	27,235
	Maximum (July)	9,681,400	27,212
	Minimum (February).....	7,678,200	27,083
1870	Average	8,167,208	27,518
	Maximum (July).....	9,390,900	27,486
	Minimum (February).....	7,178,800	27,435

		Gallons per diem.	Houses Supplied.
1871	Average	8,363,242	27,810
	Maximum (September)	9,621,800	27,838
	Minimum (January)	7,203,100	27,670
1872	Average	8,648,800	28,126
	Maximum (August)	9,642,000	28,154
	Minimum (January)	7,548,000	27,949
1873	Average	8,234,950	28,295
	Maximum (July)	9,063,400	28,270
	Minimum (February)	7,519,800	28,247
1874	Average	8,173,325	28,447
	Maximum (July)	9,115,800	28,467
	Minimum (December)	7,240,000	28,490
1875	Average	7,527,983	28,561
	Maximum (June)	8,356,200	28,555
	Minimum (December)	6,744,600	28,600
1876	Average	7,673,166	28,556
	Maximum (July)	8,861,700	28,555
	Minimum (December)	6,881,600	28,555
1877	Average	7,977,375	28,580
	Maximum (August)	9,433,500	28,555
	Minimum (January)	6,869,000	28,555

V.—LAMBETH WATER COMPANY.

The district supplied by this Company "lies to the south of that sup-"plied by the Southwark and Vauxhall Company, including Kingston, "Mitcham, Balham, Dulwich, Norwood and Beckenham, in all 60 square "miles of area, stretching as far east as the Ravensbourne, which separates "it from the district of the Kent Water Company."

The Company supplies a population of 403,788 people, residing in 57,684 houses, 3,000 of which are served on the constant system (Nov., 1877). The Company's intake is from the Thames at Molesey. There are three reservoirs for unfiltered water, occupying an area of 30 acres, their total capacity being 125,000,000 gallons. There are at present seven filter-beds, occupying an area of four acres, but it has been decided to increase the filtering power. The filter-beds are seven feet thick, and consist from above downwards of Thames sand (3-ft.); shells (1-ft.); and coarse gravel (3-ft.). During 1877 the average rate of filtration has been 3·5 gallons per square foot of filtration area. There are nine reservoirs for the filtered water, having a combined capacity of 28,765,000 gallons.

In the year 1872 the Company removed its intake from Thames Ditton to Molesey. The reason of this change was for the purpose of avoiding the water from the River Mole, which is usually more turbid than

that of the Thames, owing to finely-divided clayey matter. The present intake of the Company is situate about four miles above the junction of this affluent with the Thames, whereas the old intake at Thames Ditton was below the junction. The Rivers Pollution Commissioners speak of the Mole River as more polluted even than the Thames. Their analyses, however, only show an excess of 0·07 gr. of chlorine per gallon in the water of the Mole over that of the Thames, whereas the organic carbon and nitrogen, as well as the total nitrogen, is somewhat less than in the Thames water.

The following represent the analyses of the water from the Company's works for the past three years, made by Dr. Letheby and myself:—

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·002	0·007	0·166	0·105	20·53	1·025	14·3°	4·3°
February ..	v. s. t.	0·002	0·006	0·131	0·068	21·13	1·128	15·6°	4·2°
March	v. s. t.	0·002	0·006	0·187	0·069	19·93	1·158	14·8°	4·4°
April	v. s. t.	0·001	0·005	0·167	0·048	19·70	1·146	14·6°	3·8°
May	v. s. t.	0·001	0·008	0·148	0·041	19·03	1·104	14·0°	3·9°
June	v. s. t.	0·001	0·007	0·146	0·042	18·53	1·019	14·0°	3·3°
July	c.	0·001	0·006	0·138	0·063	17·87	1·043	13·6°	3·3°
August	s. t.	0·001	0·007	0·167	0·104	20·10	1·001	15·4°	3·8°
September..	c.	0·000	0·005	0·131	0·058	19·83	1·025	15·8°	3·7°
October	c.	0·001	0·006	0·135	0·059	20·37	1·073	16·0°	3·3°
November ..	s. t.	0·001	0·007	0·147	0·120	20·87	1·001	16·0°	4·0°
December ..	c.	0·003	0·006	0·131	0·052	21·51	1·019	16·8°	4·2°
Average..	.....	0·001	0·006	0·149	0·069	19·95	1·061	15·1°	3·9°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·001	0·005	0·147	0·066	22·20	—	—	1·073	—	15·8°	3·8°
February..	c.	0·001	0·006	0·172	0·048	22·00	—	—	1·025	—	15·6°	4·2°
March ..	c.	0·001	0·006	0·170	0·063	22·80	—	—	1·000	—	14·5°	3·4°
April	s. t.	0·001	0·005	0·105	0·085	19·55	—	—	1·001	—	14·0°	3·3°
May	c.	0·001	0·005	0·105	0·053	20·20	—	—	1·073	—	14·3°	3·3°
June	c.	0·000	0·007	0·105	0·044	21·20	—	—	0·934	—	13·2°	2·8°
July	c.	0·000	0·006	0·120	0·060	19·40	—	—	0·861	—	15·4°	3·0°
August ..	c.	0·000	0·003	0·120	0·042	16·20	—	—	0·861	1·110	12·0°	2·0°
September..	c.	0·000	0·008	0·105	0·042	18·21	7·840	0·360	0·861	1·030	12·7°	2·4°
October ..	c.	0·001	0·007	0·090	0·071	20·03	8·401	0·468	1·001	1·600	14·3°	3·3°
November..	s. t.	0·002	0·005	0·180	0·034	20·50	9·184	0·468	1·001	1·481	14·8°	3·7°
December ..	s. t.	0·002	0·007	0·135	0·103	20·00	7·610	0·578	0·940	2·130	13·2°	4·6°
Average..	.....	0·001	0·005	0·129	0·059	20·09	8·258	0·468	0·969	1·470	14·1°	3·3°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	t.	0·000	0·007	0·150	0·086	20·40	7·390	0·288	1·01	2·060	14·3°	3·3°
February..	v s. t.	0·001	0·007	0·210	0·073	21·90	9·016	0·288	1·01	2·066	13·2°	4·2°
March	v. s. t.	0·000	0·008	0·195	0·063	23·40	9·800	0·360	0·94	2·000	14·3°	4·2°
April	t.	0·000	0·008	0·160	0·053	20·90	8·510	0·320	0·94	2·000	13·2°	3·7°
May	c.	0·001	0·008	0·180	0·052	21·30	8·430	0·504	0·80	1·600	13·7°	3·7°
June	c.	0·001	0·008	0·147	0·061	20·20	7·952	0·324	0·94	1·400	13·2°	3·3°
July.....	c.	0·000	0·008	0·105	0·049	20·50	8·008	0·396	0·94	1·266	12·6°	2·8°
August ..	v. s. t.	0·001	0·008	0·135	0·070	19·70	8·120	0·432	0·94	1·433	13·2°	3·0°
September..	c.	0·000	0·008	0·135	0·082	19·40	7·784	0·329	0·86	1·433	13·2°	3·3°
October ..	c.	0·001	0·008	0·135	0·047	20·80	8·904	0·360	1·01	1·433	15·4°	3·3°
November..	c.	0·003	0·009	0·093	0·050	18·10	7·072	0·360	0·94	1·334	12·1°	2·8°
December ..	c.	0·002	0·009	0·090	0·109	19·70	7·780	0·582	0·94	1·859	12·6°	4·2°
Average..	.....	0·000	0·008	0·144	0·066	20·52	8·230	0·395	0·93	1·657	13·4°	3·4°

The following analyses represent the results of Dr. Letheby's and my own examination of the Lambeth Company's water as taken monthly from the mains during the past ten years :—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·000	—	0·071	22·07	—	14·0°	4·0°
February	c.	0·000	—	0·139	21·83	—	13·5°	3·5°
March	c.	0·000	—	0·167	19·50	—	13·0°	3·0°
April	c.	0·000	—	0·060	20·17	—	14·0°	4·0°
May	c.	0·008	0·105	0·082	22·17	—	13·5°	4·0°
June	c.	0·002	0·105	0·075	18·60	2·966	12·5°	2·6°
July	c.	0·003	0·083	0·047	17·17	1·231	11·5°	2·5°
August	c.	0·003	—	0·088	—	—	13·3°	3·6°
September	c.	0·004	0·075	0·086	18·90	—	13·0°	3·5°
October	c.	0·003	0·165	0·053	18·09	1·456	13·0°	3·5°
November	c.	0·002	0·150	0·076	20·10	1·600	13·6°	3·4°
December	c.	0·001	0·186	0·109	22·43	1·206	15·0°	4·2°
Average	.....	0·003	0·124	0·087	20·09	1·691	13·3°	3·6°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	t.	0·004	0·231	0·180	20·19	1·092	14·0°	5·2°
February	v. t.	0·006	0·498	0·217	20·00	1·025	13·8°	4·0°
March	t.	0·006	0·368	0·186	21·33	1·019	14·0°	3·9°
April	c.	0·003	0·200	0·081	20·70	1·043	14·3°	3·6°
May	c.	0·002	0·165	0·054	17·33	0·728	14·0°	3·2°
June	c.	0 001	0·128	0·059	17·47	1·086	14·1°	3·9°
July	c.	0·000	0·030	0 057	17·97	1·146	13·5°	3·3°
August	c.	0·001	0·066	0 051	17·83	0·946	13·6°	3·2°
September	c.	0·002	0·129	0·051	18·04	0·946	13·7°	3·1°
October	c.	0·001	0·129	0·058	17·13	1·019	13·1°	3·0°
November	c.	0·000	0·065	0·032	18·97	1·043	14·5°	3·5°
December	t.	0·002	0·022	0·098	19·07	1·019	14·5°	4·0°
Average	.....	0·002	0·169	0·085	18·84	1·009	13·9°	3·6°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	t.	0·003	0·078	0·102	19·90	1·164	14·8°	4·4°
February	c.	0·002	0·110	0·062	21·47	1·297	14·4°	4·4°
March	c.	0·002	0·129	0·083	18·93	1·164	14·8°	4·1°
April	c.	0·000	0·067	0·064	19·03	1·019	15·1°	4·0°
May	s. t.	0·003	0·075	0·063	18·27	1·019	13·9°	3·1°
June	c.	0·001	0·027	0·069	18·57	1·019	13·9°	4·2°
July	t.	0·001	0·049	0·071	19·20	1·019	14·0°	4·0°
August	c.	0·000	0·060	0·063	17·77	0·898	14·2°	3·6°
September	c.	0·002	0·075	0·064	16·17	0·928	12·8°	3·3°
October	c.	0·005	0·091	0·057	18·90	1·140	13·9°	3·4°
November	c.	0·005	0·091	0·064	19·10	1·140	14·2°	3·5°
December	s. t.	0·001	0·125	0·090	21·17	1·194	15·4°	4·2°
Average	.....	0·002	0·081	0·071	19·04	1·083	14·3°	3·9°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·003	0·005	0·091	0·058	22·79	1·140	16·5°	4·4°
February	s. t.	0·003	0·007	0·110	0·081	20·87	1·140	15·8°	4·0°
March	t.	0·006	0·008	0·110	0·109	20·91	1·140	15·8°	4·0°
April	t.	0·002	0·006	0·181	0·067	19·63	1·140	15·4°	4·2°
May	t.	0·004	0·008	0·146	0·136	19·57	1·140	14·6°	4·0°
June	t.	0·002	0·004	0·118	0·073	18·23	1·128	14·0°	3·8°
July	c.	0·002	0·007	0 111	0·079	18·63	1·140	14·0°	3·6°
August	c.	0·001	0 007	0·125	0·091	18·27	1·237	14·0°	3·3°
September	c.	0·002	0·006	0·110	0·079	17·27	1·140	13·8°	3·4°
October	—	—	—	—	—	—	—	—	—
November	c.	0·002	0·008	0·131	0·075	20·33	1·140	15·8°	3 5°
December	c.	0·004	0·008	0·119	0·051	21·21	1·140	15·8°	3·7°
Average	.....	0·003	0·007	0·123	0·083	19·79	1·147	15·0°	3·8°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	—	—	—	—	—	—	—	—	—
February ..	—	—	—	—	—	—	—	—	—
March	t.	0·003	0·008	0·125	0·081	20·73	1·140	15·0°	4·0°
April	t.	0·004	0·010	0·139	0·188	17·87	1·067	14·3°	3·6°
May	v. t.	0·002	0·004	0·111	0·101	18·93	1·140	15·0°	4·0°
June	t.	0·003	0·006	0·111	0·090	18·87	1·140	14·8°	3·9°
July	—	—	—	—	—	—	—	—	—
August	—	—	—	—	—	—	—	—	—
September..	—	—	—	—	—	—	—	—	—
October	v. s. t.	0·002	0·006	0·147	0·060	17·07	1·067	13·8°	3·6°
November ..	v. s. t.	0·006	0·013	0·128	0·152	20·23	1·213	15·6°	4·2°
December ..	t.	0·004	0·009	0·131	0·143	20·73	1·140	15·0°	4·0°
Average..	.....	0·003	0·008	0·127	0·116	19·21	1·129	14·8°	3·9°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	t.	0·004	0·010	0·130	0·163	20·27	1·237	15·0°	4·0°
February ..	s. t.	0·002	0·006	0·130	0·058	20·73	1·140	16·5°	3·8°
March	t.	0·005	0·010	0·113	0·125	20·11	1·225	15·4°	3·8°
April	t.	0·002	0·009	0·124	0·085	20·07	1·140	15·8°	3·8°
May	s. t.	0·001	0·007	0·104	0·054	19·43	1·073	14·8°	3·6°
June	c.	0·002	0·006	0·105	0·044	17·93	1·073	14·1°	3·4°
July	t.	0·002	0·005	0·147	0·072	18·80	1·073	15·0°	3·3°
August	s. t.	0·002	0·007	0·110	0·059	17·77	1·073	13·8°	3·3°
September..	v. s. t.	0·002	0·007	0·104	0·045	17·57	1·073	13·5°	3·3°
October	s. t.	0·002	0·006	0·091	0·044	18·10	1·073	14·3°	3·3°
November ..	s. t.	0·002	0·008	0·128	0·086	19·81	1·140	15·0°	3·8°
December ..	v. s. t.	0·003	0·006	0·115	0·037	20·93	1·001	16·0°	3·6°
Average..	.....	0·002	0·007	0·117	0·073	19·28	1·110	14·9°	3·6°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·003	0·006	0·114	0·037	20·36	1·225	15·6°	3·3°
February ..	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—
April	t.	0·003	0·005	0·116	0·049	17·47	1·140	14·3°	3·8°
May	t.	0·001	0·006	0·132	0·054	16·89	1·001	14·0°	3·4°
June	t.	0·003	0·006	0·100	0·060	17·19	1·073	14·0°	3·5°
July	v. s. t.	0·001	0·006	0·110	0·061	17·17	1·037	13·8°	3·6°
August	t.	0·001	0·007	0·147	0·076	17·00	1·001	14·0°	3·5°
September..	v. s. t.	0·001	0·005	0·110	0·050	17·30	1·073	13·8°	3·3°
October	s. t.	0·001	0·006	0·115	0·049	17·49	1·025	13·8°	3·3°
November ..	s. t.	0·001	0·005	0·131	0·043	19·63	1·134	14·9°	4·2°
December ..	s. t.	0·002	0·008	0·125	0·092	18·67	1·092	14·0°	4·0°
Average..	.....	0·002	0·006	0·120	0·057	17·92	1·080	14·2°	3·6°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	s. t.	0·002	0·010	0·167	0·131	20·87	1·031	14·4°	4·2°
February ..	t.	0·003	0·008	0·144	0·118	20·67	1·098	15·2°	4·0°
March	s. t.	0·001	0·005	0·191	0·061	20·12	1·176	14·9°	4·4°
April	s. t.	0·001	0·005	0·172	0·041	19·41	1·158	14·2°	3·8°
May	t.	0·001	0·005	0·151	0·057	18·90	1·140	13·9°	3·8°
June	t.	0·001	0·005	0·180	0·055	18·80	1·067	14·0°	3·3°
July	v. s. t.	0·001	0·006	0·141	0·057	18·07	1·086	13·8°	3·3°
August	v. s. t.	0·002	0·007	0·131	0·148	19·97	1·073	15·4°	3·8°
September..	v. s. t.	0·000	0·007	0·137	0·072	19·07	1·019	15·3°	3·5°
October	v. s. t.	0·001	0·009	0·125	0·060	19·40	1·061	15·4°	3·3°
November ..	t.	0·001	0·008	0·147	0·145	20·73	0·995	16·0°	3·8°
December ..	v. s. t.	0·002	0·009	0·115	0·081	21·37	1·007	16·5°	4·2°
Average..	.....	0·001	0·007	0·150	0·085	19·78	1·075	14·8°	3·8°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl.)	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·001	0·006	0·158	0·057	21·87	—	—	0·985	—	15·5°	3·8°
February..	c.	0·001	0·006	0·168	0·056	22·13	—	—	0·973	—	15·8°	4·2°
March	c.	0·001	0·007	0·146	0·083	20·79	—	—	—	—	13·8°	3·3°
April	s. t.	0·001	0·006	0·120	0·071	19·67	—	—	0·924	—	14·3°	3·3°
May.....	s. t.	0·001	0·006	0·105	0·061	19·50	—	—	0·924	—	14·3°	3·0°
June	c.	0·002	0·006	0·120	0·064	19·70	—	—	—	—	12·8°	3·0°
July.....	s. t.	0·000	0·007	0·120	0·059	19·60	—	—	—	—	15·4°	2·4°
August ..	c.	0·000	0·007	0·102	0·044	18·90	—	—	1·170	1·121	13·2°	2·4°
September..	c.	0·000	0·008	0·105	0·042	17·12	7·616	0·360	0·860	0·960	12·7°	2·4°
October ..	c.	0·001	0·007	0·120	0·091	20·06	8·128	0·442	1·010	1·730	14·3°	3·3°
November..	s. t.	0·001	0·005	0·180	0·038	21·60	9·016	0·468	1·010	1·411	14·8°	4·2°
December..	t.	0·001	0·007	0·150	0·110	19·46	7·390	0·578	1·010	2·600	12·7°	4·6°
Average..	.....	0·001	0·006	0·132	0·064	20·03	8·037	0·461	1·010	1·564	14·1°	3·3°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·006	0·009	0·210	0·094	20·90	8·170	0·504	1·01	2·260	14·8°	4·2°
February..	v. s. t.	0·000	0·008	0·210	0·056	21·60	8·960	0·432	1·01	2·166	13·2°	4·2°
March	t.	0·000	0·009	0·186	0·070	22·10	9·016	0·684	0·94	2·060	13·7°	4·2°
April	t.	0·001	0·008	0·174	0·070	21·10	8·700	0·360	0·94	2·060	13·7°	3·7°
May.....	s. t.	0·000	0·008	0·180	0·053	21·00	8·600	0·611	0·87	1·600	13·7°	3·7°
June	t.	0·000	0·008	0·150	0·074	19·90	8·176	0·468	1·01	1·600	13·2°	3·7°
July.....	t.	0·000	0·009	0·120	0·052	17·00	7·168	0·288	0·94	1·466	11·8°	3·3°
August ..	c.	0·000	0·008	0·135	0·077	17·70	7·560	0·324	0·94	1·260	13·2°	3·3°
September..	c.	0·001	0·009	0·130	0·079	20·70	9·080	0·396	0·94	1·330	13·7°	3·0°
October ..	s. t.	0·000	0·009	0·135	0·047	20·40	9·072	0·432	0·87	1·300	14·8°	3·3°
November..	c.	0·000	0·009	0·133	0·053	20·60	9·184	0·394	0·94	1·566	14·3°	2·8°
December..	c.	0·001	0·009	0·120	0·083	20·30	8·560	0·468	0·94	1·666	15·7°	3·7°
Average..	.....	0·000	0·008	0·156	0·067	20·27	8·437	0·446	0·94	1·694	13·8°	3·5°

In the following table is stated the average quantity, and also the maximum and minimum quantity, of water supplied by the Lambeth Water Company from 1869 to 1877 inclusive :—

		Gallons per diem.	Houses Supplied.
1869	Average	10,374,800	43,004
	Maximum (July)	11,868,300	43,285
	Minimum (December)	8,864,900	44,010
1870	Average	10,346,314	44,902
	Maximum (July)	12,701,700	45,043
	Minimum (February)	8,876,900	44,163
1871	Average	10,427,603	46,565
	Maximum (September)	11,951,451	46,937
	Minimum (January)	9,400,000	45,765
1872	Average	10,864,440	48,104
	Maximum (July)	12,275,300	48,249
	Minimum (January)	9,628,100	47,335
1873	Average	12,088,933	49,630
	Maximum (August)	13,879,200	49,864
	Minimum (January)	10,202,500	48,946
1874	Average	12,766,567	50,995
	Maximum (August)	14,282,700	51,188
	Minimum (January)	11,439,600	50,353
1875	Average	12,865,091	52,458
	Maximum (June)	14,528,100	52,387
	Minimum (March)	11,466,100	51,948
1876	Average	13,096,471	54,415
	Maximum (August)	16,012,000	54,754
	Minimum (December)	11,512,800	55,471
1877	Average	13,315,710	56,325
	Maximum	15,348,200	56,853
	Minimum	11,919,100	55,744

1. Having now completed these details on the quality and quantity of the Thames water supplied for the past ten years by the five Companies, I have thought it might be convenient to place many of the facts already referred to in a table.

COMPANY.	Intake.	Population supplied (Nov. 1877).	Houses supplied (Nov. 1877).	Houses on Constant Service (Nov. 1877).	Storage and Subsiding Reservoirs.			Pure Water Reservoirs.		Filter Beds.			
					No.	Extent in Acres.	Total capacity in Gallons.	No.	Total capacity in Gallons.	No.	Area in Acres.	Thickness of Filtering Materials.	Average rate of Filtration per sq. ft. of Area per hour in Gallons.
Grand Junction ..	Hampton	339,147	37,683	None.	4	7·0	19,500,000	3	18,000,000	4	7·75	5 ft. 6 in.	1·96
West Middlesex ..	ditto	375,487	50,065	2,090	3	10·5	56,950,000	3	10,922,000	6	10·00	5 ft.	1·12
Southwark and Vauxhall ...	ditto	494,000	79,320	450	6	17·5	66,000,000			9	14·50	5 ft. 6 in.	1·50
Chelsea	Molesey	210,000	28,555	100	4	40·0	140,000,000	2	11,000,000	7	6·75	8 ft.	2·00
Lambeth	ditto	403,788	57,684	3,000	3	30·0	125,000,000	9	28,765,000	7	4·00	7 ft.	3·50
Total		1,822,422	253,307	5,640	20	105·0	407,450,000			33	43·00		

2. The Parliamentary powers of these five Water Companies permit them to abstract 110,000,000 gallons from the Thames daily. It will be remarked that during the past year they have not taken more on an average than 60,000,000 gallons daily, or 50,000,000 gallons less than their powers enable them to take. This 60,000,000 gallons has been supplied to over 253,000 houses, and to a population of more than a million and three-quarters.

3. The gases absorbed by the water supplied by the Thames Companies have been examined on 27 different occasions during the past ten years. Of these examinations 17 were made in the summer months (May to October) and 10 in the winter months (November to April). I will content myself with stating the average of the whole, and also the averages found in the winter and in the summer months respectively, merely noting that these results prove that the water of the Thames is well and efficiently aerated.

Quantity in cubic inches contained in 1 gallon of water.	Average of 27 Analyses.	Average of 17 Analyses of the gases in water during the Summer Months.	Average of 10 Analyses of the gases in water during the Winter Months.
	Cubic inches.	Cubic inches.	Cubic inches.
Oxygen	1·69	1·19	2·19
Nitrogen	3·71	3·61	3·81
Carbonic Anhydride	11·55	11·70	11·40
Total	16·95	16·50	17·00

4. The examination of a very large number of samples (nearly 1,000) of Thames water gives us, when tabulated, the following results month by month :—

	Nitrogen as Nitrates.	Oxygen required by Organic Matter, &c.	Total Solid.	Chlorine.	Total Hardness.
	grs.	grs.	grs.	grs.	degs.
January	0·1530	0·0894	20·683	0·9836	14·59°
February	0·1747	0·0646	21·475	0·9414	14·26°
March	0·1639	0·0788	20·855	0·9380	14·13°
April	0·1208	0·0716	20·149	0·9226	13·96°
May	0·1290	0·0582	19·885	0·9031	13·82°
June	0·1170	0·0579	19·000	0·9514	13·50°
July	0·1164	0·0539	18·250	0·9174	12·26°
August	0·1074	0·0444	17·990	0·9230	12·92°
September	0·1047	0·0616	18·744	0·8850	13·09°
October	0·1192	0·0629	19·796	0·9320	13·75°
November	0·1412	0·0467	20·247	0·9680	14·22°
December	0·1410	1·0790	20·405	0·9190	13·38°

This table, which, as I said, is the average analysis of some hundreds

of samples, shows the remarkable constancy and uniformity of the water taken from the Thames as supplied to London, the extreme variation being not more than 3·5 grains of total solid matter per gallon. It is, moreover, interesting to observe exactly how and when these slight differences occur, the wave-line from crest to furrow being actually unbroken. Starting from August, when the total solid matter is least (17·99 grs. per gallon), it gradually rises for six months, month by month, until February, when the total solid is at its maximum (21·475 grs. per gallon). From this point the total solid falls, month by month, for six months. Almost the same wave-line will be noticed in the case of the oxygen required to oxidize the organic and other matters contained in the water, January representing the crest of the water where the oxidizable matter is at its maximum, and August the furrow of the wave where it is at its minimum. Again, the nitrogen as nitrates exhibits the same course, February and September representing the two extremes.

5. As regards the constituents of which the total solid matter is composed, about two-thirds is carbonate of lime (with a little carbonate of magnesia), the other third consisting of sulphate of lime, common salt, and nitrate of magnesia. These substances, in the proportion in which they exist in the metropolitan supply, are of prime importance in a dietetical and sanitary point of view, for experience has shown that waters of a moderate degree of hardness, from the presence of calcareous salts, are more wholesome than those deficient in these substances.

VI.—KENT WATER COMPANY.

The district supplied by this Company extends from Camberwell to Dartford in one direction, and from the Thames to Chislehurst and Bromley in the other.

The Company supplies an estimated population of 250,000, residing in 45,432 houses, in 6,900 of which the supply is constant (Nov., 1877).

The water supplied by this Company is entirely obtained from deep wells in the chalk. No filtration is required, the water when pumped being magnificently clear and bright. The Company have eight reservoirs, of a total capacity of 8,000,000 gallons. There are three wells at Deptford, each 250 feet deep; one at Plumstead, 500 feet deep; one at Charlton; two at Crayford, 150 feet deep; and two at Shortlands, each about 250 feet deep; and one at Belvedere. Surface infiltration is avoided by lining the wells with cast-iron cylinders to the depth of 70 or 100 feet. The yield of these different wells somewhat varies, and is said to be as follows:—

		Daily yield in gallons.
Deptford	Bath Well	1,500,000
	Garden Well	4,500,000
	"New" Well	4,500,000
Shortlands	Well No. 1	1,500,000
	Well No. 2	1,500,000
Crayford	Well (1)	900,000
	Well (2)	not used.
Plumstead	... ...	700,000
Charlton	Well (1)	600,000
	Well (2)	not used.
Belvedere	... ...	200,000

The analysis of some of these waters may be here noted.

Constituents in grains per imperial gallon.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Earthy Carbonates.	Sodic Chloride.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
Deptford Bath Well (January, 1876)	0·000	0·248	0·004	22·83	15·50	1·88	16·5°	4·6°
Do. Garden Well (October, 1875) ..	0·001	0·279	0·011	28·41	17·60	2·59	20·8°	6·0°
Do. "New" Well (November, 1863)	0·000	0·350	0·006	26·10	14·10	2·20	24·5°	7·0°
Shortlands (September, 1875)	0·000	0·346	0·000	22·41	15·60	1·69	18·9°	6·0°
Crayford (February, 1868)	0·000	0·350	0·019	23·93	17·45	1·96	15·0°	3·0°
Plumstead (August, 1875)	0·000	0·323	0·014	34·81	16·80	6·13	21·6°	11·6°
Belvedere (February, 1868).....	0·000	1·126	0·034	26·00	11·28	2·24	13·0°	8·0°

The following are the results of Dr. Letheby's and my own analyses of the water taken from the Company's mains monthly for the past ten years:—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	—	0·027	27·44	—	18·0°	6·0°
February	c.	0·002	—	0·005	27·90	—	17·5°	6·0°
March	c.	0·003	—	0·003	26·70	—	18·0°	6·5°
April	c.	0·004	—	0·019	29·50	—	20·0°	7·5°
May	c.	0·002	0·196	0·027	28·50	2·427	17·5°	7·0°
June	c.	0·001	0·312	0·024	27·02	2·431	17·6°	6·0°
July	c.	0·001	—	0·018	27·16	1·164	17·5°	6·5°
August	c.	0·002	—	0·009	25·67	1·624	17·5°	6·5°
September	c.	0·000	0·321	0·022	27·81	1·624	18·5°	7·5°
October	c.	0·001	0·270	0·038	27·60	1·729	18·5°	7·0°
November	c.	0·001	0·450	0·014	28·43	1·941	18·3°	5·7°
December	c.	0·004	0·264	0·018	27·67	1·456	18·6°	5·6°
Average	.....	0·002	0·302	0·018	27·62	1·799	18·1°	6·4°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·006	0·258	0·040	28·00	1·372	20·8°	6·7°
February	c.	0·002	0·375	0·060	27·73	1·733	19·9°	5·9°
March	c.	0·001	0·270	0·058	28·63	1·624	20·4°	6·0°
April	c.	0·001	0·412	0·040	26·83	1·474	19·9°	6·0°
May	c.	0·000	0·173	0·038	26·77	1·309	20·6°	6·0°
June	c.	0·000	0·190	0·006	27·33	1·763	19·8°	6·1°
July	c.	0·000	0·128	0·016	27·60	1·456	19·6°	5·5°
August	c.	0·000	0·129	0·015	28·40	1·456	20·2°	5·9°
September	c.	0·000	0·182	0·019	29·39	1·456	20·4°	5·6°
October	c.	0·000	0·190	0·011	28·97	1·449	20·1°	6·0°
November	c.	0·000	0·069	0·027	27·47	1·516	20·8°	5·6°
December	c.	0·000	0·022	0·013	27·07	1·583	20·4°	6·0°
Average	.....	0·000	0·200	0·031	27·87	1·515	20·2°	5·9°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·000	0·129	0·011	28·07	1·462	20·0°	6·0°
February	c.	0·001	0·168	0·035	30·97	1·522	20·5°	6·0°
March	c.	0·000	0·194	0·013	24·71	1·309	19·8°	5·6°
April	c.	0·000	0·151	0·007	27·13	1·449	21·2°	5·1°
May	c.	0·000	0·129	0·011	28·00	1·462	20·0°	5·9°
June	c.	0·000	0·033	0·004	26·77	1·462	19·2°	5·2°
July	c.	0·000	0·146	0·017	27·00	1·431	20·0°	5·3°
August	c.	0·000	0·125	0·000	27·19	1·358	19·8°	5·7°
September	c.	0·000	0·125	0·007	27·00	1·431	19·8°	5·3°
October	c.	0·000	0·182	0·006	26·97	1·431	20·0°	5·5°
November	c.	0·000	0·175	0·004	26·60	1·577	20·0°	5·6°
December	c.	0·000	0·142	0·011	27·31	1·456	20·2°	5·4°
Average	.....	0·000	0·141	0·010	27·31	1·445	20·0°	5·5°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·003	0·199	0·009	27·37	1·431	21·2°	5·3°
February....	c.	0·000	0·004	0·217	0·004	28·39	1·431	21·2°	6·0°
March.....	c.	0·001	0·003	0·199	0·004	27·73	1·717	21·0°	5·8°
April.....	c.	0·000	0·003	0·281	0·029	27·83	1·431	21·1°	5·9°
May.....	c.	0·000	0·004	0·238	0·014	26·83	1·570	20·0°	5·5°
June.....	c.	0·000	0·003	0·217	0·012	27·53	1·577	20·6°	5·8°
July.....	c.	0·000	0·004	0·212	0·010	27·93	1·577	20·0°	5·8°
August.....	c.	0·000	0·004	0·213	0·004	27·93	1·717	20·0°	5·6°
September..	c.	0·000	0·004	0·196	0·010	27·23	1·570	20·0°	5·6°
October	c.	0·000	0·003	0·197	0·005	27·80	1·577	20·0°	5·6°
November ..	c.	0·000	0·004	0·242	0·013	27·87	1·570	20·1°	5·8°
December...	c.	0·000	0·003	0·173	0·006	26·77	1·504	19·8°	5·6°
Average..	.....	0·000	0·003	0·215	0·010	27·60	1·556	20·7°	5·7°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·000	0·003	0·312	0·013	26·83	1·570	20·4°	6·0°
February ..	c.	0·000	0·003	0·256	0·012	26·97	1·570	20·3°	6·0°
March.....	c.	0·000	0·004	0·251	0·018	26·87	1·583	20·2°	5·9°
April	c.	0·000	0·003	0·264	0·011	26·63	1·577	20·0°	5·8°
May	c.	0·000	0·003	0·217	0·013	26·93	1·570	20·1°	6·0°
June	c.	0·000	0·004	0·220	0·009	27·43	1·570	20·6°	6·0°
July	c.	0·000	0·003	0·217	0·005	27·13	1·649	20·5°	5·4°
August	c.	0·000	0·003	0·217	0·017	27·47	1·570	20·1°	5·5°
September..	c.	0·000	0·003	0·235	0·011	27·77	1·570	20·0°	5·4°
October	c.	0·000	0·004	0·245	0·018	27·27	1·570	20·3°	5·2°
November ..	c.	0·000	0·004	0·208	0·011	27·67	1·570	20·4°	5·6°
December ..	c.	0·000	0·003	0·235	0·008	27·70	1·570	20·4°	5·4°
Average..	.....	0·000	0·003	0·240	0·012	27·22	1·577	20·3°	5·7°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·000	0·002	0·235	0·014	28·00	1·570	20·5°	6·0°
February...	c.	0·000	0·003	0·220	0·004	28·10	1·570	20·6°	6·0°
March.....	c.	0·000	0·003	0·231	0·008	28·57	1·570	20·4°	5·8°
April	c.	0·000	0·003	0·207	0·008	28·40	1·637	20·4°	6·0°
May	c.	0·000	0·003	0·208	0·002	28·70	1·643	20·0°	6·0°
June.....	c.	0·000	0·004	0·243	0·004	27·90	1·577	20·8°	6·0°
July	c.	0·000	0·003	0·243	0·008	28·04	1·570	20·8°	6·0°
August	c.	0·000	0·003	0·248	0·005	27·43	1·643	20·8°	5·8°
September..	c.	0·000	0·003	0·196	0·004	28·17	1·570	21·8°	5·6°
October	c.	0·000	0·003	0·186	0·007	28·69	1·570	22·0°	5·6°
November ..	c.	0·000	0·003	0·216	0·006	28·31	1·564	21·8°	5·6°
December ..	c.	0·000	0·003	0·257	0·015	28·73	1·570	21·8°	5·7°
Average..	.....	0·000	0·003	0·224	0·007	28·25	1·587	21·0°	5·8°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·003	0·208	0·002	27·83	1·570	21·2°	5·6°
February...	c.	0·000	0·003	0·230	0·000	28·43	1·570	21·2°	6·0°
March.....	c.	0·000	0·004	0·137	0·003	28·03	1·570	21·2°	6·0°
April	c.	0·000	0·003	0·239	0·001	23·23	1·570	21·2°	6·0°
May	c.	0·000	0·002	0·244	0·004	27·13	1·564	20·8°	5·6°
June	c.	0·000	0·003	0·246	0·003	27·03	1·570	21·0°	5·6°
July	c.	0·000	0·004	0·248	0·001	28·17	1·583	21·1°	5·7°
August	c.	0·000	0·003	0·280	0·004	28·00	1·577	20·8°	5·6°
September..	c.	0·000	0·002	0·248	0·004	27·60	1·570	20·4°	5·6°
October	c.	0·000	0·003	0·238	0·002	27·67	1·577	20·7°	5·8°
November ..	c.	0·000	0·004	0·231	0·003	27·64	1·570	21·0°	6·0°
December ..	c.	0·000	0·003	0·247	0·001	27·17	1·558	21·0°	6·0°
Average..	.....	0·000	0·003	0·233	0·002	27·74	1·576	21·0°	5·8°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·258	0·004	27·90	1·653	20·6°	5·8°
February ..	c.	0·000	0·003	0·245	0·008	28·13	1·699	20·6°	6·0°
March.....	c.	0·000	0·003	0·287	0·009	27·89	1·643	20·8°	6·0°
April	c.	0·000	0·002	0·261	0·003	27·60	1·577	20·2°	5·6°
May	c.	0·000	0·003	0·288	0·007	27·93	1·589	20·8°	5·6°
June	c.	0·000	0·003	0·292	0·007	27·83	1·564	20·9°	5·8°
July	c.	0·000	0·003	0·340	0·004	28·07	1·589	20·9°	5·8°
August	c.	0·000	0·003	0·312	0·004	28·17	1·570	21·2°	6·0°
September..	c.	0·000	0·002	0·344	0·003	28·30	1·570	21·2°	6·0°
October	c.	0·000	0·003	0·359	0·011	28·09	1·583	21·2°	5·6°
November ..	c.	0·000	0·004	0·344	0·019	28·17	1·577	20·6°	6·0°
December ..	c.	0·000	0·003	0·345	0·006	28·33	1·570	21·3°	6·4°
Average..	.....	0·000	0·003	0·306	0·007	28·03	1·598	20·9°	5·9°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·000	0·003	0·365	0·011	27·83	—	—	1·430	—	19·8°	5·6°
February..	c.	0·000	0·003	0·409	0·010	28·27	—	—	1·436	—	20·0°	5·7°
March	c.	0·000	0·002	0·378	0·011	27·66	—	—	—	—	18·8°	5·6°
April	c.	0·000	0·002	0·195	0·003	27·72	—	—	1·436	—	20·0°	5·6°
May.....	c.	0·000	0·002	0·210	0·010	27·40	—	—	—	—	20·6°	6·0°
June	c.	0·000	0·002	0·210	0·008	28·30	—	—	—	—	18·8°	4·2°
July	c.	0·000	0·003	0·330	0·007	27·10	—	—	—	—	18·8°	3·3°
August ..	c.	0·000	0·002	0·180	0·007	27·70	—	—	1·620	3·300	20·0°	4·2°
September..	c.	0·000	0·000	0·390	0·003	27·35	11·200	0·684	1.440	3·020	19·4°	6·0°
October ..	c.	0·000	0·000	0·255	0·010	24·24	10·248	0·576	1·130	1·930	18·2°	5·1°
November..	c.	0·000	0·002	0·300	0·014	26·12	10·640	0·684	1·370	2·869	18·8°	5·1°
December..	c.	0·000	0·002	0·216	0·007	26·73	10·024	1·008	1·370	3·000	19·4°	5·1°
Average..	.....	0·000	0·002	0·287	0·008	27·20	10·278	0·738	1·404	2·824	19·3°	5·1°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·000	0·003	0·300	0·003	27·90	11·200	0·432	1·51	3·460	20·6°	6·0°
February..	v. s. t.	0·000	0·003	0·390	0·001	28·60	11·760	0·504	1·51	4·000	18·8°	6·0°
March	c.	0·000	0·002	0·375	0·007	30·10	12·040	0·864	1·51	3·360	18·8°	4·6°
April	c.	0·000	0·003	0·350	0·006	27·90	11·611	0·658	1·51	3·460	18·8°	5·6°
May.....	c.	0·000	0·002	0·420	0·003	31·00	12·320	0·612	1·59	4·530	19·4°	6·5°
June.....	c.	0·000	0·002	0·450	0·003	28·70	11·312	0·684	1·59	4·130	19·4°	7·0°
July.....	c.	0·000	0·003	0·300	0·015	26·70	9·352	0·828	1·30	2·200	17·0°	5·1°
August....	c.	0·000	0·002	0·375	0·003	28·00	10·864	0·930	1·44	3·200	19·4°	5·6°
September..	c.	0·000	0·002	0·268	0·010	26·60	10·868	0·936	1·44	3·533	19·4°	5·1°
October ..	c.	0·000	0·004	0·285	0·010	26·10	10·808	0·720	1·37	2·400	20·0°	5·1°
November..	c.	0·000	0·002	0·366	0·003	27·30	11·200	0·612	1·37	4·000	19·4°	5·1°
December ..	c.	0·000	0·003	0·310	0·003	27·90	11·640	0·720	1·37	2·667	18·6°	6·0°
Average..	.....	0·000	0·002	0·351	0·005	28·06	11·248	0·718	1·45	3·328	19·1°	5·6°

The following table gives the average, the maximum, and the minimum quantity of water supplied daily by the Kent Water Company from the year 1869 to 1877 inclusive:—

		Gallons per diem.	Houses Supplied.
1869	Average	6,919,850	38,069
	Maximum (July)	8,093,962	38,315
	Minimum (March)	6,133,919	37,465
1870	Average	7,439,899	39,521
	Maximum (July)	8,904,517	39,657
	Minimum (December)	6,514,161	39,778
1871	Average	7,071,657	40,253
	Maximum (May)	7,868,493	40,135
	Minimum (November)	6,380,341	40,596
1872	Average	6,789,600	41,167
	Maximum (July)	7,575,000	41,266
	Minimum (December)	6,386,770	41,541
1873	Average	6,558,860	41,968
	Maximum (July)	7,446,000	42,141
	Minimum (March)	5,870,990	41,753
1874	Average	6,712,800	42,798
	Maximum (July)	7,344,566	42,938
	Minimum (November)	6,137,244	43,161
1875	Average	9,780,219	43,862
	Maximum (June)	7,635,286	43,901
	Minimum (November)	6,270,611	44,253
1876	Average	7,190,305	44,821
	Maximum (July)	8,689,725	44,838
	Minimum (December)	6,408,778	45,432
1877	Average	7,231,038	45,432
	Maximum (June)	8,324,946	45,432
	Minimum (February)	6,536,390	45,432

VII.—NEW RIVER COMPANY.

The district supplied by this Company contains an estimated population of 900,000 people, residing in 126,027 houses, 2,986 of which are on the constant service (Nov., 1877).

The sources from which the Company derive their water are—

(1.) The Chadwell Spring, near Hertford, the produce of which varies between 1,800 and 4,400 gallons per minute, or say on an average 4,500,000 gallons daily. This water gives on analysis the following results:—

	Grains per gallon.
Free or Saline Ammonia	0·001
Oxygen required to oxidize Organic Matter, &c. ...	0·136
Carbonates of Lime and Magnesia	12·20
Sulphates of Lime and Magnesia	3·53
Chloride of Sodium	1·77
Nitrate of Magnesia	0·61
Silica, &c.	0·90
Organic Matter (estimated)	1·09
Total Solid	20·10

Hardness before boiling	degrees	15·4°
„ after „	„	4·4°

(2.) The Lea River. The Company take from 15 to 20 million gallons daily from this source, the intake being situated above the outfall of the Hertford sewage. This, together with the water of the Chadwell Spring, constitute what is called the "New River," which is an open conduit constructed in the reign of James I. by Sir Hugh Middleton. This River has an average width of 18 feet and depth of 5 feet, and a fall of 5 inches to the mile. Its flow is about one-third of a mile per hour, and it is about 40 miles in length. I have had occasion to examine the water taken at

different places along the River, and the results fully bear out the remarks of the Rivers Pollution Commissioners, "that the River is well protected from the ingress of polluting streams." They note that "they found no pipe opening into it along its whole length" (Sixth Report, p. 277). In another place they remark that the River "is kept in excellent order, and is, as a rule, most carefully guarded from pollution" (Sixth Report, p. 278).

(3.) The New River supply can be further supplemented if necessary in dry seasons from wells belonging to the Company, situated at Ware, Amwell, Cheshunt, Hoddesden and Wormley, but these are very rarely needed.

The Company have 21 subsiding and storage reservoirs, occupying an area of over 100 acres, and capable of holding 169,100,000 gallons. One of these is situated at the New River Head, two at Stoke Newington, two at Hornsey, thirteen at Highgate, one at Camden Park Road, and two at Cheshunt. There are also seven pure water reservoirs, capable of holding 24,000,000 gallons. There are 13 filter-beds, three situated at the New River Head, seven at Stoke Newington, and three at Hornsey. These occupy a total area of 11¼ acres. The filter-beds are 5-ft. 3-in. thick, and consist of sand (2-ft. 3-in.) and gravel (3-ft.). The average rate of filtration per square foot of area is about 2·58 gallons per hour for the year 1877.

The following are monthly analyses made by Dr. Letheby and myself of the water from the works of the New River Company during the ten years 1868—1877 :—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·007	—	0·056	20·67	—	14·0°	3·5°
February	c.	0·010	—	0·073	21·89	—	12·5°	3·0°
March	c.	0·007	—	0·025	19·50	—	14·0°	3·5°
April	c.	0·007	—	0·042	20·00	—	13·5°	3·5°
May	c.	0·001	0·105	0·032	20·33	0·861	12·5°	3·5°
June	c.	0·001	0·094	0·043	16·87	1·153	12·0°	2·5°
July	c.	0·000	0·056	0·030	16·33	0·849	12·0°	2·5°
August	c.	0·005	0·049	0·028	15·17	0·728	11·5°	2·5°
September	c.	0·000	0·099	0·041	17·43	—	11·5°	2·5°
October	c.	0·001	0·066	0·030	16·89	0·910	12·5°	3·0°
November	c.	0·000	0·105	0·021	18·97	1·019	13·5°	3·2°
December	c.	0·001	0·150	0·061	21·60	1·019	14·9°	3·4°
Average	.....	0·003	0·090	0·040	18·80	0·933	12·9°	3·1°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·003	0·195	0·108	21·63	1·092	16·1°	4·4°
February	c.	0·003	0·222	0·098	21·60	1·019	14·9°	4·1°
March	c.	0·001	0·210	0·029	21·00	1·019	14·0°	3·2°
April	c.	0·000	0·143	0·029	19·97	0·977	14·0°	3·1°
May	c.	0·000	0·075	0·038	16·90	0·873	14·2°	3·3°
June	c.	0·001	0·098	0·024	16·37	1·019	14·4°	3·3°
July	c.	0·001	0·075	0·037	16·00	1·019	13·2°	3·0°
August	c.	0·000	0·076	0·023	17·07	0·873	13·2°	3·0°
September	c.	0·000	0·070	0·039	17·80	1·019	13·8°	3·3°
October	c.	0·000	0·050	0·041	18·90	0·873	13·9°	3·3°
November	c.	0·000	0·051	0·027	19·03	0·873	13·9°	3·7°
December	c.	0·000	0·024	0·013	19·37	0·861	14·5°	4·0°
Average	.....	0·000	0·107	0·042	18·80	0·959	14·2°	3·5°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	s. t.	0·001	0·066	0·062	21·13	1·019	15·1°	4·8°
February	c.	0·001	0·076	0·027	23·50	1·019	15·8°	5·0°
March	c.	0·000	0·123	0·020	19·17	1·019	15·0°	4·2°
April	c.	0·000	0·110	0·014	17·77	1·019	14·8°	3·3°
May	c.	0·000	0·090	0·020	18·60	0·995	13·9°	3·6°
June	c.	0·000	0·027	0·024	16·43	1·019	12·8°	3·6°
July	c.	0·001	0·075	0·027	16·37	0·928	12·6°	3·3°
August	c.	0·000	0·065	0·014	16·17	0·928	12·8°	2·8°
September	c.	0·000	0·083	0·020	16·40	1·001	13·0°	2·6°
October	c.	0·001	0·132	0·026	17·70	1·073	13·6°	3·2°
November	c.	0·003	0·125	0·035	20·37	1·080	15·9°	3·6°
December	c.	0·001	0·125	0·037	21·19	1·049	15·8°	3·9°
Average	.....	0·001	0·091	0·027	18·73	1·012	14·2°	3·7°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·004	0·005	0·136	0·033	23·47	1·001	16·0°	4·1°
February	c.	0·001	0·006	0·150	0·044	21·60	1·007	16·0°	4·0°
March	c.	0·003	0·005	0·137	0·059	19·20	1·001	15·0°	3·8°
April	c.	0·000	0·005	0·181	0·029	18·42	1·001	15·0°	4·0°
May	c.	0·001	0·004	0·133	0·050	19·40	1·001	15·4°	3·4°
June	c.	0·001	0·003	0·142	0·033	17·83	1·073	14·0°	3·3°
July	c.	0·002	0·003	0·136	0·060	16·80	1·013	13·4°	3·0°
August	c.	0·001	0·005	0·125	0·035	16·17	1·067	13·3°	3·0°
September	c.	0·000	0·004	0·125	0·030	16·49	1·001	13·6°	3·0°
October	c.	0·000	0·008	0·143	0·057	18·13	1·001	14·2°	3·0°
November	c.	0·001	0·007	0·145	0·049	20·49	1·031	15·9°	3·8°
December	c.	0·001	0·003	0·121	0·027	20·83	1·001	15·9°	3·7°
Average	.....	0·001	0·005	0·139	0·042	19·07	1·016	14·8°	3·5°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·120	0·029	21·03	1·140	15·6°	3·6°
February ..	c.	0·001	0·004	0·125	0·077	20·70	1·140	15·4°	4·0°
March	c.	0·001	0·005	0·120	0·045	18·83	1·213	14·6°	4·0°
April	c.	0·001	0·004	0·157	0·095	19·10	1·001	15·0°	4·0°
May	c.	0·001	0·004	0·147	0·044	17·98	1·080	14·8°	3·8°
June	c.	0·000	0·004	0·148	0·037	18·30	1·141	15·0°	3·8°
July	c.	0·002	0·004	0·131	0·029	17·37	1·001	13·2°	3·3°
August	c.	0·000	0·004	0·131	0·025	17·70	1.001	13·7°	3·4°
September..	c.	0·000	0·005	0·131	0·043	17·87	1·001	13·6°	3·6°
October	c.	0·001	0·005	0·147	0·025	18·30	1·019	14·1°	3·4°
November ..	c.	0·002	0·006	0·167	0·144	20·60	1·140	15·4°	4·2°
December ..	c.	0·001	0·004	0·131	0·074	21·33	1·140	16·0°	3·6°
Average..	.....	0·001	0·004	0·138	0·056	19·09	1·084	14·7°	3·7°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·131	0·076	21·27	1·140	16·5°	3·8°
February ..	c.	0·001	0·005	0·130	0·066	22·60	1·140	17·3°	4·0°
March	c.	0·001	0·004	0·128	0·062	21·47	1·140	16·0°	3·8°
April	c.	0·000	0·005	0·124	0·031	19·47	1·086	15·0°	3·3°
May	c.	0·000	0·005	0·147	0·017	17·97	1·001	14·2°	3·0°
June	c.	0·001	0·005	0·125	0·019	18·07	0·995	14·6°	3·0°
July	c.	0·000	0·004	0·167	0·016	18·13	1·073	14·1°	3·3°
August	c.	0·000	0·004	0·110	0·014	16·83	1·001	13·8°	2·8°
September..	c.	0·001	0·004	0·083	0·011	17·53	1·001	13·8°	3·4°
October	c.	0·000	0·003	0·096	0·018	18·87	1·073	14·3°	3·3°
November ..	c.	0·000	0·003	0·110	0·012	18·80	1·019	14·6°	3·3°
December ..	c.	0·001	0·004	0·131	0·031	20·57	1·001	15·8°	3·6°
Average..	.....	0·001	0·004	0·124	0·031	19·30	1·055	15·0°	3·4°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·130	0·008	20·70	1·001	15·8°	3·3°
February ..	c.	0·001	0·005	0·147	0·040	20·77	1·001	16·0°	3·3°
March	c.	0·001	0·003	0·101	0·017	19·43	1·001	16·0°	3·3°
April	c.	0·001	0·004	0·124	0·018	18·73	1·025	14·9°	3·3°
May	c.	0·000	0·004	0·113	0·019	16·77	1·001	14·0°	3·3°
June	c.	0·000	0·005	0·083	0·024	16·67	0·995	13·6°	3·3°
July	c.	0·000	0·004	0·086	0·029	16·93	1·001	13·9°	3·6°
August	c.	0·000	0·004	0·115	0·019	17·80	1·007	14·4°	3·4°
September..	c.	0·000	0·004	0·097	0·008	17·67	1·001	13·8°	3·6°
October	c.	0·000	0·003	0·101	0·010	17·30	1·007	13·6°	3·0°
November ..	c.	0·000	0·005	0·109	0·019	19·87	1·043	14·9°	4·0°
December ..	c.	0·000	0·005	0·136	0·037	19·90	1·031	14·3°	4·0°
Average..	.....	0·000	0·004	0·112	0·021	18·55	1·009	14·6°	3·5°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·005	0·143	0·033	21·77	1·001	14·9°	4·3°
February ..	c.	0·001	0·006	0·167	0·046	21·53	0·989	15·0°	3·8°
March	c.	0·001	0·004	0·184	0·018	19·70	1·116	15·0°	3·6°
April	c.	0·000	0·003	0·151	0·017	16·81	1·025	13·6°	3·3°
May	c.	0·000	0·004	0·131	0·024	17·90	1·019	13·5°	3·3°
June	c.	0·000	0·004	0·132	0·018	17·51	1·001	13·5°	3·3°
July	c.	0·000	0·004	0·131	0·026	17·20	0·989	13·4°	3·0°
August	c.	0·000	0·004	0·115	0·030	18·73	1·001	15·0°	3·0°
September..	c.	0·000	0·003	0·131	0·029	18·47	1·001	14·6°	3·3°
October	c.	0·000	0·003	0·147	0·025	18·73	1·013	14·5°	3·0°
November..	c.	0·001	0·005	0·131	0·050	20·83	0·934	16·0°	3·3°
December ..	c.	0·001	0·005	0·149	0·046	21·60	1·001	16·5°	3·8°
Average..	.....	0·001	0·004	0·143	0·030	19·24	1·007	14·6°	3·4°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·000	0·004	0·168	0·033	22·17	—	—	0·924	—	15·8°	3·8°
February..	c.	0·000	0·006	0·184	0·045	21·53	—	—	0·924	—	15·4°	3·8°
March	—	—	—	—	—	—	—	—	—	—	—	—
April	—	—	—	—	—	—	—	—	—	—	—	—
May.....	—	—	—	—	—	—	—	—	—	—	—	—
June	c.	0·000	0·004	0·135	0·008	17·98	—	—	0·862	—	13·2°	2·8°
July.....	c.	0·000	0·004	0·105	0·020	18·40	—	—	0·795	—	14·3°	2·6°
August ..	c.	0·000	0·003	0·090	0·017	16·60	—	—	0·795	—	13·0°	2·4°
September.	c.	0·000	0·003	0·090	0·017	16·61	7·392	0·504	0·795	0·754	12·7°	3·3°
October ..	c.	0·000	0·004	0·120	0·023	19·60	7·952	0·468	0·795	0·733	13·8°	3·3°
November..	c.	0·001	0·003	0·120	0·014	19·07	7·840	0·464	1·050	1·060	13·2°	2·8°
December..	c.	0·000	0·004	0·160	0·096	19·20	7·462	0·431	0·860	1·560	14·6°	4·4°
Average..	.....	0·000	0·004	0·130	0·030	19·01	7·661	0·466	0·866	1·026	14·0°	3·2°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	s. t.	0·000	0·004	0·203	0·098	20·00	8·680	0·432	0·87	1·860	14·9°	5·1°
February..	c.	0·001	0·007	0·120	0·045	18·60	7·840	0·432	0·79	1·330	12·1°	3·5°
March	c.	0·000	0·005	0·195	0·055	21·70	9·184	0·504	0·87	1·334	14·3°	3·7°
April	c.	0·000	0·006	0·090	0·060	19·00	8·560	0·360	0·87	1·200	13·2°	4·2°
May	c.	0·000	0·006	0·135	0·042	18·40	7·160	0·360	0·94	1·260	11·0°	2·8°
June	c.	0·000	0·007	0·150	0·057	17·80	7·280	0·324	0·94	1·260	12·6°	2·8°
July.....	c.	0·000	0·006	0·090	0·029	18·90	7·952	0·360	0·94	1·066	12·1°	2·4°
August ..	c.	0·000	0·007	0·105	0·031	16·40	5·600	0·216	0·94	1·000	9·5°	3·3°
September.	c.	0·000	0·005	0·099	0·020	17·40	7·616	0·288	0·94	1·100	12·6°	2·4°
October ..	c.	0·000	0·006	0·120	0·018	18·30	7·896	0·180	0·87	1·066	13·2°	3·3°
November..	c.	0·001	0·006	0·100	0·017	19·00	8·232	0·360	0·87	0·700	13·7°	3·0°
December..	c.	0·001	0·006	0·180	0·040	21·00	9·246	0·360	0·87	1·166	14·3°	4·2°
Average..	.....	0·000	0·006	0·132	0·042	18·87	7·937	0·348	0·89	1·195	12·7°	3·3°

The following are monthly analyses, made by Dr. Letheby and myself, of the water from the mains of the New River Company for the ten years 1868 to 1877:—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·007	—	0·082	22·43	—	14·0°	3·5°
February	c.	0·007	—	0·073	20·83	—	12·5°	3·0°
March	c.	0·007	—	0·029	18·50	—	14·0°	3·5°
April	c.	0·007	—	0·046	19·51	—	13·5°	3·5°
May	c.	0·006	0·068	0·036	19·13	—	12·5°	3·0°
June	c.	0·001	0·085	0·047	15·90	1·213	11·9°	2·3°
July	c.	0·000	0·052	0·042	16·67	0·898	12·0°	2·5°
August	c.	0·008	0·048	0·033	14·69	0·728	11·0°	2·5°
September	c.	0·000	0·175	0·045	17·33	0·861	11·5°	2·5°
October	c.	0·000	0·075	0·059	17·15	0·837	12·5°	3·0°
November	c.	0·001	0·120	0·021	18·77	1·019	13·0°	3·2°
December	c.	0·002	0·174	0·027	19·67	0·861	15·0°	3·5°
Average	.....	0·003	0·099	0·045	18·38	0·917	12·6°	3·0°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·005	0·240	0·107	21·43	1·019	16·4°	4·8°
February	c.	0·001	0·225	0·060	21·77	1·019	14·9°	3·8°
March	c.	0·002	0·188	0·061	20·23	1·019	13·6°	3·2°
April	c.	0·000	0·143	0·021	19·90	0·983	13·9°	3·0°
May	c.	0·000	0·075	0·032	16·33	0·873	14·0°	3·3°
June	c.	0·002	0·102	0·035	16·33	1·019	14·0°	3·3°
July	c.	0·000	0·090	0·029	17·70	0·995	14·0°	3·3°
August	c.	0·000	0·076	0·028	17·83	0·873	13·3°	3·4°
September	c.	0·000	0·076	0·039	17·33	1·061	13·7°	3·2°
October	c.	0·000	0·066	0·059	18·30	0·873	13·8°	3·3°
November	c.	0·000	0·056	0·021	18·47	0·873	14·0°	3·6°
December	c.	0·000	0·021	0·009	18·97	0·849	14·2°	3·9°
Average	.....	0·001	0·113	0·042	18·80	0·954	14·1°	3·5°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·075	0·059	20·53	1·164	14·9°	4·1°
February	c.	0·000	0·091	0·020	24·53	1·019	15·9°	4·8°
March	c.	0·000	0·091	0·033	19·53	0·904	15·1°	4·0°
April	c.	0.000	0·110	0·021	18·07	1·019	14·6°	4·0°
May	c.	0·000	0·110	0·011	16·09	0·873	13·1°	3·1°
June	c.	0·000	0·023	0·021	16·03	0·965	12·6°	3·4°
July	c.	0·000	0·060	0·027	16·43	0·928	12·9°	3·2°
August	c.	0·000	0·075	0·018	15·83	0·927	12·8°	2·6°
September	c.	0·000	0·091	0·017	15·87	0·927	12·7°	2·9°
October	c.	0·000	0·110	0·022	17·10	1·001	13·6°	3·0°
November	c.	0·000	0·110	0·018	19·03	1·001	14·6°	3·3°
December	c.	0·001	0·091	0·021	20·69	1·001	15·5°	3·8°
Average	.....	0·000	0·086	0·024	18·31	0·977	14·0°	3·5°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·003	0·125	0·045	23·37	1·001	16·0°	4·2°
February	c.	0·001	0·003	0·125	0·037	21·53	1·007	16·0°	4·0°
March	c.	0·003	0·003	0·125	0·040	20·17	1·007	15·8°	3·9°
April	c.	0·000	0·003	0·187	0·026	19·00	1·001	15·0°	4·0°
May	c.	0·000	0·003	0·136	0·049	19·13	1·001	14·8°	3·3°
June	c.	0·000	0·000	0·129	0·036	17·37	1·019	14·0°	3·3°
July	c.	0·001	0·002	0·120	0·023	17·40	1·140	14·0°	3·3°
August	c.	0·000	0·003	0·110	0·030	16·83	1·001	13·4°	3·0°
September	c.	0·000	0·003	0·126	0·021	16·43	1·001	13·5°	3·0°
October	c.	0·000	0·003	0·137	0·022	17·73	1·001	13·7°	3·1°
November	c.	0·001	0·005	0·140	0·026	20·77	1·019	16·0°	3·7°
December	c.	0·001	0·003	0·120	0·028	20·60	1·001	15·6°	3·7°
Average	.....	0·001	0·003	0·132	0·032	19·19	1·016	14·8°	3·5°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·004	0·119	0·021	20·47	1·067	15·4°	3·6°
February	c.	0·001	0·006	0·121	0·069	21·07	1·140	15·4°	3·9°
March	c.	0·002	0·004	0·124	0·060	19·30	1·146	14·8°	3·9°
April	c.	0·001	0·004	0·148	0·079	18·63	1·037	15·0°	3·8°
May	c.	0·002	0·003	0·131	0·035	17·93	1·092	14·8°	3·8°
June	c.	0·000	0·003	0·131	0·042	17·93	1·134	14·9°	3·8°
July	c.	0·000	0·003	0·147	0·013	17·87	1·140	13·7°	3·2°
August	c.	0·000	0·004	0·147	0·038	17·10	1·067	13·2°	3·4°
September	c.	0·000	0·004	0·147	0·031	18·30	1·001	13·6°	3·5°
October	c.	0·001	0·004	0·101	0·021	18·17	1·001	14·0°	3·4°
November	c.	0·002	0·005	0·131	0·094	20·50	1·140	15·4°	4·2°
December	c.	0·001	0·005	0·147	0·041	21·03	1·140	15·8°	3·6°
Average	.....	0·001	0·004	0·133	0·045	19·03	1·093	14·6°	3·7°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·167	0·080	21·43	1·140	16·3°	3·6°
February ..	c.	0·001	0·006	0·146	0·053	22·50	1·140	17·0°	3·8°
March	c.	0·000	0·005	0·147	0·050	21·27	1·140	16·0°	3·6°
April	c.	0·000	0·005	0·144	0·039	19·17	1·092	15·0°	3·3°
May	c.	0·000	0·004	0·131	0·025	17·77	1·019	14·0°	3·0°
June	c.	0·000	0·004	0·147	0·019	17·63	1·001	14·3°	3·3°
July	c.	0·000	0·004	0·147	0·024	17·83	1·001	14·0°	3·0°
August	c.	0·000	0·004	0·098	0·026	17·63	1·001	14·0°	2·4°
September..	c.	0·000	0·004	0·110	0·023	17·17	1·001	13·6°	3·0°
October	c.	0·001	0·004	0·110	0·027	17·61	1·073	14·0°	3·3°
November ..	c.	0·001	0·003	0·116	0·010	19·17	1·001	14·8°	3·3°
December ..	c.	0·000	0·004	0·147	0·022	20·33	1·001	15·6°	3·5°
Average..	.....	0·000	0·004	0·134	0·033	19·13	1·050	14·9°	3·3°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·140	0·005	20·66	1·001	16·0°	3·3°
February ..	c.	0·000	0·005	0·130	0·036	20·83	1·073	16·3°	3·3°
March	c.	0·000	0·004	0·114	0·015	19·20	1·001	15·8°	3·3°
April	c.	0·001	0·004	0·136	0·016	20·00	1·007	15·6°	4·0°
May	c.	0·000	0·003	0·132	0·027	16·33	0·989	13·8°	3·3°
June	c.	0·000	0·003	0·088	0·019	16·54	1·001	13·6°	3·3°
July	c.	0·000	0·004	0·091	0·024	16·80	0·995	13·8°	3·6°
August	c.	0·000	0·005	0·131	0·018	17·47	1·019	14·0°	3·3°
September..	c.	0·000	0·004	0·115	0·011	17·33	1·007	14·0°	3·6°
October	c.	0·000	0·004	0·114	0·015	17·29	1·001	13·4°	3·0°
November ..	c.	0·000	0·004	0·117	0·023	19·70	1·025	14·7°	4·0°
December ..	c.	0·000	0·004	0·161	0·016	19·67	1·025	14·4°	4·0°
Average..	.....	0·000	0·004	0·122	0·019	18·49	1·012	14·6°	3·5°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·001	0·004	0·147	0·018	21·87	1·019	14·9°	4·2°
February ..	c.	0·001	0·005	0·151	0·049	21·23	1·001	14·9°	4·0°
March	c.	0·000	0·003	0·187	0·016	20·07	1·128	15·2°	3·8°
April	c.	0·000	0·003	0·160	0·013	16·57	1·019	13·5°	3·3°
May	c.	0·000	0·003	0·147	0·015	17·81	0·995	13·5°	3·3°
June	c.	0·000	0·003	0·143	0·014	17·83	1·007	14·0°	3·3°
July	c.	0·000	0·004	0·134	0·023	17·36	1·001	13·5°	3·0°
August	c.	0·000	0·004	0·131	0·056	17·77	0·995	14·3°	3·3°
September..	c.	0·000	0·003	0·118	0·028	17·57	0·989	13·8°	3·0°
October	c.	0·000	0·004	0·166	0·030	18·47	1·001	14·7°	3·0°
November ..	c.	0·000	0·005	0·147	0·054	20·67	0·934	16·0°	3·3°
December ..	c.	0·001	0·005	0·131	0·049	21·47	0·995	16·4°	3·8°
Average..	.....	0·000	0·004	0·147	0·030	19·06	1·007	14·5°	3·4°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·000	0·004	0·169	0·034	21·57	—	—	0·929	—	15·4°	3·6°
February..	c.	0·000	0·004	0·174	0·041	21·60	—	—	0·919	—	15·4°	3·9°
March	c.	0·001	0·005	0·166	0·060	21·23	—	—	—	—	14·3°	3·3°
April	c.	0·000	0·005	0·107	0·017	19·87	—	—	0·924	—	14·0°	3·0°
May.....	c.	0·000	0·003	0·120	0·029	19·25	—	—	0·924	—	14·3°	3·0°
June	c.	0·000	0·003	0·135	0·040	19·20	—	—	—	—	13·2°	3·0°
July.....	c.	0·000	0·004	0·105	0·020	18·40	—	—	—	—	14·3°	2·6°
August....	c.	0·000	0·004	0·102	0·028	17·70	—	—	1·180	0·800	13·2°	2·4°
September..	c.	0·000	0·006	0·088	0·028	16·43	7·504	0·360	0·860	0·686	12·7°	3·0°
October ..	c.	0·000	0·004	0·120	0·027	19·38	7·952	0·468	0·870	0·800	14·3°	3·3°
November..	c.	0·001	0·004	0·165	0·014	19·31	8·680	0·396	0·871	1·281	14·8°	2·8°
December ..	c.	0·000	0·004	0·160	0·092	19·28	7·448	0·468	0·860	1·730	14·3°	4·2°
Average..	.....	0·001	0·004	0·134	0·035	19·43	7·896	0·423	0·918	1·059	14·1°	3·1°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·000	0·005	0·216	0·094	20·50	8·560	0·216	0·87	1·530	14·9°	3·3°
February..	v. s. t.	0·000	0·005	0·135	0·049	21·70	8·680	0·360	0·86	1·500	14·3°	4·2°
March	c.	0·000	0·006	0·168	0·066	21·20	9·240	0·540	0·79	1·334	14·8°	4·2°
April	c.	0·000	0·006	0·105	0·042	18·80	8·730	0·390	0·79	1·104	13·2°	3·7°
May	c.	0·000	0·006	0·138	0·036	19·40	8·180	0·503	0·87	1·800	12·6°	3 3°
June	c.	0·000	0·006	0·150	0·032	18·20	8·064	0·432	0·94	1·330	12·6°	3·3°
July	c.	0·000	0·006	0·120	0·019	16·40	7·672	0·432	0·94	0·866	12·1°	3·3°
August....	c.	0·000	0·009	0·129	0·024	17·90	7·728	0·396	0·94	0·867	12·6°	3·6°
September..	c.	0·000	0·006	0·090	0·017	16·10	7·840	0·360	0·94	0·870	12·6°	3·3°
October ..	c.	0·000	0·007	0·109	0·018	17·40	8·120	0·324	0·87	1·066	12·6°	2·8°
November..	c.	0·000	0·006	0·100	0·050	20·50	9·072	0·324	0·94	0·800	14·0°	2·4°
December*	c.	0·000	0·007	0·150	0·036	20·20	9·070	0·360	0·87	0·933	14·3°	3·3°
Average..	.....	0·000	0·006	0·134	0·040	19·02	8·246	0·386	0·88	1·166	13·3°	3·3°

* Six Samples.

The following table represents the average, the maximum and the minimum quantity of water supplied daily by the New River Water Company from the year 1869 to 1877 inclusive :—

		Gallons per diem.	Houses Supplied.
1869	Average	22,959,000	116,404
	Maximum (July).....	25,466,000	116,511
	Minimum (February).....	20,183,000	115,638
1870	Average	23,198,417	117,845
	Maximum (July).....	26,708,000	117,903
	Minimum (February).....	20,806,000	117,413

		Gallons per diem.	Houses Supplied.
1871	Average	23,727,333	118,193
	Maximum (August)	27,452,000	119,119
	Minimum (February)	20,937,000	118,477
1872	Average	24,404,750	120,242
	Maximum (July)	29,080,000	120,335
	Minimum (December)	20,982,000	120,662
1873	Average	24,629,917	121,304
	Maximum (September)	28,602,000	121,601
	Minimum (March)	21,172,000	120,891
1874	Average	26,647,211	122,277
	Maximum (August)	30,433,000	122,429
	Minimum (December)	22,925,000	122,792
1875	Average	26,947,334	123,399
	Maximum (September)	30,633,000	123,628
	Minimum (January)	23,953,000	122,890
1876	Average	26,147,250	124,473
	Maximum (July)	31,547,000	124,553
	Minimum (December)	24,132,000	125,011
1877	Average	26,649,100	125,530
	Maximum (August)	29,515,000	125,749
	Minimum (February)	24,299,000	125,061

Table showing the total solids and oxidizable organic matter, &c., in the water of the New River month by month. The numbers represent the average of 250 samples :—

	Total Solids.	Oxygen required by Oxidizable Organic Matter, &c.
January	21·384	0·0536
February	21·430	0·0558
March	20·059	0·0366
April	18·807	0·0373
May	18·250	0·0317
June	17·373	0·0287
July	17·243	0·0303
August	16·864	0·0236
September	17·367	0·0258
October	18·271	0·0273
November	19·703	0·0388
December	20·659	0·0462

The above table is interesting as proving, in regard to the New River water, what I have already shown with respect to the Thames water, viz., its remarkable constancy and uniformity. August, it will be seen, is in this case the crest of the wave, *i.e.*, where the total solid matter is least (16·864 grains), and February the furrow of the wave, *i.e.*, where the total

solid matter is most (21·430 grains). It will be remarked that the numbers ascend and descend with great uniformity. An almost similar result is seen in the case of the oxygen required to oxidize the organic and other constituents of the water.

VIII.—EAST LONDON WATER COMPANY.

The district supplied by this Company includes a population of 839,752 people, residing in 111,967 houses, 68,129 of which are supplied on the constant service (Nov., 1877). More than one-half of the houses in the district of the Company therefore are supplied on the constant system. The Company intend introducing a constant service, section by section, throughout their whole district.

The Company take their water chiefly from the River Lea at Ponder's End, from which spot it is conveyed to subsidence reservoirs. The Company moreover possess powers to take 10,000,000 gallons daily from the Thames. During the past year this has been done in the months of April (2,200,480 gallons daily), May (2,693,713 gallons daily), June (2,303,821 gallons daily), and September (107,143 gallons daily).

The Company possess nine storage and subsiding reservoirs, having an area of 222 acres, and a total capacity of 605,000,000 gallons. Eight of these are situated at Walthamstow, and one small one at Hanworth. There are four reservoirs for the pure filtered water, one at Old Ford, two at Hanworth, and one at Hornsey Wood. Their total capacity is 10,500,000 gallons. The Company have 25 filter-beds, occupying an area of 23 acres. The filtering material is 3-ft. 6-in. thick, and consists of sand (2 ft.), hoggin (6-in.), and coarse gravel (1-ft.). The average rate of filtration is 1·33 gallons per hour per square foot of filtering area.

The Company deliver unfiltered water in separate mains for street-watering and for trade purposes.

I content myself with merely quoting the words of the Rivers Pollution Commissioners (Sixth Report, p. 281): "The arrangements of the Company "for the filtration of the water of the Lea are not surpassed in complete-"ness by those of any other of the London Water Companies."

The monthly analyses of the water from the Company's works, made by Dr. Letheby and myself since 1868, are stated in the following tables:—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·007	—	0·100	26·60	—	16·5°	5·5°
February	c.	0·010	—	0·112	22·59	—	14·0°	4·5°
March	c.	0·007	—	0·029	21·50	—	15·5°	4·5°
April	c.	0·007	—	0·060	21·49	—	15·0°	5·0°
May	c.	0·006	0·150	0·045	22·67	0·989	13·5°	4·5°
June	c.	0·002	0·037	0·047	18·00	0·764	12·0°	3·0°
July	c.	—	—	—	16·33	—	—	—
August	c.	0·008	0·025	0·043	15·10	1·019	10·5°	2·0°
September	c.	0·002	0·075	0·041	17·03	—	11·5°	2·5°
October	c.	0·000	0·045	0·054	17·27	1·110	12·5°	3·0°
November	c.	0·001	0·048	0·026	19·20	1·250	13·8°	3·4°
December	c.	0·003	0·104	0·036	21·83	1·164	15·4°	3·4°
Average	.....	0·004	0·068	0·054	19·97	1·049	13·7°	3·8°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·001	0·249	0·133	22·87	1·237	16·4°	5·9°
February	c.	0·001	0·375	0·119	24·27	1·250	16·1°	5·0°
March	c.	0·002	0·262	0·090	22·90	1·164	16·0°	4·2°
April	c.	0·000	0·198	0·072	23·63	0·873	15·2°	3·8°
May	c.	0·000	0·083	0·048	18·10	0·873	14·0°	3·5°
June	c.	0·002	0·090	0·047	18·77	1·164	14·2°	3·8°
July	c.	0·000	0·033	0·066	16·10	1·031	13·1°	3·0°
August	c.	0·000	0·078	0·020	16·07	1·019	13·2°	3·1°
September	c.	—	—	—	—	—	—	—
October	c.	0·000	0·051	0·062	17·93	1·164	13·2°	3·3°
November	c.	0·000	0·051	0·036	18·03	1·019	14·2°	4·0°
December	c.	0·000	0·026	0·027	18·60	1·025	14·8°	4·0°
Average	.....	0·001	0·136	0·065	19·75	1·074	13·7°	4·0°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·001	0·090	0·110	21·33	1·164	15·4°	5·1°
February	c.	0·002	0·129	0·067	24·69	1·249	16·4°	5·1°
March	c.	0·001	0·091	0·043	21·69	1·019	15·8°	4·8°
April	c.	0·000	0·079	0·050	19·67	1·086	15·1°	4·0°
May	c.	0·002	0·075	0·029	16·73	1·019	13·2°	3·2°
June	c.	0·001	0·023	0·041	16·33	1·019	12·4°	3·8°
July	c.	0·001	0·065	0·060	17·53	1·001	12·9°	4·0°
August	c.	0·001	0·110	0·054	16·27	1·001	13·2°	3·0°
September	c.	0·001	0·075	0·027	15·37	1·140	12·6°	2·8°
October	c.	0·002	0·125	0·034	16·43	1·140	13·0°	3·4°
November	s. t.	0·005	0·125	0·021	19·89	1·067	15·6°	3·6°
December	c.	0·001	0·136	0·053	22·07	1·140	15·9°	4·4°
Average	.....	0·001	0·094	0·049	19·00	1·087	14·3°	3·9°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·003	0·136	0·076	26·31	1·285	16·9°	4·5°
February...	c.	0·002	0·005	0·136	0·059	23·70	1·285	16·6°	4·6°
March.....	c.	0·003	0·006	0·110	0·089	23·61	1·285	15·8°	4·4°
April	c.	0·001	0·005	0·217	0·075	21·07	1·188	15·6°	4·8°
May.....	c.	0·003	0·005	0·119	0·113	18·74	1·285	13·2°	3·8°
June	c.	0·003	0·004	0·125	0·067	17·39	1·285	14·0°	3·6°
July.....	c.	0·002	0·005	0·128	0·079	17·83	1·285	13·9°	3·8°
August	c.	0·003	0·007	0·125	0·078	17·50	1·432	13·6°	3·6°
September..	c.	0·001	0·005	0·136	0·072	15·29	1·285	12·1°	3·6°
October	c.	0·002	0·005	0·146	0·040	18·00	1·213	14·2°	3·8°
November..	c.	0·002	0·006	0·124	0·067	21·33	1·213	16·0°	4·2°
December ..	c.	0·003	0·004	0·118	0·039	22·07	1·140	16·8°	4·2°
Average..	.....	0·002	0·005	0·135	0·071	20·24	1·265	14·9°	4·1°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·004	0·006	0·119	0·060	22·77	1·285	15·9°	4·0°
February...	c.	0·004	0·006	0·125	0·110	23·80	1·285	16·3°	4·2°
March	c.	0·002	0·005	0·121	0·067	21·83	1·285	15·8°	4·3°
April	c.	0·002	0·004	0·139	0·060	19·33	1·213	15·4°	4·1°
May	c.	0·002	0·003	0·131	0·061	18·90	1·213	15·4°	4·4°
June	c.	0·001	0·005	0·181	0·057	20·37	1·285	16·5°	4·8°
July.....	c.	0·003	0·005	0·181	0·064	17·10	1·432	12·8°	3·9°
August	c.	0·002	0·006	0·166	0·064	17·40	1·285	13·0°	3·8°
September..	c.	0·002	0·006	0·167	0·076	18·10	1·225	13·2°	3·3°
October	c.	0·002	0·005	0·181	0·035	17·57	1·219	13·0°	3·4°
November..	c.	0·002	0·005	0·235	0·072	21·17	1·285	16·0°	4·6°
December ..	c.	0·002	0·009	0·147	0·114	24·40	1·285	16·8°	4·5°
Average..	.....	0·002	0·005	0·158	0·070	20·23	1·274	15·0°	4·1°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·006	0·148	0·109	23·83	1·285	17·0°	4·2°
February...	c.	0·002	0·006	0·146	0·088	24·47	1·285	17·6°	4·4°
March.....	c.	0·001	0·005	0·147	0·067	23·37	1·285	16·8°	4·2°
April	c.	0·001	0·005	0·147	0·084	18·30	1·225	14·6°	3·8°
May	c.	0·001	0·006	0·147	0·053	17·33	1·285	14·0°	3·6°
June	c.	0·002	0·005	0·146	0·034	17·13	1·219	14·3°	3·6°
July.....	c.	0·001	0·005	0·147	0·032	18·20	1·140	14·3°	3·6°
August	c.	0·001	0·006	0·136	0·043	16·80	1·225	13·4°	3·3°
September..	c.	0·002	0·008	0·110	0·035	17·40	1·140	13·5°	3·6°
October	v. s. t.	0·002	0·005	0·125	0·035	19·30	1·140	14·8°	4·2°
November..	v. s. t.	0·002	0·007	0·131	0·037	19·23	1·146	14·6°	4·0°
December ..	c.	0·003	0·006	0·181	0·071	20·70	1·140	15·8°	3·6°
Average..	.....	0·002	0·006	0·143	0·057	19·67	1·209	15·1°	3·9°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·003	0·167	0·031	21·30	1·140	16·5°	4·0°
February ..	c.	0·002	0·007	0·181	0·060	22·70	1·140	16·5°	4·6°
March	c.	0·002	0·005	0·147	0·052	21·56	1·140	16·5°	4·2°
April	s. t.	0·002	0·006	0·164	0·034	19·23	1·225	15·4°	4·2°
May	c.	0·002	0·005	0·132	0·046	17·10	1·321	14·3°	3·6°
June	c.	0·002	0·006	0·098	0·042	16·77	1·146	13·8°	3·8°
July	c.	0·002	0·005	0·136	0·025	16·47	1·140	13·7°	3·8°
August	c.	0·001	0·005	0·125	0·086	16·00	1·031	13·2°	3·2°
September..	c.	0·001	0·005	0·146	0·041	15·33	1·140	13·0°	3·0°
October	c.	0·000	0·005	0·124	0·023	15·70	1·146	13·2°	3·0°
November ..	c.	0·001	0·005	0·147	0·043	20·10	1·164	15·3°	3·6°
December ..	s. t.	0·001	0·005	0·161	0·029	20·50	1·140	15·0°	4·0°
Average..	.....	0·002	0·005	0·144	0·043	18·56	1·156	14·7°	3·8°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	v. s. t.	0·002	0·006	0·166	0·073	23·90	1·140	15·8°	4·6°
February ..	v. s. t.	0·003	0·006	0·164	0·069	24·11	1·225	16·0°	4·6°
March	c.	0·002	0·006	0·204	0·066	23·83	1·285	16·0°	4·3°
April	v. s. t.	0·001	0·004	0·181	0·035	20·40	1·225	14·5°	3·8°
May	v. s. t.	0·001	0·006	0·146	0·050	19·53	1·073	13·6°	3·8°
June	c.	0·000	0·005	0·181	0·047	18·70	1·140	14·0°	3·6°
July	c.	0·001	0·005	0·131	0·033	17·51	1·116	13·8°	3·3°
August	c.	0·001	0·005	0·131	0·085	19·93	1·225	15·4°	4·0°
September..	c.	0·000	0·005	0·167	0·052	19·43	1·128	15·4°	3·7°
October	c.	0·001	0·006	0·147	0·045	17·77	1·140	14·8°	3·7°
November ..	v. s. t.	0·001	0·006	0·165	0·084	21·30	1·146	16·0°	3·8°
December ..	c.	0·003	0·007	0·144	0·063	23·00	1·128	17·0°	3·8°
Average..	.....	0·001	0·005	0·161	0·058	20·78	1·161	15·2°	3·9°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·001	0·005	0·164	0·045	23·13	—	—	1·054	—	16·0°	4·2°
February..	c.	0·000	0·005	0·172	0·048	22·53	—	—	1·042	—	16·0°	4·2°
March	c.	—	—	—	—	—	—	—	—	—	—	—
April	c.	0·001	0·004	0·120	0·050	20·70	—	—	1·054	—	14·8°	3·8°
May	c.	0·000	0·004	0·135	0·045	20·15	—	—	1·054	—	14·8°	3·8°
June	c.	0·000	0·004	0·105	0·032	20·30	—	—	0·992	—	12·1°	3·3°
July.....	c.	0·000	0·004	0·105	0·036	18·90	—	—	0·992	—	14·8°	3·8°
August ..	c.	0·000	0·003	0·090	0·032	19·20	—	—	0·924	—	12·1°	2·0°
September.	c.	0·000	0·005	0·090	0·032	15·84	6·832	0·396	0·924	1·167	11·6°	2·4°
October ..	c.	0·001	0·005	0·105	0·030	19·28	7·561	0·684	0·992	1·530	12·5°	2·4°
November..	c.	0·001	0·003	0·120	0·029	22·10	8·960	0·648	0·992	1·810	15·9°	3·3°
December..	s. t.	0·001	0·006	0·150	0·046	24·40	9·070	0·820	1·150	2·070	16·5°	3·8°
Average..	.....	0·000	0·004	0·123	0·035	20·59	8·106	0·637	1·015	1·644	14·2°	3·3°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	v. s. t.	0·001	0·007	0·090	0·060	21·40	7·780	0·468	1·08	2·330	15·4°	4·2°
February..	v. s. t.	0·000	0·006	0·195	0·080	21·50	9·464	0·432	1·08	2·266	15·4°	4·2°
March	v. s. t.	0·000	0·007	0·165	0·056	22·10	9·464	0·728	1·08	2·460	13·2°	3·8°
April	t.	0·000	0·007	0·126	0·032	20·60	8·770	0·360	0·94	2·280	13·2°	3·8°
May	v. s. t.	0·000	0·007	0·165	0·048	20·70	8·600	0·684	0·94	2·000	13·2°	3·7°
June	t.	0·000	0·006	0·135	0·040	21·30	7·560	0·612	1·01	1·860	13·2°	3·3°
July.....	c.	0·000	0·006	0·090	0·030	17·80	8·176	0·288	1·01	1·330	12·6°	3·3°
August ..	c.	0·001	0·007	0·099	0·053	17·90	7·392	0·324	1·01	1·330	12·1°	3·3°
September.	c.	0·000	0·007	0·108	0·031	17·30	8·960	0·324	1·08	1·400	12·6°	3·3°
October ..	c.	0·000	0·008	0·090	0·029	19·10	8·400	0·323	1·01	1·400	14·3°	3·3°
November..	c.	0·001	0·007	0·100	0·025	20·40	8·400	0·324	1·01	1·660	14·8°	2·8°
December..	c.	0·000	0·007	0·090	0·047	18·20	7·760	0·682	1·01	1·500	12·6°	3·7°
Average..	.....	0·000	0·007	0·121	0·044	19·85	8·393	0·462	1·02	1·818	13·5°	3·5°

In the following tables the monthly analyses of the water from the East London Company's mains, made by Dr. Letheby and myself, are stated in detail :—

1868.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·007	—	0·104	24·94	—	15·0°	5·0°
February	c.	0·007	—	0·107	23·27	—	14·0°	4·5°
March	c.	0·007	—	0·043	20·60	—	15·0°	4·0°
April	c.	0·007	—	0·065	20·68	—	14·0°	4·5°
May	c.	0·006	0·130	0·055	21·33	0·989	13·0°	4·0°
June	c.	0·001	0·038	0·056	17·04	1·456	11·7°	2·6°
July	c.	0·001	0·015	0·042	16·50	0·989	12·0°	2·5°
August	c.	0·008	0·021	0·048	14·48	1·019	10·5°	2·0°
September	c.	0·002	0·082	0·043	16·20	1·213	11·0°	2·5°
October	c.	0·000	0·042	0·053	17·68	0·989	12·5°	3·0°
November	c.	0·001	0·075	0·026	18·27	1·250	13·0°	3·2°
December	c.	0·003	0·135	0·036	21·07	1·019	14·7°	3·2°
Average	.....	0·005	0·067	0·056	19·34	1·115	13·0°	3·3°

1869.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·300	0·107	24·47	1·309	16·3°	4·8°
February	c.	0·002	0·336	0·123	25·40	1·194	16·0°	4·6°
March	c.	0·002	0·270	0·098	24·13	1·164	16·0°	4·1°
April	c.	0·000	0·190	0·077	23·83	0·879	15·4°	4·0°
May	c.	0·000	0·090	0·054	18·90	0·873	15·3°	3·5°
June	c.	0·000	0·120	0·053	18·87	1·164	14·6°	4·2°
July	c.	0·000	0·030	0·045	16·13	1·019	13·2°	3·3°
August	c.	0·000	0·091	0·035	16·03	1·019	13·2°	3·1°
September	c.	0·001	0·076	0·067	16·33	1·146	13·2°	3·2°
October	c.	0·000	0·066	0·066	16·77	1·019	13·0°	3·4°
November	c.	0·000	0·081	0·042	18·96	0·995	14·5°	3·7°
December	c.	0·000	0·024	0·022	18·33	0·971	14·4°	4·0°
Average		0·001	0·139	0·066	19·93	1·062	14·5°	3·8°

1870.	Appearance.	Ammonia.	Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Ogranic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
							Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·091	0·106	21·83	0·995	15·2°	4·8°
February	c.	0·002	0·110	0·062	24·00	1·164	16·0°	5·1°
March	c.	0·000	0·090	0·048	21·53	1·140	15·6°	4·6°
April	c.	0·000	0·092	0·043	20·17	1·152	14·9°	4·1°
May	c.	0·002	0·091	0·020	16·11	0·983	13·2°	3·2°
June	c.	0·001	0·027	0·034	15·83	1·019	11·8°	3·2°
July	c.	0·000	0·075	0·047	17·37	1·001	13·0°	3·9°
August	c.	0·000	0·091	0·041	15·89	1·001	12·9°	3·0°
September	c.	0·001	0·110	0·017	15·37	1·140	12·0°	2·9°
October	c.	0·002	0·099	0·014	16·03	1·140	12·7°	3·3°
November	c.	0·004	0·110	0·014	18·20	1·098	14·8°	3·4°
December	c.	0·002	0·125	0·041	21·11	1·086	15·6°	4·2°
Average		0·001	0·093	0·041	18·62	1·076	14·1°	3·8°

1871.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January	c.	0·002	0·005	0·136	0·079	25·13	1·285	16·7°	4·5°
February	c.	0·003	0·005	0·165	0·070	23·89	1·219	16·8°	4·6°
March	c.	0·003	0·004	0·137	0·080	24·39	1·577	16·4°	4·2°
April	c.	0·001	0·005	0·210	0·067	20·41	1·285	15·4°	4·8°
May	c.	0·001	0·005	0·125	0·086	18·47	1·285	13·2°	3·8°
June	c.	0·000	0·001	0·146	0·049	18·47	1·358	14·6°	3·7°
July	c.	0·002	0·005	0·129	0·037	18·33	1·261	14·3°	4·0°
August	c.	0·000	0·004	0·136	0·057	17·93	1·358	13·8°	3·0°
September	c.	0·000	0·004	0·135	0·051	15·27	1·225	12·1°	3·5°
October	c.	0·001	0·007	0·149	0·035	18·33	1·140	14·3°	3·8°
November	c.	0·003	0·007	0·119	0·053	21·79	1·140	16·2°	4·2°
December	c.	0·001	0·005	0·125	0·056	22·31	1·140	16·7°	4·2°
Average		0·001	0·005	0·143	0·060	20·39	1·272	15·0°	4·0°

1872.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·003	0·005	0·136	0·068	23·00	1·285	16·0°	4·0°
February ..	c.	0·002	0·006	0·134	0·098	23·47	1·285	16·5°	4·6°
March	c.	0·002	0·004	0·138	0·066	22·00	1·285	16·0°	4·4°
April	c.	0·002	0·003	0·146	0·056	19·13	1·213	15·3°	4·0°
May	c.	0·002	0·005	0·166	0·052	18·33	1·285	15·0°	4·2°
June	c.	0·001	0·005	0·168	0·048	19·73	1·213	16·0°	4·8°
July	c.	0·001	0·005	0·167	0·055	17·37	1·285	13·0°	3·8°
August ..	c.	0·001	0·005	0·166	0·051	17·20	1·285	13·2°	3·6°
September ..	c.	0·001	0·005	0·181	0·059	17·77	1·140	13·0°	3·3°
October ..	c.	0·002	0·005	0·167	0·028	17·30	1·219	13·0°	3·6°
November ..	c.	0·002	0·008	0·121	0·088	21·33	1·285	16·0°	4·4°
December ..	c.	0·002	0·007	0·181	0·094	23·93	1·285	16·5°	4·2°
Average..	.....	0·002	0·005	0·156	0·064	20·05	1·255	15·0°	4·1°

1873.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January ..	c.	0·002	0·006	0·167	0·109	23·37	1·237	16·7°	4·2°
February ..	c.	0·002	0·004	0·166	0·084	24·06	1·237	17·0°	4·2°
March	c.	0·001	0·007	0·167	0·075	22·90	1·285	16·4°	4·0°
April	c.	0·001	0·006	0·181	0·073	18·33	1·273	14·8°	4·0°
May	c.	0·001	0·006	0·181	0·049	17·51	1·225	14·0°	3·8°
June	c.	0·002	0·005	0·165	0·038	17·47	1·219	14·3°	3·6°
July	c.	0·001	0·006	0·154	0·028	18·39	1·140	14·3°	3·5°
August	c.	0·001	0·005	0·125	0·026	17·05	1·140	13·6°	3·3°
September .,	c.	0·002	0·006	0·126	0·038	16·83	1·140	13·5°	3·0°
October ..	c.	0·001	0·006	0·125	0·040	16·67	1·140	14·4°	4·0°
November ..	c.	0·002	0·005	0·116	0·029	19·13	1·128	14·5°	4·0°
December ..	c.	0·002	0·007	0·167	0·071	20·87	1·140	16·0°	3·6°
Average..	.....	0·001	0·006	0·153	0·055	19·55	1·192	15·0°	3·9°

1874.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·005	0·166	0·025	21·53	1·140	16·2°	3·6°
February...	c.	0·002	0·006	0·147	0·048	22·37	1·140	16·5°	4·2°
March.....	c.	0·003	0·006	0·164	0·034	21·27	1·140	16·5°	4·2°
April	c.	0·002	0·005	0·165	0·031	18·73	1·213	15·3°	4·2°
May.....	c.	0·002	0·006	0·137	0·048	17·23	1·225	14·4°	3·3°
June	c.	0·001	0·005	0·121	0·051	16·58	1·128	13·5°	3·5°
July.....	c.	0·001	0·006	0·123	0·046	16·77	1·146	13·8°	3·8°
August.....	c.	0·002	0·005	0·125	0·041	16·31	1·037	13·3°	3·3°
September..	c.	0·002	0·008	0·166	0·057	15·70	1·140	13·2°	3·0°
October	c.	0·002	0·005	0·128	0·029	15·87	1·128	13·2°	3·0°
November ..	c.	0·002	0·005	0·129	0·036	20·17	1·170	15·2°	3·8°
December...	c.	0·000	0·006	0·180	0·029	20·20	1·152	15·0°	4·0°
Average..	.....	0·002	0·006	0·146	0·039	18·54	1·146	14·7°	3·7°

1875.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Chlorine.	Hardness on Clark's Scale.	
		Free and Saline.	Organic.					Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January....	c.	0·002	0·006	0·181	0·066	23·73	1·128	15·7°	4·6°
February...	c.	0·003	0·005	0·180	0·045	23·83	1·285	15·9°	4·6°
March.....	c.	0·002	0·005	0·221	0·054	23·90	1·297	16·2°	4·4°
April.....	c.	0·001	0·005	0·190	0·031	20·07	1·188	14·3°	3·8°
May.....	c.	0·001	0·005	0·129	0·046	19·73	1·116	13·8°	3·8°
June.....	c.	0·000	0·004	0·171	0·046	18·73	1·128	14·0°	3·5°
July.....	c.	0·001	0·005	0·136	0·040	17·33	1·086	13·6°	3·3°
August.....	c.	0·001	0·006	0·139	0·104	20·20	1·140	15·4°	4·0°
September..	c.	0·001	0·005	0·169	0·043	18·97	1·122	14·9°	3·7°
October....	c.	0·001	0·006	0·181	0·049	17·57	1·134	14·7°	3·7°
November..	c.	0·001	0·006	0·184	0·070	21·23	1·140	16·0°	3·8°
December...	c.	0·002	0·006	0·181	0·052	23·13	1·134	17·0°	4·0°
Average..	.....	0·001	0·005	0·172	0·046	20·70	1·158	15·1°	3·9°

1876.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CoO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January...	c.	0·001	0·006	0·171	0·056	22·37	—	—	1·048	—	15·8°	4·0°
February..	c.	0·002	0·006	0·176	0·052	22·73	—	—	1·054	—	16·1°	4·2°
March.....	c.	0·001	0·006	0·192	0·052	21·45	—	—	—	—	15·4°	3·3°
April	c.	0·001	0·004	0·105	0·053	20·72	—	—	1·054	—	14·8°	3·8°
May.....	c.	0·000	0·005	0·135	0·045	20·15	—	—	1·054	—	14·8°	3·8°
June	c.	0·000	0·005	0·120	0·024	19·80	—	—	—	—	13·2°	3·0°
July.....	v. s. t.	0·000	0·005	0·105	0·036	18·10	—	—	0·924	—	14·8°	3·8°
August	c.	0·000	0·004	0·090	0·039	19·00	—	—	1·220	—	13·2°	2·0°
September.	c.	0·000	0·005	0·093	0·028	16·22	7·616	0·324	1·010	1·167	11·6°	2·4°
October....	c.	0·000	0·005	0·105	0·037	19·51	7·616	0·568	1·050	1·160	13·3°	2·4°
November.	c.	0·000	0·004	0·120	0·034	22·01	8·960	0·612	1·080	1·611	15·9°	3·3°
December..	v. s. t.	0·002	0·006	0·135	0·052	23·21	9·200	0·612	1·150	2·460	15·4°	3·4°
Average..	.....	0·000	0·005	0·129	0·042	20·43	8·348	0·529	1·086	1·599	14·5 °	3·2°

1877.	Appearance.	Ammonia.		Nitrogen as Nitrates, &c.	Oxygen required to Oxidize Organic Matter, &c.	Total Solids.	Lime. (CaO).	Magnesia. (MgO).	Chlorine. (Cl).	Sulphuric Anhydride. (SO_3).	Hardness on Clark's Scale.	
		Free and Saline.	Organic.								Before Boiling.	After Boiling.
		grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	grs.	degs.	degs.
January...	s. t.	0·001	0·008	0·150	0·099	22·70	8·230	0·468	1·01	2·466	14·9°	3·3°
February..	v. s. t.	0·000	0·007	0·180	0·063	19·80	9·128	0·432	1·01	2·260	15·4°	4·2°
March	c.	0·000	0·006	0·150	0·070	22·50	9·408	0·648	0·94	1·900	13·7°	4·2°
April.....	c.	0·001	0·008	0·129	0·060	19·60	7·860	0·360	0·94	1·920	12·6°	3·5°
May.....	c.	0·000	0·007	0·180	0·028	18·80	8·660	0·504	1·01	1·930	11·6°	3·3°
June.....	c.	0·000	0·007	0·090	0·047	17·80	7·326	0·468	1·01	1·330	12·0°	3·0°
July.....	c.	0·000	0·007	0·090	0·046	18·30	7·784	0·218	1·01	1·266	12·1°	3·3°
August	c.	0·000	0·006	0·105	0·063	17·90	7·224	0·324	1·01	1·333	12·1°	3·7°
September.	c.	0·000	0·007	0·099	0·041	20·00	7·840	0·324	0·94	1·266	12·6°	3·0°
October....	c.	0·000	0·007	0·099	0·040	19·60	8·568	0·360	1·01	1·466	14·3°	3·3°
November..	c.	0·001	0·007	0·110	0·032	19·80	8·456	0·360	1·08	1·233	15·4°	2·8°
December..	c.	0·001	0·007	0·096	0·036	14·90	5·600	0·439	0·94	1·400	9·0°	3·7°
Average..	.....	0·000	0·007	0·123	0·052	19·30	8·007	0·408	0·99	1·647	12·9°	3·4°

In the following table is stated the average, the maximum and the minimum quantity of water supplied daily by the East London Water Company, from the year 1869 to 1877 inclusive :—

		Gallons per diem.	Houses Supplied.
1869	Average	18,187,170	89,457
	Maximum (September)	19,606,000	98,944
	Minimum (January)	17,310,000	97,971
1870	Average	19,680,966	101,238
	Maximum (June)	21,481,700	100,660
	Minimum (January)	18,588,705	100,660
1871	Average	20,434,458	102,238
	Maximum (August)	21,877,500	102,624
	Minimum (April)	19,352,700	101,852
1872	Average	20,250,880	103,854
	Maximum (July)	21,405,800	104,896
	Minimum (February)	19,248,500	103,513
1873	Average	22,484,976	104,560
	Maximum (July)	25,782,000	104,491
	Minimum (February)	19,970,000	104,637
1874	Average	22,616,608	106,028
	Maximum (August)	24,995,600	106,459
	Minimum (April)	20,685,000	105,562
1875	Average	23,534,204	107,572
	Maximum (June)	24,964,675	107,294
	Minimum (February)	21,967,843	107,294
1876	Average	24,671,033	109,375
	Maximum (July)	27,754,365	109,375
	Minimum (March)	21,886,452	109,375
1877	Average	26,096,011	111,853
	Maximum (August)	28,583,448	111,967
	Minimum (March)	23,712,504	111,967

Table showing the total solids and the oxygen required by the oxidizable organic matter, &c., in the water of the East London Water Company. The following represent the average of 200 analyses :—

	Total Solids.	Oxygen required by Oxidizable Organic Matter, &c.
January	23·344	0·0797
February	23·436	0·0812
March	22·487	0·0621
April	20·442	0·0552
May	18·995	0·0535
June	18·506	0·0456
July	17·477	0·0472
August	17·217	0·0558
September	16·787	0·0452
October	17·835	0·0387
November	20·275	0·0440
December	21·577	0·0525

The remarks I have already made respecting the regularity of the increase and decrease of the total solid matter in the case of the Thames (p. 39) and New River waters (p. 55), apply equally to the Lea. In February the total solid matter is at its maximum (23·436 grains), and in September at its minimum (16·787 grains). I may again remark how very nearly the same wave-line is to be noted in the case of the oxygen required by the oxidizable constituents of the water.

I now place before you, in a table, the quantity of water supplied to the metropolis daily for the past ten years, stating also the number of houses supplied and the quantity per head of the estimated population.

AVERAGE DAILY SUPPLY OF WATER TO LONDON BY THE EIGHT WATER COMPANIES.

1869.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	91,578,341	461,220	28·8
February	92,323,860	461,561	29·1
March	94,584,402	462,097	29·8
April	97,313,153	463,428	30·6
May	99,830,840	464,001	31·0
June	103,670,995	464,798	32·6
July	110,094,058	466,969	34·7
August	106,414,863	467,577	33·7
September	106,740,029	468,127	33·8
October	103,363,842	469,504	32·6
November	97,329,081	473,876	30·6
December	93,650,519	474,010	29·4
Mean	99,739,469	466,431	31·4

1870.	Gallons per diem.	Houses Supplied	Gallons per head of the population.
January	94,878,164	476,549	29·5
February	95,812,688	476,863	29·8
March	96,741,741	477,230	30·0
April	101,500,943	478,079	31·5
May	107,540,811	478,308	33·4
June	114,754,281	478,934	35·6
July	116,293,521	480,932	36·1
August	111,719,750	481,199	34·7
September	106,322,943	481,660	33·1
October	104,073,197	482,565	32·3
November	101,063,124	482,880	31·2
December	97,371,249	482,982	30·2
Mean	104,006,034	479,848	32·3

1871.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	102,824,606	485,328	31·5
February	100,782,216	483,566	30·9
March	101,557,556	484,969	31·2
April	103,593,573	485,734	31·8
May	108,692,357	487,198	33·3
June	111,292,104	487,692	34·1
July	112,107,697	489,331	34·4
August	116,799,067	489,545	35·8
September	114,354,087	490,332	35·3
October	105,645,974	491,485	32·4
November	103,055,193	482,719	31·6
December	102,446,507	491,857	31·4
Mean	106,929,244	487,230	32·7

1872.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	101,139,041	493,226	30·5
February	101,353,285	493,551	30·6
March	102,857,846	493,978	31·1
April	105,457,575	495,677	31·9
May	107,859.997	495,649	32·6
June	114,860,743	496,495	34·7
July	119,736,251	497,845	36·2
August	116,679,344	498,161	35·2
September	114,696,589	498,574	34·6
October	108,373,227	499,786	32·7
November	103,160,394	499,973	31·2
December	100,931,281	500,229	30·3
Mean	108,092,131	496,928	32·6

1873.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	102,068,405	501,008	30·8
February	101,041,923	501,476	30·5
March	102,837,479	501,743	31·1
April	109,807,217	503,127	33·2
May	115,893,425	503,562	35·0
June	120,204,176	503,832	35·8
July	126,144,369	504,579	37·6
August	126,240,210	504,905	37·7
September	118,874,212	505,295	35·4
October	115,326,807	505,595	34·4
November	110,814,481	506,792	33·0
December	109,367,072	506,985	32·6
Mean	113,218,365	504,076	33·7

1874.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	109,118,500	508,329	32·5
February	109,013,458	508,465	32·5
March	109,544,161	508,818	32·6
April	112,124,179	509,017	33·4
May	121,281,889	510,033	35·7
June	125,689,091	510,499	36·9
July	127,563,243	512,203	37·5
August	127,649,728	512,540	37·5
September	120,871,501	512,825	35·5
October	116,336,586	513,520	34·2
November	111,277,251	513,772	32·7
December	106,947,276	514,118	31·4
Mean	116,451,402	511,178	34·3

1875.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	108,399,776	515,292	31·9
February	109,527,033	515,346	32·2
March	109,352,343	516,154	32·2
April	113,945,907	517,200	32·8
May	121,543,736	517,489	35·3
June	127,381,916	518,127	36·9
July	122,319,088	519,063	35·5
August	125,186,742	519,569	36·3
September	117,744,887	521,068	34·2
October	117,744,907	521,068	34·2
November	109,998,771	521,336	31·9
December	111,420,340	521,566	32·3
Mean	116,138,787	518,606	33·7

1876.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	112,034,444	523,487	32·5
February	110,394,788	523,801	32·4
March	110,441,128	524,183	29·4
April	114,316,265	524,669	30·4
May	121,146,297	525,183	32·3
June	123,192,994	525,841	32·8
July	137,135,102	526,577	36·3
August	134,139,552	527,321	35·7
September	121,622,500	527,949	32·3
October	117,228,394	529,022	31·2
November	112,638,531	530,030	30·0
December	110,454,197	530,299	29·4
Mean	118,728,681	526,530	32·0

1877.	Gallons per diem.	Houses Supplied.	Gallons per head of the population.
January	112,206,296	527,690	29·9
February	110,670,434	530,474	29·5
March	111,349,139	530,932	29·7
April	113,059,473	531,070	30·1
May	127,627,550	531,427	33·6
June	132,570,962	532,254	34·8
July	133,642,090	533,067	35·1
August	134,067,457	533,772	35·5
September	128,090,869	534,628	33·7
October	122,683,744	535,492	33·0
November	118,048,106	535,733	31·2
December	116,033,974	537,118	30·9
Mean	121,679,176	532,805	32·25

I have now, I hope, placed before you all the facts necessary to lead you to a just conclusion on the vexed question of the London Water Supply. I have been anxious to adhere to what I said at the commencement of this report, viz., that my object was to state facts, and not to draw vague or speculative inferences. Let me, however, suggest that the question we, as Health Officers, have to consider is simply this : *Is the present water supply to London pure and wholesome?* We need not trouble ourselves about vested interests, cost, taxation, and the like (we leave these matters for others) ; our concern is with the health of the community, and with that only. And let me remark further, our view-point is not that of pure chemists, but of practical physicians. As officers of health we know very well that the water question is not one that can be settled off-hand, by even the most refined of refined analytical processes. There is, of course, the chemical view, and I should naturally be the last to undervalue it; but the chemical aspect of the matter can never take the place of the medical. And here then I venture to state broadly—and the analyses I now place before you justify me in the assertion—that the water supplied to London, the healthiest city in the world, is as excellent in quality as it is liberal in quantity. The Kent Company's water, although reported to be loaded with previous sewage contamination, is undoubtedly of excellent quality ; nevertheless, although I have most diligently considered and compared the death rates, and also, as far as possible, the causes of death of different parts of the metropolis supplied by the Thames water, the Lea water, and the water from the chalk wells of the Kent Company respectively, I have failed to discover any differences worth noting in the death rates, or any evidence

whatsoever that any special class of disease has been prevalent from drinking the waters of the Thames and Lea, or absent from the use of the chalk water. Indeed, what differences exist are in favour of the Thames and Lea waters, over that of the chalk wells. It has, I know, lately been publicly stated that at Millbank Prison diseases were caused by the prisoners drinking Thames water, which disappeared when water was supplied to the prison from wells. This statement is contrary to fact. The truth is, Millbank is and has been from 1874 supplied by the Chelsea Water Company, since which time the medical officer has yearly reported on the excellent health of the prisoners. I am therefore fully prepared to endorse the high opinion entertained of the wholesome quality of the water supplied to London, as expressed in the reports of the Scientific Commission of 1850, the Select Committee of the House of Commons of 1867, and the Royal Commission on Water Supply in 1869, all specially appointed to investigate the quality of the water supplied to the metropolis. Further, there is clear evidence that the quality of the Thames water as supplied by the Companies has, during the past few years, been gradually improving—due, probably, to increased care in filtration. If, therefore, in 1867 the Select Committee of the House of Commons were, as they reported, "satisfied that both the "quantity and the quality of the water supplied from the Thames is so far "satisfactory that there is no ground for disturbing the arrangements made "under the Act of 1852, and that any attempt to do so would end in entail-"ing a waste of capital, and an unnecessary charge upon the owners and "occupiers of property in the metropolis," *a fortiori* they would be satisfied now. With all these facts before us we may well be amazed to read the following paragraph from the Sixth Report of the Rivers Pollution Commission—a Commission, let me remark, consisting only of two members, neither of whom were medical men; indeed I would venture to suggest that if there had been one medical man upon the Board, such words as I am about to quote would never have been written. In speaking (and speaking justly) in laudatory terms of the water of the Kent Company, and in equally depreciatory terms (unjustly, I think), of the water supplied by the other London Companies, the two Rivers Pollution Commissioners go on to say: "The supply of such water" (*i.e.* the water of the Kent Company) "to the metropolis generally would be a priceless boon, and *would at "once confer upon it absolute immunity from epidemics of cholera*" (Sixth Report, p. 275, three lines from bottom). We who know how little is known of the cause of such epidemics, how they come amongst us even when we think our defences most secure, how little able we are to cope with

them when they are in our midst, may fairly stand aghast when those who are outside our profession, and have never had to fight the battles we have had to fight with disease, have been rash enough to commit such words as these to paper. The Members of that Commission, laying claim, as it would seem, almost to prophetic power, or at any rate to a knowledge positively superhuman, have drawn what I may venture to designate as a very violent conclusion, for which I think the facts I have laid before you prove there is not the slightest foundation, and which is, moreover, expressly contradicted by the progress of cholera in other parts of the world, whether supplied with water of this particular description or not.

I earnestly submit these facts to you for your consideration, and beg to subscribe myself

Your faithful Servant,

C. MEYMOTT TIDY.