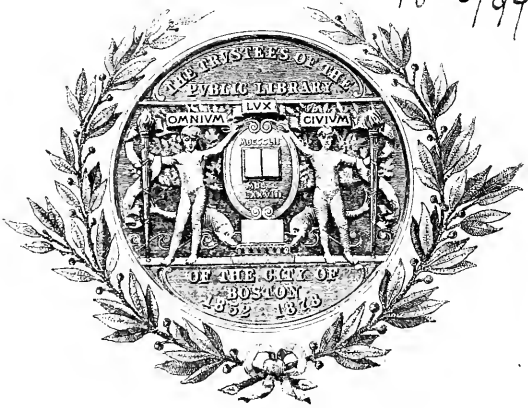
Second Annual Report

OF THE

WATER COMMISSIONER

FOR THE YEAR ENDING

JANUARY 31, 1897



SECOND ANNUAL REPORT

OF THE

WATER COMMISSIONER

FOR THE

YEAR ENDING JAN. 31, 1897.

Printed for the Department.

BOSTON:
MUNICIPAL PRINTING OFFICE.
1897.

Office of the Water Commissioner,
City Hall, Boston, Feb. 1, 1897.

Hon. Josiah Quincy, *Mayor:*

Sir: I submit the report of the doings of the Water Department for the year ending Jan. 31, 1897.

The financial condition of the department is satisfactory, the income showing an increase over last year, and the net debt a marked decrease. The stock on hand has increased $37,000 worth during the year.

The work accomplished by the department, as a whole, has been excellent. The miles of pipe laid — thirty-five and four-tenths — is the largest in the history of the department. The work connected with a large portion of it was of a difficult nature, owing to its being laid in the heart of the city.

The most expensive work that the department does is the taking up of old pipe and the laying of new in its place, the replacing of old gates with new ones, and the making of special connections. More of this work has been done than in years past, especially of relaying. The amount of pipe relaid was eight and six-tenths miles.

Notwithstanding that the department has been compelled to meet some extraordinary expenses — such as placing a new electric plant in the Chestnut-Hill Pumping Station; new machinery; selling a large number of the horses of the department, that were absolutely unfit for service and purchasing new horses in their places; rebuilding of the Eastern Division stable, which was unsafe and unhealthy; repairing the water tower at Orient Heights; re-establishment of a system of Deacon meter and waste inspection; the relaying of miles of old pipe, etc. — the expenses of the department have been smaller than last year, and in proportion to the work accomplished will compare more than favorably with previous years.

The daily consumption of water has increased far more than was warranted by the increase in population. The Deacon Meter system demonstrates that a lack of proper care and inspection of household fixtures is responsible to a great

extent for this increase. If the work of the Waste Inspection division is properly done, there is no reason why the consumption cannot be reduced.

Last summer was an exceptionally dry one, and the supply of water in the basins was the lowest in many years. It was found necessary to inspect all fixtures and send emergency notices to water-takers. This resulted in a marked decrease in the consumption of water, followed by an increased consumption when the rain came and the public realized that there was no immediate danger of a water famine.

The height of the water in the storage basins at the present time is very low, and, if the rainfall of the coming year should be less than normal, there is still great danger of exhausting our water supply. In anticipation of this measures have been taken to meet such a difficulty by raising Whitehall pond two feet, thus increasing its storage capacity four hundred million gallons; also by the action of the Metropolitan Water Board, who have arranged to store fifteen hundred million gallons in the partially constructed basin, No. 5. This increased storage in Whitehall pond and Basin 5 will give us a sufficient supply of water to meet all but extraordinary emergencies.

Placing the Department on a Permanent Basis.

The method pursued heretofore has been to partially suspend a large number of the working force for a portion of the year. With your approval, the whole force has been permanently employed this year. The results have been satisfactory, and the money expended in maintaining the department on a permanent basis has been well spent.

Meters.

The use of meters has not been extended, partially because of lack of appropriation.

Organization.

The general organization of the department has been changed very materially. The Mystic division has been

consolidated with the Eastern, and as the department is now constituted it consists of two divisions, the Eastern and the Western.

The system of keeping the general accounts has also been changed, and a different method of reporting on the work and its cost has been established, resulting in more correctness.

The new methods have been applied to the Cochituate branch of the Water Department — Districts 1, 2, and 3. They have worked so satisfactorily that next year the same methods will be used in District 4 (formerly the Mystic Division) and in the Meter Department.

I am of the opinion that the work that *must* be done during the coming year will be larger than last year. There will be a great deal of relaying of old pipe in our business sections, as the pipe laid there years ago is in a more or less dangerous condition and requires to be changed as a matter of safety and also on account of the repaving of important thoroughfares by the Street Department. The demands made for increased fire protection, brought about by the height and size of our new buildings, will also necessitate an increase in the capacity of our low, and the extension of our high, service mains. This relaying and extension of service mains is necessary and should be done. It means, however, a large expenditure of money.

The receipts and disbursements of the department for the year were as follows:

Total receipts of the Water-Works, from all sources, for the year ending Jan. 31, 1897:

Income from sales of water	$2,437,320 76	
Income from shutting off and letting on water, and fees	6,155 53	
Elevator, fire and service pipes, sale of old materials, etc.	54,826 10	
Total receipts	$2,498,302 39	
Less refunded water rates	1,666 06	
Net receipts		$2,496,636 33

Total expenditures of the Water-Works, from revenue, for the year ending Jan. 31, 1897:

[1] Current expenses	$591,550 42
Interest on funded debt	878,379 98
Sinking-fund requirement, 1895-96	194,740 00
[2] Extension of mains, etc.	232,142 98
Amount paid Chelsea, Somerville and Everett, under contracts	172,527 82
Damages for maintaining Mystic sewer filtering beds,	11,666 00
Balance to general revenue account of city	415,629 13
	$2,496,636 33

COST OF CONSTRUCTION, AND CONDITION OF THE WATER DEBT.

Cost of construction of Water-Works to Feb. 1, 1896	$26,856,002 82
Cost of construction of Water-Works to Feb. 1, 1897	26,414,817 32
[3] Decrease during the year	$441,185 50
Stock on hand Feb. 1, 1896	$62,268 85
Stock on hand Feb. 1, 1897	99,885 22
Increase during the year	$37,616 37
The outstanding Water Loans Feb. 1, 1896, were	$18,261,273 98
The outstanding Water Loans Feb. 1, 1897, were	18,261,273 98
Nothing issued during the year.	
The Water Sinking-Fund Feb. 1, 1896, was	$9,099,966 39
The Water Sinking-Fund Feb. 1, 1897, was	[4] 9,704,387 99
Increase during the year	$604,421 60
Net Water Debt Feb. 1, 1896	$9,161,307 59
Net Water Debt Feb. 1, 1897	8,556,885 99
Decrease during the year	$604,421 60

SUMMARY OF COST OF WORKS TO FEB. 1, 1897.

Cochituate supply:		
Lake Cochituate	$291,838 35	
Amount carried forward	$291,838 35	

[1] The total amount of current expenses was really $617,566.53, the $26,016.11 representing stock used this year and purchased or paid for in previous years.
[2] See details on page 11.
[3] Decrease due to crediting amounts paid by the State on account of taking by Metropolitan Water Board, $1,118,975.74.
[4] Consisting of investments (city of Boston bonds) $9,262,740.00 and cash to the amount of $441,647.99.

Amount brought forward	$291,838 35	
Compensating reservoirs	66,859 80	
Land and water damages	248,827 34	
Engineering expenses to Jan. 1, 1852	40,000 00	
Cochituate aqueduct	1,068,425 24	
		$1,715,950 73
Sudbury supply:		
Reservoir No. 1	$257,143 81	
" " 2	465,954 11	
" " 3	419,402 72	
" " 4	813,846 38	
" " 5, to date	1,107,461 33	
" " 6	911,752 33	
Whitehall pond	305,209 55	
Cedar swamp	33,599 21	
Work about Farm pond	17,297 94	
Roadway in Framingham	23,947 32	
Land damages, not otherwise specified	342,846 38	
Water damages	559,190 64	
Temporary connection with Lake Cochituate	75,611 73	
Investigations of Shawshine and Charles rivers, etc.	27,646 59	
Protection of supplies	352,933 11	
Engineering and engineering expenses	300,371 22	
Office expenses, travelling, etc.,	80,594 74	
Miscellaneous	40,238 76	
Conduit and connections at Chestnut-hill Reservoir	3,082,661 95	
		9,217,709 82
Distributing reservoirs and distribution:		
Brookline reservoir	$200,077 21	
Beacon-hill " (net cost)	363,533 21	
Chestnut-hill "	2,277,042 93	
South Boston "	90,908 10	
East " "	66,103 09	
Parker-hill "	205,793 81	
Fisher-hill "	191,135 35	
Roxbury high service	103,829 53	
Brighton " "	7,745 00	
East Boston high service	30,208 12	
West Roxbury high service	22,346 56	
Chestnut-hill pumping-station,	525,195 46	
Amounts carried forward,	$4,083,918 37	$10,933,660 55

Amounts brought forward,	$4,083,918 37	$10,933,660 55
Jamaica-pond aqueduct	88,417 20	
Pipe-yards and buildings	94,832 16	
Engineering expenses	57,873 58	
Distribution	10,468,774 48	
		14,793,815 79
Total cost of Sudbury and Cochituate Works,		$25,727,476 34

Cost of Mystic Works to Feb. 1, 1897:

Land damages	$153,211 63	
Dam	$17,167 26	
Grubbing at lake	9,393 26	
Lowering Mystic river,	3,012 06	
	29,572 58	
Conduit	129,714 30	
Engine-house	$83,388 75	
Engines	213,834 72	
	297,223 47	
Reservoir	141,856 26	
Distribution	874,863 58	
Buildings	18,603 05	
Engineering, inspection and salaries	53,216 27	
Mystic-valley sewer	83,608 70	
Miscellaneous	24,446 88	
Total cost of Mystic Works,		1,806,316 72
Total cost of combined supplies		$27,533,793 06
Credit by amount received from the State on account of taking (Jan. 4, 1896.)		1,118,975 74
		$26,414,817 32

The outstanding Water Loans on this date, Feb. 1, 1897, are as follows:

Loans.	Date of Maturity.	Amount.
6 per cent Currency,	Due Dec., 1897	$500,000 00
6 " " "	" June, 1898	450,000 00
6 " " "	" Oct., 1898	540,000 00
6 " " "	" April, 1899	250,000 00
6 " " "	" Jan., 1901	625,000 00
6 " " "	" April, 1901	688,000 00
6 " " "	" July, 1901	330,000 00
6 " " "	" July, 1902	100,000 00
5 " " Sterling Loan, (£399,500),	" Oct., 1902	1,947,273 98
6 " " Currency,	" April, 1903	905,000 00
6 " " "	" Jan., 1904	8,000 00
6 " " "	" April, 1904	38,000 00
Carried forward		$6,381,273 98

	Loans.	Date of Maturity.	Amount.
	Brought forward,		$6,381,273 98
6	per cent Currency,	Due Jan., 1905	161,000 00
6	" " "	" April, 1905	142,700 00
6	" " "	" July, 1905	44,000 00
6	" " "	" Oct., 1905	6,000 00
5	" " Gold Loan,	" Oct., 1905	1,000,000 00
6	" " Currency,	" Jan., 1906	82,550 00
6	" " "	" April, 1906	8,750 00
5	" " Gold Loan,	" April, 1906	552,000 00
5	" " "	" Oct., 1906	2,000,000 00
6	" " Currency,	" Oct., 1906	4,000 00
6	" " "	" Jan., 1907	8,000 00
6	" " "	" April, 1907	5,000 00
6	" " "	" July, 1907	1,000 00
5	" " Currency Loan,	" Oct., 1907	1,000 00
5	" " " "	" April, 1908	12,000 00
4	" " "	" April, 1908	588,000 00
4	" " Loan,	" July, 1909	82,000 00
4½	" " "	" Oct., 1909	268,000 00
4	" " "	" April, 1910	280,000 00
4	" " "	" April, 1912	324,000 00
4	" " "	" July, 1913	111,000 00
4	" " "	" Oct., 1913	336,000 00
4	" " "	" Jan., 1914	466,000 00
4	" " "	" April, 1914	18,500 00
4	" " "	" Oct., 1914	16,000 00
4	" " "	" Jan., 1915	50,000 00
3½	" " "	" April, 1915	50,000 00
4	" " "	" April, 1915	145,700 00
3½	" " "	" Oct., 1915	50,000 00
4	" " "	" Oct., 1915	23,000 00
3½	" " "	" Jan., 1916	100,000 00
4	" " "	" Jan., 1916	58,000 00
4	" " "	" April, 1916	128,500 00
3½	" " "	" July, 1916	75,000 00
3½	" " "	" Oct., 1916	25,000 00
4	" " "	" Oct., 1916	286,300 00
4	" " "	" Jan., 1917	21,000 00
3	" " "	" April, 1917	200,000 00
3½	" " "	" April, 1917	275,000 00
4	" " "	" April, 1917	161,000 00
4	" " "	" July, 1917	7,000 00
4	" " "	" Oct., 1917	160,700 00
4	" " "	" Jan., 1918	20,000 00
4	" " "	" April, 1918	6,300 00
3½	" " "	" July, 1918	100,000 00
4	" " "	" Oct., 1918	100,000 00
4	" " "	" April, 1919	200,000 00
3½	" " "	" Oct., 1919	145,000 00
4	" " "	" Oct., 1919	300,000 00
3½	" " "	" Nov., 1919	130,000 00
3½	" " "	" Jan., 1920	220,000 00
4	" " "	" Oct., 1920	384,000 00
4	" " "	" April, 1921	100,000 00
4	" " "	" Oct., 1921	162,500 00
4	" " "	" Jan., 1922	100,000 00
4	" " "	" April, 1922	75,000 00
4	" " "	" Oct., 1922	283,000 00
4	" " "	" Oct., 1923	576,275 00
4	" " "	" Oct., 1924	644,225 00
	Total		$18,261,273 98

SUMMARY.

3	per cent	Loans	$200,000 00
3½	"	"	1,170,000 00
4	"	"	6,214,000 00
4½	"	"	268,000 00
5	"	Currency Loans	13,000 00
5	"	Gold "	3,552,000 00
5	"	Sterling "	1,947,273 98
6	"	Loans	4,897,000 00
	Total		$18,261,273 98

Cochituate Water Debt, Gross and Net,

At the Close of Each Fiscal Year.

Fiscal Year.	Gross Debt.	Sinking-Funds.	Net Debt.
1847-48	$2,129,056 32 [1]		$2,129,056 32
1848-49	3,787,328 98		3,787,328 98
1849-50	4,463,205 56		4,463,205 56
1850-51	4,955,613 51		4,955,613 51
1851-52	5,209,223 26		5,209,223 26
1852-53	5,972,976 11		5,972,976 11
1853-54	5,432,261 11		5,432,261 11
1854-55	5,403,961 11		5,403,961 11
1855-56	5,230,961 11		5,230,961 11
1856-57	5,031,961 11		5,031,961 11
1857-58	4,724,961 11		4,724,961 11
1858-59	4,754,461 11		4,754,461 11
1859-60	3,846,211 11		3,846,211 11
1860-61	3,455,211 11		3,455,211 11
1861-62	3,012,711 11		3,012,711 11
1862-63	2,992,711 11		2,992,711 11
1863-64	2,992,711 11		2,992,711 11
1864-65	2,942,711 11		2,942,711 11
1865-66	3,152,711 11		3,152,711 11
1866-67	3,370,711 11		3,370,711 11
1867-68	3,867,711 11		3,867,711 11
1868-69	5,107,711 11		5,107,711 11
1869-70	5,731,711 11		5,731,711 11
1870-71	6,482,711 11	$1,100,000 00	5,382,711 11
1871-72	6,812,711 11	1,185,049 67	5,627,661 44
1872-73	6,912,711 11	1,268,234 97	5,644,476 14
1873-74	7,863,711 11	1,372,953 62	6,490,757 49
1874-75	8,123,711 11	1,533,890 28	6,589,820 83
1875-76	9,735,711 11	1,560,917 83	8,174,793 28
1876-77	11,548,711 11	1,709,492 60	9,839,218 51
1877-78	11,545,273 98	2,043,764 73	9,501,509 25
1878-79	11,753,273 98	2,143,847 85	9,609,426 13
1879-80	11,697,273 98	1,771,692 92	9,925,581 06
1880-81	11,631,273 98	1,989,300 88	9,641,973 10
1881-82	11,631,273 98	2,281,857 89	9,349,416 09
1882-83	11,955,273 98	2,607,768 46	9,347,505 52
1883-84	12,882,273 98	2,746,505 58	10,135,768 40
1884-85	13,045,473 98	3,106,323 82	9,939,150 16
1885-86	13,491,473 98	3,385,201 26	10,106,272 72
1886-87	14,142,273 98	3,947,616 92	10,194,657 06
1887-88	14,741,273 98	4,373,304 09	10,367,969 89
1888-89	14,941,273 98	4,864,092 54	10,077,181 44
1889-90	15,696,273 98	5,440,819 47	10,255,454 51
1890-91	16,267,773 98	5,979,297 80	10,288,476 18
1891-92	16,423,773 98	6,471,545 34	9,952,228 64
1892-93	16,758,773 98	7,019,058 38	9,739,715 60
1893-94	17,055,273 98	7,649,504 87	9,405,769 11
1894-95	17,761,273 98	8,444,773 55	9,316,500 43
1895-96	18,261,273 98	9,099,966 39	9,161,307 59
1896-97	18,261,273 98	9,704,387 99	8,556,885 99

[1] No account taken of amounts borrowed temporarily from 1846 to 1852 and afterwards funded by the issue of the water bonds that figure in this statement.

Cochituate Water Sinking-Fund Receipts.

[SINCE THE ESTABLISHMENT OF THE BOARD OF SINKING-FUND COMMISSIONERS IN 1871.]

YEAR.	From Tax Levy or City Income.	Interest on Investments.	Interest on Bank Deposits.	Water-Rates, etc.	Premiums on Loans.	Other Sources.	Totals.
1871. April 30, received from Committee on Reduction of Debt	$1,100,000 00	.....	.....	.....	.....	.....	$1,100,000 00
1871-72	14,325 00						
	Taxes, 9,375 00	$61,000 00	$349 67	.....	.....	.....	85,049 67
1872-73	9,000 00	70,137 50	1,017 80	.....	.....	.....	80,155 30
1873-74	30,090 00	76,799 60	2,072 65	.....	.....	.....	108,962 25
1874-75	75,973 28	82,842 25	2,121 13	.....	.....	.....	160,936 66
1875-76	65,554 00	85,470 00	3,617 55	.....	.....	$386 00	155,027 55
1876-77	234,814 00	86,245 66	4,119 47	$26,480 18	.....	915 46	352,574 77
1877-78	Taxes, 214,500 00	85,830 85	10,809 31	27,099 92	.....	.....	338,240 08
1878-79	Taxes, 207,456 00	93,264 49	6,181 26	177,195 91	.....	9,874 21	493,971 87
1879-80	.....	90,472 42	5,687 62	214,707 24	.....	4,411 64	315,278 92
1880-81	.....	86,460 00	167 32	195,668 90	.....	1,762 04	284,058 26
1881-82	.....	96,546 35	2,767 90	193,840 36	.....	494 08	293,648 69
1882-83	.....	105,129 51	8,486 33	216,581 72	.....	1,241 04	331,438 60
1883-84	Taxes, 973 00	138,120 90	2,268 22	.....	.....	.....	141,362 12
1884-85	.....	143,049 45	7,510 40	209,258 39	.....	.....	359,818 24
1885-86	.....	156,694 01	5,804 31	120,129 12	.....	442 27	283,069 71
1886-87	Taxes, 75,496 00	181,264 89	2,644 70	297,928 95	.....	5,081 12	562,415 66
1887-88	.....	199,883 90	4,178 16	221,620 11	.....	.....	425,682 17
1888-89	.....	213,048 22	8,958 69	256,013 57	$11,552 50	.....	489,572 98
1889-90	.....	228,000 83	11,730 60	300,903 00	36,092 50	.....	576,726 93
1890-91	.....	229,509 17	29,763 94	242,675 22	36,530 00	.....	538,478 33
1891-92	.....	175,808 33	22,560 16	275,014 05	.....	78,865 00	552,247 54
1892-93	.....	260,506 20	30,148 34	240,435 00	16,413 50	.....	547,503 04
1893-94	.....	298,224 44	18,133 03	299,467 27	14,621 75	.....	630,446 49
1894-95	.....	312,332 05	18,524 22	297,518 29	.....	9,894 12	638,268 68
1895-96	.....	378,819 55	5,892 29	205,791 00	64,690 00	.....	655,192 84
1896-97	.....	403,840 02	5,225 08	194,740 00	.....	616 50	604,421 60
	$2,037,556 28	$4,339,300 59	$220,740 15	$4,213,068 20	$179,900 25	$113,983 48	$11,104,548 95

DETAILED EXPENDITURES UNDER THE SEVERAL APPROPRIATIONS.

FEBRUARY DRAFT, 1896, to FEBRUARY DRAFT, 1897.

Extension of Mains, etc. (from Revenue.)

Labor	$90,221 68	
Teaming	4,456 32	
Blasting	4,062 55	
Travelling expenses	1,213 00	
Water-pipes, contracts (including inspection, $977.50)	79,026 34	
Stock	51,190 99	
Miscellaneous contracts	1,972 10	
		$232,142 98

From the above amount of $232,142.98 should be deducted $2,528.11, which is due the Water Department from outside corporations for work performed on their account during the year, leaving the actual amount of expenditure for Extension of Mains $229,614.87.

[1] *Mystic Water-Works, Land, Etc.*

Labor	$325 00	
Miscellaneous	50 00	
		$375 00

MAINTENANCE ACCOUNTS [2].

(FROM REVENUE.)

FEBRUARY DRAFT, 1896, TO FEBRUARY DRAFT, 1897.

Salaries, travelling expenses, printing, stationery, advertising, postage and miscellaneous, on account of office	$29,345 34
Salaries and labor, travelling expenses, printing, stationery and miscellaneous, on account of Income Division	85,892 33
Salaries, travelling expenses and transportation of men, printing, stationery and miscellaneous, on account of Eastern Division	35,279 34
Salaries, travelling expenses, printing, stationery and miscellaneous, on account of Western Division	14,079 94
Engineering	14,270 41
New meters, and setting	10,166 88
Amount carried forward	$189,034 24

[1] Of the sum of $65,000.00 appropriated in 1895, the amount of $60,981.25 was expended during the year 1895-96. Balance remaining at this date, $3,643.75.

[2] Cochituate and Mystic accounts consolidated.

Amount brought forward	$189,034 24
Meters, repairing	14,668 95
Machine shop, Albany street	15,926 15
Mystic repair shop	3,481 80
Telephones	2,401 89
Cochituate Aqueduct	3,795 70
Sudbury Aqueduct	8,737 16
Mystic Aqueduct	1,618 18
Main-pipe relaying (including stock and labor)	26,899 67
" repairing " " " "	22,741 44
Hydrants " " " " "	30,453 05
Stop cocks " " " " "	5,795 24
Hydrant and stop-cock boxes and repairing (including stock and labor)	2,947 14
Tools and repairing (including stock and labor)	7,087 49
Streets " " " " "	8,905 22
Fountains " " " " "	2,792 73
Stables " " " " "	25,746 38
Waste detection	14,078 58
Basins, Framingham and Ashland (including stock and labor)	14,334 05
Service pipe repairing (including stock and labor)	30,412 46
Protection of supplies	12,294 72
High service, Chestnut Hill (including fuel, salaries, repairs, etc.)	38,517 64
High service, East Boston (including fuel, salaries, repairs, etc.)	4,876 28
High service, West Roxbury (including fuel, salaries, repairs, etc.)	5,626 86
Mystic pumping service (including fuel, salaries, repairs, etc.)	39,034 60
Electrolysis	605 23
Harbor service	1,476 87
Temporary high service, Elm Hill	3,114 92
Albany-street yard	7,151 07
Chestnut-hill reservoir (care of grounds, etc.)	16,168 69
Parker-hill reservoir	1,270 42
Brookline reservoir	1,697 85
East Boston and South Boston reservoirs	548 49
Fisher-hill reservoir	2,566 45
Mystic reservoir	6,699 11
Lake Cochituate	3,365 30
Mystic lake	11,545 40
Chestnut-hill driveway (including stable)	11,079 78
Taxes	3,420 88
Damages	3,414 36
Analyses of water, etc.	350 95
Amount carried forward	$606,683 39

Amount brought forward		$606,683 39
Biological Laboratory		4,403 72
Natick filters		4,312 99
		$615,400 10
Mystic pumping engine No. 4, balance (total, $66,738.02)		1,197 01
Addition to Mystic pumping station, balance (total, $10,548.33)		969 42
		$617,566 53

From the amount of the Maintenance expenditure, $617,566.53, should be deducted $14,838.03, which is due the Water Department from outside corporations for work performed on their account during the year, leaving the actual expenditure on account of maintenance $602,728.50.

Additional Supply of Water[1] (*from Loans*).

(Account of Basin 5, Whitehall pond, Cedar swamp, Filter beds at Basin 6, and protection of supply.)		
Salaries and labor	$16,736 82	
Engineering and supplies	845 43	
Materials	1,317 48	
Teaming	1,983 74	
Freight and express	152 92	
Travelling expenses	375 15	
Printing and postage	139 19	
Land damages	243,164 20	
Miscellaneous	371 87	
Town of Natick, towards sewerage system	18,000 00	
Retainers and expenses in connection with taking of works by the Metropolitan Water Board	4,955 83	
		$288,042 63
(Account of New High-Service Main, Main-Pipe Laying, and High Service, Chestnut Hill.)		
Labor	$101,067 36	
Engineering	889 49	
Materials	40,620 38	
Teaming	2,528 15	
Blasting	5,387 88	
Travelling expenses	4,515 50	
Advertising and miscellaneous	171 16	
Amounts carried forward	$155,179 92	$288,042 63

[1] The appropriations made for additional supply of Water are authorized under Chapter 177, Acts of 1872.

Amounts brought forward	$155,179 92	$288,042 63
Miscellaneous contracts	2,175 00	
Contract, pipes and specials (including inspection, $241.66)	41,337 41	
Contract, laying 48-inch main in Brookline, balance (total, $17,379.03)	2,469 12	
Contract, laying 4-inch pipe between Long and Rainsford Islands, balance (total, $11,406.41)	3,016 91	
Contract, laying 4-inch pipe across Shirley Gut	3,650 00	
Contract, laying and burying pipe between Squantum and Thompson Island	1,430 00	
Contract, laying pipes in Boston, Dorchester and Telegraph streets, South Boston, and Dorchester avenue and Adams street, Dorchester (on account)	5,853 35	
Contract, laying pipes in Border street, East Boston (on account),	1,785 00	
Contract, laying pipes in Blue Hill avenue, Dorchester (on account),	1,798 97	
		218,695 68
		$506,738 31

Contracts Made and Pending during Year commencing Feb. 1, 1896, and ending Jan. 31, 1897.

Contracts marked thus (*) are completed. Amounts marked thus (†) are for extra work.

DATE.	CONTRACTORS.	WORK.	AMOUNT.	PAID ON CONTRACT.		
				Previous Years.	Year 1896.	Total.
1893.						
* Dec. 30,	George F. Blake Manufacturing Co.	Mystic Pumping Engine, No. 4.	$38,950	$38,450 00 † 118 81	$500 00	$39,068 81
1894.						
* Oct. 30,	Mack & Moore	Addition to Mystic Pumping Station	$10,900 (estimated)	10,917 91	429 42	11,347 43
1895.						
* Mar. 7,	Charles E. Howe	Teaming water-pipes, etc.	48 cents per ton, 2½ miles..... 85 " " " over 2½ miles..	7,111 22	378 88	7,490 10
* " 8,	Mechanics Iron Foundry Co.	Iron and service-box castings, estimated, viz.: (450,000 lbs. iron, 250,000 lbs. service-box-)...	.01 and 4-10 cents per lb.	9,757 10	4,318 27	14,075 37
* " 8,	Stephen Anderson	Brass and Composition Castings: — viz.: — No. 1, 8,000 lbs. " 2, 25,000 " " 3, 6,000 " Estimated.	13 and 46-100 cents per lb..... 12 " 47½-100 " " " ..... 10 " " " "	3,691 20	1,191 85	4,883 05
* June 6,	Dennis F. O'Connell	Laying 48-inch main pipe through Brookline.	$21,291 (estimated)	14,909 91	2,469 12	17,379 03
* " 12,	Perkins & White	Laying 2,400 linear feet, 4-inch flexible joint pipe between Long and Rainsford Islands..	$4.75 per foot	6,035 00	5,371 41	11,406 41
" 27,	L. M. Ham & Co.	Iron Stairway at "Echo Bridge," Newton Upper Falls	$600.			
July 17,	George F. Blake Manufacturing Co.	Additional hand-rails stanchions, etc., around pit at Mystic Pumping-Station	$95.75.			
* Aug. 16,	Wilkinson and Feldman.	Electric-wiring at Mystic Pumping Station	$475	253 50	221 50	475 00

Contracts Made and Pending during Year. — *Continued.*

DATE.	CONTRACTORS.	WORK.	AMOUNT.	PAID ON CONTRACT.		
				Previous Years.	Year 1896.	Total.
1895.						
* Aug. 21,	Harrison Safety Boiler Works	Feed Water Heater, Mystic Pumping Station	$398		$398 00	$398 00
* " 28,	Horatio Wellington & Co.	Coal for East Boston and West Roxbury Pumping Stations to January 1, 1896	$3.99 per ton (2,000 lbs.) E. B. $4.34 " " " " W. Rox.	$646 45	286 25	932 70
* Oct. 21,	L. G. Burnham & Co.	400 tons coal for Mystic Pumping Station additional to contract of Aug. 19, 1895 (in bins) 200 tons (more or less)	$3.34 per ton (2,240 lbs.) $3.59 " " " "		2,801 31	2,801 31
* " 24,	Wilkinson & Feldman	Alterations in electric fixtures at Mystic Pumping Station	$16		16 00	16 00
* Nov. 6,	Josiah H. Long	Stop-cocks, viz.:— 4—20-inch. @ 6—24 " " 7—30 " " 6—36 " "	$165.00 $195.00 $309.00 $485.00		6,903 00	6,903 00
* " 13,	George F. Blake Manufacturing Co.	Furnishing engine-room floor-grating and materials for Mystic Pumping Station	$540		540 00	540 00
* Nov. 20,	H. P. Nawn	Changing house-sewer connections on Huntington avenue, between Gainsboro' street and Rogers avenue	$15.00 for each	300 00		300 00
* Dec. 4,	Thomas Burke	Blasting, Commonwealth avenue, Brighton	$6.50 per cubic yard		175 50	175 50
* " 7,	McNeal Pipe and Foundry Company	40 tons 40-in. pipe, Class B. 58 " 30 " " A. 25 " 30 " " B. 50 " Specials for 30-in. and 40-in. pipes.	$23.90 per ton. On account for the Boston Transit Commission. Total Contract....$5,764.57 $50.40 per ton. Amount paid by Boston Transit Commission.....$5,037.97		726 60	726 60

* " 17,	Hancock Inspirator Co..	Furnishing 36 spare valves and seats for Mystic Pumping-engine No. 4...	$9.85 each.....	.....	354 60	354 60
* " 26,	E. J. Bowes.....	Blasting Wait street, Roxbury.....	$5.90 per cubic yard.....	.....	33 04	33 04
* Dec. 28,	Thomas Burke.....	Blasting Middleton avenue, Dorchester.....	$4.00 per cubic yard.....	.....	154 80	154 80
* " 28,	Warren Foundry and Machine Company..	Furnishing 15 tons special castings for duplicates in cases of emergency.....	2⅝ cents per lb., f. o. b. cars, Boston.....	.....	613 91	613 91
1896. * Jan. 24,	Martin F. Kelley.....	Blasting, Howard avenue, Dorchester.....	$3.99 per cubic yard.....	.....	19 95	19 95
* " 29,	G. G. Stillman, Agent...	Furnishing and erecting complete, one Spencer Damper Regulator with all pipes, valves, etc., and about 90 ft. brass pipe for Mystic Pumping Station....	$120.....	.....	120 00	120 00
* Feb. 14,	McNeal Pipe and Foundry Company..	132 tons 30-in. A pipe ..... 16 " " Specials	$22.25 per ton. 2¼ cents per lb. (On account for the Boston Transit Commission. Total contract....$4,163.77 Amount paid by Boston Transit Commission.....$3,423.18)	.....	740 59	740 59
* " 14,	L. G. Burnham & Co....	800 tons George's Creek Cumberland Coal in bins at Chestnut Hill Pumping Station.....	$3.94 per ton of 2,240 lbs.....	.....	3,400 26	3,400 26
* " 14,	L. G. Burnham & Co....	1,000 tons George's Creek Cumberland Coal in bins at Mystic Pumping Station.....	$3.63 " " 2,240 lbs.....	....	3,547 28	3,547 28
* " 20,	Thomas Burke.....	Blasting, Calumet street, Roxbury.....	$5.00 per cubic yard.....	.....	19 50	19 50
* " 26,	Thomas Burke.....	Blasting, Blue Hill avenue.....	$2.07 " "	.....	145 52	145 25
* Mar. 3,	Martin F. Kelley.....	Blasting, Calumet street, Roxbury.....	$8.00 " "	.....	13 60	13 60
" 5,	Mechanics' Iron Foundry Company.....	Iron and Service Box Castings for year ending March 15, 1897, viz.: 800,000 lbs., Iron. Increased about 700,000 " " 300,000 " Service Box.	Total, 1,800,000 lbs. estimated @ 1 and 58-100 cents per lb...	.....	28,630 43	28,630 43

Contracts Made and Pending during Year. — *Continued.*

Date.	Contractors.	Work.	Amount.	Paid on Contract.		
				Previous Years.	Year 1896.	Total.
1896. * Mar. 6,	McNeal Pipe and Foundry Company..	30-in. and 40-in. curves	2¼ cents per lb. f.o.b. cars. Less ¼c. " " as per proposal of April 8, 1896.....	Ordered for and paid for by the Boston Transit Commission.		
* " 6,	Union Iron Works.....	Brass and composition castings for year ending March 15, 1897, viz.: 8,000 lbs. No. 1. @ .13 2-5 per lb..... 28,000 " " 2. " .12 2-5 " " ..... 6,000 " " 3. " 10c. " "	$5,144 (estimated). Contract abandoned by mutual consent, Oct. 6, 1896.....	.....	$3,498 90	$3,498 90
" 9,	Pierce F. Lonergan & Co.	Teaming water-pipes, etc., for year ending March 15, 1897.....	35 cents per ton (short haul) 2½ miles. ..... 95 cents per ton (long haul), over 2½ miles.....	.....	3,379 50	3,379 50
* " 16,	Holly Manufacturing Co.	Two beams and 2 beam-shafts for Gaskill Engines at Chestnut-Hill Pumping Station.....	Beams, $612 64 Beam shafts, $208 44 $821 08	.....	821 08	821 08
" 27,	R. D. Wood & Co.:					
	(Contract No. 1.).....	20 tons 4-inch pipe, B..... 950 " 6 " " B..... 460 " 8 " " B..... 200 " 10 " " B..... 700 " 16 " " B..... 250 " 24 " " A..... 50 " 24 " " B..... 50 " Specials.....	$20.25 per ton. $19.80 ..... $20.25 ..... Estimated $53,820 00	.....	115,689 71	115,689 71
	(Contract No. 2.).....	600 tons 12-inch pipe, A..... 980 " 12 " " B..... 700 " 16 " " B..... 520 " 20 " " B..... 50 " Specials.....	$19.80 per ton. Estimated, $56,430 00			
	Additional.....	200 tons (extra) 20-inch A pipe, ordered for East Boston.....				

" 31,	Atlantic Works	Patterns for iron castings			590 00	590 00
" 31,	Lockwood Manufacturing Company	Patterns for iron castings			1,203 00	1,203 00
* April 1,	Martin F. Kelley	Blasting, Calumet street, Roxbury	$4.99 per cubic yard		20 46	20 46
* " 8,	Thomas Burke	" Kearsarge avenue, "	$3.75 " " "		11 25	11 25
* " 10,	McNeal Pipe and Foundry Company.	Five 12-ft. lengths 40-inch pipe, B	36,794 lbs. @ $23.90 per ton 2,240 lbs. $392.58; Less allowance on final estimate under contract of Feb. 14, 1896, 365.48		27 10	27 10
* " 17,	Daniel E. Lynch	Blasting, Blue Hill avenue (Section 1.)	$3.50 per cubic yard		808 50	808 50
* " 17,	Daniel E. Lynch	Excavating and refilling pipe trench in Blue Hill avenue, Roxbury	Sheeted trench @ 60 cents per linear foot; Trench not sheeted @ 30 cents per linear foot; Earth excavation over rock, 60 cents per cubic yard; Curbing removed, .06 cents per linear foot		1,130 10	1,130 10
* " 17,	Hancock Inspirator Co.	Facing, with rubber, valves on Mystic Pumping engine	2.88 each		910 08	910 08
* " 21,	Martin F. Kelley	Blasting, Virginia street, Dorchester	$2.63 per cubic yard		69 43	69 43
* " 23,	" "	" Commonwealth avenue, Brighton	$2.08 " "		360 88	360 88
* " 27,	" "	" Calumet street, Roxbury	$3.00 " "		27 60	27 60
* " 27,	Thomas Burke	" St. Alphonsus street, Roxbury	$2.28 " "		443 23	443 23
* " 28,	Martin F. Kelley	" Abbotsford street, Roxbury	$3.00 " "		32 70	32 70
* May 2,	" "	" Alpine street, Roxbury	$8.00 " "		12 80	12 80
* " 8,	George W. Townsend	Laying 8-in. flexible joint pipe across Shirley Gut,	$4,000 (estimated)		3,650 00	3,650 00
* " 15,	Martin F. Kelley	Blasting, Hartford street, Dorchester	$8.75 per cubic yard		15 75	15 75

Contracts Made and Pending during Year. — *Continued.*

Date.	Contractors.	Work.	Amount.	Paid on Contract.		
				Previous Years.	Year 1896.	Total.
1896.						
* May 16,	Martin F. Kelley	Blasting, Phipps avenue, Dorchester	$9.00 per cubic yard		$33 30	$33 30
* " 19,	McNeal Pipe and Foundry Company	46 lengths 6-in. pipe	$19.50 per ton of 2,000 lbs. delivered on wharf, Albany street		1,751 03	1,751 03
* " 19,	Coffin Valve Company	Stop Cocks: 50—16-in. @ $55.00 each; 50—12 " $38.50 "; 30—10 " $31.00 "			5,605 00	5,605 00
* " 21,	E. J. Bowes	Blasting, Norfolk street, Dorchester	$8.00 per cubic yard		33 60	33 60
* " 21,	Martin F. Kelley	" Oakland street, Dorchester	$8.50 " "		101 15	101 15
* " 25,	Thomas Burke	" Pontiac street, Roxbury	$5.00 " "		54 50	54 50
* " 26,	L. G. Burnham & Co.	1,000 tons Cumberland coal for Mystic Pumping Station	$3.66 per ton, 2,240 lbs.		3,698 70	3,698 70
* June 1,	Martin F. Kelley	Blasting, Hollingsworth street, Dorchester	$8.50 per cubic yard		99 45	99 45
* " 11,	Richard B. Kelly	" Warren street, Roxbury	$2.25 " "		9 68	9 68
" 26,	Dennis F. O'Connell	Laying pipes in Boston, Dorchester, and Telegraph streets, South Boston, and in Dorchester avenue and Adams street, Dorchester, viz.: —3,900 linear feet, 24-in. @ 87 cents; 3,650 " " 16 " 62 "	$5,656 (estimated)		†51 98 5,801 37	5,853 35
* " 26,	James Dolan	Blasting, Blue Hill avenue	$2.00 per cubic yard		111 00	111 00
* " 29,	Thomas Burke	" Chamblett street, Dorchester	$3.75 " "		15 75	15 75

* July 1,	L. G. Burnham & Co.....	800 tons Cumberland coal, for Chestnut Hill Pumping Station.....	$3.90 per ton, 2,240 lbs.....	.....	3,133 65	3,133 65
* " 3,	James Dolan.....	Blasting, Astoria street, Dorchester.....	$3.00 per cubic yard.....	.....	75 60	75 60
* " 10,	" McDonald	" Commonwealth avenue, Brighton.....	$2.30 " "	.....	269 33	269 33
* " 10,	Richard B. Kelly.....	" Calumet street, Roxbury.....	$3.00 " "	.....	9 00	9 00
* " 10,	Edison Electric Illuminating Company....	Installation of Generating set, Chestnut Hill Pumping Station.....	$1,775.....	.....	1,775 00	1,775 00
* " 15,	Thomas Burke.....	Blasting, Boylston terrace, West Roxbury	$7.50 per cubic yard.....	.....	190 50	190 50
* " 17,	Richard B. Kelly.....	Blasting, Heath street, Roxbury.....	$3.75 per cubic yard.....	.....	9 38	9 38
* " 18,	Thomas Burke.....	" Columbia street, Dorchester.....	$9.00 " " "	.....	17 10	17 10
* " 31,	James Dolan.....	" Hollingsworth street, "	$3.10 " " "	.....	257 30	257 30
* Aug. 3,	Richard B. Kelly.....	" Blue Hill avenue, "	$3.50 per cubic yard	This contract was taken from Kelly, Aug. 24, 1896, and the work finished by Thomas Burke, under order of the Water Commissioner. Burke was paid for work $250.93.....	Paid to Kelly, Paid to Burke,	158 55 250 93	409 48
* " 7,	Thomas Burke.....	" Rosewood street, "	$5.00 per cubic yard.....	.....	32 00	32 00
* " 21,	" "	" Devon street, "	$8.00 " " "	.....	22 40	22 40
* " 21,	" "	" Virginia street, "	$7.00 " " "	.....	17 50	17 50
* " 25,	" "	" F street, South Boston.....	$8.50 " " "	.....	17 00	17 00
* " 26,	L. G. Burnham & Co.....	1,500 tons Cumberland coal delivered in bins Mystic Pumping Station.....	$3.55 per ton, 2,240 lbs.....	.....	5,451 11	5,451 11
* " 27,	Martin J. Connolly.....	Blasting, Walkhill street, Dorchester.....	$4.95 " cubic yard.....	.....	20 79	20 79

Contracts Made and Pending during the Year. — *Continued.*

Date.	Contractors.	Work.	Amount.	Paid on Contract.		
				Previous Years.	Year 1896.	Total.
1896. * Sept. 2,	Thomas Burke	Blasting, Devon street, Dorchester.	$3.00 per cubic yard		$180 00	$180 00
* " 5,	" "	" Ballou avenue "	$3.80 " " "		131 10	131 10
* " 5,	E. J. Bowes	" Walnut " Roxbury	$6.00 " " "		20 40	20 40
* " 5,	Perkins & White	Relaying and burying water-pipes, between Squantum and Thompson's Island	$2.75 per linear foot, not including rock. In case of rock, 15% over cost to them,		1,430 00	1,430 00
* " 17,	John J. Kelley	Blasting, Kilton street, Dorchester	$2.45 per cubic yard		127 40	127 40
* " 24,	Patrick Cushing	" Cliff street, Roxbury	$3.50 " " "		126 70	126 70
* " 26,	John McMorrow	" Castle Rock street, Dorchester	$3.00 " " "		405 00	405 00
* Oct. 1,	John J. Kelley	" Chestnut square, West Roxbury	$2.15 " " "		41 61	41 61
* " 2,	French & Bryant	" Bynner and Catalpa streets, Roxbury,	60 cents " " including back filling	N.B. This contract included in that made with Thos. L. Livermore, Oct. 19, 1896.		
" 8,	O'Rourke & Nelson	Laying 2,130 ft. 20-inch pipe in Border street, East Boston	$1.00 per linear foot. $1.00 per joint		$1,785 00	$1,785 00
* " 10,	Frank C. Jacobs	Excavating and backfilling pipe trench, Bynner street, Roxbury	60 cents per cubic yard		276 60	276 60
* " 10,	Patrick Cushing	Blasting, Fairland street, Roxbury	$4.00 " " "		51 60	51 60
* " 14,	John J. Kelley	" Woodward Park street, Roxbury	$2.64 " " "		97 68	97 68

* " 14,	" " "	" Hooper avenue, Roxbury.....	$3.74 " " "	.....	48 99	48 99
* " 16,	Thomas Burke.....	" Athelwold street, Dorchester.....	$3.49 " " "	.....	64 22	64 22
*Oct. 16,	Granular Metal Co.....	Composition Castings, viz.: —				
		No. 1. 21 1-10 cents per lb. " 2. 20 9-10 " " " " " 3. 19½ " " " "			999 68	999 68
" 19,	Thomas L. Livermore....	Blasting, Bynner street, Roxbury.....	$3.00 per cubic yard.....			
* " 21,	Patrick Cushing.....	" Calumet " "	$5.00 " " "	.....	16 50	16 50
* " 26,	John J. Kelley.....	" Ritchie " "	$4.74 " " "	.....	63 52	63 52
" 29,	Thomas Burke.....	" Beach Glen avenue, Roxbury.....	$4.00 " " "			
" 30,	O'Rourke & Nelson.....	Laying 16-inch pipe in Blue Hill avenue, Dorchester.....	80 cents per linear foot.... $5.00 per cubic yard for rock excavation above grade.. $1.00 per cubic yard for earth excavation below grade. $10.00 per M. ft. for lumber for shoring..... .80 cents each for 16-inch pipe joints.....	.....	1,798 97	1,798 97
* " 31,	R. D. Wood & Company.	25 lengths 36-in. pipe, Class A.....	$18.60 per ton, 2,000 lbs..$1,177 06			
		2 36-in. Y-Branches, special design. ..... 1 36-in. x 36-in. 3 Way Branch, two bells.....	@ 3½ cents per lb. f. o. b. cars, Boston.....$896 63	.....	2,073 69	2,073 69
*Nov. 3,	Thomas Burke.....	Blasting, Morton street, Dorchester.....	@ $3.75 per cubic yard.....	.....	534 00	534 00
" 4,	L. G. Burnham & Co.....	Furnishing 800 tons Cumberland coal in bins, Chestnut Hill Pumping Station.....	$4.15 per ton, 2,240 lbs.....	.....	2,340 60	2,340 60
* " 4,	James McDonald	Blasting, Rockdale street, Dorchester.....	$2.98 per cubic yard.....	.....	202 64	202 64
* " 12,	" "	" Blue Hill avenue, "	$1.98 " "	.....	233 64	233 64
" 16,	James Dolan.....	" " " "	$2.00 " "	.....	111 00	111 00

Contracts Made and Pending during Year.—*Concluded.*

Date.	Contractors.	Work.	Amount.	Paid on Contract.		
				Previous Years.	Year 1896.	Total.
1897.						
*Nov. 18,	John J. Kelley	Blasting, Winter street, Dorchester,	$2.94 per cubic yard		$187 87	$187 87
" 21,	Granular Metal Co.	Composition Castings to amount of $2,000 00; (authority given by Mayor to purchase without advertising.)	No. 1—21 1-10 cents per lb. " 2—20 9-10 " ..... " 3—19½ "		1,021 23	1,021 23
" 27,	Warren Foundry and Machine Company	400 tons 12-in. pipe, Class B	$18.40 per ton, f. o. b. cars, Boston			
" 27,	John J. Kelley	Blasting, Arnold street, West Roxbury	$2.44 per cubic yard.			
* " 27,	" "	" Woodward Park street, Roxbury	$6.00 " "		41 40	41 40
" 28,	Warren Foundry and Machine Company	30 tons 4-in. B Pipe	$19.40 per ton, 2,000 lbs. f. o. b. cars, Boston			
*Dec. 2,	Martin J. Connolly	Blasting, Bellevue and Stanley streets, Dorchester,	$3.25 per cubic yard	Withdrawn from contractor Dec. 23, and work given to Thomas Burke, Dec. 26, 1896; fly day work.		
* " 2,	" "	" Blue Hill avenue, Dorchester	$2.35 " "	Withdrawn from contractor Dec. 17, and contract made Dec. 19, 1896, with Thomas Burke to finish the work.		
" 3,	James Fagan	Alterations on stable, Albany street yard	$10,242.00			
" 17,	James McDonald	Blasting, Harold street, Roxbury	$3.25 per cubic yard.			
" 19,	Thomas Burke	" Blue Hill avenue, Dorchester	$2.70 " "			

" 22,	George H. Stoddard, Manager.....	Insulating 20-in. main over Cottage Farm Bridge,	$800.	
" 23,	James McDonald.....	Blasting, Wait street, Roxbury.....	$2.98 per cubic yard.	
1897. Jan. 6,	Horatio Wellington & Co.	1,500 tons Cumberland coal delivered into bins, Mystic Pumping Station.....	$3.81 per ton, 2,240 lbs.	
" 11,	Thomas Burke.....	Blasting, Centre street, Roxbury.....	$7.00 per cubic yard.	
" 15,	Patrick Cushing.....	" Rockledge street, Roxbury..	$4.50 " "	
" 20,	Camden Iron Works, Philadelphia, Pa....	275 Tons 8-in. "B" pipe..... 800 " 12-in. "B" " ..... 240 " 16-in. "A" " ..... 540 " 24-in. "B" " ..... 505 " 30-in. "B" " ..... 625 " 36-in. "A" " ..... 2,985 " ..... 50 " Specials.....	$17.38 per ton, 2,000 lbs. estimated, $52,748 30	
" 20,	McNeal Pipe and Foundry Co., Burlington, N. J.....	700 tons 6-inch "B" pipe..... 550 " 12 " "A" " ..... 635 " 20 " " " ..... 505 " 30 " "B" " ..... 625 " 36 " "A" " ..... 3,015 " ..... 50 " Specials	@$17.17 per ton 2,000 lbs. estimated at $53,767 55 $40.00 per ton 2,000 lbs.	

In the appendices annexed hereto are submitted the reports of the City Engineer and the superintendents of the department. They furnish full details of the present condition of the works and what has been accomplished.

Respectfully,

JOHN R. MURPHY,
Water Commissioner.

APPENDIX A.

REPORT OF THE INCOME DIVISION.

OFFICE OF GENERAL SUPERINTENDENT, INCOME DIVISION,
CITY HALL, BOSTON, Feb. 1, 1897.

HON. JOHN R. MURPHY,
Water Commissioner:

Herewith please find report of the Income Division, Water Department, for the calendar year ending Dec. 31, 1896, it being impracticable to render report of this division for the financial year ending Jan. 31, 1897.

RECEIPTS.

	Cochituate.	Mystic.	Total.
Turning water off and on for repairs . .	$1,884 00	$237 50	$2,121 50

TABLE I.

	Cochituate.	Mystic.				Totals.
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	
Number of takers by annual rates	87,341	6,895	7,859	13,864	5,321	121,280
Number of takers by meter	4,107	188	102	118	33	4,548
Number of takers of all kinds	91,448	7,083	7,961	13,982	5,354	125,828

TABLE II.

Showing the purposes for which water was taken by Annual Rates, and the districts where taken.

PURPOSES FOR WHICH WATER WAS TAKEN BY ANNUAL RATES.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Armories	3	3	1	.....	.....	7
Bakeries	256	22	22	12	6	318
Bath-houses	5	.....	.....	.....	.....	5
Building purposes	1,436	21	68	280	149	1,954
Cemeteries	8	.....	1	1	.....	10
Churches	220	10	14	25	6	275
Clubs	82	24	28	13	6	153
Depots	31	1	1	8	4	45
Disinfecting-places	1	.....	.....	.....	.....	1
Dwelling-houses	48,392	4,722	5,849	8,470	3,468	70,901
Fire Department:						
Chemical engines	10	.....	.....	.....	.....	10
Combination wagons	2	.....	.....	.....	.....	2
Water tower	1	.....	.....	.....	.....	1
Hydrants	6,398	344	90	149	53	7,034
Ladder companies	16	.....	.....	.....	.....	16
Steam-engines	40	5	5	6	2	58
Fountains	23	4	5	12	3	47
Freight-houses	5	11	.....	.....	.....	16
Greenhouses	70	.....	3	13	9	95
Gymnasium	5	.....	.....	.....	.....	5
Halls	155	8	8	4	8	183
Hand-hose	9,057	269	632	2,817	811	13,586
Hospitals and asylums	57	.....	.....	1	.....	58
Laundries	390	32	27	30	28	507
Libraries and museums	12	1	1	1	.....	15
Manufactories	13	8	25	17	8	71
Model houses	7,045	400	191	377	98	8,111
Morgue	1	.....	.....	.....	.....	1
Motor	12	1	1	2	1	17
Offal-stations	2	.....	.....	.....	.....	2
Offices	1,010	42	57	15	16	1,140
Photograph-rooms	22	1	2	3	1	29
Police-stations	7	1	1	.....	1	10
Public Institutions	12	1	.....	1	1	15
Restaurants & Lunches	288	8	10	5	3	314
Saloons	445	52	.....	.....	.....	497
Schools	124	5	2	7	3	141
Sewers	.....	.....	2	2	1	5
Shops	2,327	155	110	115	30	2,737
Shipping	39	1	.....	.....	.....	40
Stables	3,364	331	368	1,144	462	5,669
Steam-engines	197	19	12	2	1	231
Steam-rollers	12	.....	.....	.....	.....	12
Stone-crushers	7	.....	1	1	1	10
Sto es	5,331	373	308	280	110	6,402
Theatres (special)	2	.....	.....	.....	.....	2
Urinals (public)	19	.....	.....	.....	.....	19
Washing carts	3	.....	.....	.....	.....	3
Watering streets	384	20	14	51	31	500
Totals	87,341	6,895	7,859	13,864	5,321	121,280

TABLE III.

Showing the amounts assessed for water taken by Annual Rates, the purposes for which and the places where taken.

AMOUNTS ASSESSED BY ANNUAL RATES.	COCHITUATE.	MYSTIC.				
	Boston excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Armories	$93 00	$56 50	$12 00	.....	.....	$161 50
Bakeries	3,235 74	270 50	297 50	$151 00	$90 25	4,044 99
Bath-houses	206 00	.....	.....	.....	.....	206 00
Building purposes	14,717 65	185 57	301 10	1,202 32	536 16	16,942 80
Cemeteries	75 00	.....	15 00	5 00	.....	95 00
Churches	2,603 53	121 00	163 00	245 84	75 00	3,208 37
Clubs	1,451 50	271 17	322 50	234 37	62 92	2,342 46
Depots	437 95	19 50	19 50	107 00	98 00	681 95
Disinfecting places	25 00	.....	.....	.....	.....	25 00
Dwel'g-houses	708,511 75	62,824 53	63,242 27	112,210 75	40,339 57	987,128 87
Fire Department:						
Chemical-engines	150 00	.....	.....	.....	.....	150 00
Combination wagon	30 00	.....	.....	.....	.....	30 00
Water tower	15 00	.....	.....	.....	.....	15 00
Hydrants	127,960 00	6,880 00	2,670 00	4,172 00	1,484 00	143,166 00
Ladder companies	240 00	.....	.....	.....	.....	240 00
Steam engines	1,000 00	115 00	125 00	130 00	50 00	1,420 00
Fountains	448 00	40 00	40 00	65 00	25 00	618 00
Freight houses	59 50	68 00	.....	.....	.....	127 50
Greenhouses	1,208 33	.....	36 09	91 00	83 00	1,418 33
Gymnasiums	554 67	.....	.....	.....	.....	554 67
Halls	1,950 41	113 50	137 00	37 84	83 30	2,322 05
Hand-hose	45,285 00	1,345 00	3,160 00	14,085 00	4,055 00	67,930 00
Hospitals and asylums	4,453 00	.....	.....	170 00	.....	4,623 00
Laundries	7,236 41	593 33	491 25	572 71	273 50	9,167 20
Libraries and museums	267 67	10 00	12 00	26 00	.....	315 67
Manufactories	220 75	179 39	268 67	250 92	74 00	993 73
Model houses	158,201 67	7,332 08	4,073 74	7,958 11	2,033 23	179,598 83
Morgue	10 00	.....	.....	.....	.....	10 00
Motor	125 00	20 00	35 00	10 00	5 00	195 00
Offal-stations	225 00	.....	.....	.....	.....	225 00
Offices	11,044 07	413 17	485 84	151 83	147 00	12,241 91
Photograph rooms	451 00	22 00	35 00	65 00	12 00	585 00
Police-stations	130 00	13 00	15 00	.....	20 00	178 00
Car'd forward	$1,092,622 60	$80,893 24	$75,957 37	$141,941 69	$49,546 93	$1,440,961 83

TABLE III. — *Concluded.*

AMOUNTS ASSESSED BY ANNUAL RATES.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Brought forw'd,	$1,092,622 60	$80,893 24	$75,957 37	$141,941 69	$49,546 93	$1,440,961 83
Public Inst....	7,574 50	44 50	.....	25 00	21 00	7,665 00
Restaurants and Lunches,	6,260 66	129 00	177 25	82 00	32 00	6,680 91
Saloons.....	16,765 60	2,130 00	.....	.....	.....	18,895 60
Schools.....	1,709 84	65 00	20 50	64 75	39 00	1,899 09
Sewers.....	9,667 64	.....	134 92	60 00	109 55	9,972 11
Shops.....	24,265 91	993 45	903 92	789 05	188 83	27,141 16
Shipping.....	1,210 57	3 00	.....	.....	.....	1,213 57
Stables.....	23,882 66	2,881 94	1,774 69	6,290 04	2,009 62	36,838 95
Steam-engines,	3,520 51	276 75	153 00	18 00	10 00	3,978 26
Steam-rollers..	206 25	.....	.....	.....	.....	206 25
Stone-crushers,	195 00	.....	6 00	96 40	28 00	325 40
Stores.....	55,841 24	3,250 61	2,877 18	2,563 20	883 69	65,415 92
Theatre (special).....	86 16	.....	.....	.....	.....	86 16
Urinals public)	545 00	.....	.....	.....	.....	545 00
Washing carts,	150 00	.....	.....	.....	.....	150 00
Watering sts...	40,480 00	50 00	1,655 60	4,650 24	486 95	47,322 79
Totals.....	$1,284,984 14	$90,717 49	$83,660 43	$156,580 37	$53,355 57	$1,669,298 00

TABLE IV.

Showing the purposes for which water was taken by Meter, and the districts where taken.

PURPOSES FOR WHICH WATER WAS TAKEN BY METER.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Bakeries	14	4	1	.....	.....	19
Baths	7	.....	.....	.....	.....	7
Boarding	50	.....	1	.....	1	52
Bottling	43	2	.....	1	.....	46
Breweries	26	1	.....	.....	.....	27
Cemeteries	3	.....	.....	.....	1	4
Chemicals	6	1	1	.....	.....	8
Club-houses	30	.....	.....	.....	.....	30
Distilleries	5	1	.....	1	.....	7
Electrical companies	10	.....	1	.....	.....	11
Elevators and motors	476	8	4	6	3	497
Factories	265	26	34	19	8	352
Fish-houses	32	.....	.....	.....	.....	32
Gas works	13	2	2	.....	.....	17
Greenhouses	13	.....	.....	.....	2	15
Halls	6	2	.....	.....	.....	8
Hospitals	20	2	3	1	.....	26
Hotels	103	8	.....	2	.....	113
Ice-manufacturing co.'s	1	1	.....	.....	.....	2
Iron-works	29	3	2	1	.....	35
Laundries	23	1	3	.....	2	29
Markets	9	.....	.....	.....	.....	9
Mills and engines	45	8	.....	5	.....	58
Models	640	18	3	4	.....	665
Navy Yard and barracks	.....	2	.....	.....	.....	2
Offices, stores, and shops	1,294	13	12	25	3	1,347
Oil-works	6	.....	1	.....	.....	7
Parks	6	1	.....	.....	.....	7
Police-stations	14	1	.....	1	.....	16
Public institutions	24	1	2	1	.....	28
Saloons and restaurants	310	3	.....	.....	.....	313
Schools	120	12	10	19	8	169
Slaughtering-houses	4	.....	.....	4	.....	8
Stables	294	46	15	26	4	385
Steam and str't R.R. co.'s	64	16	3	.....	1	84
Stone-works	5	.....	.....	.....	.....	5
Sugar-refineries	1	.....	.....	.....	.....	1
Tanneries	5	.....	.....	.....	.....	5
Theatres	21	.....	.....	.....	.....	21
Warehouses	8	.....	1	.....	.....	9
Wharves and shipping	62	5	3	2	.....	72
Totals	4,107	188	102	118	33	4,548

TABLE V.

Showing the amounts assessed by Meter, the purposes for which, and the district where water was taken.

AMOUNTS ASSESSED BY METER.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Bakeries	$802 00	$997 80	$81 20			$1,881 00
Baths	531 00					531 00
Boarding	3,563 70		23 80	$15 00	$63 00	3,665 50
Bottling	3,989 84	168 00				4,157 84
Breweries	33,036 90	2,639 80				35,676 70
Cemeteries	334 30				80 00	414 30
Chemicals	275 35	160 00	433 20			868 55
Club-houses	6,287 70					6,287 70
Distilleries	1,486 30	182 30		186 80		1,855 40
Electrical companies	21,329 80		1,291 20			22,621 00
Elevators and motors	60,862 03	386 65	136 40	111 80	45 00	61,541 88
Factories	53,226 35	3,289 40	6,746 31	4,928 80	2,748 45	70,939 31
Fish-houses	3,722 75					3,722 75
Gas works	17,448 20	1,506 60	85 40			19,040 20
Greenhouses	1,105 80				44 80	1,150 60
Halls	343 20	75 60				418 80
Hospitals	14,364 30	441 80	1,790 40	125 00		16,721 50
Hotels	56,994 10	793 10		212 60		57,999 80
Ice-manufacturing companies	1 40	190 00				191 40
Iron-works	7,865 70	413 50	57 40	110 00		8,446 60
Laundries	4,627 60	480 00	194 20		180 00	5,481 80
Markets	5,259 20					5,259 20
Mills and engines	10,077 61	1,656 40	910 00	267 10		12,911 11
Models	69,340 17	1,923 70	345 50	367 10		71,976 47
Navy Yard barracks		5,970 40				5,970 40
Offices, stores, and shops	149,696 36	614 70	530 15	1,347 30	60 25	152,248 76
Oil-works	917 70		56 00			973 70
Parks	687 75	74 00				761 75
Police-stations	2,209 10	106 00		72 80		2,387 90
Public institutions	17,066 70	4,044 00	125 65	29 40		21,265 75
Saloons and restaurants	29,773 10	94 80				29,867 90
Schools	12,668 15	818 05	261 40	887 65	245 60	14,880 85
Slaughtering-houses	1,574 20			14,120 70		15,694 90
Stables	21,773 73	2,462 50	985 50	1,417 60	161 60	26,800 93
Steam and street railroads	99,931 66	28,159 90	3,274 60	11,719 00	220 50	143,305 66
Stone-works	1,055 20					1,055 20
Sugar-refineries	26,369 60					26,369 60
Tanneries	791 90					791 90
Theatres	5,729 63					5,729 63
Warehouses	643 90		594 00			1,237 90
Wharves and shipping	27,590 93	4,594 30	1,739 00	378 20		34,302 43
Totals	$775,354 91	$62,243 30	$19,661 31	$36,296 85	$3,849 20	$897,405 57

TABLE VI.

Showing the quantities of water taken by Meter, the purposes for which and the district where taken.

QUANTITIES TAKEN BY METER.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
	Cubic ft.	*Cubic ft.*	*Cubic ft.*	*Cubic ft.*	*Cubic ft.*	*Cubic ft.*
Bakeries	578,000	783,000	58,000	.....	.....	1,419,000
Baths	396,000	.....	.....	.....	.....	396,000
Boarding	2,568,000	.....	17,000	8,000	45,000	2,638,000
Bottling	2,998,000	121,000	.....	.....	.....	3,119,000
Breweries	27,702,000	2,180,000	.....	.....	.....	29,882,000
Cemeteries	251,000	.....	.....	.....	58,000	309,000
Chemicals	193,000	117,000	341,000	.....	.....	651,000
Club-houses	4,932,000	.....	.....	.....	.....	4,932,000
Distilleries	1,143,000	137,000	.....	138,000	.....	1,418,000
Electrical companies	18,371,000	.....	1,056,000	.....	.....	19,427,000
Elevators and motors	46,686,000	265,000	90,000	50,000	15,000	47,106,000
Factories	43,218,000	2,433,000	5,333,000	3,395,000	2,176,000	56,555,000
Fish-houses	2,881,000	.....	.....	.....	.....	2,881,000
Gas-works	15,320,000	1,231,000	61,000	.....	.....	16,612,000
Greenhouses	805,000	.....	.....	.....	32,000	837,000
Halls	252,000	54,000	.....	.....	.....	306,000
Hospitals	11,710,000	337,000	1,432,000	90,000	.....	13,569,000
Hotels	46,108,000	578,000	.....	155,000	.....	46,841,000
Ice-mfg. companies,	1,000	143,000	.....	.....	.....	144,000
Iron-works	6,093,000	308,000	41,000	80,000	.....	6,522,000
Laundries	3,632,000	380,000	140,000	.....	132,000	4,284,000
Markets	4,625,000	.....	.....	.....	.....	4,625,000
Mills and engines	7,798,000	1,300,000	715,000	191,000	.....	10,004,000
Models	51,718,000	1,422,000	254,000	269,000	.....	53,663,000
Navy Yard and barracks	.....	5,113,000	.....	.....	.....	5,113,000
Offices, stores, and shops	113,424,000	435,000	361,000	918,000	39,000	115,177,000
Oil-works	681,000	.....	40,000	.....	.....	721,000
Parks	515,000	53,000	.....	.....	.....	568,000
Police-stations	1,615,000	76,000	.....	52,000	.....	1,743,000
Public Institutions,	13,865,000	3,421,000	86,000	21,000	.....	17,393,000
Saloons and restaurants	22,163,000	68,000	.....	.....	.....	22,231,000
Schools	9,546,000	523,000	178,000	627,000	169,000	11,043,000
Slaughter'g-houses,	1,244,000	.....	.....	13,587,000	.....	14,831,000
Stables	16,054,000	1,765,000	702,000	987,000	111,000	19,619,000
Steam and street R.R. companies	102,024,000	26,189,000	2,699,000	12,283,000	65,000	143,260,000
Stone-works	799,000	.....	.....	.....	.....	799,000
Sugar-refineries	30,932,000	.....	.....	.....	.....	30,932,000
Tanneries	593,000	.....	.....	.....	.....	593,000
Theatres	4,480,000	.....	.....	.....	.....	4,480,000
Warehouses	455,000	.....	475,000	.....	.....	930,000
Wharves and shipping	22,167,000	3,737,000	1,411,000	288,000	.....	27,603,000
Totals	640,536,000	53,169,000	15,490,000	33,139,000	2,842,000	745,176,000

TABLE VII.

Number and Amounts of Abatements Allowed during the Year 1896.

ABATEMENTS.	COCHITUATE.		MYSTIC.							
	Boston, excluding Charlestown.		Charlestown.		Chelsea.		Somerville.		Everett.	
On account of Assessments of.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No	Amount.
1896	2,997	$21,812 98	195	$820 91	309	$1,367 58	331	$1,626 18	180	$794 80
1895	1,861	24,069 00	120	1,202 50	167	1,271 66	347	2,252 56	181	1,243 75
1894	1,715	15,056 01								
1893	5	1,197 90								
Totals	6,578	$62,135 89	315	$2,023 41	476	$2,639 24	678	$3,878 74	361	$2,038 55

Total number of abatements.....8,408 Total amount of abatements.....$72,715 83

The abatements allowed on account of 1896 assessments, amounting to $26,422.45, were due to changes in occupancy of premises, changes in ownership, vacancies, errors in valuations and assessments, inaccuracy of meters as proved by tests, underground leaks for which the owner could not be held entirely responsible, and for other reasons, which in the judgment of the General Superintendent, entitled the water taker to consideration.

The abatements on account of 1895–1894 and 1893 assessments, amounting to $42,293.38, were due to bills uncollectible, changes of ownership, failures, shut off for non-payment, and cleaning up of old accounts.

Tables VIII. and IX. represent the work of the Off and On Service, as follows:

TABLE VIII.

NEW ELEVATOR, MOTOR, FIRE, AND SERVICE PIPES.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Elevator	16	.....	.....	.....	.....	16
Motor	6	1	.....	1	.....	8
Fire	31	1	.....	1	.....	33
Service	2,350	51	86	469	175	3,131
Totals	2,403	53	86	471	175	3,188

TABLE IX.

TURNING WATER OFF AND ON.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
For repairs in mains	1,003	7	.....	.....	.....	1,010
For repairs in service	4,105	441	12	32	13	4,603
For non-payments	1,608	90	98	88	100	1,984
For waste	21	.....	.....	.....	.....	21
Turning on first time	2,105	44	118	392	259	2,918
Vacants	2,376	189	350	445	303	3,663
Totals	11,218	771	578	957	675	14,199

TABLE X.

Showing the kind of fixtures in use January 31, 1897, their number and the districts wherein located.

FIXTURES IN USE JAN. 31, 1897.	COCHITUATE.	MYSTIC.				
	Boston, excluding Charlestown.	Charlestown.	Chelsea.	Somerville.	Everett.	Totals.
Bath-tubs	53,972	1,694	2,412	6,938	3,014	68,030
Bowls	84,168	2,530	2,919	7,275	2,783	99,675
Foot-tubs	539	9	2	8	1	559
Sinks	143,515	12,249	9,763	16,317	5,491	187,335
Taps	19,886	1,181	1,085	3,208	900	26,260
Urinals	4,334	178	77	43	20	4,652
Wash-tubs	81,392	2,090	2,694	8,374	2,659	97,209
Water-closets	127,331	8,190	7,331	14,013	4,111	160,976
Totals	515,137	28,121	26,283	56,176	18,979	644,696

METER, ELEVATOR, AND MOTOR SERVICE.

Number of water meters taken from service during the year 1896, subject to an accuracy test	1,897
New hydraulic elevators inspected, measured and accepted	13
Old hydraulic elevator cylinders remeasured, clocks readjusted to accuracy	12
Old hydraulic elevator cylinders remeasured, and location of clock changed and readjusted to accuracy	18
Total number of elevator cylinders measured	43
Number of elevators found registering against the revenue	39
New hydraulic elevators inspected, measured and accepted	9

FIRE-PIPE SERVICE.

Number of buildings examined having a fire-pipe service	378

Number of outlet valves of various kinds inspected, subject to sealing	2,590
Number of outlet valves of various kinds resealed or sealed first time	2,226
Number of premises examined equipped with fire hydrants	99
Number of hydrants found subject to sealing	107
" " resealed	84

WASTE DETECTION.

Premises on which defective fixtures were found	4,395
Premises re-examined	4,483
Second notices to repair issued	513
Wilful-waste notices issued	15

The defective fixtures may be divided into the following classes:

Ball-cocks and valves	2,865
Sink, hopper, bowl, and bath faucets	2,200
Service pipes burst	177
Wilful waste	15
Number of notices issued from this office for waste of water reported by the waste and Deacon meter system	2,642

Yours respectfully,

J. H. CALDWELL,

General Superintendent Income Division.

APPENDIX B.

REPORT OF THE RESIDENT ENGINEER AND SUPERINTENDENT OF THE WESTERN DIVISION.

SOUTH FRAMINGHAM, Jan. 1, 1897.

HON. JOHN R. MURPHY,

Water Commissioner:

SIR: The annual report of the Western Division of the Boston Water Works is herewith submitted.

SUDBURY-RIVER BASINS.

Water-shed, 75.2 Square Miles.

The rainfall for 1896 was 43.21 inches at Framingham, and 42.22 inches at Chestnut-Hill Reservoir. The mean rainfall on the Sudbury-river water-shed was 43.07 inches, which is about 5 inches below the average.

As a whole, the year can hardly be classified among the years of drought. The deficiency, however, occurring in five consecutive months, beginning with April and ending with August, caused some uneasiness, in view of the possibility of a small rainfall for the rest of the year.

The following table shows the average yield of the Sudbury-river water-shed for 1875–95, inclusive, and the yield for 1896. It will be seen that the month of May was really the dry month, and remarkably so.

Yield of the Sudbury-river water-shed in millions of gallons per square mile per day.

	1875-95.	1896.
January	1.211	1.084
February	1.846	2.676
March	2.825	3.835
April	2.053	1.494
May	1.148	0.360
June	0.473	0.399
July	0.187	0.095
August	0.286	0.057
September	0.240	0.388
October	0.545	0.592
November	0.951	0.659
December	1.038	0.657

The city, however, had on store September 1, about 3,000,000,000 gallons in the Sudbury system alone and 2,700,000,000 gallons on October 1—the lowest point reached during the year. There is no doubt that in a year of the most excessive drought the city supply is somewhat below the safety line, caused by the delay in undertaking the building of Reservoir 5. This reservoir will be completed in a year from the present date, and it is now sufficiently advanced to store about 1,200,000,000 gallons. It is the present intention to store this additional amount of water at this point during the winter and spring. This water, with the present storage facilities, and an additional amount added to Reservoir 8 by raising its surface 2 feet, will meet all the probable demands of the city during the coming year.

On Jan. 4, 1896, Reservoir 5 was seized by the Commonwealth, through the agency of the Metropolitan Water Board, and the construction of this important addition to Boston's supply has been continued under the direction of that Board. Owing to the large amount of work going on in the bottom of that reservoir, it has been even more difficult than last year to maintain the good quality of the water delivered to the city's distribution pipes. A large degree of success has, however, been met with in this direction, due to the very large scale of the Boston works and the excellent sanitary conditions maintained by the Commonwealth in the construction of Reservoir 5. At times 2,000 men and a large number of teams were engaged in stripping the soil in Southborough and Marlborough, not far above Reservoir 3, and the water flowing into this reservoir was necessarily very muddy. In anticipation of this condition, the surface of Reservoir 3 was early drawn down as low as possible, and then it was allowed to fill slowly with the poor water, and none of the supply of the city was drawn directly from this source during the whole summer.

Reservoirs 4 and 6 were drawn down, and, as they contained excellent water the city supply was never better during nearly the whole season.

The color of the tap water fell as low as 0.40. The color now is about 0.70. Whenever it became necessary to draw a little water from Reservoir 3, it was allowed to settle first in Reservoir 1, and then it had to pass through Chestnut-Hill Reservoir.

A small day force has been kept at work on the Filter Beds at Reservoir 6 during the year, and three of the beds are now completed and underdrained.

RESERVOIR 1.

Grades, H. W., 161.00; Tops of Flash-boards, 159.29 and 158.41; Crest of Dam, 157.54. Area, Water Surface, 143 acres; Greatest depth, 14 ft.; Contents, below 161.00, 376,900,000; below 159.29, 288,400,000 gals.

On Jan. 1, 1896, water in this reservoir stood at elevation 158.11, and water was wasting over the stone crest of the dam and continued to waste, with the exception of January 16, until April 13, when both sets of flash-boards were placed in position. The water in the reservoir then rose, and on April 16, a small amount of waste commenced over the flash-boards and continued until May 1, when the water in the reservoir fell below the top of the flash-boards. On May 12, the water in the reservoir was at elevation 157.08, and from this date until November 6, the water in the reservoir was kept near elevation 157.00 by drafts first from Reservoir 3 and later from Reservoir 2. The water then rose and began to waste over the stone crest, which continued until December 3, when the water in the reservoir fell for a while below the stone crest, but soon rose, and on December 9, waste again commenced, and continued until December 17, when waste for the year ceased. The water in the reservoir then fell, and on December 31, was at an elevation of 156.43.

No water was wasted from this reservoir into the Sudbury river through the flood gates, except on April 22 and 23, when a gate was opened for a while to prevent too great a depth of water from flowing over the flash-boards.

Both sets of flash-boards were placed in position on the dam on April 13 and removed on August 7.

The highest elevation reached during the year was 159.00, on March 1, and the lowest 156.29 on December 27.

Water for the supply of the city was drawn wholly from this reservoir from 12 M., January 6, to 11 A.M., March 31; from 9 A.M., April 20, to 6 A.M., April 21; and from 10.30 A.M., December 17, to 10 A.M., December 18.

Water was drawn partially from this reservoir and partially from Reservoir 2 from 11 A.M., March 31, to 9 A.M., April 20; from 6 A.M., April 21, to 5 P.M., April 22; from 3.30 P.M., April 23, to 11 A.M., August 8; from 11 A.M., August 10, to 9 A.M., September 7; from 11 A.M., September 21, to 11 A.M., November 5; from 10.15 A.M., November 18, to 10.30 A.M., December 17; and from 10 A.M., December 18, to the end of the year.

RESERVOIR 2.

Grades, H. W., 168.00; Tops of Flash-boards, 167.12 and 166.49; Crest of Dam, 165.87. Area, Water Surface, 134 acres; Greatest Depth, 17 ft.; Contents, below 168.00, 568,300,000; below 167.12, 529,860,000 gals.

On Jan. 1, 1896, water in this reservoir stood at elevation 166.17 and was flowing over the stone crest of the dam and continued to flow until April 13, when both sets of flash-boards were placed on the stone crest, after which the water rose and on April 16 was flowing over the flash-boards and so continued with the exception of three days until April 29, when an extra set of flash-boards was put on the regular set. On May 3, water began to waste over the flash-boards until May 24. The water then gradually fell with slight rises at times, to elevation 163.02 on June 26, when water was drawn from Reservoir 4. On July 30, water was also drawn from Reservoir 6, and still later, on September 16 from Reservoir 8, to keep up the supply. Reservoir 2 was kept on an average between elevations 162.50 and 163.00 until September 20, then between elevations 163.00 and 164.00 until November 30, when the waste gate at Reservoir 8 was finally closed, the gate at Dam 4 having been closed on October 7 and at Dam 6 on November 20. On November 30 water in the reservoir was at elevation 163.52, at 164.57 on December 18 and at 163.82 on December 31. All flash-boards were removed on August 7.

The highest elevation reached by the water during the year was 167.60 on May 7 and 8, and the lowest was 162.33 on August 20. Water for the supply of the city was drawn wholly from this reservoir from 7 A.M., January 1, to 12 M., January 6; from 5 P.M., April 22, to 3.30 P.M., April 23; from 11 A.M., August 8, to 11 A.M., August 10; from 9 A.M., September 7, to 11 A.M., September 8; from 10 A.M., September 20, to 11 A.M., September 21; and from 11 A.M., November 5, to 10.15 A.M., November 18.

Between August 27 and October 27 the town of Ashland finished the widening of Fountain street, near the head of Reservoir 2. For a distance of about 2,250 feet land was taken from the city for the widening. No compensation has been made for the land so taken.

About 530 feet of the fence that the city has to maintain on Fountain street, Framingham, near the bridge, has been rebuilt. The remainder is in poor condition and should be renewed as soon as possible. The Fountain-street bridge was painted in October.

The average number of organisms for the year in Reservoir 2 has been 95 per c.c. and amorphous matter 181 per c.c.

Infusoria were the most important organisms, but they were at no time abundant. Synura, Glenodinium and Euglena Acus were observed. The Diatomaceæ reached a maximum of 400 on June 1.

RESERVOIR 3.

Grades. H. W., 177.00; Crest of Dam (no flash-boards), 175.24.
Area at 177.02, 253 acres; Contents, below 177.00, 224,500,000 gals.
Area at 175.24, 248 acres; Contents, below 175.24, 1,081,500,000 gals.
Greatest depth, 21 feet.

On Jan. 1, 1896, water in this reservoir stood at elevation 175.75 and was flowing over the stone crest, and continued to overflow until May 12, with the exception of February 9 and 10, March 16, 17, 18, 19, 20, and 21, when water was running through the gates into Reservoir 1. On May 12, an outlet gate into Reservoir 1 was opened, and the water gradually fell to 168.23 on August 6, when the outlet gate was closed. The water then remained at about 168.35 until September 5, and rose to 171.46 on September 23, when the outlet was opened, falling then to 170.86 on October 13. The water then rose, and on November 5 was flowing over the stone crest, and continued to overflow until December 27, when the outlet gate was again opened. The water in the reservoir then fell to elevation 174.82 on December 31.

The highest point reached during the year was 176.81 on February 7, and the lowest, 168.23 on August 6.

The average number of organisms for the year was 506 per cc.; of amorphous matter 269 per cc.

Diatomaceæ were present in small numbers during the first of the year, but were unimportant until October 1, when a vigorous growth of Tabellaria commenced, which reached a maximum of 1,600 on October 20, and decreased gradually until the end of the year. Infusoria were present from March until May. Euglena Acus appeared on March 24, and reached a maximum of 368 at the middle of April. Uroglena was present to the amount of 300 on the last of April. The Chlorophyceæ and Cyanophyceæ reached a considerable growth about June 1. On August 25, Cœlosphærium was present to the amount of 2,140 standard units per cc.

On account of work at Dam No. 5, the water of the influent stream, which enters Reservoir 3, has been turbid a considerable portion of the time, frequently so turbid as to make the estimation of the color impossible. On several occasions this turbidity extended throughout the water of the reservoir.

RESERVOIR 4.

Grades, H. W., 215.21; Tops of Flash-boards, 215.21 and 214.89; Crest of Dam, 214.23.
Area, Water Surface, 167 acres; Greatest Depth, 49 feet; Contents, below 215.21, 1,416,400,000 gals.

On Jan. 1, 1896, water in this reservoir was at elevation 213.86, and on January 3 was flowing over the stone crest of the waste weir, and continued to overflow until March 18, when an outlet gate was opened. On March 21 the gate was closed, and the water again began to overflow, which continued until April 13, when the lower set of flash-boards was put in place. On April 15, the upper set was put in place; on April 19, water again began to waste, and so continued until June 26, when the supply for the use of the city was drawn from this source. The water fell to 183.45 on September 7, when the outlet gate was closed. The water then rose to elevation 184.72 on September 15, when a gate being again opened it fell to 182.43 on October 7. The outlet gate was then closed for the year, the reservoir gradually filling to 194.99 on December 31.

The highest elevation reached during the year was 215.38 on March 1 and April 24, and the lowest 182.12 on September 29.

A considerable amount of work has been done during the year on Cold Spring Brook, below Dam 4, principally on the first bridge below the dam. The abutments of this bridge are on a quicksand foundation, and they had moved out of line to such an extent that it was determined to rebuild them. The site was surrounded by a coffer-dam of sheeting, and a deep concrete foundation put in place, upon which the abutments were started. This work is still in progress. It was begun with a small force on October 19.

The average number of organisms for the year was 103 per cc., against 39 per cc. for 1895, and of amorphous matter 176 against 158 for last year.

Diatomaceæ have been present throughout the year, and have constituted the greater part of the growth of organisms. With the exception of a small number of Synedra during July, the growth has been almost entirely composed of the small Cyclotella, which reached a maximum of 1,465 in the middle of December. Chlorophyceæ appeared in July, but were not abundant. There was a considerable growth of Draparnaldia on the stones just below the entrance of the influent stream during November, but none of it appeared in the water.

RESERVOIR 6.

Grades, H. W., 295.00; Top of Flash-boards, 295.00; Crest of Dam, 294.00. Estimated Area, 185 acres; Estimated Contents, 1,530,300,000 gals.

On Jan. 1, 1896, water in this reservoir stood at elevation 294.39 and was flowing over the stone crest, and continued to overflow, with the exception of March 18, 19, 20, 21, and 22, when the outlet gate was opened to prevent the water in the reservoir from rising too high, until April 13, when the lower set of flash boards was placed in position. The reservoir then kept at about high-water mark, elevation 295.00, until August 1, when an outlet gate was opened for the supply of the city. The water fell to 261.69 on November 20, when the gate was closed. It then rose to 267.38 on December 18, when water was drawn on to the filter beds to test their efficiency. On December 31 the surface stood at 266.56. From August 1 to September 22 a small portion of the water, drawn from this source, was filtered on Beds 1 and 3. The highest elevation reached during the year was 295.27 on March 1, and the lowest 261.69 on November 20.

Between May and December 21, work has been continued by the day upon the filter beds in course of construction below Dam 6. Beds 2 and 4 were graded, and Bed 5 nearly completed. Beds 2 and 3 were thoroughly underdrained by two different systems. One outlet well has been built at the ends of the pipes.

The following tables give the results of such experiments as have been made upon the filtration of water through the beds. In this connection it must be kept in mind that the results obtained are, in some respects, never as satisfactory when the beds are new as they are after the beds have been in use for a short time.

Color, Organisms and Amorphous matter in the Applied Water and Filtered Water at Filter Beds at outlet of Reservoir No. 6.

	Date.	Applied Water.	Effluent Water.	Amount of Reduction.	Per cent of Reduction.	Rate in mil. gals. per acre per day.
Beds Nos. 1 and 3. Combined outlets Beds 1 and 3.						
Color	Dec. 28, 1896	.88	.57	.31	35.2	4½
	" 30, "	.88	.60	.28	31.8	"
	Jan. 1, 1897	.90	.60	.30	33.3	"
Organisms	Dec. 28, 1896	157	11	146	93.0	"
	" 30, "	153	36	117	76.4	"
	Jan. 1, 1897	126	28	98	77.7	"
Amorphous matter	Dec. 28, 1896	176	56	120	68.2	"
	" 30, "	220	54	166	75.5	"
	Jan. 1, 1897	156	54	102	65.4	"
Bacteria	Dec. 28, 1896	70	42	28	40.0	"
	" 30, "	27	28	sl. increase	.....	"
	Jan. 1, 1897	38	41	" "	.....	"
Bed No. 3. Effluent from Bed 3 only.						
Color	Jan. 2, 1897	.90	.54	.36	40.0	
	" 3, "	.90	.41	.49	43.3	
Organisms	" 2, "	126	8	118	96.3	
	" 3, "	126	18	108	85.7	
Amorphous	" 2, "	156	48	108	69.2	
	" 3, "	156	42	114	73.1	
Bed No. 2. Effluent from Bed No. 2.						
Color	Dec. 28, 1896	.88	.05	.83	94.3	.58
	" 30, "	.88	.05	.83	94.3	.48
	Jan. 1, 1897	.90	.07	.83	92.2	.33
Organisms	Dec. 28, 1896	157	4	153	97.4	.58
	" 30, "	153	8	145	94.8	.48
	Jan. 1, 1897	126	8	118	93.6	.33
Amorphous	Dec. 28, 1896	176	52	124	70.4	.58
	" 30, "	220	46	174	79.1	.48
	Jan. 1, 1897	156	48	108	69.2	.33
Bacteria	Dec. 28, 1896	70	240	Increase	.....	.58
	" 30, "	27	532	"	.....	.48
	Jan. 1, 1897	38	507	"	.....	.33

NOTE. — The colors on the above are those of the Boston Water Works scale.

	Color.		
	Applied Water.	Filtered Water.	
August 14, 1896.....	0.42	0.30	Boston Water Works scale.
" 24, "	0.45	0.29	
" 31, "	0.44	0.25	
September 8, "	0.43	0.25	
August 14, "	0.43	0.26	State Board of Health colors.
" 24, "	0.49	0.25	
" 31, "	0.48	0.19	
September 8, "	0.44	0.19	

The channel of Indian brook has been excavated and its banks gravelled for a distance of about 1,000 feet. The long shed which had been used as a barn and which stood on the site of Bed 5 was removed. One-half of it was sold, and the other half moved to the attendant's house. The walk on the top of the dam has been regraded with proper materials.

The average number of organisms for the year was 137 per cc. against 72 per cc. for 1895, and of amorphous matter 178 against 234 for 1895.

Diatomaceæ were present throughout the greater part of the year. The most abundant growth consisting mainly of Tabellaria, occurred in September.

Infusoria were present throughout the greater part of the year, although not in very large numbers. During the latter part Glenodinium was more abundant.

Anthrophysa was present in the influent in June. Investigation showed that there was a large growth of Infusoria in several enlargements of the influent stream or pockets at the head of the reservoir, and some special studies were made of these growths.

Chlorophyceæ and Cyanophyceæ were present from June to September. There was a large growth of Draparnaldia on the stones at the head of the reservoir in November, but none was observed free in the water.

RESERVOIR 8.

Grades, H. W., 327.91; Bottom of Gates, 317.78.
Area at 327.91, 601 acres; Contents, between 327.91 and 317.78, 1,256,900,000 gals.

On Jan. 1, 1896, water in this reservoir stood at elevation 325.29 or 2.62 feet below high water. The outlet gate

was open. On March 4 the water was at 326.07 and on March 29, when the gate was closed, was at 325.58. The water then rose to 326.58 on April 26. It remained at about this level until June 30, falling to 325.82 on September 16, when the outlet gate was opened to furnish water to Reservoir 2 for the supply of the city. On October 17, when the gate was closed, the surface was at 324.56. It then rose to 324.92 on November 17, when the gate was again opened. The water then fell to 324.35 on Nov. 30, when the gate was finally closed, after which it gradually rose to 324.77 on December 31.

The highest elevation reached during the year was 326.71 on June 16 and 18, and the lowest 324.35 on November 30.

Weir measurements of the waste have been taken as usual.

Towards the last of the year, it was decided to raise the dam at the outlet in order to store an additional two feet in depth of water. It was found that besides raising the dam, it would be necessary to build a dyke at the cove, on the north-westerly side of the reservoir, to rebuild a culvert and raise a short piece of road at the southerly extremity, and also as a precautionary measure to build a coffer-dam across the narrow part of the reservoir, about 130 feet above the old dam. Work was commenced December 28, by driving sheeting at the site of the dyke.

FARM POND.

Grades, H. W., 149.25; Low Water 146.00.
Area at 149.25, 159 acres; Contents, between 149.25 and 146.00 165,500,000 gals.

On Jan. 1, 1896, water in this pond was at elevation 149.67. On February 10 it had risen to 150.22, but water was then wasted into Sudbury river, and the surface fell to 149.25 on February 20. It then began to rise and on March 12 reached 149.77, when water was again wasted into the Sudbury river, and it receded to 149.11 on March 14. It then rose to 149.57 on April 4, when it began to recede, and on September 3 had fallen to 148.21. The water then rose to 148.53 on September 14, and from this time to the end of the year remained between 148.50 and 149.00.

The highest elevation reached during the year was 150.22 on February 10, 11 and 12, and the lowest 148.21, on September 3 and 5.

No water for the supply of the city has been drawn from this pond during the year.

The Framingham Water Company has pumped 139,300,000 gallons during the year, an average of 380,601 gallons daily.

The total amount of waste was 93,900,000 gallons, of which 2,000,000 gallons were used in cleaning the aqueduct, and the remainder wasted into the river.

LAKE COCHITUATE.

Grades, H. W., 134.36; Invert of Aqueduct, 121 03; Top of Aqueduct, 127.36.
Area, Water Surface at 134.36, 785 acres.
Contents, between 134.36 and 127.36, 1,515,180,000; between 134.26 and 125.03, 1,910,280,000 gals.
Approximate Contents, between 134.36 and 121.03, 2,447,000,000 gals.; between 134.36 and 117.03, 2,907,000,000 gals.

On Jan. 1, 1896, water in the lake was at elevation 132.30 or 2.06 feet below high water. On January 24 it had fallen to 131.86, but on February 8 rose to 133.86. The waste was opened for a while. On February 19 it rose to 134.02 and the waste gate was again opened, and kept open nearly all the time until April 9, when it was finally closed. On April 9 the water was at 134.20, and on April 23 it had risen to high water, 134.36. The surface gradually fell to elevation 127.77 on October 13, from which date it remained at about 128.00 until the end of the year.

The amount of water wasted from the lake at the outlet dam was 42,900,000 gallons in January, 434,300,000 gallons in February, 1,262,200 gallons in March, and 167,600,000 gallons in April; a total of 1,907,000,000 gallons.

In April 300,000 gallons were turned into the lake from the Sudbury sources, and in May 35,200,000 gallons, a total of 35,500,000 gallons.

All of the flash-boards have been in place on the crest of the outlet dam during the year. All of the at stop-planks the circular dam were put in place on June 6, and on November 2 one stop-plank was removed.

Early in the autumn the low level of the lake rendered it probable that it might be necessary to pump into the aqueduct to maintain the supply. In consequence, all the machinery for this purpose was overhauled, tested, and put in perfect readiness to begin pumping. The platforms for the pumps and shafting were completed as far as possible. One of the Atlas engines, intended for pumping at the lake, was in use at the Natick filter beds. An Ames engine was taken from the storehouse at South Framingham to take its place. The heavy rainfall in September enabled the supply to be kept up, without resorting to pumping.

Early in the summer, G. F. Whitney built a boat-house within a few feet of the city's line on his land on the east shore of Pegan meadows, and attempted to grade from his boat-house over the city's land to the water. In order to

stop further trespassing, a fence, 900 feet long, and passing by the boat-house, was built on the line between the city and Whitney.

The Natick sewerage works were completed and put in use last fall.

The Pegan filter beds have been in use the larger part of the time during the year. The following table shows the total number of gallons of water pumped, the amounts delivered to each bed, etc., for each month of the year:

MONTH, 1896.	No. of Days Pumps were run.	AMOUNT OF WATER PUMPED.		AMOUNT OF WATER DELIVERED ON BEDS.		
		Total for Month.	Average for each Day Pumps ran.	No. 1.	No. 2.	No. 3.
		Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
January	28	25,726,000	918,800	5,184,000	7,873,000	12,669,000
February	29	28,544,000	984,300	3,953,000	10,919,000	13,672,000
March	31	33,826,000	1,091,200	8,003,000	11,664,000	14,159,000
April	30	31,266,000	1,042,200	13,381,000	17,010,000	875,000
May	25	16,265,000	650,600	3,046,000	.....	13,219,000
June	23	19,213,000	835,300	8,618,000	10,206,000	389,000
July	23	10,562,000	459,200	1,166,000	1,685,000	7,711,000
August	9	7,420,000	824,400	1,782,000	.....	5,638,000
September	29	21,028,000	725,100	5,605,000	4,471,000	10,952,000
October	30	21,352,000	711,700	3,013,000	.....	18,339,000
November	27	21,092,000	781,200	12,069,000	8,116,000	907,000
December	29	21,805,000	751,900	10,773,000	1,361,000	9,871,000
For the year	313	258,099,000	824,600	76,593,000	73,305,000	108,201,000

The total amount of coal used during the year was 320,425 pounds; 805.5 gallons were pumped per pound of coal.

Bacteria in Effluents of Natick Filter Beds.

Drain	No.	2	(for	3	months)	.	.	.	17
"	"	3	"	4	"	.	.	.	3
"	"	4	"	10	"	.	.	.	18
"	"	5	"	8	"	.	.	.	8

The bottom of the waste way of the receiving basin at the filter beds, which was built of paving imbedded in sand, was caved in, and the side walls cracked and lowered in some places by the wasting of water early in the year. During the summer the bottom was thoroughly repaired by replacing the paving on a bed of concrete for the entire length of the waste-way, and the side walls were taken down and rebuilt where necessary. On the north side of the waste-way sheeting was driven and a concrete core-wall built to the border of the city land, on the centre line of the dam produced, to prevent the percolation of water from the basin.

This winter quite a large quantity of roots, hummocks, etc., which had been raised by the ice, and deposited on Pegan meadows, were removed above high water, and the appearance of the meadow improved.

No adjustment of damages has yet been made between the Boston & Albany Railroad and the Water Department for the damage caused by filling into and across the lake. Some of the city land was also taken by the railway which has not yet been paid for.

The average number of organisms for the year was 569 per c.c. against 360 per c.c. for 1895. The amorphous matter was 411 per c.c. against 569 last year.

The spring growth of diatoms reached a maximum of 450 on May 25. They were not abundant again until November 1, when a vigorous growth of Asterionella commenced, which amounted to 1,500 per c.c. on November 23, and decreased slowly during December. In connection with the autumn growth there was considerable Melosira, especially at the mid-depth and bottom.

Infusoria have been present during the year, but were not abundant until the middle of July, when a growth of Mallomonas appeared at the mid-depth. They reached a maximum of 3,640 on August 4, and disappeared as a distinct growth about the middle of October. A growth of Uroglena, which commenced about the middle of June, appeared to be the cause of a simultaneous growth in Chestnut-Hill Reservoir. Anabæna (sterile) was present during January, but the main growth of Chlorophyceæ and Cyanophyceæ did not begin until June 1. They were represented mainly by Protococcus, Microcystis, Anabæna, and Anabæna (sterile). The autumn growth of Anabæna (sterile) began about the middle of November, and continued through the remainder of the year.

Crenothrix appeared at the bottom on July 1, and was noticed a few times at other depths after the overturn of the

water in the autumn, which occurred between November 13 and 15.

Feeders of Lake Cochituate.

Means of Monthly Observations (1896).

	Temperature.	Color.	Organisms.	Amorphous.	Bacteria.
Beaver Dam brook (mouth of brook),	53.6[2]	0.86	99	214	434
Beaver Dam brook (last culvert) ...	54.9[2]	0.80[1]	133[1]	214[1]	355[3]
Course brook	54.0[3]	0.89	283	235	395
Dug pond	60.6[4]	0.21	478	213	223[1]
Circular dam	54.9[2]	0.78	43	169	727
Pegan brook	60.0[5]	0.24	68[5]	646[5]	3,775[2]
Snake brook	50.1[4]	0.55	69	271	337

[1] For 11 months. [3] For 9 months. [5] For 7 months.
[2] " 10 " [4] " 8 " [6] " 5 "

DUDLEY POND.

Grades, H. W., 146.46; 18-inch Pipe, 130.36 and 127.36.
Area, Water Surface, 81 acres; Greatest Depth, 27 feet; Contents, above 130.36, 250,000,000 gals.

On Jan. 1, 1896, water in this pond was at elevation 143.53 or 2.93 feet below high water, and on December 31 it was at 143.16. No water has been drawn from the pond during the year.

SUDBURY-RIVER AQUEDUCT.

Grades, 141.352 at Farm Pond; 124.051 at Terminal Gate-House.
Length, 15.89 miles; Size, 7 ft. 8in. × 9 ft.; Capacity, 109,000,000 in gals. 24 hours.

The three portions of this aqueduct are in good condition. The supply and Farm-pond aqueducts were cleaned once by machine on April 16. The main aqueduct was cleaned by machine from Farm pond to the West Siphon Chamber on April 22 and 23, and by hand from East Siphon Chamber to Chestnut Hill-Reservoir on May 14 and 15.

While the Supply and Farm-pond aqueducts were undergoing their annual cleaning on April 16, 50 feet of the main aqueduct, easterly from the gate-house at Farm pond, was cleaned; also the muddy deposits of the swampy sections as far as the Rockland tunnel; also Course-brook Waste-Weir and 50 feet easterly and westerly from the weir, Bacon's Waste Weir and Fuller's Waste Weir and 50 feet each side

of the weirs; also the muddy deposit on the arch from Waban bridge to West Pipe Chamber; also the pipe chamber, and 50 feet of aqueduct in a westerly direction.

On April 30 the Rockland and Badger Hill tunnels were both cleaned. They were covered with a black deposit and sponge growth, the latter on the bottom and one foot above the same, only. In the Beacon-street tunnel 40 lbs. of slate stone had fallen at Station 780 + 55 and 6 lbs. of conglomerate at Station 791+25. The concrete lining and railroad track were found in excellent condition.

The 48-in. pipes in Reservoir 1 have been flushed into the river below Dam 1, once during the year.

The three portions of the aqueduct have been in use for the same length of time, 359.2 days.

The flow was stopped, except for cleaning the aqueduct, only three times during the year.

The amount of water sent to the city has been 14,857,300,000 gallons, a daily average of 40,594,000 gallons. Besides the above, 35,500,000 gallons have been turned into Lake Cochituate.

The whole line of the aqueduct is in most excellent condition, with the exception of the Waban arches. A large amount of careful attention has been given to every structure, the fences, iron work, roofs, etc., and their maintenance reflects credit on the small maintenance force of five men.

Last year the Waban arches were thoroughly repaired at considerable expense, and they were made absolutely watertight; but they are now leaking badly again. It has been proved that it is impossible to keep the aqueduct tight under all the changes of temperature in this climate, and it is simply a matter of time when the masonry is irretrievably ruined, unless constant efforts are made to keep it in repair. On February 14, 1896, an examination was made of the bridge between the bottom of the aqueduct and the longitudinal galleries under the same. The upper gallery on the north side of the bridge was found covered with ice to a depth of 4 inches. This ice extended the whole length, with the exception of 100 feet at each end. In the other two galleries the ice covered about one-half the length of the structure. The ice extended upward 1 foot on to the adjacent walls. On the north wall of the north gallery the ice reached the top. In places the water was percolating through the walls, and standing to a depth of three-quarters of an inch in places in the southerly galleries.

The top of the main arches beneath the galleries were covered with ice over their whole surface, as far as could be

seen, which appeared to be about 6 inches in thickness. Frost and ice were visible on the vertical portions of the work throughout.

A year later similar conditions were found, and the masonry was leaking badly. Water was running into the tell-tale pipes at the end of the bridge. At the easterly end the stream was 1 foot wide and $\frac{1}{2}$ inch deep. At the westerly end the stream was 2 feet wide and 1 inch in depth with considerable velocity. These streams did not represent all the leakage, as some water was percolating into the spaces over the main arches. In thawing weather this water makes its way through the joints in the granite. In the interior of the work the cement joints are working out and plastering is forced off. Exterior joints are displaced by the action of the frost and the running out of the water. If this action is going on in as fine a piece of masonry as the Waban arches, built with every apparent precaution and well drained, what must it be in an inferior piece of aqueduct bridge construction? It will probably be necessary to line the aqueduct over the Waban arches with lead and then to repair the masonry thoroughly.

A tunnel has been built under the aqueduct at Newton Highlands to contain a sewer. The building of these sewers under the aqueduct has always proved a costly and dangerous operation. This year it was determined to try a novel scheme. Excavations were made on each side of the aqueduct to the desired depth. Steel cylinders, 6 feet 6 inches long, were then forced through the soil by a jack-screw and the material excavated from in front of them. The cylinders were in telescopic form, the largest 5 feet 10 inches in diameter, and the smallest 5 feet inside measurement. They were made of boiler steel, $\frac{3}{8}$ inch thick, in one sheet lapped and fastened with one row of rivets. When placed in position in the tunnel, each cylinder lapped over the adjoining one 6 inches. The whole length of the tunnel was 35 feet between the plank bulkheads at each end. There were 7 feet 6 inches of roof between the under side of the bottom of the aqueduct and the steel cylinders. It was 27 feet from the top of the embankment to the bottom grade line of excavation.

The material was a coarse loose gravel, containing stones of all sizes up to 2 cubic feet. One jack-screw properly applied did all the work. This method of construction is a great success, and avoids any settlement of the material under the aqueduct. The excavating was done when the cylinder was hard pressed against the gravel. The gravel around the edge of the cylinder was first scraped away with trowels and

a sharp pointed hammer; the central portion would then fall of itself. When large stones were met partially outside the line of the cylinders, they were carefully removed and the cavities filled with stiff cement. Two men at the jack-screw outside and two men in the cylinders did all the work. The tunnelling was all done from one end. It was found important to have each cylinder 2 inches smaller than the preceding one in order to keep the alignment true. The average time of driving each cylinder, excavating the gravel and removing the same was $12\frac{2}{3}$ hours.

After the tunnel was completed, the sewer and underdrain were built inside of it, and all spaces filled with masonry.

This same method has since been tried on the Cochituate aqueduct in the presence of water, the water being first lowered by pumping, so that the excavation was comparatively dry.

Cochituate Aqueduct.

Grades, 121.03 at Lake; 116.77 at Brookline Reservoir.
Length, 14.60 miles; Size, 5 ft. × 6 ft. 4 in.; Capacity, 20,000,000 gals. in 24 hours.

This aqueduct has been in constant use during the year, except from 5 P.M., April 5, to 5 A.M., April 9, when the flow was stopped for cleaning the interior.

A depth of $6\frac{1}{2}$ feet has been maintained in the aqueduct, except for the last six days of December, when the lake was not high enough to furnish this flow.

The aqueduct was cleaned from the gate-house at Lake Cochituate to the influent gate-house at Chestnut-Hill Reservoir on April 6, 7 and 8. From the lake to Station 10 + 00, Division 1, there was found a large quantity of moss, some Spongilla, and a black deposit about one inch in depth. To Station 27 + 00 the Spongilla was increasing, the moss decreasing, and the deposit about the same. From Station 27 + 00 to Station 130 + 00, Division 1, the Spongilla and deposit were decreasing, and there was no moss. From Station 130 + 00 to the Charles-river bridge the Spongilla and deposit gradually decreased. From Charles-river bridge to the influent gate-house there was a considerable deposit, but not much Spongilla.

The part of the aqueduct from the influent gate-house to Brookline reservoir was not cleaned, as the water could not be shut off from that section.

The sewer at Newton Highlands, which was mentioned as passing under the Sudbury-river aqueduct, also crosses the line of this aqueduct. The tunnel was driven by the method already described, but in this case pumping was necessary to keep down the water.

Another sewer has been laid across the aqueduct on the Newton Boulevard, opposite Irving street, Newton Centre. In order that the sewer might be perfectly tight it consisted here of a 10-inch iron pipe, 43 feet long, with lead joints. The sewer and the 6-inch earthen sub-drain are surrounded by from 6 inches to 10 inches of American cement concrete.

A private sewer, 8 inches in diameter, crossing the aqueduct about 1,200 feet west of the Chestnut-Hill reservoir grounds has been made secure in the same way as the preceding.

A new iron ladder has been put in the Newton Centre Waste Weir, and all the iron work there scraped and painted with one coat of asphalt paint.

The bushes along the line of the aqueduct have been mowed for a width of about 60 feet from Lake Cochituate to Newton Centre, a distance of about 10½ miles.

The bound stones from Wellesley to Lake Cochituate have been examined, and those which had been disturbed by frost have been reset. Missing bound stones along the whole length of the aqueduct should be replaced.

CHESTNUT-HILL RESERVOIR.

Grades, H. W., 125.00; Dam, 128; Effluent pipes, 99 80.
Area, Lawrence Basin, 37.5 acres; Contents, 166,000,000 gals.; Area, Bradlee Basin, 87.5 acres; Contents, 391,000,000 gals.
Total Contents above grade, 100.00, 557,000,000 gals.

The extension of Commonwealth avenue, which cut through a portion of the driveway, has necessitated the removal of the arch, which marked the beginning of the driveway. It was taken down in June, and the stones numbered and piled on the reservoir grounds.

The stone wall on South street, near the Lawrence basin, which had to be removed, on account of the construction of the Commonwealth-avenue boulevard through a portion of South street, has been rebuilt by the Street Department.

A pipe has been laid to the stable, for the purpose of protecting it in case of fire. The necessary hose and connections have been provided.

An extensive series of experiments was made in the spring on the flow of water through the 36-inch force main leading to Fisher Hill Reservoir, with velocities ranging from 0.5 to 4.5 feet per second. The quantity of water flowing was measured at the 10-foot weir at Fisher Hill. The frictional loss was found to be much larger than had been anticipated. The coefficient c in the Chezy formula, $v = c\ (RS)^{½}$ was found to be as low as 113, although the pipe had been laid less than two years. To determine, if possible, the cause of

this great frictional loss the pipe was partially drained, and entered at one end. The interior surface was found to be somewhat tuberculated, and entirely covered with a slimy growth of one of the protozoa. More than a third of the surface felt roughly granular, as though covered with incipient tubercles.

A 100-foot standard of length has been established at Chestnut-Hill Reservoir for the purpose of testing measuring tapes. The standard consists of a steel bar one inch by one-quarter inch in cross section, resting on rolls one foot apart. It is supported by a bench, built along the side of the manure shed, at an average height of about four feet from the ground. It is provided with covers to protect the steel from the weather. It is graduated every ten feet on silver discs set into the steel. The graduations were obtained from the United States standard at Washington by two steel tapes which had been tested by the United States Coast and Geodetic Survey. A long series of comparisons of these tapes with the bar as graduated was made, for the purpose of determining the true length of the bar. The results were adjusted by the method of least squares, giving

100 feet — .0061 inch ± .0019 inch
as the length of the bar at 62° Fahr.

A simple and inexpensive apparatus for cleaning mercury, devised by Professor Crafts, and extensively used at the Massachusetts Institute of Technology, has been set up for the purpose of purifying the mercury used in our pressure gauges, and has proved entirely satisfactory.

The average number of organisms for the year in samples of water collected at the effluent gate-house was 224 per c.c. The average number of organisms in samples taken from the surface, mid-depth, and bottom, near the centre of the reservoir for nine months, was 245 per c.c. The organisms have as usual followed closely those of the sources from which the water was drawn.

The average number of organisms for the year at the taps in the city was 182 per c.c., as against 142 in 1895.

Chestnut-Hill Pumping Station.

By your order, dated May 27, this pumping-station, formerly in the Eastern Division, was placed in my charge, beginning June 1.

Since that date the electric plant has been entirely overhauled, a new dynamo and engine installed, and the wir-

ing put in proper condition under the supervision of the Commissioner of the Electrical Division, Public Buildings Department.

Extensive repairs have been made by the Lockwood Manufacturing Company on Gaskill Engine No. 1, extending through the months of November and December.

The coal-hoist has been improved by extending the platform and removing the old hopper, so that the bucket can be filled from the cars, thus doing away with one handling of the coal.

A Cochrane Separator for removing the oil from the feed-water has been put in. An oil-filter has been set up, and a new exhaust-pipe put in to heat the oil to be filtered. The Belpaire boiler was boiled out to remove the oil which had accumulated.

New Johns grates have been put under the Belpaire boiler.

A measurement over the Fisher Hill Weir of the water pumped by Engine No. 3 showed a slip of nearly 8 per cent. An examination of the pumps was accordingly made, and it was found that the plungers had worn so that there was a considerable space around them. Plans are now being made by Mr. E. D. Leavitt for stuffing boxes for the plungers.

A large increase in the capacity of the pumping-plant will soon be required. The Metropolitan Water Board will before the end of 1897 assume control of the pumping station.

BROOKLINE RESERVOIR.

Grade, H. W., 125.00; Area, 12 acres; Greatest Depth, 24 feet; Contents, 119,583,960 gals.

Everything in connection with this reservoir is in good condition. No work other than maintenance has been done at this point during the year.

For a number of years there has been a disagreement with the Assessors of Brookline, regarding the taxes assessed by them on lands of the city of Boston, lying in the town of Brookline. An understanding with the Town Engineer has been reached, according to which the areas taxable in Brookline are as stated by him in a communication to the Board of Assessors, of which the following is a copy:

TOWN OF BROOKLINE, OFFICE OF TOWN ENGINEER.
TOWN HALL, BROOKLINE, MASS., Sept. 19, 1896.

To the Assessors of Brookline:

GENTLEMEN: On the 28th of July, at the request of your Board, I furnished you a statement of areas of lands in Brookline, owned by the city of Boston for water-works purposes.

Those areas were made up from the best data then at hand. More recently, Mr. FitzGerald has kindly placed at my disposal data taken from the original records of lands purchased and taken, which modify to some extent the areas above referred to, so that for the purposes of assessment, the following areas should be used:

The Boston Reservoir, Boylston street, about	1,447,576 sq. ft.
Aqueduct location from Chestnut Hill avenue to High-Service Pumping Station, about	299,593 " "
Water-pipe location, Beacon street to Sumner Road, about	232,880 " "
Fisher-Hill Reservoir land, about	459,670 " "
Total	2,439,719 sq. ft.

Respectfully,

ALEXIS H. FRENCH,
Town Engineer.

FISHER-HILL RESERVOIR.

Grades, H. W., 241.00; Pipe inverts, 220.00; Depth, 21 feet; Contents, 15,400,000 above 223

This high service reservoir is in good condition. It has been maintained by the Chestnut-Hill Reservoir force.

The wooden flap valve over the end of the branch pipe, leading to the 10-foot weir, was found to be leaking badly. It has accordingly been removed and rebuilt, and is now perfectly tight.

The 5-foot measuring weir in the gate-house was found in very bad condition, so that it could not be used. It was therefore torn out, and a new one built in October. The crest of the new weir is about 1.70 feet higher than that of the old one, so that the reservoir need not be drawn so low as was formerly necessary in order to use the weir. The screens for "smoothing" the water as it approaches the weir are built in sections, and are so constructed that they can be removed from the gate-house when not needed, thus removing a slight obstruction to the flow of the water.

INSPECTION OF WATER SOURCES.

The following is a summary of the work of the inspection of pollution department for the year 1896:

Total number of cases inspected	597
Old cases	586
New cases	11

Present condition of all cases:

Remedied	147
Present safe	387
Seem safe	36
Suspected	8
Unsatisfactory	19

Legal notices, 9.

No legal injunctions were necessary during the year.

BIOLOGICAL LABORATORY.

During the year 1896, 1,568 microscopical examinations of water were made at the laboratory. Of these, 1,401 were of the regular weekly samples, and 167 were in connection with special investigations of the sources of supply.

The usual number of bacteriological examinations were made, and it is hoped that in the future more prominence may be given to this side of the work. The work in bacteriology has been greatly facilitated by the introduction of gas into the laboratory and the use of a thermostat for growing cultures at 98° Fahr.

Special attention has been given during the year to the indications obtained by the analyses of the regular samples collected from the different sources of supply, with a view of tracing the different growths of algæ to their original sources and studying the causes. These investigations have been made the subject of special reports. As examples, may be mentioned the investigation of the connection between the presence of Uroglena in Chestnut-Hill Reservoir and Lake Cochituate, and the growth of Infusoria in the pockets at the head of Reservoir 6; the influence of the work on Dam No. 5 on the water of Reservoir 3.

The estimation of the degree of turbidity by means of a disc, containing alternate dark and light quadrants, was studied in Lake Cochituate.

The comparison of the effect of storage in Reservoirs 4 and 6 was continued through the year, and it is hoped that general conclusions can be drawn from the results.

The efficiency of the filter beds at Reservoir 6 was made the subject of study near the close of the year.

Stagnation phenomena have been followed by means of the regular series of temperature observations taken at the different sources.

The extent of circulation and mingling of water from the Cochituate and Sudbury aqueducts in the Chestnut-Hill Reservoir, was investigated by means of an extensive series of color readings.

On account of the proposed increase in the use of Whitehall pond (Reservoir 8) as a source of supply, samples will soon be collected from it regularly for examination.

The following tables give first the average condition of the chemical analyses of the tap water as made under the direction of the State Board of Health, and second the averages of monthly analyses of the sources of supply; then follow biological tables, which are the result of the work in the laboratory at Chestnut-Hill Reservoir. Following these tables are the usual tables of detailed expenditure and rainfall.

Very truly yours,

Desmond FitzGerald,
General Superintendent.

Average Condition of Tap Water, Boston, 1896. (State Board of Health.)

PARTS IN 100,000.

LOCALITY.	Color.	RESIDUE ON EVAPORATION.			Chlorine.	NITROGEN.					Oxygen consumed.	Hardness.
		Total.	Loss on ignition.	Fixed.		Albuminoid Ammonia.		Free Ammonia.	Nitrites.	Nitrates.		
						Unfiltered.	Filtered.					
Service pipe Mass. Inst. of Technology.....	0.49[1]	4.29	1.67	2.62	0.37	.0165	.0142	.0005	.0001	.0155	.5594	1.4

[1] = 0.45 Boston Water Works Standard (Platinum-Cobalt.)

Average of Monthly Analyses, Jan. 1 to Dec. 31, 1896.

PARTS IN 100,000. (STATE BOARD OF HEALTH.)

LOCALITY.	Color.	RESIDUE ON EVAPORATION.			Chlorine.	NITROGEN.					Oxygen consumed.	Hardness.
		Total.	Loss on ignition.	Fixed.		Albuminoid Ammonia.		Free Ammonia.	Nitrites.	Nitrates.		
						Unfiltered.	Filtered.					
Reservoir No. 2, influent	0.85	4.13	1.86	2.27	.29	.0244	.0219	.0012	.0001	.0053	.9042	.9
Reservoir No. 2, near outlet, 8 feet below surface	0.74	4.08	1.86	2.22	.30	.0233	.0197	.0011	.0001	.0051	.8361	.9
Reservoir No. 3, near outlet, 1 foot below surface	0.94	7.47	2.50	4.97	.41	.0318	.0254	.0059	.0003	.0188	.9444	2.3
Reservoir No. 3, near outlet, 8 feet below surface	0.66	5.04	1.84	3.20	.37	.0234	.0193	.0031	.0001	.0186	.6567	1.7
Reservoir No. 4, influent	1.17	4.74	2.37	2.37	.26	.0285	.0260	.0011	.0000	.0034	1.2150	1.0
Reservoir No. 4, near outlet, 1 foot below surface	0.70	3.71	1.76	1.95	.25	.0228	.0199	.0007	.0000	.0024	.8413	.9
Reservoir No. 4, bottom [1]	0.73	4.07	1.89	2.18	.26	.0213	.0186	.0012	.0000	.0039	.8840	1.0
Reservoir No. 6, influent	1.37	5.95	3.04	2.91	.49	.0337	.0309	.0020	.0001	.0039	1.5225	1.3
Reservoir No. 6, near outlet, 1 foot below surface	0.64	3.86	1.74	2.12	.32	.0208	.0175	.0017	.0001	.0040	.7126	.9
Reservoir No. 6, bottom	0.63	3.82	1.75	2.07	.35	.0189	.0164	.0013	.0001	.0050	.7154	.9
Lake Cochituate, gate-house	0.29	4.88	1.65	3.23	.50	.0176	.0145	.0012	.0002	.0131	.4469	1.9
Service Pipe, Mass. Inst. Tech., Boston	[2] 0.49	4.29	1.67	2.62	.37	.0165	.0142	.0005	.0001	.0155	.5594	1.4
Mystic Lake	0.16	11.71	2.46	9.25	1.68	.0220	.0134	.0016	.0008	.0568	.2756	4.3

[1] Average for nine months. [2] = 0.45 Boston Water Works Standard (Platinum-Cobalt.)

Lake Cochituate, 1896.

MONTH.	ORGANISMS.[1]					AMORPHOUS.[1]					REMARKS.
	Sur.	Mid.	Bot.	Mean.	Willow Br.	Sur.	Mid.	Bot.	Mean.	Willow Br.	
January	305	375	472	384	24	181	174	221	192	111	Diatomaceæ and a few Infusoria.
February	180	196	215	197	25	204	199	438	280	216	
March	92	159	182	144	244	192	136	106	145	279	
April	457	465	430	451	230	177	206	201	195	264	
May	642	352	405	466	202	129	204	261	198	181	Diatomaceæ and a few Infusoria.
June	600	406	303	436	242	225	194	282	234	182	Chlorophyceæ. Diatomaceæ. Cyanophyceæ.
July	232	880	587	566	463	121	216	487	275	165	Chlorophyceæ. Cyanophyceæ. — Crenothrix at bottom.
August	141	1,978	278	799	243	148	420	591	386	173	Infusoria. Cyanophyceæ.
September	244	236	912	464	205	160	391	2,540	1,030	154	Cyanophyceæ. Infusoria decreasing.
October	518	351	163	344	298	198	247	2,337	927	157	Cyanophyceæ. Diatomaceæ.
November	1,200	1,197	1,131	1,176	99	331	328	1,476	712	167	Diatomaceæ. Cyanophyceæ.
December	1,467	1,289	1,447	1,401	125	285	289	498	357	160	Diatomaceæ. Cyanophyceæ. — Crenothrix after overturn of the water.
Mean	507	657	544	569	200	196	250	787	411	184	Diatomaceæ. Cyanophyceæ.

[1] Standard units per c.c.

Reservoir 2, 1896.

Month.	Organisms.[1]					Amorphous.[1]					Remarks.
	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	
January	13	21	17	17	13	131	119	159	136	139	Diatomaceæ most abundant during the late spring and early summer.
February	16	10	35	20	15	123	129	169	140	97	
March	23	14	13	17	17	142	138	150	143	135	
April	115	135	91	114	116	157	156	176	163	149	
May	105	168	130	134	164	213	146	135	165	250	Chlorophyceæ present in small numbers during summer.
June	267	287	231	262	83	273	253	327	284	342	
July	100	145	86	110	99	200	218	317	245	196	
August	141	373	63	192	51	145	214	217	192	189	Infusoria present in small numbers throughout the greater part of the year.
September	62	55	82	66	44	166	169	206	180	190	
October	52	25	52	43	23	209	217	248	225	139	
November	56	140	66	87	111	123	196	135	151	98	
December	93	71	74	79	74	139	156	152	149	154	
Mean	87	120	78	95	68	168	176	199	181	173	

[1] Standard units per c.c.

Reservoir 3, 1896.

Month.	Organisms.[1]					Amorphous.[1]					Remarks.
	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	
January	36	31	33	33	9	138	133	217	163	365	Diatomaceæ were present in small numbers in May and were abundant from October until the last of the year.
February	20	6	15	14	2	214	208	194	205	331	
March	18	14	20	17	5	453	304	480	412	314	
April	272	333	273	293	123	147	111	146	135	122	
May	66	85	139	97	111	381	380	537	433	1,229	
June	219	308	238	255	89	263	378	338	326	2,559	
July	815	622	591	676	37	198	199	226	208	1,610	Infusoria were most abundant in April and May.
August	1,269	939	993	1,067	105	252	255	371	293	658	
September	890	703	832	808	66	218	322	273	271	3,606	
October	1,163	1,438	1,110	1,237	129	263	349	406	339	1,022	Chlorophyceæ and Cyanophyceæ present from June until October. Cœlosphærium 2,140 on the last of August.
November	956	949	1,160	1,022	165	188	181	275	215	566	
December	562	479	566	536	69	254	208	217	226	608	
Mean	524	467	498	506	76	247	252	307	269	1,083	

[1] Standard units per c.c.

Reservoir 4, 1896.

Month.	Organisms.[1]					Amorphous.[1]					Remarks.
	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	
January	14	37	20	24	3	66	182	138	129	48	Diatomaceæ, mainly Cyclotella, present throughout the year. The maximum number reached in December.
February	15	8	16	13	7	175	118	119	137	78	
March	12	5	7	8	18	169	211	228	203	106	
April	76	89	80	82	61	103	74	148	108	75	
May	172	103	34	103	89	127	137	148	137	136	
June	175	92	25	97	62	107	100	126	111	150	
July	108	8	48	55	98	117	165	169	150	175	
August	37	27	60	41	12	107	158	155	140	158	Chlorophyceæ present in small numbers in July.
September	30	54	48	44	79	398	254	292	315	99	
October	50	67	84	67	78	309	330	427	357	378	
November	171	232	217	207	121	151	153	173	159	102	
December	273	570	629	491	56	151	163	178	164	129	
Mean	94	108	106	103	57	165	170	192	176	136	

[1] Standard units per c.c.

Basin 6, 1896.

Month.	Organisms.[1]					Amorphous.[1]					Remarks.
	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	
January	10	12	15	12	25	82	84	105	90	77	Diatomaceæ present in small numbers throughout the year.
February	8	3	3	5	1	121	105	130	118	56	
March	7	4	4	5	13	173	164	166	168	157	
April	64	33	28	42	126	146	140	127	138	88	Maximum growth in September.
May	111	86	29	75	206	164	215	222	200	156	
June	158	82	66	102	89	173	114	167	151	161	Infusoria present in small numbers throughout the greater part of the year.
July	213	42	18	91	366	131	133	179	144	208	
August	482	62	48	197	244	132	154	166	151	199	
September	670	519	414	634	300	488	261	430	393	122	
October	250	236	348	228	42	209	249	282	247	97	Chlorophyceæ and Cyanophyceæ June to September.
November	190	176	186	184	43	179	196	185	187	85	
December	105	164	89	119	17	136	148	175	153	85	
Mean	189	118	104	137	106	178	164	195	178	124	

[1] Standard units per c.c.

Gate-Houses and Taps, 1896.

Month.	Chestnut Hill Reservoir.						Brookline Gate-House.		Taps in City.			
	Organisms.[1]			Amorphous.[1]			Organisms.[1]	Amorphous.[1]	Organisms.[1]		Amorphous.[1]	
	Sudbury.	Cochituate.	Effluent.	Sudbury.	Cochituate.	Effluent.			Park Sq.	Mattapan.	Park Sq.	Mattapan.
January	23	193	66	116	131	168	78	178	71	39	119	79
February	16	130	62	153	171	218	36	137	46	24	127	234
March	10	75	52	146	121	158	48	123	38	.....	124	
April	68	376	243	135	226	194	182	149	194	.....	131	
May	164	583	286	843	161	191	276	283	168	.....	206	
June	252	616	348	256	240	198	350	258	339	.....	265	
July	97	187	442	269	284	211	588	261	325	.....	236	
August	300	109	201	377	162	187	130	222	249	.....	275	
September	79	109	153	343	165	179	111	187	112	.....	179	
October	103	499	206	325	160	196	283	211	158	.....	183	
November	116	853	254	257	286	199	230	149	187	.....	195	
December	170	1,449	379	189	290	151	572	216	293	.....	175	
Mean	117	432	224	284	200	188	240	198	182	.....	185	

[1] Standard units per c.c.

Chestnut-Hill Reservoir, 1896.

MONTH.	ORGANISMS.[1]				AMORPHOUS.[1]			
	Sur.	Mid.	Bot.	Mean.	Sur.	Mid.	Bot.	Mean.
January	—	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—
April	260	182	191	211	163	163	148	158
May	154	239	160	184	204	199	222	208
June	481	483	266	410	234	193	418	282
July	414	367	151	311	196	201	215	204
August	229	202	74	168	233	184	1,148	522
September	117	151	124	131	162	170	690	341
October	177	194	222	198	219	195	228	214
November	246	286	228	258	179	188	295	221
December	363	324	321	336	214	205	210	210
Mean	271	270	193	245	200	189	397	262

[1] Standard units per c.c.

Temperature (Fahrenheit), 1896.

Month.	Lake Cochituate.				Basin 2.					Basin 3.					Basin 4.					Basin 6.				
	Sur.	Mid.	Bot.	Mean.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.
January	33.9	35.4	36.4	35.2	32.3	33.2	33.9	33.1	32.3	32.4	33.4	34.1	33.3	32.3	33.1	35.3	33.3	34.9	32.5	32.7	34.2	36.2	34.4	32.4
February	33.7	35.7	37.2	35.5	32.4	33.4	31.5	33.4	32.4	32.5	33.7	34.7	33.6	32.4	34.0	36.5	38.2	36.2	32.7	33.1	35.4	38.7	35.7	32.5
March	.....	.....	.....	.....	33.4	34.7	35.8	34.6	33.3	33.5	35.1	36.1	34.9	32.9	34.5	36.5	39.5	36.8	34.2	32.5	35.8	39.5	35.9	32.9
April	46.4	40.5	39.7	42.2	54.8	48.9	47.5	50.4	50.9	48.5	47.3	46.0	47.3	48.6	47.9	42.0	41.3	43.7	51.8	46.8	41.4	40.9	43.0	49.5
May	63.4	42.3	40.8	48.8	65.0	63.0	61.6	63.2	66 2	64.7	63.1	61.7	63.2	64.3	63.6	49.4	43.1	52.0	61.3	63.0	46.5	43.7	51.5	60.0
June	68.5	42.8	40.8	50.7	68.5	67.5	66.6	67.5	66.4	68.5	67.6	67.0	67.7	65.7	68.2	51.7	43.6	54.5	62.2	68.8	48.9	45.1	54.3	62.8
July	74.4	43.2	40.9	52.8	74.8	73.5	72.4	73.6	72.1	75.5	74.0	73.1	74.2	73.2	74.9	50.1	43.7	56.2	72.4	73.2	48.2	43.9	55.1	66.3
August	76.4	43.7	41.2	53.8	74.6	73.4	72.6	73.5	69.2	75.9	74.8	73.8	74.8	73.2	76.0	70.0	54.2	66.7	72.7	74.2	55.7	45.1	58.3	67.8
September	65.1	44.3	41.4	50.3	64.7	64.1	63.3	64.0	63.8	65.8	65.2	63.9	65.0	63.2	65.2	63.9	63.3	64.1	59.6	63.3	63.2	60.3	62.3	62.6
October	51.9	48.0	41.8	47.2	50.8	50.2	49.6	50.2	48.2	51.3	50.7	50.2	50.7	46.7	51.5	51.5	51.5	51.5	47.2	48.4	48.2	48.0	48.2	44.8
November	46.6	46.6	42.5	55.2	46.5	46.0	45.4	46.0	44.8	45.9	45.4	44.9	45.4	44.2	46.8	46.8	46.8	46.8	41.5	42.2	43.1	42.7	42.7	39.0
December	44.1	44.1	44.1	44.1	36.2	36.8	37.6	36.9	35.3	36.9	37.4	37.9	37.4	35.9	37.9	38.1	38.1	38.0	35.9	36.2	37.4	37.5	37.0	33.6
Mean	54.9	42.4	40.6	46.0	52.8	52.1	51.7	52.2	52.1	52.6	52.3	51.9	52.3	51.5	52.8	47.7	45.0	48.5	50.3	51.2	44.9	43.5	46.5	48.6

Temperatures (Fahrenheit), 1896.

MONTH.	CHESTNUT HILL RESERVOIR GATE-HOUSES.			CHESTNUT HILL RESERVOIR.			BR'K-LINE.	TAPS.	
	Sudbury.	Cochituate.	Effluent.	Surface.	Mid-depth.	Bottom.	Gate-House.	Park Sq.	Mattapan.
January	34.6	34.9	33.9	.....	.....	.....	35.0	36.0	39.4
February	34.8	36.7	35.2	.....	.....	.....	35.6	36.0	38.0
March	35.4	37.5	35.2	.....	.....	.....	36.0	37.7	
April	46.4	45.2	45.7	48.1	47.4	43.2	47.3	46.3	
May	62.9	61.9	61.4	62.8	59.7	50.9	62.8	60.0	
June	66.7	66.3	66.9	68.8	66.3	49.7	67.0	65.5	
July	72.3	73.2	73.5	75.1	72.3	54.1	73.1	72.6	
August	72.0	74.3	73.9	79.2	75.3	54.7	74.4	73.9	
September	66.1	67.1	67.1	67.8	65.0	60.4	66.9	66.5	
October	52.7	53.4	53.8	52.9	52.6	52.1	53.6	54.4	
November	46.7	48.3	47.8	48.1	48.0	47.5	47.4	48.9	
December	39.6	41.2	40.8	.....	.....	.....	39.4	41.4	
Mean	52.5	53.3	52.9	.....	.....	.....	53.2	53.3	—

Color, 1896. (Platinum Standard.)

Month.	Lake Cochituate.					Basin 2.					Basin 3.					Basin 4.					Basin 6.				
	Sur.	Mid.	Bot.	Mean.[1]	Influent Streams.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.	Sur.	Mid.	Bot.	Mean.	Influent.
January	.34	.34	.35	.34	.72	.70	.72	.70	.71	.71	.74	.72	.73	.73	.77	.93	.93	.93	.93	.90	.88	.86	.86	.87	1.12
February	.41	.40	.50	.44	.61	.63	.63	.65	.64	.64	.66	.66	.66	.66	.74	.83	.86	.86	.85	.74	.79	.85	.85	.83	.85
March	.49	.44	.46	.46	.52	.52	.52	.52	.52	.50	.62	.60	.63	.62	.58	.66	.75	.78	.73	.65	.63	.70	.75	.69	.58
April	.43	.44	.45	.43	.83	.53	.54	.53	.53	.67	.53	.52	.52	.52	.91	.63	.63	.63	.63	.79	.59	.59	.60	.59	1.10
May	.35	.38	.42	.38	.89	.63	.63	.63	.63	.80	.60	.60	.61	.60	1.11	.65	.63	.63	.64	1.07	.53	.54	.54	.54	1.34
June	.31	.37	.74	.47	.66	.67	.67	.67	.67	.86	.65	.65	.66	.65	1.44	.65	.63	.62	.63	1.24	.52	.52	.52	.52	1.89
July	.23	.31	1.06	.53	50	.66	.66	.66	.66	.64	.64	.64	.64	.64	.87	.55	.55	.56	.55	.72	.46	.46	.46	.46	1.21
August	.20	.43	1.77	.80	.41	.51	.51	.51	.51	.50	.56	.59	.63	.59	.58	.45	.47	.49	.47	.71	.43	.42	.46	.44	.98
September	.20	.43	2.00	.88	.83	.45	.46	.46	.46	.61	.44	.45	.46	.45	.87	.44	.44	.46	.45	1.00	.40	.41	.45	.42	1.56
October	.23	.32	2.49	1.01	1.02	.89	.90	.90	.90	1.14	.51	.51	.51	.51	.....	.63	.63	.64	.63	1.33	.43	.43	.43	.43	1.57
November	.35	.35	1.40	.70	.90	1.01	1.01	1.02	1.01	1.09	.65	.65	.65	.65	.....	.83	.83	.83	.83	1.31	.66	.66	.66	.66	1.56
December	.33	.34	.36	.34	.80	1.02	1.02	1.02	1.02	1.01	.81	.82	.82	.82	1.11	.92	.92	.93	.92	1.43	.87	.87	.88	.87	1.30
Mean	.32	.38	1.00	.57	.73	.69	.69	.69	.69	.76	.62	.62	.62	.62	.75	.68	.69	.70	.69	.99	.60	.61	.62	.61	1.26

[1] This does not fairly represent the average color, as the high color of the bottom represents but a very small proportion of the water of the lake.

Colors, 1896. (Platinum Standard.)

MONTH.	CHESTNUT HILL RESERVOIR GATE-HOUSES.			CHESTNUT HILL RESERVOIR.			BR'K-LINE.	TAPS.	
	Sudbury.	Cochituate.	Effluent.	Surface.	Mid-depth.	Bottom.	Gate-House.	Park Square.	Mattapan.
January	.74	.36	.66	.....	.....	.....	.59	.66	.60
February	.60	.42	.58	.....	.....	.....	.55	.58	.54
March	.53	.45	.51	.....	.....	.....	.50	.50	
April	.50	.41	.43	.43	.42	.43	.42	.43	
May	.61	.32	.43	.42	.42	.41	.44	.42	
June	.66	.31	.43	.43	.43	.42	.46	.44	
July	.65	.24	.44	.44	.44	.44	.46	.44	
August	.53	.20	.42	.39	.40	.73	.40	.40	
September	.43	.19	.33	.32	.33	.56	.32	.33	
October	.74	.21	.36	.38	.39	.39	.42	.43	
November	1.00	.31	.54	.56	.55	.55	.63	.57	
December	.90	.32	.63	.62	.62	.62	.62	.65	
Mean	.66	.31	.48	.44	.44	.56	.48	.49	

Maintenance of Western Division for 1896-97.

DRAFTS.	Western Division.	Basins.	Sudbury Aqueduct.	Cochituate Aqueduct.	Lake Cochituate.	Pegan Filters.	Chestnut-Hill Reservoir.	Chestnut-Hill Driveway.	Brookline Reservoir.	Fisher-Hill Reservoir.	Biological Department.	Inspection Department.	High Service Chestnut-Hill.[1]	Total.
February 1, 1896.....	$350 01	$380 88	$252 64	$25 00	$110 70	$213 83	$65 64	$82 63	.....	$1 85	$69 98	$233 17	$1,762 09	$3,548 42
March 1, "	971 46	628 35	718 45	218 25	180 15	331 41	1,768 12	1,264 32	$351 00	234 75	322 38	686 89	2,340 76	10,016 29
April 1, "	988 91	738 54	738 01	114 88	188 63	298 68	987 73	1,268 09	123 00	46 00	333 04	665 62	5,099 53	11,590 66
May 1, "	1,198 61	673 02	609 71	586 39	188 04	308 33	1,064 60	939 57	107 50	143 72	290 88	148 97	1,781 91	8,041 25
June 1 "	1,211 33	1,007 02	1,037 69	255 93	264 98	416 10	1,853 01	921 49	116 75	161 87	420 94	529 28	1,547 24	9,743 63
July 1, "	1,187 85	689 56	679 67	426 54	214 15	387 70	1,406 40	701 40	104 00	77 00	303 02	521 09	1,714 04	8,412 42
August 1, "	1,095 67	846 34	659 38	507 77	262 74	609 53	1,450 52	1,307 26	200 00	223 00	619 66	318 08	1,444 31	9,544 26
September 1, "	1,163 61	832 85	947 08	488 67	241 50	346 10	1,492 59	1,125 55	95 75	409 93	474 89	353 37	5,428 54	13,400 43
October 1, "	1,099 93	944 38	716 61	214 87	372 37	223 84	1,045 80	690 43	162 00	474 81	280 14	540 68	2,034 29	8,800 15
November 1, "	1,214 49	1,402 03	739 19	396 25	377 81	312 42	1,390 17	781 01	155 50	426 92	434 90	551 66	3,363 91	11,546 26
December 1, "	1,082 51	1,761 68	758 48	194 91	644 63	284 11	1,056 01	760 14	87 90	122 90	327 27	548 22	2,305 21	9,933 97
January 1 and 31, 1897..	1,503 60	4,904 28	973 33	542 66	349 10	608 19	2,740 05	1,237 89	194 45	243 70	559 00	903 15	9,690 36	24,449 76
Total for year.....	$13,067 98	$14,808 93	$8,830 24	$3,972 12	$3,394 80	$4,340 24	$16,320 64	$11,079 78	$1,697 85	$2,566 45	$4,436 10	$6,000 18	$38,512 19	$129,027 50

[1] Expenditures on High Service Chestnut Hill for the first five months were not under Western Division, but are so given.

Table of Rainfall at Chestnut-Hill Reservoir for Year ending December 31, 1896.

DATE.	Inches.	Snow or Rain.	Duration.
Jan. 7	0.18	Snow.	3.30 p.m. to 8.45 p.m.
" 9	0.65	"	1.50 p.m. to
" 10			5.30 pm.
" 12	0.09	"	5.00 p.m. to 8.00 p.m.
" 19	0.07	"	10.15 a.m. to 9.00 p.m.
" 24	1.78	Rain.	11.40 a.m. to
" 25			10.00 a.m
" 25	0.03	"	11.30 a.m. to 3.00 p.m.
Total.	2.80		
Feb. 1	0.54	Snow and rain.	5.30 a.m. to 5.45 p.m.
" 3	2.57	"	10.00 p.m.
" 4			to
" 5			
" 6			7.30 p.m.
" 9	0.48	"	6.00 a.m. to 8.00 p.m.
" 13	0.45	"	7.45 a.m. to 11.30 p.m.
" 16	0.12	Snow.	5.30 a.m. to 12.30 p.m.
" 18	0.10	"	7.00 a.m.
" 19			to 10.30 a.m.
" 19	0.30	"	7.00 p.m. to 9.15 p.m.
" 29	0.89	Rain.	7.00 a.m. to 12.00 midnight.
Total.	5.45		
Mar. 1	1.73	Rain and snow.	Midnight Feb. 29
" 2			to
" 3			5.00 p.m.
" 4	0.10	Snow.	11.30 a.m. to 9.00 p.m.
" 7	0.32	Rain.	6.30 a.m. to 4.30 p.m.
" 11	0.40	Snow.	12.20 p.m.
" 12			to 11.00 a.m.

DATE.	Inches.	Snow or Rain.	Duration.
Mar. 15	1.33	Snow and rain.	6.50 p.m. to
" 16			6.00 a.m.
" 17			
" 19	0.66	Snow and rain.	7.00 a.m. to
" 20			3.00 a.m.
" 23	0.03	Snow.	5.00 p.m. to 9.30 p.m.
" 29	0.96	Rain.	9.00 a.m. to
" 30			4.00 p.m.
Total.	5.53		
April 2	0.66	Rain.	3.30 a.m. to 7.00 p.m.
" 7	0.05	Snow.	3.30 a.m. to 10.00 a.m.
" 17	0.26	Rain.	4.35 p.m. to
" 18			5.30 a.m.
" 19	0.43	"	12.30 p.m. to 9.30 p.m.
" 21	0.32	Rain and snow.	4.20 p.m. to
" 22			3.00 p.m.
Total.	1.72		
May 3	0.10	Rain.	3.30 p.m. to 5.00 p.m.
" 9	0.03	"	2.45 a.m. to 3.15 a.m.
" 19	0.40	"	2.00 p.m. to 3.00 p.m.
" 21	0.05	"	8.00 a.m. to 3.30 p.m.
" 26	0.16	"	6.00 a.m. to 3.30 p.m.
" 28	0.59	"	5.00 p.m. to
" 29			7.30 a.m.
" 31	0.52	"	4.00 a.m. to 10.15 a.m.
Total.	1.85		

Table of Rainfall at Chestnut-Hill Reservoir. — *Continued.*

DATE.	Inches.	Snow or Rain.	Duration.
June 7	0.79	Rain.	6.40 a.m. to 10.15 a.m.
" 8			
" 9			
" 10	0.54	"	4.00 a.m. to 3.00 p.m.
" 14	1.53	"	4.15 a.m. to 9.00 a.m.
" 15			
" 17	0.02	"	7.30 a.m. to 9.30 a.m.
" 28	0.10	"	7.20 p.m to 9.30 p.m.
Total.	2.98		
July 4	0.37	Rain.	9.15 p.m. to 7.00 a.m.
" 5			
" 6	0.57	"	6.45 p.m. to 10.00 p.m.
" 7			
" 15	0.93	"	7.50 a.m. to 7.30 a.m.
" 16			
" 20	0.20	"	3.35 p.m. to 8.45 a.m.
" 21			
" 23	0.13	"	12.45 a.m. to 6.00 a.m.
" 24	0.60	"	2.25 p.m. to 11.30 a.m.
" 25			
" 27	0.08	"	9.45 a.m. to 11.30 a.m.
" 30	0.12	"	3.40 a.m. to 11.00 a.m.
Total.	3.00		
Aug. 2	0.90	Rain.	3.00 a.m. to. 930 a.m.
" 5	0.15	"	3.15 p.m. to 3.30 p.m.
" 5	0.66	"	8.10 p.m. to 2.45 a.m.
" 6			
" 6	0.15	"	8.30 p.m. to 11.30 p.m.
" 13	0.22	"	6.40 a.m. to 7.00 a.m.
" 18	0.33	"	3.55 p.m. to 6.00 p.m.
" 22	0.13	Rain.	1.00 a.m. to 6.30 a.m.
" 23	0.11	"	12.15 p.m. to 1.15 p.m.
Aug. 24	0.03	Rain.	3.00 a.m. to 5.00 a.m.
" 3	0.06	"	3.00 p.m. to 4.30 p.m.
Total.	2.74		
Sept. 3	0.48	Rain.	7.15 p.m. to 10.15 p.m.
" 5	1.67	"	9.00 p.m. to 9.00 p.m.
" 6			
" 9	2.43	"	2.30 p.m. to 5.15 p.m.
" 10			
" 10	0.04	"	9.00 p.m. to 9.30 p.m.
" 13	0.43	"	5.30 a.m. to 11.30 a.m.
" 14			
" 17	0.07	"	8.20 p.m. to 9.00 p.m.
" 19	0.68	"	4.30 a.m. to 11.15 a.m.
" 19	0.46	"	6.15 p.m. to 11.00 p.m.
" 22	0.07	"	11.30 a.m. to 7.00 p.m.
" 30	0.83	"	3.00 a.m. to 9.30 a.m.
Total.	7.16		
Oct. 2	0.03	Rain.	9.15 a.m. to 3.30 p.m.
" 4	0.47	"	9.30 a.m. to 10.00 a.m.
" 5			
" 6			
" 7	0.02	"	9.15 a.m. to 2.30 p.m.
" 12	1.27	"	8.00 p.m. to 9.30 p.m.
" 13			
" 15	0.51	"	1.00 a.m. to 5.45 p.m.
" 18	0.14	"	4.30 p.m. to 10.00 p.m.
" 23	1.02	"	6.30 p.m. to 9.00 a.m.
" 24			
" 29	0.03	"	9.30 a.m. to 12.30 p.m.
Total.	3.49		

Table of Rainfall at Chestnut-Hill Reservoir. — *Concluded.*

DATE.	Inches.	Snow or Rain.	Duration.
Nov. 5	1.05	Rain.	1.00 a.m. to 10.00 p.m.
" 8	0.50	"	10.15 a.m. to 6.00 p.m.
" 11	0.06	"	2.20 p.m. to 7.30 p.m.
" 12	0.03	"	3.30 p.m. to 5.00 p.m.
" 13	0.32	Rain and snow.	12.20 p.m. to 3.00 a.m.
" 14			
" 21	0.48	Snow and rain.	11.30 a.m. to 4.00 a.m.
" 22			
" 24	0.03	Rain.	8.15 a.m. to 5.00 p.m.
" 26	0.30	"	1.00 a.m. to 6.00 p.m.
" 28	0.56	Rain.	1.45 p.m. to 6.00 a.m.
" 29			
Nov. 29	0.28	Snow.	8.00 p.m. to 4.00 a.m.
" 30			
Total.	3.61		
Dec. 5	0.02	Snow.	1.00 a.m. to 2.00 a.m.
" 8	0.98	Rain.	9.00 p.m. to 1.15 p.m.
" 9			
" 16	0.47	Snow.	2.00 a.m. to 6.30 p.m.
" 18	0.12	Rain.	6.10 p.m. to 10.00 p.m.
" 22	0.30	Snow.	11.30 p.m. to 5.00 p.m.
" 23			
Total.	1.89		

NOTE. — Total Rainfall for the Year, 42.22 Inches.

REPORT OF THE SUPERINTENDENT OF THE EASTERN DIVISION.

OFFICE OF SUPERINTENDENT OF EASTERN DIVISION,
710 ALBANY STREET, BOSTON, Feb. 1, 1897.

HON. JOHN R. MURPHY,
Water Commissioner:

The annual report of the Eastern Division for the year ending Jan. 31, 1897, is respectfully submitted.

During the year the Mystic Division was consolidated with the Eastern Division. A summary of the work of both divisions will therefore be given in this report, that of Somerville, Chelsea and Everett being mentioned apart from that of the city of Boston.

MAIN PIPE.

City of Boston: There were laid in the city of Boston during the year 35.4 miles of main pipe, nine miles more than were laid last year. Of the above amount, 8,655 feet were laid for private parties, and are not included in the total length of our system. Nine and eight-tenths miles of pipe were abandoned during the year, making the total length of our system (exclusive of Somerville, Chelsea and Everett), 658.9 miles.

Of the 35.4 miles laid, 8.6 miles were relaid, or about three times as much as was relaid during the previous year. Relaying is always a difficult and costly kind of work, and, as much of this year's was in the business portions of the city, the conditions were unusually severe.

The above totals do not include 3,188 feet of main pipe laid and 890 feet abandoned in connection with hydrants, "blow-offs," and reservoirs.

Over the Boston and Albany railroad bridge on Huntington avenue, 227 feet of 42-inch pipe were laid, thus connecting the two sections of the 42-inch high-service main laid in that street last year, and allowing the water to be turned on, supplying the downtown high-service district with additional head.

An isolated section of 36-inch pipe, 522 feet long, was laid in Ruthven street, Roxbury, between Humboldt avenue and Elm Hill avenue. This will be connected with the

section laid last year in Heath street, Roxbury, thus giving the Elm-Hill district sufficient service, and doing away with the necessity of a pumping-station at Wayne street.

In Shirley Gut 540 feet of 8-inch flexible and 871 feet of 8-inch ordinary pipe were laid, and 540 feet of 8-inch flexible and 888 feet of 8-inch ordinary pipe abandoned. Between Squantum and Thompson's Island, 420 feet of 6-inch pipe have been lowered and 100 feet relaid, and at Rainsford Island 660 feet of 6-inch flexible, 2,394 feet of 4-inch flexible, and 824 feet of 4-inch ordinary pipe were laid, and 2,014 feet of 3-inch wrought iron and 510 feet 4-inch ordinary pipe abandoned.

During the year 1,783 feet of main pipe were lowered; and on Tremont street, between Eliot and Boylston, 307 feet of 30-inch pipe were cut off and moved bodily by means of jack-screws and rollers a distance varying vertically, from 0 at one end to 3 feet at the other, and horizontally, from 0 at one end to 4 feet at the other.

The main pipe work as a whole was of an exceedingly difficult nature, occasioned, as it was, by several causes, viz.: The construction of the Subway, which necessitated work of an extraordinary character, done under most unfavorable conditions; the raising of the tracks on the Providence Division of the N.Y., N.H., & H. R.R., on account of which it was necessary to establish temporary mains and relocate permanent ones; and lastly the extension and widening of Blue Hill, Columbus, Commonwealth, and Huntington avenues, which required a large amount of relaying and extension, rendered unusually hard by the great number of connections made with the many streets which either intersect or lead from these avenues.

Somerville, Chelsea and Everett.—The distribution system has been extended by the addition of 128 feet of 3-inch pipe, 19,952 feet of 6-inch pipe, 771 feet of 8-inch pipe, 6,272 feet of 10-inch pipe, 1,084 feet of 12-inch pipe, 48 feet of 16-inch pipe, and 140 feet of 20-inch pipe, making a total of 28,395 feet added to the system. Forty-four thousand four hundred and eighty feet of pipe were relaid, replacing, as a rule, pipe of smaller sizes.

GATES OR STOP-COCKS.

City of Boston.—During the year 594 gates were established, and 145 abandoned. Of the former 14 were "blow-off" and 15 private gates, and of the latter 3 were "blow-off" gates. All gates were inspected, oiled, and, where necessary, repaired.

There are still in service a number of old-fashioned gates with rectangular trunks. They are known as "left-handed" gates on account of the direction in which the gearing works. These are all to be removed during the coming year, and gates of an improved pattern substituted.

Somerville, Chelsea and Everett.—In these cities 180 gates were established and 59 abandoned, showing a net increase of 121, and making the total number of gates in use 1,794.

AIR-COCKS.

City of Boston.—During the year 19 air-cocks were established and 2 renewed.

HYDRANTS.

City of Boston.—Five hundred and twenty-six hydrants were established and 271 abandoned, making a net increase for the year of 255, and a total of 7,066 connected with the system.

We found in service this year more than 100 hydrants of an obsolete type. These hydrants are rapidly being replaced with new ones of an improved type.

Somerville, Chelsea and Everett.—There were established 132 Post-Hydrants, and 38 were abandoned. This shows an increase of 94, making the total number of hydrants in use 1,283, all of which are of the Post pattern.

WATER-POSTS.

City of Boston.—Eight new water-posts were established and one abandoned, making a total of 405 in use Jan. 31, 1897.

Somerville, Chelsea and Everett.—Twenty-eight water-posts were established in these cities, making a total of 96 now in use.

FOUNTAINS.

City of Boston. — One drinking fountain was established at the corner of Cottage and Maverick streets; and one abandoned at Lamartine street, corner of Centre street, Roxbury. Careful attention has been given the fountains during the year, especially in regard to cleanliness.

Somerville, Chelsea and Everett. — Three new drinking-fountains have been added to the number already in use.

SERVICE-PIPES.

City of Boston. — Two thousand eight hundred and eight service pipes (68,547 feet) have been laid during the year,

and 322 (8,057 feet) abandoned, showing a net increase of 2,486 service-pipes (60,490 feet) for the year, and making the total number of pipes now in use 79,518 with a length of 2, 240,510 feet. Under the law governing the laying out of new streets, we were obliged to lay to vacant lots, 470 service-pipes with a total length of 10,221 feet, from which no revenue is at present derived.

Somerville, Chelsea and Everett. — Seven hundred and seventy-seven new services were laid, distributed as follows: Somerville, 453; Chelsea, 93; Everett, 231, for which 17,675 feet of pipe were required.

Meters.

City of Boston. — Three hundred and thirty-one meters have been applied, 406 discontinued, 1,520 changed, 441 repaired in service, 254 repaired at factory, and 1,020 repaired in our own shop. The total number now in use is 4,827.

Maintenance.

City of Boston. — We have made 2,796 repairs on pipes during the year. Of those on main pipe we find the most numerous causes to be:

Joints strained by settling in Subway	406
Defective joints	142
Defective stop-cocks	119
Defective packing	54
Of those on service-pipes, which number 1,976, we find the causes most prevalent to be rust	486
Settling of earth	219
Relaying of main pipe	251
Construction of Subway	196
Sewer construction	122
Defective pipes	160
Fish	105
Struck by pick	90

A perusal of our statement of miscellaneous work performed will give an idea of how the department spent some of its time and money during the year. It will show among other things that 5,099 gate locations were either marked or re-marked; 2,799 hydrant boxes cleaned out; 1,955 hydrants repaired in service; 841 examinations made on false reports; 570 gate or stop-cock boxes repaired in service; 425 dead-ends blown off; 349 hydrant boxes repaired in service; 284

water-posts repaired; and 212 gate or stop-cock boxes renewed.

All excavations in the streets that were likely to expose our pipes were carefully inspected, with a view of protecting said pipes from damage, and in all cases where corporations were at work laying conduits, etc., in the streets, an inspection was made to prevent encroachment and the covering of our pipes by said corporations.

Reservoirs and Stand-Pipes.

Parker Hill and East Boston are both in good condition.

South Boston. — This reservoir is not in use.

College Hill. — Five hundred and twenty-five feet of the road around the reservoir and 850 feet of Capen street have been macadamized. The banks and walks have received the usual attention.

Breed's Island Stand-pipe. — When the extensive repairs which are in progress on this building are completed, it will be in first-class condition.

Mt. Bellevue Stand Pipe. — This building is in fairly good condition, but will require painting during the coming year. During the summer season it has been open to the public who seem to appreciate the opportunity offered of viewing the surrounding country.

Fire Reservoirs.

During the year on account of the construction of the Subway, the following fire reservoirs were abandoned.

Tremont street at Boylston.
" " " Hollis.
" " " Park.
" " " School.
Hanover "
Haymarket square.

Pumping-Stations.

Mystic. — Engine No. 2 received a thorough overhauling and is in good condition. On Engine No. 3 the foot valve was repaired. On Engine No. 4 a new air-chamber was placed and all the water valves were faced with three-eighth inch rubber. The rock-shaft stand was too weak, so was replaced by a stronger one and braced. The large dash-pot shaft was removed and a lighter one substituted. Metallic packing was put on the piston rods. The dynamo

being defective was replaced by one from Chestnut-Hill station. The boilers received slight repairs, and a new brick floor was laid in the boiler-room. The road on the west side of the pumping station was regraded, a part of the walk in front of the station was concreted, and the railroad track repaired.

West Roxbury. — This station is in good condition. The exhaust steam and coal gas complained of as a nuisance by the residents in the vicinity have been cared for by exhausting into an iron pipe, placed within the chimney. The building and chimney have been pointed and other repairs made.

Wayne Street. — Although a temporary station, improvements have been made during the year, so that at present it answers the required purposes.

East Boston. — This station is in general good condition.

Yards.

Albany Street. — It has been necessary to enlarge the machine shop and purchase new machinery in order to meet the increased demand for hydrants, gates, and service-fittings. The stable, which was erected in March, 1890, has proved to be very unsafe, and on that account it was necessary to almost entirely reconstruct it. The work is not yet complete, and in the meantime the horses are being cared for in temporary quarters.

Dorchester, Brighton, East Boston, and Charlestown. — These yards have been given the usual attention, and are in good condition.

West Roxbury. — This district is sorely in need of proper headquarters. The present facilities are entirely inadequate. For a year or more it has been necessary to hire a yard at some distance, where extra accommodations could be had. This division of our stock and property between the two yards makes it inconvenient to transact business, and I would earnestly recommend that more ample provision be made for this rapidly growing district.

Mystic Lake.

From January 1 to January 7, water was wasted over the dam, and from January 25 to May 2, and from December 10 to December 25, was wasting almost constantly. On August 24, with the surface 8.73 feet below high water, the pumps were started, and pumping continued until September 9, when the water had risen sufficiently to gravitate to the pumping-station. On September 5, the elevation of the lake was .88 feet above the conduit invert, within 1.79 feet

of the lowest point ever reached. During the year separators were connected with the engines, and a new cylinder was obtained for Engine No. 2, a new floor was laid in engine room No. 2, and the fence on the Arlington road was rebuilt.

The rainfall on the Mystic water-shed for the past twelve months was as follows:

February	5.28	August	2.90
March	5.19	September	7.78
April	1.99	October	3.32
May	2.13	November	3.56
June	2.51	December	2.39
July	2.45	January	3.95
Total			43.45 inches.

CONDUIT.

The two gates in the gate-chamber were repaired. New valve rods were substituted and the gearing rearranged. The old ten to one gears were replaced by gears four to one, thus greatly facilitating the operation of the gates. On the "blow-off" pipe, outside the pipe chamber, a 30-inch gate was placed. The conduit was flushed six times during the year.

WATER-SOURCES.

The chemical treatment of the effluent from Tidd's and Fitzgerald's tanneries has been abandoned, as both tanneries are now connected with the Metropolitan sewer system.

A summary of the inspection work for the past year is as follows: Total number of cases inspected, 532; of these there are old cases, 527; new cases, 5. The present condition of all inspected cases is: Present safe, 340; seem safe, 15; suspected, 8; unsatisfactory, 21; remedied, 148. Seven legal notices were served.

DEACON AND WASTE SERVICE.

The Deacon meter service has been re-established, and the results of its work in the detection of leaks and waste have been satisfactory. The Inspectors of Waste have found 2,810 defective fixtures, inspected 15,288 houses, made 2,635 waste reports, and re-examined 2,411 premises.

Appended you will find tables showing details of the work performed.

Yours respectfully,

HUGH MCNULTY,

General Superintendent Eastern Division.

TABLES SHOWING DETAILS OF WORK PERFORMED IN CITY OF BOSTON.

Table showing the Length of Supply and Distribution Mains laid During the Year 1896, and the Length Connected with the Sudbury, Cochituate and Mystic (Charlestown) Works, Jan. 31, 1897.

	Diameter of Pipes in Inches.																	Total.
	60	48	42	40	36	30	28	24	20	16	12	10	8	6	4	3	2	
EASTERN DIVISION.																		
Length in use Jan. 31, 1896..	....	33,861	15,478	23,054	34,090	96,320	244	76,670	69,493	97,614	893,299	61,820	414,027	1,349,240	149,967	10,562	3,745	3,329,484
Length laid or relaid during the year.....	....	.....	227	340	522	1,619	....	3,988	4,112	25,083	50,234	5,656	30,617	53,551	2,428	.....	.....	178,377
Length abandoned during the year.....	....	.....	.....	290	.....	1,565	....	50	90	2,386	12,774	.....	2,263	19,764	10,765	2,189	.....	52,136
Length in use Jan. 31, 1897..	....	33,861	15,705	23,104	34,612	96,374	244	80,608	73,515	120,311	930,759	67,476	442,381	1,383,027	141,630	8,373	3,745	3,455,725
WESTERN DIVISION.																		
Length in use Jan. 31, 1897..	266	16,051	.....	1,435	1,166	2,140	....	.....	.....	20	2,043	.....	.....	360	.....	.....	.....	23,481
Total connected with works Jan. 31, 1897.	266	49,912	15,705	24,539	35,778	98,514	244	80,608	73,515	120,331	932,802	67,476	442,381	1,383,387	141,630	8,373	3,745	3,479,206 or 658.9 miles.

Statement of Hydrant, Blow-off and Reservoir Pipes, Jan. 31, 1897.

	Diameter in Inches.								Total.
	16	12	10	9	8	6	4	3	
Total length in use Jan. 31, 1896..	472	7,053	100	2,975	1,062	22,488	10,894	3	45,047
Length laid or relaid during the year		30				2,764	394		3,188
Length abandoned during the year				60		320	510		890
Total length in use Jan. 31, 1897	472	7,083	100	2,915	1,062	24,932	10,778	3	47,345

Statement of Service-pipes Laid and Abandoned During the Year Ending Jan. 31, 1897.

	City Proper.		South Boston.		East Boston.		Roxbury.		Dorchester.		West Roxbury.		Brighton.		Charlestown.		Total.	
	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.
6-inch laid	.....	.....	1	36	.....	.....	.....	.....	.....	.....	1	46	1	100	1	48	4	230
6 " abandoned	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	
4 " laid	31	743	2	36	3	10	5	113	4	126	1	38	2	191	.....	.....	48	1,257
4 " abandoned	.....	.....	.....	.....	1	53	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	2	53
3 " laid	9	260	3	115	1	53	3	67	.....	.....	.....	.....	.....	.....	.....	.....	16	495
3 " abandoned	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	31	.....	.....	.....	.....	1	31
2 " laid	16	580	3	144	2	82	4	103	3	75	.....	.....	1	37	2	66	31	1,087
2 " abandoned	2	92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	110	4	202
1½ " laid	28	738	.....	.....	4	127	5	110	6	122	2	29	1	9	1	22	47	1,157
1½ " abandoned	7	114	.....	.....	1	10	2	19	.....	.....	.....	.....	.....	.....	.....	.....	10	143
1¼ " laid	21	678	4	103	.....	.....	9	314	2	62	2	57	.....	.....	.....	.....	38	1,214
1¼ " abandoned	5	150	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	150
1 " laid	58	1,846	5	144	3	111	39	1,067	7	166	11	290	2	48	1	30	126	3,702
1 " abandoned	17	412	1	17	4	132	1	15	3	46	.....	.....	1	4	2	52	29	678
¾ " laid	57	1,458	4	161	6	167	97	2,213	2	42	.....	.....	1	15	9	210	176	4,266

Statement of Service-pipes Laid and Abandoned.—*Continued.*

	City Proper.		South Boston.		East Boston.		Roxbury.		Dorchester.		West Roxbury.		Brighton.		Charlestown.		Total.	
	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.	Number of services.	Length in feet.
¾ inch abandoned	6	201	1	26	.....	.....	3	92	1	16	.....	.....	.....	.....	1	16	12	351
⅝ " laid	97	2,128	137	4,159	110	2,900	806	17,792	672	16,351	294	6,782	144	3,601	46	1,194	2,306	54,907
⅝ " abandoned	122	3,035	13	329	11	268	68	1,662	9	201	8	76	4	168	1	10	236	5,749
½ " abandoned	3	184	3	123	.....	.....	3	130	2	46	.....	.....	.....	.....	10	217	21	700
Private pipes laid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	232	.....	.....	.....	.....	16	232
Total laid	317	8,431	159	4,898	129	3,450	968	21,779	696	16,944	327	7,474	152	4,001	60	1,570	2,808	68,547
Total abandoned	162	4,188	18	495	17	463	78	1,918	15	309	9	107	8	172	15	405	322	8,057
Net increase	155	4,243	141	4,403	112	2,987	890	19,861	681	16,635	318	7,367	144	3,829	45	1,165	2,486	60,490

Statement of Location, Size, and Number of Feet of Main Pipe Relaid during the Year ending Jan. 31, 1897.

NOTE.—C. P., indicates City Proper; Rox., Roxbury; W. R., West Roxbury; Bri., Brighton; Dor., Dorchester; So. B., South Boston; E. B., East Boston; Chn., Charlestown.

In what Street.	Between what Streets.	District.	Size.	Length.	Original Size.
Tremont st.....	Boylston and Mason sts.....	C. P.	40-in.	340	40-in.
" "	Eliot and Mason sts.....	"	30-in.	620	30-in.
" "	Warrenton and Eliot Streets.....	"	"	999	"
Haymarket sq.....	.....	"	24-in.	100	24-in.
" "	.....	"	20-in.	96	20-in.
Hanover st.....	No. Bennet and Charter sts.....	"	16-in.	473	12-in.
" "	Charter and Salutation sts.....	"	"	22	"
Park st.....	Tremont and Beacon sts.....	"	"	76	6-in.
" "	At Tremont st.....	"	"	213	"
West st.....	" " "	"	"	29	"
Haymarket sq.....	Sudbury and Canal sts.....	"	"	70	16-in.
Winter st.....	Tremont and Washington sts.....	"	"	539	6-in.
Boston Common	Over the Subway	"	"	100	16-in.
West st.....	At Washington st.....	"	"	39	6-in.
Centre st.	Columbus ave. and Amory st.....	Rox.	"	878	16 and 12-in.
Amory st.	Centre st. and Stony brook.....	"	"	437	"
Centre st.	Columbus ave. and Ritchie st.....	"	"	520	16-in.
Terrace st.	New Heath st. and Parker pl.....	"	"	552	6-in.
Commonwealth ave.,	At Cottage Farm station.....	Bri.	"	18	16-in.
" "	Lake and Foster sts.....	"	"	1,275	12-in.
Central sq.	Border and Bennington sts.....	E. B.	"	336	"
	Total 16-inch.....	.....	.....	5,577	
Cross st.....	North and Hanover sts.....	C. P.	12-in.	22	6-in.
" "	" " Fulton sts.....	"	"	30	"
North st.	Fleet and Union sts.....	"	"	2,082	6 and 8-in.
Cross st.....	Commercial st. and Haymarket sq.,	"	"	1,508	6-in.
Tremont st.	Hollis and Warrenton sts.....	"	"	127	"
Mason st.	At Tremont st.....	"	"	22	"
	Carried forward.....	.....	.....	3,791	

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.	Original Size.
	Brought forward.....	.....	.....	3,791	
Hanover st.....	Portland and Court sts.....	C. P.	12-in.	452	12-in.
Bosworth st.....	Tremont and Province sts....	"	"	287	4-in.
Province st.....	Bromfield st. and Province court...	"	"	182	6-in.
West st.....	At Washington st.....	"	"	10	"
Indiana st.....	Harrison ave. and Washington st.,	"	"	5	12-in.
Hanover st.....	Opposite Friend st.....	"	"	30	"
Washington st.....	Haymarket sq. and Hanover st....	"	"	427	"
" "	Corner of Hanover st.....	"	"	62	6-in.
Amory st.....	Centre st. and Stony brook.....	Rox.	"	254	12-in.
Haskins st.....	Vernon and Ruggles sts.....	"	"	654	6-in.
Vernon st.....	Washington and Downing sts.....	"	"	1,616	"
Cabot st.....	At Vernon st.....	"	"	16	"
Rogers ave.....	Near Ruggles st.....	"	"	25	"
Centre st.....	Columbus ave. and Amory st.....	"	"	24	12-in.
" "	N.Y., N.H. & H. R.R. and Wise st.,	"	"	359	"
Ritchie st.....	At Centre st.....	"	"	14	"
Lamartine st.....	Centre and Roys sts.....	"	"	176	"
Guild st.....	At Washington st.....	"	"	25	4-in.
Ruggles st.....	" Rogers ave.....	"	"	35	12-in.
Centre st.....	" N.Y., N.H. & H. R.R.....	"	"	194	"
" "	" Lamartine st..	"	"	7	"
Cliff st.....	Washington and Regent sts.....	"	"	1,134	6 and 4-in.
Columbus ave.....	Cedar and New Heath sts.....	"	"	794	12-in.
New Heath st.....	Across Columbus ave.....	"	"	30	6-in.
Centre st.....	Columbus ave. and Ritchie st.....	"	"	508	16-in.
Ritchie st.....	Centre st. and Stony brook.....	"	"	197	12-in.
Ruggles st.....	Columbus ave. and Duncan st.....	"	"	334	"
Rogers ave.....	From Ruggles st.....	"	"	156	"
Parker st.....	Across Centre st.....	"	"	50	6-in.
Washington st.....	Near Dedham Branch crossing....	W. R.	"	87	12-in.
Boylston st.....	At N.Y., N.H. & H. R.R.....	"	"	77	"
Walk Hill st.....	" " " "	"	"	152	"
Commonwealth ave.,	" Cottage Farm station.....	Bri.	"	140	"
	Carried forward.....	.....	.....	12,304	

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.	Original Size.
	Brought forward			12,304	
Commonwealth ave.	At Essex st.	Bri.	12-in.	57	6-in.
Washington st.	" Chestnut Hill ave	"	"	15	12-in.
Blue Hill ave.	Columbia and Glenway sts.	Dor.	"	700	12-in.
Centre st.	Washington st. and Railroad	"	"	177	6-in.
Winter st.	Adams and East sts.	"	"	90	"
Blue Hill ave.	Grove Hall and Seaver st.	"	"	1,420	12 and 6-in.
Farnsworth st.	Congress st. and Railroad	So. B.	"	682	"
Cross st.	Border and New sts	E. B.	"	192	4-in
	Total 12-inch			15,637	
Dover st.	Shawmut and Harrison aves.	C. P.	10-in.	798	6-in.
Prentiss st.	At Columbus ave	Rox.	"	82	"
Walpole st	" " "	"	"	63	"
Prentiss st.	Tremont st. and Columbus ave	"	"	184	"
Walpole st.	" " "	"	"	299	"
Blue Hill ave.	Glenway and Esmond st.	Dor.	"	875	12-in.
	Total 10-inch			2,301	
Suncourt st	Moon and North sts.	C. P.	8-in.	27	4-in.
Tremont st.	Hollis and Warrenton sts.	"	"	54	8-in.
Prince st.	Hanover and Garden-Court sts.	"	"	171	4-in.
Garden-Court st.	North sq. and Prince st.	"	"	12	6-in.
Brattle st.	Court and Washington sts.	"	"	476	"
North sq.	Prince and North sts	"	"	422	"
Haymarket sq.	Washington and Sudbury sts.	"	"	57	"
Water st.	Liberty sq. and Broad st.	"	"	306	"
Union Park st.	Washington st. and Harrison ave.,	"	"	481	4-in.
Boylston st.	At Tremont st	"	"	14	8-in.
Malden st	Washington st. and Harrison ave.,	"	"	560	6-in.
Warrenton st.	Shawmut ave. and Tremont st.	"	"	80	"
Tremont st.	Over Subway at Common st.	"	"	60	"
North st.	At North sq	"	"	10	"
Sterling st.	Shawmut ave. and Washington st.,	Rox.	"	316	4-in.
McLellan st.	Paige ave. and Bradshaw st.	Dor.	"	137	6-in.
	Carried forward			3,183	

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Street.	District.	Size.	Length.	Original Size.
	Brought forward			3,183	
Church st	Winter and High sts	Dor.	8 in.	363	6-in.
East st	Winter st. and Williams pk	"	"	329	"
Blue Hill ave	At Evelyn st	"	"	106	12-in.
Sleeper st	Congress st. and railroad	So. B.	"	650	6-in.
New st	Sumner and Maverick sts	E. B.	"	475	"
Boston Harbor	Shirley Gut		"	871	8-in.
Boston Harbor (contract)	" "		"	540	"
	Total 8-inch			6,517	
North Centre st	North and Hanover sts	C. P.	6-in.	24	6-in.
Hanover ave	Hanover and North sts	"	"	37	4-in.
Salutation st	" "	"	"	34	"
Norwich st	Mystic and Meander sts	"	"	235	"
Meander st	Norwich and E. Dedham sts	"	"	222	"
Laconia st	Harrison ave. and Washington st.,	"	"	354	"
Hanover ave	From Hanover st	"	"	11	"
Harris st	" "	"	"	16	"
Webster ave	" "	"	"	16	"
Pine st	Washington st. and Harrison ave.,	"	"	442	6-in.
Knapp st	Beach st. and Harrison ave	"	"	367	4-in
Cotting st	Lowell and Leverett sts	"	"	325	"
Jackson pl	Off Winter st	"	"	15	"
Winter pl	" "	"	"	21	"
Stillman st	Endicott and Charlestown sts	"	"	221	6-in.
Acton st	Washington and Bradford sts	"	"	305	4-in.
Newland st	Pembroke and Trumbull sts	"	"	63	"
James st	Concord and E. Newton sts	"	"	140	"
Province court	From Province st	"	"	95	"
Eliot st	At Tremont st	"	"	4	6-in.
Friend st	At Washington st	"	"	17	"
Concord sq	Tremont st. and Columbus ave	"	"	594	4-in.
Concord pl	Off Concord sq	"	"	41	"
Tremont st	School st. and Scollay sq	"	"	10	6-in.
Hanover st	At Elm st	"	"	10	"
	Carried forward			3,619	

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.	Original Size.
	Brought forward			3,619	
Dix pl.	Off Washington st.	C. P.	6-in.	333	4-in.
Ohio st.	Shawmut ave and Washington st.,	"	"	401	"
Seaver pl.	Off Tremont st.	"	"	143	"
Burroughs pl.	Off Hollis st.	"	"	178	"
Kent st.	At Vernon st.	Rox.	"	16	"
Columbus ave.	Davenport and Walpole sts.	"	"	870	6 and 4-in.
Davenport st.	At Columbus ave.	"	"	18	4-in.
Benton st.	" " "	"	"	34	6-in.
Burke st.	" " "	"	"	37	"
Coventry st.	" " "	"	"	24	"
Cunard st.	" " "	"	"	25	"
Sarsfield st.	" " "	"	"	32	"
Walpole st.	" " "	"	"	26	"
Tabor st.	Across Winslow st.	"	"	73	4-in.
Rogers ave.	At Ruggles st.	"	"	109	6-in.
Newcomb st.	Washington and Reed st.	"	"	182	4-in.
Putnam st.	At Roxbury	"	"	31	"
Rogers ave.	Near Ruggles st.	"	"	79	6-in.
Cottage pl.	At Columbus ave.	"	"	13	4-in.
Terry st.	" " "	"	"	17	6-in.
Culvert st.	" " "	"	"	33	4-in.
Riverside st.	" " "	"	"	17	6-in.
Weston st.	" " "	"	"	23	"
Old Heath st.	Columbus ave. and Albert st.	"	"	83	"
Glenwood st.	At Cliff st.	"	"	21	4-in.
Grosvenor pl.	" " "	"	"	10	"
Davenport st.	Columbus ave. and Tremont st.	"	"	308	"
Sarsfield st.	" " Grinnell st.	"	"	175	3-in.
Culvert st.	Tremont and Columbus ave.	"	"	211	4-in.
Kenilworth st.	Across Dudley st.	"	"	59	"
Linden ave.	At Linden Park st.	"	"	12	6-in.
Lamont st.	" " "	"	"	36	4-in.
Sanford pl.	" E. Lenox st.	"	"	27	"
	Carried forward			7,275	

Statement of Location, Size, etc. — *Concluded.*

In what Street.	Between what Streets.	District.	Size.	Length.	Original Size.
	Brought forward			7,275	
Prescott st.	At Eustis st	Rox.	6-in.	27	4-in.
Eustis st.	" Prescott st.	"	"	12	6-in.
Orchard st.	" Eustis st.	"	"	22	4-in.
Rogers ave.	From Ruggles st	"	"	76	6-in.
Cottage pl.	Columbus ave. and Tremont st.	"	"	130	4-in.
Clark pl.	At Lamartine st.	W. R.	"	28	"
Gaylor st.	" Washington st	Dor.	"	26	6-in.
Dix st	Adams st. and Dorchester ave.	"	"	20	"
Athelwold st.	School and Killion sts	"	"	350	"
Gibson st	Adams st. and Dorchester ave.	"	"	20	"
Blue Hill ave.	Columbia and Glenway sts	"	"	9	12-in.
Parkman st.	Adams st. and Dorchester ave.	"	"	20	6-in.
Blue Hill ave	Canterbury and Angell sts.	"	"	195	12-in.
Dove st.	E and F sts.	So. B.	"	547	4-in.
Telegraph st.	At Thomas Park	"	"	36	"
"	Dorchester st. and Thomas pk.	"	"	826	"
Gates st.	At Telegraph st.	"	"	65	"
Webster st.	Scaver and Cottage sts.	E. B.	"	40	"
Monument court	From Winthrop st.	Chn.	"	215	"
Parker st.	Cambridge and Perkins sts.	"	"	45	6-in.
Boston Harbor (contract)	Squantum and Thompson's Island,		"	100	"
Boston Harbor (contract)	Rainsford's Island		"	660	4-in.
	Total 6-inch			10,744	
Stillman pl.	Cooper and Stillman sts.	C. P.	4-in.	28	"
Hayden Terrace	At Washington st	Rox.	"	6	1-in.
Boston Harbor (contract)	Rainsford's Island		"	2,394	3-in.
	Total 4-inch			2,428	

Statement of Location, Size, and Number of Feet of Main Pipe Extended during the Year ending Jan. 31, 1897.

In what Street.	Between what Streets.	District.	Size.	Length.
Huntington ave.....	Exeter and Irvington sts.....	C. P.	42-in.	227
Ruthven st.....	Humboldt and Elm Hill aves.....	Rox.	36-in.	522
Dorchester ave. (contract).....	East and Adams sts.....	Dor.	24-in.	2,224
		"	"	
Adams st. (contract)..	Dorchester ave. and Parkman st.....	"	"	1,664
	Total 24-inch.....	.....	.....	3,888
Commonwealth ave...	Essex and St. Paul sts.....	Bri.	20-in.	220
Hancock st.....	Dudley st. and Cushing ave.....	Dor.	"	23
Border st. (contract).	West Eagle st. and Central sq.....	E. B.	"	2,132
"	Condor and West Eagle sts.....	"	"	491
Condor st.....	Brooks and Border sts.....	"	"	1,150
	Total 20-inch.....	.....	.....	4,016
Huntington ave.....	Parker st. and Longwood ave.....	Rox.	16 in.	597
Boylston st.....	Boylston and Audubon roads.....	"	"	2,058
"	At Brookline ave.....	"	"	20
Commonwealth ave...	Chestnut Hill ave. and Newton line...	Bri.	"	940
" " ...	Essex and St. Paul sts.....	"	"	983
Blue Hill ave.....	Fessenden and Walk Hill sts.....	Dor.	"	289
Boston st.....	Hancock and Dudley sts.....	"	"	613
Dudley st.....	Boston and Hancock sts.....	"	"	62
Hancock st.....	Dudley st. and Cushing ave.....	"	"	148
Blue Hill ave.....	At Laurlat ave.....	"	"	62
" "	Talbot ave. and Walk Hill st.....	"	"	3,883
Boston st.....	From No. 58 to No. 354.....	"	"	3,815
Blue Hill av. (contract)	Evelyn st. and Noyes ave.....	"	"	2,183
Telegraph st.....	At Thomas park.....	So. B.	"	50
Dorchester st.....	At Railroad	"	"	136
Telegraph st. (contract).....	Old Harbor and Dorchester sts.....	"	"	940
Dorchester st. (contract).....	Dorchester ave. and Telegraph st.....	"	"	1,990
Boston st. (contract)..	Dorchester ave. and No. 58 Boston st.	"	"	737
	Total 16-inch.....	.....	.....	19,506

Statement of Location, Size, etc.— *Continued.*

In what Street.	Between what Streets.	District.	Length.	Size.
High st.	Pearl and Oliver sts.	C. P.	12-in.	298
State st.	Broad st. and Atlantic ave.	"	"	670
Haymarket sq.		"	"	15
Eliot st.	Carver st. and Columbus ave.	"	"	281
High st.	Oliver and Purchase sts.	"	"	680
Purchase st.	From High st.	"	"	246
Haymarket sq.	Over the Subway.	"	"	73
Hanover st.	Across Washington st.	"	"	57
Roy st.	Lamartine and Wise sts.	Rox.	"	191
Francis st.	At Huntington ave.	"	"	91
Columbus ave.	Camden and Walpole sts.	"	"	1,044
Audubon road	Ivy and Monmouth sts.	"	"	587
St. Alphonsus st.	Tremont and Calumet sts.	"	"	697
Calumet st.	St. Alphonsus and Hillside sts.	"	"	169
Alleghany st.	Across St. Alphonsus st.	"	"	57
Stony Brook bank	Amory and Lamartine sts.	"	"	545
Columbus ave.	Tremont and Walpole sts.	"	"	831
St. off Huntington av.,	Second right, south of Parker st.	"	"	26
Bryant st.	At Huntington ave.	"	"	53
Vancouver st.	Across Huntington ave.	"	"	197
Fenway, off Huntington ave.	First left, north of Longwood ave.	"	"	26
Fenway, off Huntington ave.	Second left, north of Longwood ave.	"	"	34
Ward st.	At Huntington ave.	"	"	23
St. Alphonsus st.	At Ward st.	"	"	25
Parker Hill ave.	At Huntington ave.	"	"	38
Riverway st.	Longwood ave. and Park st.	"	"	420
St. off Boylston st.	Near Boylston road.	"	"	8
Parker Hill ave.	Huntington ave. and Hillside st.	"	"	32
Audubon road	Beacon st. and B. & A. R.R.	"	"	399
Fisher ave.	Hayden st. and Parker Hill ave.	"	"	595
Regent st.	At Cliff st.	"	"	10
Brookline ave.	Bellevue and Short sts.	"	"	481
Belgrade ave.	Beech and Lorraine sts.	W. R.	"	270
Pelton st.	Park and Irving sts.	"	"	370
	Carried forward			9,539

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			9,539
Centre st.	Montclair ave. and Congreve st.	W. R.	12-in.	252
Centre st.	At Dedham line	"	"	254
Arnold st.	Weld st. and Cemetery entrance	"	"	2,372
Weld st.	Corey and Arnold sts.	"	"	535
Arborway	Hampstead road and Centre st.	"	"	2,652
Colberg ave.	Beech and Lorraine sts.	"	"	314
Lasell st.	Temple and Perham sts.	"	"	211
Colberg ave.	Lorraine and Montello sts.	"	"	203
Kittredge st.	Metropolitan ave. and Hemman st.	"	"	526
Centre st.	Stimson st. and Dedham line	"	"	645
Catalpa st.	Castleton and Evergreen sts.	"	"	242
Arborway	South st. and Hampstead road	"	"	403
Park st.	Mountview and Centre sts.	"	"	136
"	Centre st. and March ave.	"	"	129
Glen Road	Washington and Forest Hills st.	"	"	333
Green st.	Washington, and N. Y., N. H. and H. R.R.	"	"	380
Lake st.	Commonwealth ave. and Kenrick st.,	Bri.	"	467
Faneuil st.	Fairbanks and Parsons sts.	"	"	630
Commonwealth ave.	Essex and St. Paul sts.	"	"	333
Faneuil st.	Parsons and Goodenough sts.	"	"	454
Esmond st.	Bradshaw st. and Blue Hill ave.	Dor.	"	900
Morton st.	From Blue Hill ave.	"	"	13
Sydney st.	Harbor View and Crescent ave.	"	"	238
Dorchesterway	From Boston st.	"	"	153
Hancock st.	Freeport and Trull sts.	"	"	6
Barrington st.	From Stonehurst st.	"	"	40
Sydney st.	Hartland and Romsey sts.	"	"	100
Centre st.	Washington st. and Railroad	"	"	344
Morton st.	Selden and Oakridge sts.	"	"	2,023
Winter st.	Adams and Church sts.	"	"	366
Blue Hill ave.	Across Harvard st.	"	"	99
Morton st.	" Blue Hill ave.	"	"	108
Ponemah st.	From "	"	"	15
	Carried forward			25,435

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			25,435
Blue Hill ave	At Ponemah st	Dor.	12-in.	113
Kilton st	From Washington st	"	"	117
Sydney st	From Hartland st	"	"	97
Adams st	Park and Gibson sts	"	"	90
"	Neponset ave. and Gibson st	"	"	23
Wilmington ave	Milton ave. and Nevada st.	"	"	640
Milton ave	Fairmount st. and Wilmington ave	"	"	282
Lauriat ave	Birch st. and Blue Hill ave	"	"	1,371
Ballou ave	From Mountain ave	"	"	306
Barrington st	Speedwell st. and Homes ave	"	"	83
Park st	Washington and Waldeck sts	"	"	60
Lyon st	Dorchester ave. and Adams st	"	"	694
Geneva ave	Bloomfield st. and Railroad	"	"	319
Blue Hill ave	Wales st. and Talbot ave	"	"	816
Sydney st	At Hartland st	"	"	36
Bloomfield st	From Greenbrier st	"	"	4
Roseclair st	" Dor. ave. at Mt. Vernon st	"	"	70
Oakland st	Hollingsworth and Haven sts	"	"	419
Haven st	From Oakland st	"	"	44
Dorchester ave	At Adams st	"	"	18
White st	Bicknell st. and Sanborn ave	"	"	536
Telegraph st	At Thomas Park	S. B.	"	4
D st	Dorchester ave. and Railroad	"	"	316
Bellflower st	Boston st. and Dorchester ave	"	"	346
Orienta pl	From Gladstone st	E. B.	"	276
Bennington st	Antrim and Walley sts	"	"	763
Walley st	Bennington and Leyden sts	"	"	822
Overlook st	Farrington st. and Water ave	"	"	497
	Total 12-inch			34,597
Huntington ave	Wigglesworth and Francis sts	Rox.	10-in.	60
St. off Huntington ave.	1st, right, south of Wigglesworth st.	"	"	30
Columbus ave	Tremont and Walpole sts	"	"	1,642
Murdock st	No. Beacon and Spring sts	Brl.	"	240
	Carried forward			1,972

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			1,972
Colberg ave	Belgrade ave. and Arden st	W. R.	10-in.	283
Capen st	Norfolk and Evans sts	Dor.	"	188
Greenbrier st	Bowdoin and Bloomfield sts	"	"	816
Greenbrier st	Bloomfield and Park sts	"	"	96
	Total 10-inch			3,355
Hanover st	Elm and Court sts	C. P.	8-in.	338
Arch st	Summer and Franklin sts	"	"	156
Chapman pl	School and Bosworth sts	"	"	90
Washington st	Hanover st. and Haymarket sq	"	"	449
Washington st	Hanover and Friend sts	"	"	17
Tremont st	Opposite Hollis st	"	"	2
Shawmut ave	Common and Warrenton sts	"	"	95
Huntington ave	Massachusetts ave. and Parker st.	Rox.	"	2,723
" "	Wigglesworth and Francis sts	"	"	756
Randall st	Albany and Fellows sts	"	"	286
Columbus ave	Washington st. and W. Walnut pk.,	"	"	423
Calumet st	St. Alphonsus and Hillside sts	"	"	29
Huntington ave	Parker st. and Longwood ave	"	"	2,324
Ruggles st	At Huntington ave	"	"	12
Ward st	" " "	"	"	39
St. off Boylston st	Near Audubon road	"	"	10
Wensley st	At Bickford ave	"	"	43
Bryant st	Huntington ave. and St. Stephens st.,	"	"	143
Paine st	Walk Hill and Canterbury sts	W. R.	"	221
Tower st	From Hyde Park ave	"	"	402
Temple st	Spring and Hillcrest sts	"	"	308
Boylston st	Centre st. and Boylston terrace	"	"	284
Walter st	Hewlett and Selwyn sts	"	"	8
Hampstead road	Off Park road	"	"	976
Cornell st	Poplar and Kittredge sts	"	"	72
Temple st	Mt. Vernon and Lasell sts	"	"	303
Montello st	Colberg and Belgrade aves	"	"	177
Bynner st	Day st. and Parkway	"	"	647
	Carried forward			11,333

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			11,333
Elmira st.	Etna and George sts.	Bri.	8 In.	286
George st.	At Elmira st.	"	"	18
Ridgemont st.	Eleanor and Allston sts	"	"	361
Antwerp st.	Lincoln st. and Western ave.	"	"	1,338
Newton st.	Brooks and Gerrish sts.	Bri.	"	243
Ridgemont st.	West from Eleanor st.	"	"	36
Blue Hill ave.	At Lauriat ave.	Dor.	"	106
" "	" Woolson st.	"	"	107
Fessenden st.	From Blue Hill ave.	"	"	20
Shawmut park	Lonsdale and Mallett sts.	"	"	284
Thacher road	Cushing ave. and Stoughton st.	"	"	805
Saxton st.	From Savin Hill ave.	"	"	410
Holden st.	" Humphrey st.	"	"	153
Alban st.	Talbot and Burt aves.	"	"	355
Welles ave.	Ocean st. and Talbot ave	"	"	202
Duncan st.	From Greenwich st.	"	"	36
Cushing ave.	" Upham st.	"	"	58
Sherwood st.	" Norfolk ave.	Rox.	"	288
Hollingsworth st.	" Oakland st.	Dor.	"	357
Astoria st.	" Elizabeth st.	"	"	287
Fairmount ave.	Milton ave. and Nevada st.	"	"	634
Willis st.	Sumner and Pleasant sts.	"	"	351
Bakersfield st.	From Willis st.	"	"	4
Langdon st.	Norfolk ave. and George st.	Rox.	"	292
Kerwin st.	From Bernard st.	Dor.	"	370
Blue Hill ave.	At Board of Survey st.	"	"	104
Blue Hill ave.	" Proposed st.	"	"	104
Proposed st.	From Blue Hill ave.	"	"	4
Rich st.	" West Selden st.	"	"	319
Magdala st.	Van Winkle and Codman sts.	"	"	277
Oakridge st.	From Morton st.	"	"	183
Saxton st.	" Savin Hill ave.	"	"	330
Thane st.	" Athelwold st.	"	"	50
	Carried forward			20,105

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			20,105
Private way	Blue Hill ave. and Back st	Dor.	8-in.	263
Charles st	From Geneva ave.	"	"	47
Waldeck st	" " "	"	"	35
Duncan st	" Greenwich st	"	"	27
Blue Hill ave	Wales st. and Talbot ave.	"	"	17
Phipps ave	Blue Hill ave. and Columbia st	"	"	290
Weyanoke st	From Carruth st	"	"	375
Nightingale st	Bicknell st. and Talbot ave	"	"	36
Blue Hill ave	Canterbury and Angell sts	"	"	114
Woolson st	From Norfolk st	"	"	23
Fessenden st	" " "	"	"	19
Hollingsworth st	" Oakland st	"	"	252
Faxon st	Clinton and Elmont sts	"	"	202
Charlotte st	Blue Hill ave. and White st	"	"	909
Rawson st	Boston st. and Dorchester ave	So. B.	"	209
A-st. extension	From Congress st	"	"	685
Farrington st	LaFayette ave. and Overlook st	E. B.	"	492
	Total 8-inch			24,100
Mason st	At Tremont st	C. P.	6-in.	12
Mystic st	E. Canton and E. Brookline sts	"	"	146
Dartmouth st	Huntington ave. and R.R. bridge	"	"	84
Chauncy st	Summer and Avon sts	"	"	329
Avon st	Washington and Chauncy sts	"	"	11
Hawley st	Summer and Franklin sts	"	"	168
Shawmut ave	Warrenton and Common sts	"	"	72
Harold st	Walnut ave. and Monroe st	Rox.	"	409
Wait st	Hillside st. and Huntington ave	"	"	300
Sunset st	Eldora st. and Parker Hill ave	"	"	132
Plant ave	Parker and Bickford sts	"	"	208
Bromley st	Old Heath st. and Bromley park	"	"	124
Mark st	From Day st	"	"	225
Hammett ave	At Sarsfield st	"	"	81
Cunard st	Tremont and Cabot sts	"	"	261
	Carried forward			2,562

Statement of Location, Size, etc.— *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			2,562
Estey st	Lawn and Ellingwood sts	Rox.	6-in.	136
Ellingwood st	From Estey st	"	"	560
Winthrop pl	Shawmut ave. and Washington st	"	"	228
Smith st	Huntington ave. and Whitney st	"	"	227
Audubon road	Beacon st. and B. & A. R.R.	"	"	380
Audubon circle	So. side Beacon st	"	"	128
Centre st	At Highland st	"	"	12
Hutchings st	Humbolt ave. and Harold st	"	"	60
Estey st	At Fisher ave	"	"	12
Bickford ave	At Wensley st	"	"	28
Bickford st	Centre st. and Plant ave	"	"	354
Atherton st	Arcadia and Copley sts	"	"	172
Sunnyside st	Creighton and Westerly sts	"	"	83
Weldon st	Quincy and Holborn sts	"	"	147
Wise st	Roy and Centre sts	"	"	66
Pontiac st	Hillside and Cherokee sts	"	"	239
Creighton st	Centre and Sunnyside sts	"	"	200
Bryant st	At Huntington ave	"	"	29
Courtland st	" " "	"	"	19
St. off Huntington ave,	1st, Left, north of Francis st	"	"	24
Rougemont pl	At Columbus ave	"	"	13
Williams st	Westminster st. and Williams terrace	"	"	102
Columbus ave	Camden and Davenport sts	"	"	503
St. off Columbus ave	Opp. Davenport st	"	"	7
St. off Columbus av	Nearly opp. Benton st	"	"	9
Pontiac st	At Cherokee st	"	"	89
Kenmore st	Across Beacon st	"	"	54
Columbus av	Tremont and Walpole sts	"	"	2,682
St. off Huntington ave.	First, left, south of Gainsboro' st	"	"	52
" " " "	Second " " " " "	"	"	53
" " " "	First, right, " " " "	"	"	8
" " " "	" " " " Parker st	"	"	26
" " " "	" left, " " " "	"	"	4
	Carried forward			9,268

Settlement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			9,268
St. off Huntington ave.	First, right, south of Francis st.	Rox.	6-in.	59
" " " "	Second " " " " "	"	"	61
" " " "	Third " " " " "	"	"	51
" " " "	Fourth " " " " "	"	"	45
Drisko st.	At Huntington ave	"	"	53
Ruggles st.	" " "	"	"	26
Smith st.	At Huntington ave	"	"	53
Clifton st.	Albans and Kittredge sts.	W. R.	"	58
Mozart ave.	Selwyn and Walter sts.	"	"	62
Dalrymple st.	Egleston and Georgiana sts.	"	"	214
Boylston terrace	Off Centre st.	"	"	155
Westover st.	Weld and Dunbar st.	"	"	212
Orange st.	Beech and Cornell sts.	"	"	300
Danforth st.	Paul Gore and Wyman sts.	"	"	89
Congreve st.	South and Centre sts.	"	"	44
Chestnut sq.	Off Chestnut ave	"	"	221
Keith ave.	At Temple st.	"	"	10
Rexham st.	Colberg and Belgrade aves.	"	"	221
Arden st.	" " " "	"	"	305
Private road	Off Hampstead road	"	"	569
Barbara st.	From Centre st., near Perkins st.	"	"	329
Dent st.	Ivory and Pleasant sts.	"	"	36
Flora st.	Kenneth st. and Clement ave.	"	"	202
Lorraine st.	Colberg and Belgrade aves.	"	"	362
Irving st.	East of Pelton st.	"	"	154
Emsella terrace	Lamartine st. and N. Y., N. H. and H. R.R.	"	"	192
Peter Parley st.	Washington and Forest Hills st.	"	"	100
Washington st.	Cornwall st. and Jackson pl.	"	"	145
Orange st.	Brooks and Cornell sts.	"	"	208
Webster ave.	Webster pl. and Webster st.	Bri.	"	120
Fairbanks st.	Faneuil and Washington sts.	"	"	48
Leicester st.	Surrey and Bennett sts.	"	"	145
Etna st.	At Elmira st.	"	"	50
	Carried forward			14,167

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			14,167
George st.	At Elmira st.	Bri.	6-in.	32
Sidlaw road.	Chiswick road and Commonwealth av.	"	"	340
Kingsley st.	North Harvard and Hubbard sts.	"	"	60
Commonwealth ave.	Chestnut Hill ave. and Newton line	"	"	1,281
Fairbanks st.	Faneuil and Washington sts	"	"	79
Adams st.	Everett and Franklin sts.	"	"	663
Ericsson ave.	Adams and Lincoln sts.	"	"	331
Parkman st.	Brooks st. and B. & A. R.R.	"	"	218
Wicklow st.	From North Beacon st.	"	"	241
Cypress road	Etna and George sts.	"	"	226
Spring st.	" " "	"	"	167
Gerrish st.	Brooks and Bigelow sts.	"	"	591
Jackson ave.	Chestnut Hill ave. and High School pl.	"	"	60
Garden st.	Murdock and George sts.	"	"	350
Etna st.	At Garden st.	"	"	8
Maple ave.	Murdock and George sts.	"	"	323
Etna st.	At Maple ave.	"	"	10
Woodstock st.	Summit ave. and Winchester st.	"	"	195
Etna st.	Cypress road and North Beacon st.	"	"	254
Kenneth st.	At Bayard st.	"	"	88
Corona st.	From Bowdoin st.	Dor.	"	436
Devon st.	" Columbia st.	"	"	164
" "	Blue Hill ave. and Columbia st.	"	"	556
Shawmut park	From Lonsdale st.	"	"	94
Blue Hill ave.	Canterbury and Angell sts.	"	"	851
May st.	From Glenway st.	"	"	50
Morse st.	" Washington st.	"	"	231
Flint st.	" Norfolk st.	"	"	37
Clinton st.	At Faxon st.	"	"	34
Elmont st.	" " "	"	"	14
Holiday st.	Bowdoin and Geneva sts.	"	"	208
Southern ave.	Washington and Whitfield sts.	"	"	168
Samoset st.	From Centre st.	"	"	220
	Carried forward			22,747

Statement of Location, Size, etc. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			22,747
Willowwood st	From Ballou ave.	Dor.	6 in.	477
Rosedale st	Washington and Whitfield sts	"	"	435
Hartland st	From Sydney st.	"	"	6
Virginia st	Dudley and Davenport sts	"	"	90
New st	From Greenbrier st.	"	"	24
Devon st	" Blue Hill ave	"	"	92
Randolph terrace	" Weyanoke st	"	"	135
Mellen st	Montague and Waldorf sts	"	"	160
Coffee court	From Washington st.	"	"	390
Kingsdale st	" Bernard st.	"	"	36
Johnson terrace	" Lauriat ave	"	"	26
Birch st	" " "	"	"	37
Willowwood st	" " "	"	"	28
Leeds st	" Savin Hill ave.	"	"	24
Holiday st	Topliff st. and Geneva ave	"	"	420
Devon st	From Columbia st.	"	"	394
Wilder st	Washington st. and Geneva ave	"	"	312
Clarkson st	Quincy and Barrington sts	"	"	224
Upham st	Hancock st. and Cushing ave.	"	"	269
Fairview st	From Frost ave	"	"	110
Chickatawbut st	Plain and Glide sts	"	"	207
Gibson st	From Adams st.	"	"	323
Preston court	Off Gibson st.	"	"	119
Private way	From No. 5 Richfield st.	"	"	137
Dudley st	Near Howard ave.	"	"	61
Pond st	From Pleasant st.	"	"	120
Castle rock	" Grampian way	"	"	341
Russell park	" 66 Westville st.	"	"	187
Athelwold st	School and Kilton sts	"	"	735
Millett st	From Athelwold st.	"	"	52
Gawain st	" " "	"	"	51
Proposed st	" " "	"	"	17
Woodward Park st	Folsom st. and Howard av.	"	"	96
	Carried forward			28,882

Statement of Location, Size, etc. — *Concluded.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			28,882
Hooper ave	From Magnolia st	Dor.	6-in.	298
Roslin st	Washington and Montague sts	"	"	218
Grace st	From Roslin st	"	"	115
Montague st	" " "	"	"	129
Cottage side	" Willis st	"	"	26
Rockdale st	" Oakland st	"	"	164
Pond st	From Pleasant st	"	"	36
Cottage terrace	Marshfield and E. Cottage sts	"	"	237
Stanley st	From Bellevue st	"	"	235
Bellevue st	Trull and Stanley sts	"	"	62
Blue Hill ave	Angell and Powanda sts	"	"	6,230
Robinson court	From Savin Hill ave	"	"	36
Orchard Dale st	From Westville st	"	"	200
Freeman st	From Faulkner st	"	"	78
King st	At Adams st	"	"	75
Atherstone st	Fuller and Bailey sts	"	"	340
Arcadia pl	From Arcadia st	"	"	221
Blue Hill ave	Cheney and Seaver sts	"	"	1,309
Downer ave	From Sawyer ave	"	"	680
Crescent ave	Spring Garden and Sydney sts	"	"	99
May st	From Glenway st	"	"	236
Shepton st	Shawmut park and Denver st	"	"	718
Danube st	Brookford and Dewey sts	"	"	88
Preston court	From Gibson st	"	"	92
Mallett st	From Adams st	"	"	459
Hartland st	From Tileston ave	"	"	36
Champney st	From Mercer st	S. B.	"	127
East Ninth st	Dorchester and Mercer sts	"	"	386
Mercer st	At Telegraph st	"	"	7
Knowlton st	" " "	"	"	3
Collins st	Bayswater st. and Austin ave	E. B.	"	477
Bremen st	Glendon court and Curtis st	"	"	408
Meridian st	Condor and W. Eagle sts	"	"	100
	Total 6-inch			42,807

Statement of Private Mains Laid During the Year ending Jan. 31, 1897.

For Whom Laid.	Where Laid.	Size.	Length.
Park Department.....	Arborway, between Centre street and Hampstead road.....	10-inch.	3,087
" "	Arborway, between Hampstead road and South street.....	"	378
	Total 10-inch.....	.....	3,465
Park Department.....	Franklin Park, from Blue Hill avenue....	6-inch.	411
Dept. Public Institutions....	Parental School, Spring st., W. Roxbury,	"	397
	Total 6-inch.....	.....	808
Dept. Public Institutions....	Rainsford's Island.....	4-inch.	824
Mt. Hope Cemetery Trustees,	Mt. Hope Cemetery, Walk Hill st.....	"	3,558
	Total 4-inch.....	.....	4,382

Statement of Main Pipe Abandoned.

In what Street.	Between what Streets.	District.	Size.	Length.
Tremont st.	Boylston and Mason sts	C. P.	40-in.	290
" "	" " " "	"	30-in.	550
" "	Warrenton and Eliot sts	"	"	1,015
Haymarket sq.		"	24-in.	50
" "		"	20-in.	90
Boston Common	On line of Subway	"	16-in.	100
Haymarket sq.	Sudbury and Canal sts.	"	"	110
Centre st.	Columbus ave. and Amory st.	Rox.	"	415
" "	" " " Ritchie st.	"	"	926
Amory st.	Stony Brook and Centre st.	"	"	285
Commonwealth ave.	At Cottage Farm station	Bri.	"	510
" "	At Essex st.	"	"	10
Talbot ave.	At Blue Hill ave.	Dor.	"	30
	Total 16-in			2,386
Hanover st.	No. Bennet and Charter sts.	C. P.	12-in.	469
" "	Charter and Salutation sts.	"	"	22
" "	Court and Portland sts.	"	"	419
" "	Opp. Friend st.	"	"	30
Indiana st.	Washington st. and Harrison ave.	"	"	5
Washington st.	Haymarket sq. and Hanover st.	"	"	280
Ritchie st.	Stony Brook and Centre st.	Rox.	"	231
Amory st.	" " " " "	"	"	527
Centre st.	At Hogg's bridge	"	"	160
" "	Hogg's bridge and Wise st.	"	"	323
Lamartine st.	Centre and Roys st.	"	"	177
Centre st.	Columbus ave. and Amory st.	"	"	420
" "	Wise st. and N.Y. N.H. & H. R.R.	"	"	36
Ruggles st.	At Roger's ave	"	"	28
Centre st.	At Lamartine st.	"	"	7
Columbus ave.	Cedar and New Heath sts.	"	"	812
Centre st.	Columbus ave. and Ritchie st.	"	"	143
Ruggles st.	Columbus ave. and Duncan st.	"	"	331
	Carried forward			4,420

Statement of Main Pipe Abandoned. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			4,420
Rogers ave	Near Ruggles st	Rox.	12-in.	7
Washington st	Near Dedham branch crossing	W. R.	"	42
Walk Hill st	Morton st. and railroad crossing	"	"	460
Boylston st	At N. Y., N. H. and H. R.R.	"	"	77
Blue Hill ave	North of Walk Hill st.	Dor.	"	144
" " "	Grove Hall and Seaver sts	"	"	1,455
" " "	Columbia and Glenway sts	"	"	624
" " "	Glenway and Esmond sts	"	"	750
" " "	Canterbury and Angell sts	"	"	195
" " "	At Evelyn st	"	"	144
" " "	" Harvard st	"	"	235
" " "	Vaughn st. and Talbot ave	"	"	179
" " "	At Back st	"	"	44
Harvard st	" Blue Hill ave	"	"	133
Commonwealth ave	" Cottage Farm station	Bri.	"	134
" "	Foster and Lake sts	"	"	1,275
Washington st	At Chestnut Hill ave	"	"	15
Central sq	Border and Bennington sts	E. B.	"	336
	Total 12-inch			10,669
Tremont st	Hollis and Warrenton sts	C. P.	8-in.	181
Mason st	Across Boston Common	"	"	194
West st	At Tremont st.	"	"	29
Boylston st	" " "	"	"	9
North st	Fleet and Lewis sts	"	"	96
Murdock st	No. Beacon and Spring sts	Bri.	"	5
Elmira st	Ætna and George sts	"	"	12
Back st	At Blue Hill ave	Dor.	"	309
Boston Harbor	Winthrop and Deer Island		"	1,428
	Total 8-inch			2,263
North Centre st	North and Hanover sts	C. P.	6-in.	15
North st	Fleet and Union sts	"	"	1,986
Cross st	Commercial st. and Haymarket sq.	"	"	1,508
	Carried forward			3,509

Statement of Main Pipe Abandoned. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward.....	.....	.....	3,509
Pine st.....	Harrison ave. and Washington st.....	C. P.	6-in.	442
Garden-Court st.....	North sq. and Prince st.....	"	"	12
Brattle st.....	Court and Washington sts.....	"	"	476
North sq.....	Prince and North sts.....	"	"	422
Haymarket sq.....	Washington and Sudbury sts.....	"	"	112
Park st.....	Tremont and Beacon sts.....	"	"	76
"	At Tremont st.....	"	"	213
Water st.....	Liberty sq. and Broad st.....	"	"	306
Mason st.....	At Tremont st.....	"	"	22
Stillman st.....	Endicott and Charlestown sts.....	"	"	221
Warrenton st.....	Shawmut ave. and Tremont st.....	"	"	48
Malden st.....	Washington st. and Harrison ave.....	"	"	560
Winter st...	Washington and Tremont sts.....	"	"	539
Bosworth st.....	Province and Tremont sts.....	"	"	7
Province st.....	Bromfield st. and Province court.....	"	"	182
Eliot st.....	At Tremont st.....	"	"	4
Friend st.....	At Washington st.....	"	"	11
Mt. Vernon st.....	Beacon st. and Beacon Hill pl.....	"	"	110
Tremont st,.....	School st and Scollay sq.....	"	"	4
West st.,.....	At Washington st..... ...	"	"	49
Dover st.....	Shawmut and Harrison aves.....	"	"	798
Hanover st,.....	At Elm st.....	"	"	5
Tremont st.....	At Common st.....	"	"	60
Washington st.....	Haymarket sq. and Hanover st.....	"	"	95
Cross st..... ...	North and Hanover sts.....	"	"	22
"	North and Fulton sts.....	"	"	30
Congress sq.....	Off State st.....	"	"	72
Haskins st.....	Vernon and Ruggles sts.....	Rox.	"	654
Vernon st.....	Washington and Downing sts.....	"	"	1,616
Cabot st.....	At Vernon st.....	"	"	16
Carey st.....	Riverside and Terry sts.....	"	"	237
Pierpont st.....	Prentiss and Station sts.....	"	"	150
Station st.....	At Columbus ave.....	"	"	70
	Carried forward.....	.....	.....	11,150

Statement of Main Pipe Abandoned. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			11,150
Prentiss st	At Columbus ave	Rox.	6-in.	83
Riverside st	" " "	"	"	139
Weston st	" " "	"	"	100
Rogers ave	At Ruggles st	"	"	87
Prentiss st	Columbus ave. and Tremont st	"	"	184
Old Heath st	Columbus ave. and Albert st	"	"	83
Cliff st	Washington and Regent sts	"	"	889
New Heath st	Across Columbus ave	"	"	30
Cedar st	Across Columbus ave	"	"	32
Walpole st	Columbus ave. and Tremont st	"	"	299
Linden ave	Across Linden Park st	"	"	12
Eustis st	At Prescott st	"	"	12
Centre st	Columbus ave. and Richie st	"	"	81
Parker st	Across Centre st	"	"	51
Terrace st	New Heath st. and Parker pl	"	"	552
Larch pl	At N. Y., N. H. and H. R.R.	W. R.	"	22
Crosby sq	" " " " "	"	"	32
Blue Hill ave	Grove Hall and Seaver st	Dor.	"	80
Gibson st	Adams st. and Dorchester ave	"	"	20
Gaylor st	At Washington st	"	"	20
Dix st	Adams st. and Dorchester ave	"	"	20
Athelwold st	From School st	"	"	350
Parkman st	Adams st. and Dorchester ave	"	"	20
McLellan st	From Blue Hill ave	"	"	165
Church st	Winter and High sts	"	"	363
Winter st	Adams and East sts	"	"	90
East st	Winter st. and Williams pl	"	"	329
Centre st	Washington st. and Railroad	"	"	177
Sleeper st	Congress st. and Railroad	S. B.	"	650
Farnsworth st	" " " "	"	"	682
Essex st	At Commonwealth ave	Bri.	"	89
Parker st	Cambridge and Perkins sts	Chn.	"	45
New st	Sumner and Maverick sts	E. B.	"	475
Boston Harbor	Squantum and Thompson's Island		"	100
	Total 6-inch			17,513

Statement of Main Pipe Abandoned. — *Continued.*

In what Street.	Between what Streets.	District.	Size.	Length.
Sun-Court st	North and Moon sts	C. P.	4-in.	27
Hanover ave	North and Hanover sts	"	"	48
Salutation st	" " " "	"	"	34
Norwich st	Mystic and Meander sts	"	"	235
Meander st	Norwich and East Dedham sts	"	"	222
Laconia st	Harrison ave. and Washington st	"	"	620
Harris st	From Hanover st	"	"	16
Webster ave	" " "	"	"	16
Knapp st	Beach st. and Harrison ave	"	"	367
Cotting st	Lowell and Leverett sts	"	"	325
Prince st	Hanover and Garden-Court sts	"	"	171
Jackson pl	Off Winter st	"	"	15
Winter pl	" " "	"	"	21
Stillman pl	Stillman and Cooper sts	"	"	28
Union Park st	Washington st. and Harrison ave	"	"	481
Acton st	" " " Bradford st	"	"	305
Newland st	Pembroke and Trumbull sts	"	"	63
Bosworth st	Province and Tremont sts	"	"	230
James st	Concord and E. Newton sts	"	"	140
Province court	From Province st	"	"	95
Concord sq	Tremont st. and Columbus ave	"	"	594
Concord pl	From Concord sq	"	"	41
Dix pl	Off Washington st	"	"	333
Congress sq	" State st	"	"	105
Ohio st	Washington st. and Shawmut ave	"	"	401
Seaver pl	Off Tremont st	"	"	143
Burroughs pl	" Hollis st	"	"	178
Kent st	At Vernon st	Rox.	"	20
Sterling st	Shawmut ave. and Washington st	"	"	246
Newcomb st	Washington and Reed sts	"	"	183
Putnam st	At Roxbury st	"	"	31
Columbus ave. (private way)	Cottage pl. and Prentiss st	"	"	118
Cottage pl	At Columbus ave	"	"	150
Culvert st	" " "	"	"	91
	Carried forward			6,093

Statement of Main Pipe Abandoned. — *Concluded.*

In what Street.	Between what Streets.	District.	Size.	Length.
	Brought forward			6,093
Tabor st	Across Winslow st	Rox.	4-in.	73
Guild st	At Washington st	"	"	25
Culvert st	Columbus ave. and Tremont st	"	"	211
Kenilworth st	Across Dudley st	"	"	59
Cliff st	Washington and Regent sts	"	"	250
Glenwood st	Across Cliff st	"	"	21
Grosevenor pl	" " "	"	"	10
Lamont st	" Linden Park st	"	"	36
Sanford pl	" E. Lenox st	"	"	27
Prescott st	" Eustis st	"	"	29
Orchard st	" " "	"	"	22
St. off Parker st	Near Centre "	"	"	220
Cottage pl	Tremont st. and Columbus ave	"	"	130
Clark pl	Across Lamartine st	W. R.	"	28
Dove st	E and F sts	S. B.	"	547
Telegraph st	At Thomas Park	"	"	36
" "	Dorchester st. and Thomas Park	"	"	826
Gates st	At Telegraph st	"	"	65
Gold st	Near Railroad	"	"	130
Cross st	Border and New sts	E. B.	"	192
Webster st	Seaver and Cottage sts	"	"	40
Monument court	From Winthrop st	Chn.	"	215
Boston Harbor	Rainsford's Island		"	510
	Total 4-inch			9,795
Boston Harbor	Rainsford's Island		3-in.	2,014

Statement of Main Pipe Abandoned on the J. P. A. System.

In what Street.	Between what Streets.	District.	Size.	Length.
Parker st	Madison court and Ruggles st	Rox.	12-in.	572
Ruggles st	Tremont and Parker sts	"	"	1,496
Ward st	At Huntington ave	"	"	26
St. Alphonsus st	At Ward st	"	"	11
	Total 12-inch			2,105
Greenleaf st	Near Huntington ave	Rox.	6-in.	392
Parker st	Greenleaf st. and Madison court	"	"	248
Columbus ave. (Berlin st.)	Davenport and Walpole sts	"	"	800
Benton st	At Columbus ave	"	"	12
Burke st	" "	"	"	12
Coventry st	" "	"	"	10
Cunard st	" "	"	"	10
Rogers ave	At Ruggles st	"	"	88
Columbus ave. (Chapel st.)	Sarsfield and Weston sts	"	"	220
Terry st	At Columbus ave	"	"	89
Sarsfield st	" "	"	"	100
Walpole st	" "	"	"	105
Rogers ave	Near Ruggles st	"	"	165
	Total 6-inch			2,251
Haskins st	Vernon and Ruggles sts	Rox.	4-in.	650
Columbus ave. (Berlin st.)	Davenport and Walpole sts	"	"	70
Davenport st	At Columbus ave	"	"	10
" "	Tremont st. and Columbus ave	"	"	240
	Total 4-inch			970
Sarsfield st	Columbus ave. and Grinnell st	Rox.	3-in.	175

Statement of Main Pipe Lowered.

In what Street.	Between what Streets.	District.	Size.	Length.
Parker Hill ave	Huntington ave. and Hillside st	Rox.	12-in	221
Lamartine st	Centre and Roys sts	"	"	43
	Total 12-in			264
Greenbrier st	Bowdoin and Bloomfield sts	Dor.	8-in.	800
Abbotsford st	Walnut ave. and Harold st	Rox.	6-in.	260
Shepherd ave	At Huntington ave	"	"	39
Boston Harbor	Squantum and Thompson's Island	"	"	420
	Total 6-in			719

Gates Established and Abandoned during the Year and Number in use Jan. 31, 1897, exclusive of Blow-off and Private Gates.

	Diameter in Inches.													Total.
	48	40	36	30	24	20	16	12	10	8	6	4	3	
Number in use Jan. 31, 1896	6	7	28	51	63	49	150	1,413	99	845	3,713	824	13	7,261
Established during the year	.....	.....	1	3	3	5	30	140	21	97	255	10	.....	565
Abandoned during the year	.....	.....	.....	.....	1	1	1	24	.....	2	71	42	.....	142
Total number in use Jan. 31, 1897	6	7	29	54	65	53	179	1,529	120	940	3,897	792	13	7,684

Blow-off Gates Established and Abandoned during the Year.

	Diameter in Inches.		Total.
	4	6	
Number established	12	2	14
Number abandoned	2	1	3
Increase	10	1	11

Private Gates Established and Abandoned during the Year.

	Diameter in Inches.				Total.
	4	6	8	10	
Number established	7	5	1	2	15
Number abandoned					
Increase	7	5	1	2	15

Hydrants Established and Abandoned during the Year.

	Established.					Abandoned.					
	Lowry.	Post.	B. Lowry.	Boston.	Totals.	Lowry.	Post.	B. Lowry.	Boston.	Totals.	Increase.
City Proper (Public)	51	29	4	...	84	28	2	4	49	83	1
" (Private)		5			5		2			2	3
South Boston (Public)	6	18	2		26	5		2	14	21	5
East Boston (Public)	12	22	3		37			2	20	22	15
Roxbury (Public)	19	67	18		104	38	3	13	9	63	41
Dorchester (Public)	8	136	37	...	181	8	17	23	3	51	130
West Roxbury (Public)	1	19	27	1	48	1	1	11	3	16	32
" (Private)		2			2						2
Brighton (Public)	1	18	14	1	34	1	3	8	1	13	21
Charlestown (Public)	2				2						2
Rainsford's Island (Private)			3		3						3
Total Public	100	309	105	2	516	81	26	63	99	269	247
Total Private		7	3		10	...	2			2	8

Total Number of Hydrants in use Jan. 31, 1897

	Lowry.	Post.	B. Lowry.	Boston Y.	Boston.	Totals.	Notes.
City Proper (Public).....	727	301	58	....	390	1,476	
" " (Private).....	.....	10	.....	....	46*	56	* 27 not for fire.
South Boston (Public)....	219	111	23	....	202	555	
" " (Private)...	2	9	.....	1	33*	45	*2 not for fire.
East Boston (Public).....	144	119	25	....	91	379	
" " (Private)....	8	7	.....	....	25*	40	*7 not for fire.
Roxbury (Public).....	642	325	82	....	67	1,116	
" (Private).....	1*	.....	.....	....	10*	11	*1 Lowry, *1 Boston } not for fire.
Dorchester (Public).....	580	669	239	....	52	1,540	
" (Private).....	.....	.....	1	....	5*	6	*2 not for fire.
West Roxbury (Public)...	129	555	198	....	41	923	
" " (Private)..	.....	13	.....	....	1	14	
Brighton (Public).....	78	313	70	....	30	491	
" (Private).....	.....	6	.....	....	2*	8	*2 not for fire.
Charlestown (Public).....	205	38	36	....	4	283	
" (Private).....	14	36	1	....	6*	57	*1 not for fire.
Deer Island (Private).....	.....	18	.....	....	.....	18	
Long Island (Private).....	.....	6	.....	....	.....	6	
Thompson's Island (Private)....	.....	2	.....	....	.....	2	
Galloupe's Island (Private).....	.....	1	.....	....	1*	2	*1 not for fire.
Rainsford's Island (Private)....	.....	1	3	....	1*	5	*1 not for fire.
Pumping Station, West Somerville (Private)....	.....	2	.....	....	1	3	
Brookline.....	5	.....	.....	....	3	8	
Chelsea.....	.....	.....	.....	....	7	7	
Quincy.....	.....	7	.....	....	.....	7	
Medford.....	.....	2	.....	....	6	8	
Total number Public Hydrants.....	2,724	2,431	731	....	877	6,763	
Total number Private and Suburban Hydrants	30	120	5	1	147	303	

Water-Posts.

DISTRICT.	Number in use Jan. 31, 1896.	Established during the Year.	Abandoned during the Year.	Number in use Jan. 30, 1897.
City Proper	53	1	.....	54
South Boston	28	.....	.....	28
East Boston	32	.....	.....	32
Roxbury	69	.....	.....	69
Dorchester	80	1	1	80
West Roxbury	69	6	.....	75
Brighton	47	.....	.....	47
Charlestown	20	.....	.....	20
	398	8	1	405

Meters Applied.

	DIAMETER IN INCHES.								Totals.
	6	4	3	2	1½	1	¾	⅝	
Worthington	.....	1	1	16	11	36	33	.....	98
Crown	1	5	6	11	12	27	28	54	144
Hersey	.....	.....	.....	2	9	6	13	1	31
Metropolitan	.....	.....	.....	.....	3	4	42	.....	49
B. W. W.	.....	.....	.....	.....	.....	.....	4	.....	4
Gem	1	3	.....	.....	.....	.....	.....	.....	4
Torrent	1	.....	.....	.....	.....	.....	.....	.....	1
Totals	3	9	7	29	35	73	120	55	331

Meters Discontinued.

	Diameter in Inches.							Totals.
	4	3	2	1½	1	¾	⅝	
Worthington	1	.....	7	8	35	39	3	93
Crown	2	6	5	8	11	31	125	188
Hersey	.....	.....	.....	7	9	17	3	36
Metropolitan	.....	.....	.....	3	14	65	.....	82
B. W. W.	.....	.....	.....	.....	.....	5	.....	5
Champion	.....	.....	.....	.....	.....	1	.....	1
Ball & Fitts	.....	.....	.....	.....	1	.....	.....	1
Totals	3	6	12	26	70	158	131	406

Meters Changed.

Cause.	Total.
Not registering	373
Test	622
No force	99
Change of location	14
Leak at spindle	29
Clock broken	70
Clock defaced	19
Leak at packing	43
Unsatisfactory	121
Enlargement	56
Spindle stuck	5
Stoppage	38
Burst	3
Size decreased	1
Frost	27
	1,520

Meters in Service, Jan. 31, 1897.

	Diameter in Inches.								Totals.
	6	4	3	2	1½	1	¾	⅝	
Worthington	2	22	34	156	114	598	426	17	1,369
Crown	6	37	47	78	151	338	431	1,203	2,291
Hersey		4	10	24	32	65	160	17	312
Metropolitan				4	21	123	648	3	799
Thomson								4	4
B. W. W							40		40
Gem	1	5	1						7
Ball & Fitts			1				1	1	3
Champion							1		1
Torrent	1								1
Totals	10	68	93	262	318	1,124	1,707	1,245	4,827

Meters Purchased.

	Diameter in Inches.							Totals.
	6	4	3	2	1	1	¾	
Worthington						4		4
Crown	1	5	1	9	13	28	6	63
Hersey						4		4
Gem	1							1
Totals	2	5	1	9	13	36	6	72

Meters Sent to Factory for Repairs.

	Diameter in Inches.					Totals.
	2	1½	1	¾	⅝	
Worthington	6					6
Crown	8	11	40	46	133	238
Hersey		2		5		7
Metropolitan				3		3
Totals	14	13	40	54	133	254

Meters Repaired in Service.

Cause.	Totals.
Leak at coupling	35
Leak at spindle	132
Gear broken	6
Cap broken	3
Ratchet broken	7
Leak at nipple	5
Leak at packing	7
Leak at piston	3
Flange broken	1
Screw broken	1
Clock defaced	88
Clock broken	117
Unsatisfactory	35
Hot water	1
Total	441

General Statement of Meters for the Year ending Jan. 31, 1897.

	Meters.	Boxes.
In service Jan. 31, 1897	4,827	
New set	331	97
Discontinued	406	
Changed	1,520	
Changed location	20	
Tested	2,886	
Repaired at shop	1,020	
Repaired at factory	254	
Repaired in service	441	62
Purchased	72	

Repairs of Pipes during the Year ending Jan. 31, 1897.

	DIAMETER OF PIPES IN INCHES.																				Tot'ls
	48	42	40	36	30	28	24	20	16	12	10	8	6	4	3	2	1½	1¼	1	¾	⅝	½	
City Proper..	2	2	5	1	132	1	8	16	28	143	2	125	137	44	7	21	14	5	50	18	692	9	1,462
So. Boston...	..	..	..	..	4	..	..	..	..	18	..	2	19	3	2	5	..	..	1	..	224	8	286
E. Boston....	..	..	..	..	....	..	1	..	1	3	3	....	4	2	..	3	3	..	..	4	55	4	83
Roxbury.....	1	..	..	2	1	..	4	2	3	18	..	3	10	3	1	5	2	..	9	8	397	15	484
Dorchester...	..	..	..	..	....	..	..	..	2	11	..	....	13	..	..	5	1	..	..	1	178	3	214
W. Roxbury..	..	..	..	..	1	..	..	1	..	12	1	1	10	..	..	3	..	..	8	..	106	2	145
Brighton.....	..	..	..	2	....	..	..	..	..	1	..	....	1	1	..	2	..	..	..	..	24	..	31
Charlestown..	..	..	..	..	....	..	..	..	..	....	..	1	....	..	3	9	..	..	..	5	61	2	81
Brookline....	2	1	..	..	5	..	..	..	..	....	..	....	....	..	..	..	..	..	..	..	.....	..	8
Long Island..	..	..	..	..	....	..	..	..	..	....	..	....	....	..	..	1	..	..	..	..	.....	..	1
Galloupe's Island.....	..	..	..	..	....	..	..	..	..	....	..	....	1	..	..	..	..	..	..	..	.....	..	1
Totals.....	5	3	5	5	143	1	13	19	34	206	6	132	195	53	13	54	20	5	68	36	1,737	43	2,796

Causes of repairs that have been made on pipes of 4-inch diameter and upwards: —

Blasting	7	
Defective joints	142	
" stop-cocks	119	
" pipes	34	
" packing	54	
Frozen	8	
In way of West End Street Railway	25	
Joints strained by settling in subway	406	
On account of Sewer Division	6	
Settling of earth	14	
Struck by pick	5	
	——	820
On 3-inch and on service-pipes:		
Broken in wall	20	
" " sewer	122	
" by builders of subway	196	
" " team	1	
" " steam-roller	1	
	——	
Carried forward	340	820

Brought forward	340	820
Broken by blasting	2	
" " pick	90	
" " settling of earth	219	
Defective pipe	160	
" joints	47	
" stop-cocks	66	
" packing	16	
" coupling	29	
" valve	18	
Eaten by soil	10	
" " electricity	1	
Frozen	22	
Gnawed by rats	9	
In way of West End Street Railway	5	
" " " N. Y., N. H. and H. R.R.	26	
Relaying main pipe	251	
Stopped by rust	486	
" " dirt	72	
" " fish	105	
" " gasket	2	
	—	1,976
		2,796

Statement of Miscellaneous Work Performed during the Year.

Locations of gates marked and re-marked	5,099
Dead ends blown off	425
Hydrant barrels changed for repairs	181
" boxes repaired in service	349
" " renewed	86
" nipples put in	56
Hydrants changed on account of no guides	51
" repaired in service	1,955
Hydrant boxes cleaned out	2,799
Boxes over bridges repaired	10
Main cocks renewed	23
Sidewalk cocks renewed	50
New sidewalk cocks put on old services	66
" " uprights " " "	66
Sidewalk uprights raised or lowered	237
" " moved on account of edgestone	37
New main uprights put on	4

Stopcock or gate boxes repaired in service	570
" " " " renewed	212
Water posts repaired	284
Number of examinations caused by false reports	841
Fire reservoirs repaired	3

Statement of Leaks and Stoppages, from 1850 to 1896.

YEAR.	DIAMETER IN INCHES.		TOTAL.
	Four inches and upwards.	Less than four inches.	
1850	32	72	104
1851	64	173	237
1852	82	241	323
1853	85	260	345
1854	74	280	354
1855	75	219	294
1856	75	232	307
1857	85	278	363
1858	77	234	311
1859	82	449	531
1860	134	458	592
1861	109	399	508
1862	117	373	490
1863	97	397	494
1864	95	394	489
1865	111	496	607
1866	139	536	675
1867	122	487	609
1868	82	449	531
1869	82	407	489
1870	157	707	864
1871	185	1,380	1,565
1872	188	1,459	1,647
1873	153	1,076	1,229
1874	434	2,160	2,594
1875	203	725	928
1876	214	734	948
1877	109	801	910
1878	213	1,024	1,237
1879	211	995	1,206

Statement of Leaks and Stoppages, from 1850 to 1896.—*Concluded.*

YEAR.	DIAMETER IN INCHES.		TOTAL.
	Four inches and upwards.	Less than four inches.	
1880	135	929	1,064
1881	145	883	1,028
1882	170	1,248	1,418
1883	171	782	953
1884	253	1,127	1,380
1885	111	638	749
1886	150	725	875
1887	172	869	1,041
1888	216	1,140	1,356
1889	183	849	1,032
1890	180	718	898
1891	194	758	952
1892	212	1,232	1,444
1893	327	1,555	1,882
1894	349	1,354	1,703
1895	215	1,320	1,535
1896	820	1,976	2,796

TABLES SHOWING DETAILS OF WORK PERFORMED IN SOMERVILLE, CHELSEA AND EVERETT.

Length of Distributing Mains connected with Works, Jan. 31, 1897.

	Diameter in Inches.											
	3-in.	4-in.	6-in.	8-in.	10-in.	12-in.	14-in.	16-in.	18-in.	20-in.	24-in.	Totals.
Somerville	5,482	55,177	182,821	67,253	30,958	37,044	8,037	1,044	387	1,203	.....	389,406
Chelsea	12,671	34,898	81,283	20,152	36,420	.....	.....	2,348	.....	.....	.....	187,772
Everett	788	55,540	88,424	13,416	18,162	1,937	206	2,233	.....	2,900	2,485	186,091
Totals	18,941	145,615	352,528	100,821	85,540	38,981	8,243	5,625	387	4,103	2,485	763,269

Number of Gates connected with Works, Jan. 31, 1897.

	3-in.	4-in.	6-in.	8-in.	10-in.	12-in.	14-in.	16-in.	20-in.	24-in.	Totals.
Somerville	4	164	417	98	59	69	.....	3	1	.....	815
Chelsea	28	169	130	33	27	.....	.....	.....	.....	.....	387
Everett	2	159	350	29	37	4	1	4	4	2	592
Totals	34	492	897	160	123	73	1	7	5	2	1,794

New Services.

	Size.								
	½-in.	⅝-in.	¾-in.	1-in.	1¼-in.	1½-in.	2-in.	Total.	Total ft.
Somerville	.....	.....	434	9	6	2	2	453	10,411
Chelsea	30	60	3	.....	.....	.....	.....	93	2,650
Everett	.....	219	.....	12	.....	.....	.....	231	4,614
Totals	30	279	437	21	6	2	2	777	17,675

Summary of Services.

	Somerville.	Chelsea.	Everett.	Totals.
Number of services	9,039	5,848	3,785	18,672
Number of feet	301,938	151,893	75,820	529,651

Distribution-Pipes Relaid.

Locations.	Original Size.	4-in.	6-in.	8-in.	10-in.	12-in.	Totals.
Somerville:							
Auburn avenue	4-in.	.....	626	.....	.....	.....	626
Autumn street	4-in.	.....	440	.....	.....	.....	440
Benedict street	4-in.	.....	535	.....	.....	.....	535
Bonair street	4-in.	.....	13	1,561	.....	.....	1,574
Brastow avenue	4-in.	.....	581	.....	.....	.....	581
Brook street	4-in.	.....	556	.....	.....	.....	556
Cherry street	4-in.	.....	.....	1,305	.....	.....	1,305
Clyde street	4-in.	.....	5	596	.....	.....	601
Cross street	4-in.	.....	18	.....	.....	.....	18
" "	6-in.	.....	.....	.....	.....	2,244	2,244
Cross Street place	4-in.	15 0	13	.....	.....	.....	163
Dana street	6-in.	.....	450	.....	.....	.....	450
Flint street	6-in.	.....	.....	1,093	.....	.....	1,093
Gilman street	4-in.	.....	14	.....	.....	.....	14
" "	6-in.	.....	.....	.....	1,461	.....	1,461
Glen street	4-in.	.....	1,162	.....	.....	.....	1,162
Carried forward	.....	150	4,413	4,555	1,461	2,244	12,823

Distribution-Pipes Relaid — *Concluded.*

LOCATIONS.	Original Size.	4-in.	6-in.	8-in.	10-in.	12-in.	Totals.
Brought forward		156	4,413	4,555	1,461	2,244	12,823
Highland avenue	10-in.				573		573
Houghton street	4-in.		6		232		238
Holland street	6-in.		10				10
" "	10-in.					455	455
James street	6-in.		20				20
Lowell street	6-in.					213	213
Murdock street	4-in.		5	884			889
Mystic avenue	4-in.		171				171
" "	6-in.				236		236
Oliver street	4-in.			724			724
Otis street	4-in.			368			368
Perkins place	3-in.	2					2
Perkins street	6-in.		10	1,139			1,149
Pinckney street	6-in.		29	1,210			1,239
Porter street	4-in.			1,188			1,188
Rush street	4-in.		3	1,474			1,477
Sargent avenue	4-in.		1,110				1,110
Shawmut street	4-in.			46			46
Tufts street	6-in.		13			935	948
Union street	4-in.		6			322	328
Veazie street	6-in.		189				189
Wigglesworth street	6-in.		361				361
Williams court	3-in.	164					164
Wilson avenue	2-in.	300					300
Webster street	6-in.		6	531			537
Chelsea:							
Franklin street	4-in.		526				526
Harvard street	4-in.		343				343
Washington street	3 & 4-in.				1,289		1,289
Congress avenue	4-in.		625				625
Hawthorne street	4-in.		1,132				1,132
Miller street	3-in.		142				142
Ellsworth street	4-in.		549				549
Bellingham street	4-in.		480				480
Willow street	4-in.			913			913
Carried forward		616	10,149	13,032	3,791	4,169	31,757

Distribution-Pipes Relaid. — *Concluded.*

LOCATIONS.	Original Size.	4-in.	6-in.	8-in.	10-in.	12-in.	Totals.
Brought forward	.....	616	10,149	13,032	3,791	4,169	31,757
Central avenue.....	6-in.	.....	.....	892	.....	.....	892
Highland street.....	6-in.	.....	.....	1,180	.....	.....	1,180
China street.....	3 & 4-in.	.....	418	.....	.....	.....	418
Franklin avenue.....	4-in.	.....	1,000	.....	.....	.....	1,000
Spruce street.	4-in.	.....	208	.....	.....	.....	208
Warren avenue.....	4-in.	.....	190	.....	.....	.....	190
Gardner street.	4-in.	.....	814	.....	.....	.....	814
John street.....	4-in.	.....	744	.....	.....	.....	744
Sturgis street	4-in.	.....	114	.....	.....	.....	114
Forsyth street.....	4-in.	.....	443	.....	.....	.....	443
Heard street.....	4-in.	.....	560	.....	.....	.....	560
" "	4-in.	.....	.....	150	.....	.....	150
Cary avenue.....	6-in.	.....	121	.....	.....	.....	121
Spencer avenue.....	4-in.	.....	251	.....	.....	.....	251
Broadway.....	4-in.	.....	481	.....	.....	.....	481
Bellingham street.....	4-in.	.....	530	.....	.....	.....	530
Cherry street.....	3-in.	.....	570	.....	.....	.....	570
Jefferson street	4-in.	.....	1,100	.....	.....	.....	1,100
Crescent avenue.....	6-in.	.....	.....	436	.....	.....	436
Everett:							
Chelsea street.....	6-in.	.....	.....	1,480	.....	.....	1,480
Courtland street.....	4-in.	.....	1,041	.....	.....	.....	1,041
Totals.....	.....	616	18,734	17,170	3,791	4,169	44,480

Extension of Distribution-Pipes.

LOCATIONS.	3-in.	6-in.	8-in.	10-in.	12-in.	16-in.	20-in.	Totals.
Somerville:								
Alpine street	.....	730	.....	.....	.....	.....	.....	730
Auburn avenue....	.....	5	.....	.....	.....	.....	.....	5
Beach avenue	.....	256	.....	.....	.....	.....	.....	256
Beacon street.....	.....	50	.....	.....	.....	.....	.....	50
Bedford street.....	.....	166	.....	.....	.....	.....	.....	166
Benton avenue.....	.....	.....	.....	307	.....	.....	.....	307
Carried forward....	.....	1,207	.....	307	.....	.....	.....	1,514

Extension of Distribution-Pipes. — *Continued.*

LOCATIONS.	3-in.	6-in.	8-in.	10-in.	12-in.	16-in.	20-in.	Totals.
Brought forward		1,207		307				1,514
Bolton street		529						529
Bonair street		43						43
Brastow avenue		21						21
Brooks street		190						190
Cherry street		21						21
Cleveland street		242						242
Clyde street		5						5
College avenue		4			748			752
Columbia court		260						260
Columbia street				549				549
Conlon court		115						115
Cross street		18						18
East Albion street				396				396
Earle street		239						239
Electric avenue		474						474
Flint street		14						14
Fremont street		6		180				186
Garfield avenue		1,113						1,113
Gilman street		21						21
Glass House court						48		48
Glen street		28						28
Hall avenue		7		200				207
Harding street		115						115
Highland avenue		33			150			183
Houghton street				553				553
Hudson street		18						18
Hunting street		125						125
Ibbetson street		12	562					574
Jenny Lind avenue,		15						15
Liberty avenue			15					15
Lowell street		6		429	186			621
Moreland street		466						466
Mt. Vernon street		6						6
Monmouth street		100						100
Murdock street		5						5
Carried forward		5,458	577	2,614	1,084	48		9,781

Extension of Distribution-Pipes. — *Continued.*

LOCATIONS.	3-in.	6-in.	8-in.	10-in.	12-in.	16-in.	20-in.	Totals.
Brought forward	.....	5,458	577	2,614	1,084	48	.....	9,781
Museum street	.....	223	.....	.....	.....	.....	.....	223
Mystic avenue	.....	11	.....	.....	.....	.....	.....	11
Mystic street	.....	364	.....	.....	.....	.....	.....	364
Norfolk street	.....	353	.....	.....	.....	.....	.....	353
Norwood avenue	.....	20	.....	.....	.....	.....	.....	20
Oak street	.....	1,268	.....	.....	.....	.....	.....	1,268
Oliver street	.....	7	.....	.....	.....	.....	.....	7
Otis street	.....	6	.....	.....	.....	.....	.....	6
Partridge avenue	.....	12	.....	.....	.....	.....	.....	12
Paulina street	.....	32	.....	577	.....	.....	.....	609
Perkins street	.....	6	.....	.....	.....	.....	.....	6
Pinckney street	.....	20	.....	.....	.....	.....	.....	20
Porter street	.....	15	.....	.....	.....	.....	.....	15
Princeton street	.....	653	.....	.....	.....	.....	.....	653
Prospect street	.....	4	.....	1,022	.....	.....	.....	1,026
Rush street	.....	13	.....	.....	.....	.....	.....	13
Sargent avenue	.....	14	.....	.....	.....	.....	.....	14
Sartwell avenue	.....	280	.....	.....	.....	.....	.....	280
Shawmut street	.....	20	.....	.....	.....	.....	.....	20
South street	128	10	.....	417	.....	.....	.....	555
Spring Hill terrace	.....	743	.....	.....	.....	.....	.....	743
Stone avenue	.....	535	.....	.....	.....	.....	.....	535
Tufts	.....	13	.....	.....	.....	.....	.....	13
Tremont street	.....	652	.....	.....	.....	.....	.....	652
Trull street	.....	14	7	.....	.....	.....	.....	21
Union street	.....	6	.....	.....	.....	.....	.....	6
Victoria street	.....	468	.....	.....	.....	.....	.....	468
Water street	.....	15	.....	373	.....	.....	.....	388
Webster avenue	.....	.....	.....	559	.....	.....	140	699
Webster street	.....	6	.....	.....	.....	.....	.....	6
Westminster street	.....	138	.....	.....	.....	.....	.....	138
Willow place	.....	132	.....	.....	.....	.....	.....	132
Winslow avenue	.....	469	.....	.....	.....	.....	.....	469
Woodbine street	.....	250	.....	.....	.....	.....	.....	250
Broadway park	.....	3	.....	.....	.....	.....	.....	3
Carried forward	128	12,233	584	5,562	1,084	48	140	19,779

Extension of Distribution-Pipes. — *Concluded.*

LOCATIONS.	3-in.	6-in.	8-in.	10-in.	12-in.	16-in.	20-in.	Totals.
Brought forward	128	12,233	584	5,562	1,084	48	140	19,779
Chelsea:								
Garfield avenue		426						426
Washington avenue				710				710
" "		1,208						1,208
Marlboro street		121						121
Ellsworth street		110						110
Suffolk street		200						200
Highland street			187					187
Summit street		200						200
Lambert avenue		277						277
Everett:								
Shute street		94						94
Robbins street		294						294
Glendale avenue		108						108
Clay avenue		147						147
Vine street		25						25
Tileston street		134						134
Burdett street		157						157
Emery street		180						180
Woodward street		240						240
Gledhill street		270						270
Russell street		185						185
Cedar street		84						84
Rock Valley		380						380
Derne street		178						178
Jefferson avenue		252						252
Prospect street		250						250
Hamilton street		618						618
Glendale street		895						895
Pleasant avenue		26						26
Elm road		226						226
Elmway		142						142
Francis street		42						42
Bowdoin street		250						250
Totals	128	19,952	771	6,272	1,084	48	140	28,395

Hydrant Statement.

	ESTABLISHED.	ABANDONED.	Increase.	Total number in use Jan. 31, 1897.
	Post.	Post.		Post.
Somerville	93	21	72	764
Chelsea	28	17	11	224
Everett	11		11	295
Totals	132	38	94	1,283

Water Posts.

	Number in use Jan. 31, 1896.	Established during the year.	Abandoned during the year.	Number in use Jan. 31, 1897.
Somerville	44	7		51
Chelsea	5	9		14
Everett	19	12		31
Totals	68	28		96

Breaks and Leaks on Distribution-Pipes.

	SIZE.				
	4-in.	6-in.	10-in.	12-in.	Totals.
Somerville	8	15	1	1	25
Chelsea	17	3			20
Everett	—	—	—	—	—
Totals	25	18	1	1	45

APPENDIX E.

REPORT OF THE ENGINEER.

ENGINEERING DEPARTMENT, CITY HALL, Feb. 1, 1897.

HON. JOHN R. MURPHY,

Water Commissioner:

SIR: I hereby submit the following report of the work done and records kept during the past year: —

SOURCES OF SUPPLY.

The rainfall during the year 1896 was about 10 per cent below the average for the past thirty-four years and the conditions so serious as to arouse fears of a scarcity of water, which fortunately were not realized.

The rainfall and quantities collected on the several watersheds were as follows: —

	Sudbury.	Cochituate.	Mystic.
Rainfall, in inches	43.705	42.780	39.795
Rainfall collected, in inches	21.453	20.834	19.044
Daily average yield of watershed, in gallons	76,628,967	18,667,700	24,302,000

Reservoir No. 1.

Grades, H.W., 161.00; Tops of Flash-boards, 159.29 and 158.41; Crest of Dam, 157.54; Area, Water Surface, 143 acres; Greatest Depth, 14 ft.; Contents below 161.00, 376,900,000 gals.; Below 159.29, 288,400,000 gals.

The surface of this reservoir was at grade 158.11 on Jan. 1, 1896, at this time water was wasting over the dam, and so continued until April 13, when the flash-boards were placed in position.

On April 16 waste began over the flash-boards and continued until May 1. On August 7 the flash-boards were

removed from the dam. On November 7 the water surface reached grade 157.67 and waste began and continued until December 3.

The water surface again reached the crest of the dam on Jan. 8, 1897, waste began and continued until the 12th. On Feb. 1, 1897, the water surface was at grade 156.13. The dam is in good condition.

Reservoir No. 2.

Grades, H.W., 168.00; Tops of Flash-boards, 167.12 and 166.49; Crest of Dam, 165.87; Area, Water Surface, 134 acres; Greatest Depth, 17 ft.; Contents below 168.00, 568,300,000 gals.; Below 167.12, 529,860,000 gals.

On Jan. 1, 1896, water was wasting over dam, the water surface being at grade 166.17. Waste continued until April 13, when the flash-boards were placed upon the dam. On April 16 waste began over flash-boards and continued until May 28, excepting April 19, 20, and 29. On August 7 the flash-boards were removed. On March 31 the reservoir was drawn upon for the supply of the city. Water was run into reservoir, from reservoirs No. 4 and 6, during a few days in March; from reservoir No. 4 during July; from reservoirs No. 4 and 6 during August and September; and from reservoir No. 6 during October and twenty days of November. On Feb. 1, 1897, the water surface was at grade 161.37. The dam is in good condition.

Reservoir No. 3.

Grades, H.W., 177.00; Crest of Dam (no Flash-boards), 175.24. Area at 177.00, 253 acres; Contents below 177.00, 1,224,500,000 gallons. Area at 175.24, 248 acres; Contents below 175.24, 1,081,500,000 gallons. Greatest Depth, 21 ft.

On Jan. 1, 1896, water was wasting over crest of dam, and this waste continued until May 12, with the exception of March 17 to March 22. From May 13 the water surface fell slowly, and on August 6 it was 7.01 feet below the crest of the dam. Filling gradually, from August 6, the water surface reached the crest of the dam on November 5, and from that date until December 27 water wasted over the dam. On Feb. 1, 1897, the water surface was at grade 173.31. The dam is in good condition.

Reservoir No. 4.

Grades, H.W., 215.21; Tops of Flash-boards, 215.21+ and 214.89; Crest of Dam, 214.23. Area, Water Surface, 167 acres; Greatest Depth, 49 ft.; Contents below 215.21, 1,116,400,000 gallons.

On Jan. 1, 1896, the water surface in this reservoir was .37 feet below the crest of the dam. On January 3 waste began and continued until April 13, excepting March 19, 20 and 21.

On April 13 one set of flash-boards was placed upon the dam, and waste occurred over this set on April 16 and 17. On April 18 the second set of flash-boards were placed in position, and waste continued until June 27. On June 26 the reservoir was drawn upon for the supply of the city, and on September 29 the water surface had fallen 32.11 feet below the crest of the dam.

Since September 29 it has been gradually filling, and on Feb. 1, 1897, the water surface was at grade 199.80.

The dam is in good condition.

Reservoir No. 6.

Grades, H.W., 295.00; Top of Flash-boards, 295.00; Crest of Dam, 294.00. Estimated Area, 185 acres; Estimated Contents, 1,530,300,000 gals.

On Jan. 1, 1896, the water surface in this reservoir was at grade 294.39 and water was wasting over the dam, and so continued until April 13, with the exception of March 19, 20, 21 and 22.

On April 13 one set of flash-boards was placed on the dam, and on April 17 the second set was placed in position.

On April 20 the second set was removed and waste occurred from April 20 to April 28, on which date the second set was again placed upon the dam. Water wasted over the dam from May 3 to May 14, also from May 29 to June 20. On August 14 the flash-boards were removed. On August 1 the water surface began to fall and reached its lowest point on November 20, being 32.31 feet below the crest of the dam on that date, since then it has been gradually filling, and on Feb. 1, 1897, the water surface was at grade 271.59. The dam is in good condition.

Whitehall Pond.

Elevation, H.W., 327.91; Bottom of Gates, 317.78. Area at 327.91, 601 acres; contents, between 327.91 and 317.78, 1,256,900,000 gals.

On Jan. 1, 1896, the water surface was at grade 325.29, or 2.62 feet below high water. It reached grade 326.52 on April 20, and remained at about this height until July 1, when the water surface began to fall slowly, being at grade 324.70 on November 2. Since that date it has remained at about this grade, being, on Feb. 1, 1897, at grade 325.45. Water was drawn from the lake for the supply of the city from January 1 to March 29, from September 16 to October 14, and from November 17 to 30.

It was decided to build a temporary dam, in order to raise the water in this basin two feet; this work is now in progress. The storage capacity will be increased about 400,000,000 gallons.

Farm Pond.

Grades, H.W., 149.25; Low Water, 146.00. Area at 149.25, 159 acres; Contents, between 149.25 and 146.00, 165,500,000 gals.

No water has been drawn from this pond for the supply of the city during the year 1896. On Jan. 1, 1896, the surface of the pond was at grade 149.67 or .42 feet above high water mark, the water surface rose slowly during January, and on February 12 was at grade 150.22. During March and April it remained at about grade 149.50. It began to fall in May and reached the lowest point of the year on September 5, being at grade 148.21 on that date. During the remainder of the year it has remained at about grade 148.80, being at grade 149.00 on Feb. 1, 1897.

The Framingham Water Co. has drawn 139,300,000 gallons from the pond during the year.

Lake Cochituate.

Grades, H.W., 134.36; Invert Aqueduct, 121.03; Top of Aqueduct, 127.36. Area, Water Surface at 134.36, 785 acres; Contents, between 134,36 and 127.36. 1,515,180,000 gals.; between 134.36 and 125.03, 1,910,280,000 gals.; Approximate Contents, between 134.36 and 121.03, 2,447,000,000 gals.; Between 134.36 and 117.03, 2,907,000,000 gals.

The dam is in good condition. On Jan. 1, 1896, the surface of the lake was 2.06 feet below high water mark; filling gradually, high water mark was reached on April 24. The water surface fell during the remainder of the year, being at grade 128.75 or 5.61 feet below high water mark on Feb. 1, 1897.

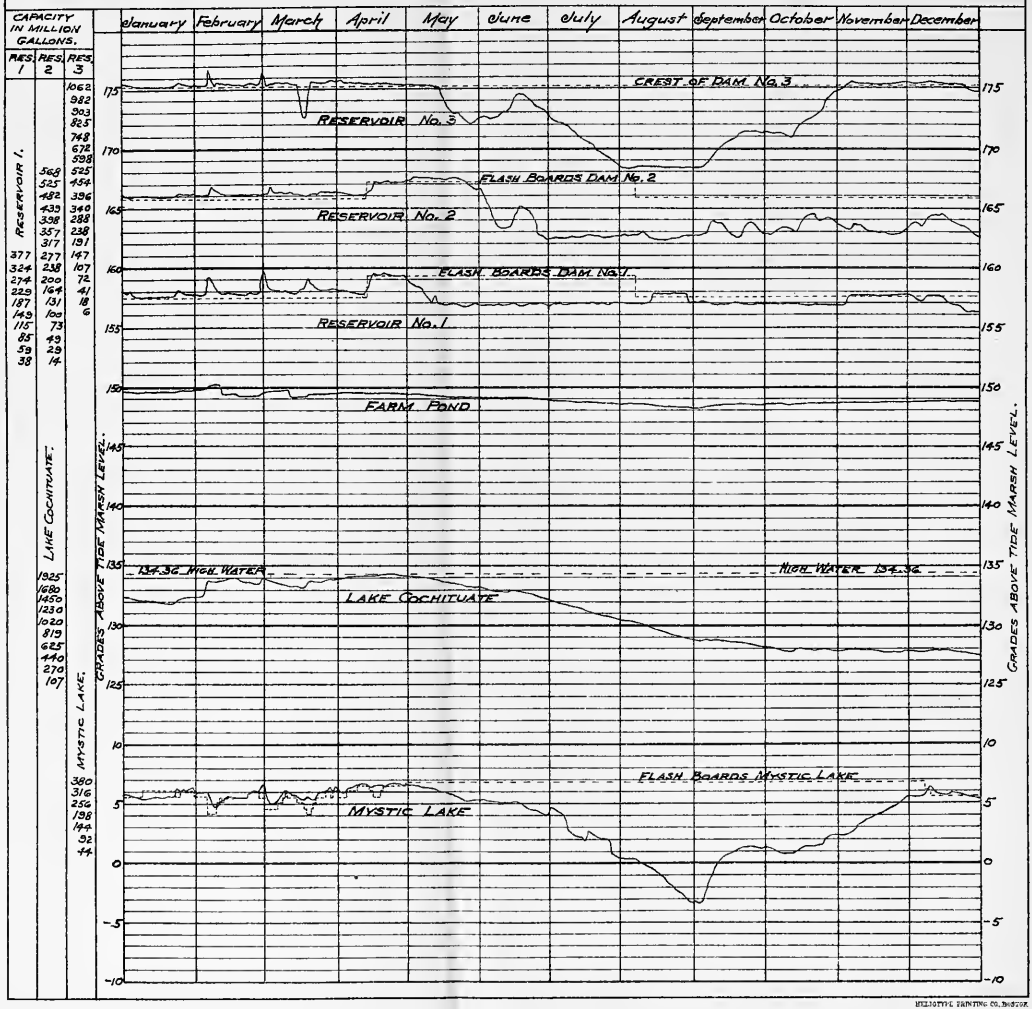
The beds for filtering the water of Pegan brook have been in use for the greater portion of the year and 258,099,000 gallons have been pumped upon them. No difficulty has been experienced in their operation during the winter season. Water has been drawn from the different reservoirs as follows: —

From	7	A.M.	Jan.	1	to	12	M.	Jan.	6	from Reservoir	No. 2.
"	12	M.	Jan.	6	"	11	A.M.	Mar.	31	" "	No. 1.
"	11	A.M.	Mar.	31	"	5	P.M.	Apr.	15	" "	Nos. 1, 2.
"	5	P.M.	Apr.	15	"	9	A.M.	Apr.	17	No flow.	
"	9	A.M.	Apr.	17	"	2	P.M.	May	13	from Reservoir	Nos. 1, 2.
"	2	P.M.	May	13	"	12.30	P.M.	May	15	No flow.	
"	12.30	P.M.	May	15	"	11	A.M.	Nov.	5	from Reservoir	Nos. 1, 2.
"	11	A.M.	Nov.	5	"	7	A.M.	Nov.	18	" "	No. 2.
"	7	A.M.	Nov.	18	"	1.30	P.M.	Dec.	17	" "	Nos. 1, 2.
"	1.30	P.M.	Dec.	17	"	2.45	P.M.	Dec.	17	" "	No. 1.
"	2.45	P.M.	Dec.	17	"	7	A.M.	Feb.	1, 1897	"	Nos. 1, 2.

The height of the water in the various storage reservoirs on the first day of each month is as follows: —

BOSTON WATER WORKS.

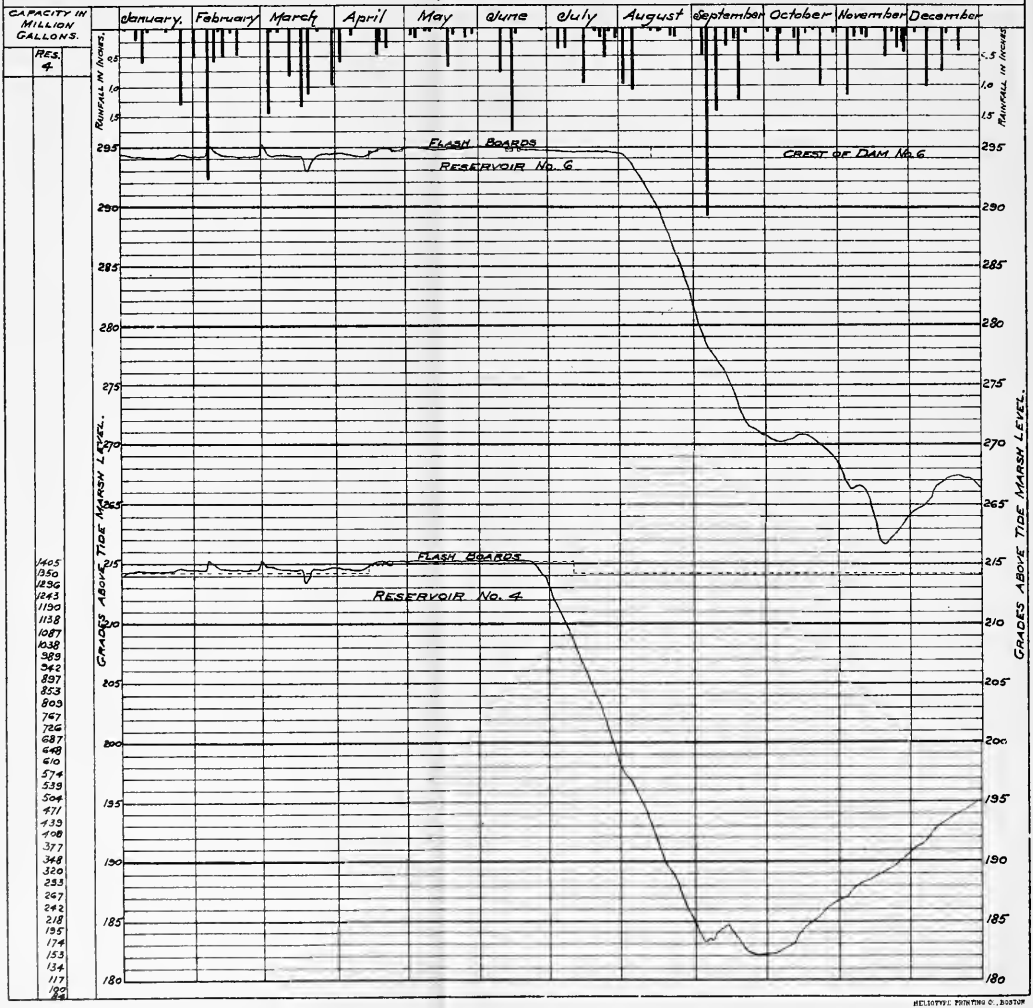
Diagram showing the heights of Sudbury River Reservoirs Nos. 1, 2 and 3. Farm Pond and Cochituate and Mystic Lakes during the Year 1896.



HELIOTYPE PRINTING CO., BOSTON.

BOSTON WATER WORKS.

Diagram showing the heights of Sudbury River Reservoirs Nos. 4 and 6. and the Rainfall on the Sudbury River Water Shed during the year 1896.



HELIOTYPE PRINTING CO., BOSTON

	Reservoirs.					Farm Pond.	Whitehall Pond.	Lake Cochituate.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 6.			
	Top of Flashboards.	Top of Flashboards.	Crest of Dam.	Crest of Dam.	Top of Flashboards.	High Water.	High Water.	Top of Flashboards.
	159.29	167.12	175.24	214.23	295.00	149.25	327.91	134.36
Jan. 1, 1896..	158.11	166.17	175.75.	213.86	294.39	149.67	325.29	132.30
Feb. 1, 1896..	157.80	166.16	175.48	214.51	294.27	149.80	325.09	132.40
Mar. 1, 1896..	159.50	167.33	176.53	215.38	295.27	149.54	325.77	133.66
April 1, 1896..	158.24	166.37	175.80	214.78	294.56	149.54	325.86	133.92
May 1, 1896..	159.30	167.35	175.44	215.20	294.96	149.44	326.58	134.25
June 1, 1896..	156.91	166.65	172.58	215.24	295.13	149.18	326.59	133.27
July 1, 1896..	156.91	162.40	173.02	213.70	294.76	148.95	326.47	132.22
Aug. 1, 1896..	157.05	162.73	168.55	198.52	294.64	148.59	326.09	130.55
Sept. 1, 1896..	157.00	162.73	168.33	185.22	282.24	148.25	325.62	128.92
Oct. 1, 1896..	157.00	162.82	171.36	182.25	270.93	148.59	325.19	128.25
Nov. 1 1896..	156.90	163.54	174.75	186.79	268.45	148.72	324.69	127.90
Dec. 1, 1896..	157.71	163.70	175.50	190.78	264.18	148.83	324.36	127.80
Jan. 1, 1897..	156.37	162.63	174.82	195.11	266.41	148.78	324.77	127.43
Feb. 1, 1897..	156.13	161.37	173.31	199.80	271.59	149.00	325.45	128.75

AQUEDUCTS AND DISTRIBUTING RESERVOIRS.

The Sudbury-river aqueduct has been in use 359.6 days, and has delivered 14,857,300,000 gallons to Chestnut-hill reservoir and 35,500,000 gallons to Lake Cochituate. The Cochituate aqueduct has been used 362.4 days and delivered 5,731,790,000 gallons.

Both aqueducts have been cleaned during the year. The different distributing reservoirs are in good condition.

HIGH-SERVICE PUMPING STATIONS.

The daily average quantity pumped at the Chestnut-hill pumping station was 28 per cent. more than in 1895.

Engine No. 1 was run 804 hours 45 minutes, pumping . . .	301,560,800 gallons.
Engine No. 2 was run 758 hours 35 minutes, pumping . . .	286,377,150 gallons.
Engine No. 3 was run 6,395 hours 1 minute, pumping . . .	4,594,872,800 gallons.
Total amount pumped . .	5.182,810,750 gallons.

Amount of coal used by Engines Nos. 1 and 2	715,387 lbs.
Amount of coal used by Engine No. 3	4,427,668 lbs.
Total amount of coal used	5,143,055 lbs.
Percentage of ashes and clinkers	10.8
Quantity pumped per lb. of coal by Engines Nos. 1 and 2	821.8 gallons.
Quantity pumped per lb. of coal by Engine No. 3	1,037.8 gallons.
Average lift in feet, Engines Nos. 1 and 2	121.07
Average lift in feet, Engine No. 3	123.16
Daily average amount pumped	14,609,100 gallons.

Table VII., on pages 157 and 158, show in detail the work done by the engines and boilers.

COST OF PUMPING.

Salaries	$15,915 24
Fuel	10,441 73
Repairs	1,438 51
Oil, waste and packing	1,413 06
Small supplies	542 13
Total	$29,750 67

Cost per million gallons raised one foot high	$0.0495
Cost per million gallons pumped to reservoir	$5 74

At the West Roxbury pumping-station the daily average quantity pumped was 253,200 gallons, an increase of 41.3 per cent. over the amount pumped in the previous year. At the East Boston pumping-station 483,000 gallons per day have been pumped for the supply of the high-service district, and 57,600 gallons per day for the Breed's Island high-service. Owing to the non-completion of the 36-inch high-service line through Roxbury, it was necessary to maintain the pumping plant on Blue Hill avenue and Wayne street during the year, and to keep it in constant service.

MYSTIC LAKE.

On Jan. 1, 1896, the water surface was .96 feet below high water; waste was then occurring over the dam and

continued until May 2, excepting the period between January 9 and 24.

The water surface, which on May 2 was at grade 6.75, gradually fell, reaching its lowest point on September 5; the water surface being at grade — 3.26, or 10.26 feet below high water.

Filling gradually from September 5, it reached grade 6.40 on December 12. Waste occurred over stop-planks on dam from December 10 to 25; from Jan. 6 to 11, 1897, and from Jan. 22 to 24, 1897. On Feb. 1, 1897, the water surface was at grade 5.85. The fishway was opened on April 15, and was kept open until June 12, when it was closed, and remained so during the rest of the year. The dam at the outlet of the lake is in good condition.

MYSTIC CONDUIT AND RESERVOIR.

The conduit has been cleaned several times during the year.

MYSTIC PUMPING STATION.

The daily average quantity pumped at the Mystic station was 26.2 per cent more than in 1895.

Engine No. 1 was run 1,962 hours 15 minutes, pumping	421,731,900 gallons.
Engine No. 2 was run 1,030 hours 45 minutes, pumping	208,004,600 gallons.
Engine No. 3 was run 6,540 hours 45 minutes, pumping	2,222,277,100 gallons.
Engine No. 4 was run 3,430 hours 30 minutes, pumping	1,522,599,300 gallons.
Total amount pumped	4,374,612,900 gallons.
Amount of coal used by Engines Nos. 1, 2 and 3	6,907,870 lbs.
Amount of coal used by Engine No. 4	1,792,100 lbs.
Total amount of coal used	8,699,970 lbs.
Percentage of ashes and clinkers	11.6
Quantity pumped per lb. of coal by Engines Nos. 1, 2 and 3	412.9 gallons.
Quantity pumped per lb. of coal by Engine No. 4	849.6 gallons.

Average lift in feet, Engines Nos. 1, 2 and 3	145.72 gallons.
Average lift in feet, Engine No. 4	152.70 gallons.
Daily average amount pumped	11,952,500 gallons.

COST OF PUMPING.

Salaries	$13,749 51
Fuel	15,706 84
Repairs	2,914 61
Oil, waste and packing	1,725 62
Small repairs	348 79
Total	$34,445 37

Cost per million gallons raised one foot high	$0.053
Cost per million gallons pumped to reservoir	7.88

Table VIII, on pages 159 and 160, shows in detail the work done by the engines during the year.

CONSUMPTION.

The daily average consumption for the year was as follows: —

Sudbury and Cochituate Works	56,288,200 gallons.
Mystic works	11,951,100 "
Total for the combined supplies,	68,239,300 "

an increase of 3,426,000 gallons, or 13.2 per cent over that of the previous year. During the year Charlestown has been supplied from the Mystic Works, excepting the periods between January 1 to 7 and July 13 to September 28, when the supply was from the Cochituate Works. The following table shows the consumption per inhabitant for the past two years: —

MONTH.	COCHITUATE.		MYSTIC.		COMBINED SUPPLIES.	
	Consumption in Gallons per Capita.		Consumption in Gallons per Capita.		Consumption in Gallons per Capita.	
	1895.	1896.	1895.	1896.	1895.	1896.
January	104.9	128.1	92.0	96.2	102.7	121.0
February	128.4	134.8	94.8	102.5	120.7	127.4
March	107.1	134.5	83.5	96.9	102.9	125.9
April	94.5	118.3	77.3	87.3	91.5	111.2
May	97.3	106.9	77.6	85.8	93.3	102.1
June	102.0	113.2	83.2	88.4	97.6	110.1
July	104.2	116.0	76.8	85.9	98.7	107.2
August	107.0	112.9	76.5	85.4	101.6	107.9
September	107.1	107.1	93.3	83.1	104.7	102.7
October	98.9	106.4	81.1	78.8	95.8	100.1
November	96.7	107.3	78.8	76.5	93.6	100.2
December	105.9	118.6	86.1	90.6	102.4	112.1
Average	104.3	116.8	83.3	88.3	100.3	110.6

DISTRIBUTION.

On the Cochituate Works 33.8 miles of pipe were laid and 9.8 miles abandoned, making a net increase of 24 miles and a total of 620 miles now connected with the system. Early in the spring a 16-inch high service main was laid from Upham's Corner to Thomas Park by way of Boston, Dorchester and Telegraph streets, affording an additional supply for the South Boston high service district and making the reservoir on Thomas Park, which the city contemplated taking for a high school site, no longer necessary. The length of pipe laid was 8,491 feet, of which amount 3,667 feet was laid by contract; this line is not yet in service and will be used only in an emergency until the completion of the 36-inch, 30-inch and 20-inch mains through Roxbury and Dorchester.

The 24-inch low service main in Dorchester was extended from Dorchester avenue and East street, through Dorchester avenue and Adams street, a distance of 3,888 feet, all the work being done by contract. This extension has increased the minimum head at the Lower Mills 7 feet, as shown in Table 6. A further extension of this line to Milton Lower Mills should be made during the coming season.

In June the 42-inch high service main was completed and placed in service; as shown on Table No. 6 the minimum head in the city proper was increased nearly 20 feet. During the months of October and November it was decided to put the 48-inch high service main in Brookline out of service during the construction of a sewer by the Town of Brookline in Walnut street, in close proximity to the water pipe, the excavation for the sewer being largely in solid rock; the reduction in pressure and the consequent small consumption in gallons on the high service can be seen in Tables VI. and VII., on pages 156, 157 and 158. In September, for the better protection of East Boston, in case of fire, and also to give an adequate supply for domestic use, a 20-inch low service main was laid from the corner of Brooks and Condor streets to Central square by way of Condor and Border streets, the length laid being 3,773 feet, of which amount 2,131 feet was laid by contract. This line has increased the minimum head 12 feet. During the coming season it is intended to extend the 20-inch pipe in Border street to Maverick street and to lay a 16-inch line to Maverick square.

In May of this year an 8-inch pipe, with Ward's flexible joints, was laid across Shirley gut to replace the two lines of similar pipe laid in 1870; the latter had been broken a number of times, and were entirely exposed to a blow from passing vessels on the Deer Island shore; as a matter of fact both were broken in this way before water was turned on the new line. The work was done, under contract, by George W. Townsend; the pipe was first jointed on the Winthrop shore, upon rollers, and was then hauled across the gut, empty oil barrels being lashed to it to facilitate the work; it is laid in a trench, excavated six feet deep on each shore to low water mark, at that point the trench decreases in depth until it is one foot deep at the middle of the channel.

No trouble was experienced during the past winter with the service between the islands in the harbor; while the cold was severe at times, it was not long continued. The precaution was taken of tapping the pipes on each island at high water mark; during a cold snap the temperature of the water in the pipes was taken daily at the different points established. In this way the exact conditions are known, and danger of freezing can probably be averted.

Sectional plans of the city proper on a scale of 50 feet to the inch are being prepared; they are based entirely upon actual surveys.

The distributing mains connected with the Mystic Works have been extended 5.4 miles and 0.05 miles have been re-

laid. The total length now in service is 184 miles. There has been an increase of 253 in the number of hydrants connected with the Cochituate Works, making a total now in use of 6,711. On the Mystic Works 96 hydrants have been added, and the total now in use is 1,639; 243 petitions for main pipe have been reported upon, and 64 contracts for rock excavation have been made. Various profiles have been made, levels taken and lines and grades furnished for the main pipe laying. All pipe laid has been located and plotted on the plans.

Appended to this report will be found the usual tables of rainfall, consumption, etc., for the past year, and, in addition, tables are given of the rainfall, rainfall collected, and percentage collected on the Cochituate water-shed since 1863, on the Sudbury river water-shed since 1875, and on the Mystic water-shed since 1878. These will be found valuable for future reference.

Yours respectfully,

WILLIAM JACKSON,
City Engineer.

GENERAL STATISTICS.

SUDBURY AND COCHITUATE WORKS.	1893.	1894.	1895.	1896.
Daily average consumption in gallons,	47,453,200	46,560,000	50,801,100	56,288,200
Daily average consumption in gallons per inhabitant	107.5	99.8	104.3	116.85
Daily average amount used through meters, gallons	11,651,600	11,170,400	12,084,500	13,125,700
Percentage of total consumption metered	24.5	24.0	23.8	23.3
Number of services	66,586	68,556	70,879	73,230
Number of meters and motors	4,585	4,877	4,910	4,788
Length of supply and distributing mains, in miles	560	572.8	595.9	619.9
Number of fire-hydrants in use	6,042	6,217	6,458	6,711
Yearly revenue from water-rates	$1,638,772 21	$1,657,701 23	$1,743,292 35	$2,038,526 07
Yearly revenue from metered water	$683,948 52	$672,474 17	$711,467 39	$775,354 91
Percentage of total revenue from metered water	41.8	40.5	40.8	38.0
Cost of works on February 1	$22,727,456 03	$23,583,967 89	$25,052,227 53	[2]$24,608,500 60
Yearly expense of maintenance[3]	$433,408 18	$440,840 63	$420,907 09	$617,566 53
MYSTIC WORKS.				
Daily average consumption in gallons,	10,742,500	10,282,100	9,467,000	11,951,100
Daily average consumption in gallons per inhabitant	84.4	87.6	83.3	88.26
Daily average amount used through meters, gallons	1,921,570	2,014,000	2,105,800	2,144,300
Percentage of total consumption metered	17.9	19.6	22.2	17.9
Number of services	22,398	23,257	24,120	24,870
Number of meters and motors	482	515	525	536
Length of supply and distributing mains, in miles	165	173.7	178.6	184.0
Number of fire-hydrants in use	1,306	1,446	1,543	1,639
Yearly revenue from water-rates	$422,707 31	$453,627 50	$471,188 47	$501,755 05
Yearly revenue from metered water	$109,367 37	$115,811 32	$121,436 10	$122,050 66
Percentage of total revenue from metered water	25.9	25.6	25.8	24.3
Cost of works on February 1	$1,721,609 33	[1]$1,676,471 94	$1,803,775 29	$1,806,316 72
Yearly expense of maintenance	$160,643 97	$156,214 05	$189,194 61	

[1] $52,637.00 credited on account of sale of portion of Mystic Sewer.
[2] $1,118,975.74 credited by amount paid by State.
[3] Mystic department combined with Cochituate.

BOSTON WATER WORKS.

Diagram showing the rainfall and daily average Consumption for each month

—Yearly Averages shown thus—

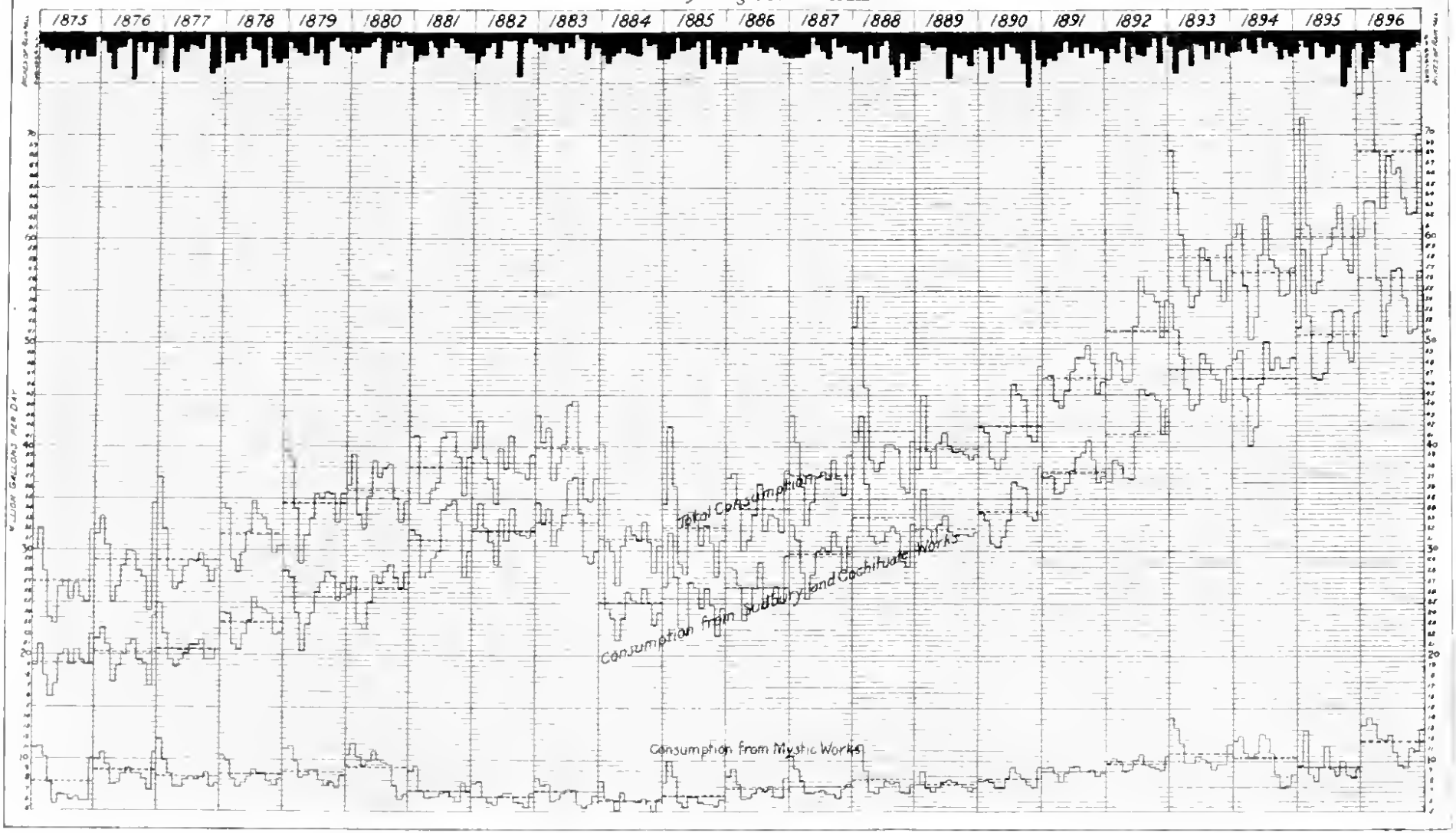


TABLE I.

Daily Average Consumption of Water, in Gallons, from the Cochituate and Mystic Works.

Month.	Cochituate Works.							Mystic Works.						
	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
January	33,680,000	37,230,100	36,756,400	53,847,100	48,395,000	51,476,100	60,284,800	8,187,900	9,389,300	9,878,200	14,129,700	11,823,500	39,528,100	13,462,300
February	33,030,700	37,280,700	38,881,500	51,299,400	49,207,500	58,905,100	63,526,700	8,299,700	9,466,900	10,332,200	13,174,700	12,295,000	12,953,200	14,290,700
March	30,844,400	35,532,400	38,395,100	48,700,200	44,844,300	52,706,700	63,513,300	8,055,800	8,811,000	9,970,500	11,692,700	10,720,800	8,712,200	13,552,300
April	30,446,600	35,751,600	37,171,000	45,573,100	40,070,200	46,614,200	56,002,300	7,481,600	8,045,800	9,145,000	9,812,500	10,236,200	8,098,000	12,262,100
May	31,381,200	36,580,700	37,055,900	43,451,500	41,827,700	46,470,500	50,684,500	7,488,400	8,841,300	9,204,900	9,817,400	10,661,000	9,426,500	12,087,100
June	33,022,700	37,801,900	41,564,000	44,125,100	45,906,400	47,089,500	53,757,900	8,396,000	9,478,400	10,146,300	[1]10,460,000	12,552,300	11,509,200	12,497,800
July	36,701,100	39,062,600	45,738,100	48,986,900	50,044,000	50,064,800	56,937,700	9,463,300	9,581,700	10,702,900	[1]10,167,000	12,172,000	9,265,900	[4]10,908,600
August	36,316,000	39,460,400	45,031,600	48,062,000	47,288,500	53,095,100	57,215,700	8,932,200	9,122,300	9,751,500	9,826,200	10,696,700	8,117,400	9,620,200
September	36,165,800	40,677,700	45,261,900	46,926,500	[2]48,558,700	53,246,900	54,345,200	8,436,700	9,128,700	9,549,400	9,115,000	[3]8,703,600	9,937,900	9,403,300
October	33,429,800	53,884,600	44,626,700	46,416,600	47,072,500	49,278,000	[5]50,947,600	7,784,100	9,259,100	9,340,500	9,630,400	7,421,200	8,667,300	11,302,700
November	32,955,100	36,640,800	41,347,800	44,328,900	47,101,500	48,258,600	[5]51,441,700	7,601,300	8,585,200	9,230,000	9,569,700	7,563,100	8,453,400	11,003,700
December	38,334,100	37,342,500	43,766,400	47,807,800	48,511,600	52,934,800	56,957,700	9,448,300	8,960,600	10,473,700	11,620,800	8,667,800	9,276,700	13,088,400
Yearly average	33,871,700	37,686,900	41,312,400	47,453,200	46,560,000	50,801,100	56,288,200	8,301,400	9,055,290	9,810,800	10,742,500	10,282,100	9,457,000	11,951,100

[1] From June 7 to July 29 about 3,000,000 gallons per day were wasted from a blow-off.
[2] After September 12 Charlestown was supplied with Cochituate water.
[3] Charlestown was supplied with Cochituate water from January 1 to February 6, February 21 to May 18, and July 13 to Jan. 1, 1896.
[4] Charlestown was supplied with Cochituate water from January 1 to 7, July 13 to September 28.
[5] In October 2,542,000 gallons wasted from 48-inch line in Brookline. In November 2,064,400 gallons washed from 48-inch line in Brookline.
1897—January: Cochituate, 61,331,300; Mystic, 14,516,487.

TABLE II.

Diversion of Sudbury River Water, 1890–1896.

MONTH.	1890.	1891.	1892.		1893.	1894.		1895.		1896.	
	To Chestnut Hill Res'r.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.	To Lake Cochituate.	To Chestnut Hill Res'r.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
January	518,600,000	715,000,900	.....	630,800,000	1,325,900,000	.....	1,012,000,000	1,300,000	1,186,100,000	.....	1,367,300,000
February	475,000,000	560,800,000	.....	610,400,000	957,600,000	.....	944,000,000	.....	1,318,400,000	.....	1,346,900,000
March	498,600,000	573,200,000	45,100,000	625,200,000	1,023,900,000	529,100,000	947,100,000	680,000,000	1,115,800,000	.....	1,502,700,000
April	417,000,000	641,900,000	545,000,000	662,500,000	917,000,000	134,100,000	725,600,000	.....	982,300,000	300,000	1,252,800,000
May	536,300,000	740,300,000	114,700,000	690,490,000	858,600,000	215,800,000	826,500,000	87,700,000	931,500,000	35,200,000	1,101,300,000
June	513,100,000	629,500,000	197,500,000	779,300,000	856,700,000	80,700,000	875,500,000	114,000,000	941,100,000	.....	1,128,800,000
July	664,100,000	755,100,000	.....	948,000,000	1,040,800,000	.....	1,064,600,000	.....	1,061,900,000	.....	1,285,900,000
August	625,500,000	722,900,000	.....	897,700,000	994,100,000	.....	951,600,000	.....	1,147,600,000	.....	1,291,500,000
September	606,400,000	732,400,000	.....	876,300,000	948,300,000	.....	987,100,000	.....	1,142,800,000	.....	1,163,500,000
October.	539,900,000	715,300,000	.....	908,500,000	956,600,000	1,100,000	958,500,000	6,600,000	951,700,000	.....	1,086,000,000
November	526,000,000	752,200,000	.....	788,000,000	862,700,000	400 000	1,021,000,000	5,600,000	998,600,000	.....	1,070,700,000
December	675,500,000	767,100,000	.....	1,216,100,000	995,700,000	1,000,000	1,137,100,000	1,600,000	1,130,700,000	.....	1,259,900,000
Totals	6,596,000,000	8,306,600,000	902,300,000	9,633,200,000	11,737,900,000	962,200,000	11,450,600,000	896,800,000	12,908,500,000	35,500,000	14,857,300,000
Total diversion from Sudbury river	6,596,000,000	8,306,600,000	10,535,500,000		11,737,900,000	12,412,800,000		13,805,300,000		14,892,800,000	
Average daily diversion for whole year.	18,071,200	22,757,800	28,800,000		32,158,600	34,007,700		37,822,700		40,690,700	

TABLE III.

Statement showing Amount of Water drawn from Lake Cochituate; Amount Wasted; Amount of Rainfall collected in Lake; Amount received into Lake from Sudbury River; Percentage of Rainfall collected, etc., 1852 to 1896; Water-shed of Lake, 12,077 Acres.

YEAR.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Amount received into Lake from Sudbury River.	STORAGE.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1852[1]	2,974,042,800	4,020,566,900			261,360,000	6,733,249,700	18,396,900	47.93	20.61	43.
1853	3,117,939,500	3,166,417,500		239,580,000		6,523,937,000	17,873,800	55.73	19.51	35.
1854	3,614,230,000	4,187,733,000			217,800,000	7,584,163,000	20,778,500	43.15	22.87	53.
1855	3,776,399,500	No acc't kept.			326,700,000			34.96		
1856	4,409,787,600	"		598,950,000				40.80		
1857	4,644,990,000	10,625,900,000		32,670,000		15,303,560,000	41,927,600	63.10	46.69	74.
1858	4,689,155,000	1,934,500,000			141,570,000	6,482,085,000	17,759,000	48.66	19.46	40.
1859[2]	4,808,875,000	7,569,000,000		283,140,000		12,661,015,000	34,687,700	49.02	38.24	78.
1860	6,309,108,000	None.		174,240,000		6,483,348,000	17,714,100	55.44	19.40	35.
1861	6,639,095,900	3,377,559,000			1,459,260,000	8,557,394,900	23,444,900	45.44	25.45	56.
1862	6,059,000,000	33,200,000		1,306,800,000		7,399,000,000	20,271,200	49.69	22.36	45.
1863	5,927,052,500	2,165,696,500		763,300,000		8,855,049,000	24,260,400	69.30	26.88	39.

[1] Observations of rainfall at Lake Cochituate commenced 1852, and these observations are assumed as correct for the whole district.

[2] Lake raised two feet.

TABLE III. — *Concluded.*

Statement showing Amount of Water drawn from Lake Cochituate; Amount wasted; Amount of Rainfall collected in Lake; Amount received into Lake from Sudbury River; Percentage of Rainfall collected, etc., 1852 to 1896; Water-shed of Lake, 12,077 Acres.

Year.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Amount received into Lake from Sudbury River.	Storage.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1864	6,105,306,700	1,368,746,000			1,848,577,000	5,625,475,700	15,370,200	42.60	18.35	43.
1865	4,621,630,060	1,688,120,700		743,242,500		7,052,993,200	19,323,300	49.46	20.50	41.
1866	4,463,585,000	None.		743,242,500		5,206,827,500	14,265,300	62.32	16.01	26.
1867	4,951,225,000	2,482,041,000			698,811,000	6,734,455,000	18,450,600	56.25	21 80	39.
1868	5,405,515,000	2,507,684,000		346,371,000		8,259,570,000	22,567,200	49.71	24.98	50.
1869	5,503,751,000	1,635,570,000		480,882,000		7,620,203,000	20,877,300	64.34	21.99	34.
1870	5,477,810,000	4,818,971,000			1,736,085,000	8,560,696,000	23,453,900	55.89	26.08	47.
1871	5,223,500,000	None.			250,933,000	4,972,567,000	13,623,500	45.39	15.16	33.
1872	5,775,151,200	None.	1,676,666,400	1,543,995,500		5,642,480,300	15,416,600	48.47	17.22	35.
1873	6,511,826,900	2,917,977,000			515,132,900	8,914,671,900	24,423,800	45.43	27.13	60.
1874	6,623,972,900	1,145,851,700			1,367,715,000	6,402,109,600	17,540,000	35.93	19.52	54.
1875	7,092,955,500	None.	2,555,800,000	1,222,885,000		5,760,040,500	15,780,900	45.49	17.57	39.
1876	7,277,175,200	1,619,243,800	2,528,300,000	43,438,000		6,411,557,000	17,517,900	48.49	19.54	40.
1877	7,626,889,200	1,484,978,600	1,894,350,000	378,727,000		7,596,244,800	20,811,600	43.80	23.17	53.

1878.....	437,904,700	3,341,875,000	2,668,300,000	219,789,000	.....	8,637,268,700	23,663,700	53.58	26.34	49.
1879.....	6,051,828,900	1,523,361,400	411,300,000	.....	1,322,697,300	5,841,203,000	16,003,300	38.01	17.81	47.
1880.....	4,284,147,100	65,577,700	826,700,000	.....	146,265,000	3,376,759,800	9,226,100	35.83	10.30	29.
1881.....	2,846,459,700	2,231,016,700	187,600,000	468,089,400	.....	5,357,965,800	14,679,400	41.09	16.34	40.
1882.....	3,935,490,600	1,358,543,700	.....	.....	357,334,700	4,936,699,600	13,525,200	40.29	15.05	37.
1883.....	4,731,227,700	162,361,800	1,245,100,000	.....	334,400,000	3,314,089,500	9,079,700	31.20	10.11	32.
1884.....	4,533,156,450	1,842,837,100	1,416,300,000	1,340,436,700	.....	6,300,130,250	17,213,450	45.57	19.21	42.
1885.....	4,091,674,900	1,006,622,800	.....	8,594,800	.....	5,106,892,500	13,991,500	43.66	15.57	36.
1886.....	4,432,536,100	3,116,283,200	.....	.....	360,662,000	7,188,157,300	19,693,600	46.97	21.92	47.
1887.....	4,802,120,700	3,658,652,900	.....	.....	763,205,000	7,697,568,600	21,089,200	41.58	23.47	56.
1888.....	4,968,503,100	4,229,200,000	.....	959,309,000	.....	10,157,012,100	27,751,400	56.93	30.97	54.
1889.....	5,570,423,600	3,373,929,000	233,400,000	454,766,800	.....	9,165,719,400	25,111,600	50.23	27.95	56.
1890.....	5,722,170,800	2,380,441,200	.....	.....	64,166,300	8,038,445,700	22,023,100	51.23	24.51	48.
1891.....	5,508,178,900	6,064,000,000	.....	.....	1,056,057,800	10,516,121,100	28,811,300	46.42	32.07	69.
1892.....	5,464,791,300	281,000,000	902,300,000	200,284,300	.....	5,033,775,600	13,753,500	39.04	15.35	39.
1893.....	5,623,532,500	255,300,000	.....	.....	89,200,000	5,789,632,500	15,862,000	45.28	17.65	39.
1894.....	5,520,092,100	None.	962,200,000	.....	296,900,000	4,260,992,100	11,674,000	39.08	12.99	33.
1895.....	5,654,765,700	657,600,000	896,800,000	1,200,400,000	.....	6,615,965,700	18,125,900	48.96	20.17	41.
1896.....	5,731,790,000	1,907,000,000	35,500,000	.....	998,000,000	6,605,290,000	18,047,200	42.78	20.14	47.
Averages.....	5,263,261,600	2,237,333,900	.....	.....	.....	7,099,590,300	19,438,600	47.43	21.59	45

TABLE IV.

Statement showing Amount of Water diverted from Sudbury River to Lake Cochituate and Chestnut Hill Reservoir; Amount wasted; Amount of Flow in River; Percentage of Rainfall collected, etc., 1875 to 1896.

(Water-shed from 1875 to 1878, inclusive, = 77.764 sq. miles; in 1879 and 1880 = 78.238 sq. miles; and from 1881 to 1896, inclusive, = 75.2 sq. miles.)

YEAR.	Amount of Water diverted to Lake Cochituate and Chestnut Hill Reservoir.	Amount of Water used by Framingham Water Co.	Amount of Water wasted from River.	STORAGE.		Total Amount of Flow in River.	Daily average Amount of Flow in River.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1875.....	2,555,800,000	.....	24,971,600,000	66,300,000	.....	27,593,700,000	75,599,200	45.490	20.418	44.88
1876.....	2,528,300,000	.....	29,942,300,000	.....	160,700,000	32,309,900,000	88,278,400	49.563	23.908	48.24
1877.....	1,894,350,000	.....	32,438,300,000	112,100,000	.....	34,444,750,000	94,369,200	44.018	25.847	57.90
1878.....	3,422,100,000	.....	37,125,200,000	654,700,000	.....	41,202,000,000	112,882,200	57.931	30.487	52.63
1879.....	3,749,200,000	.....	20,817,500,000	962,200,000	.....	25,528,900,000	69,942,200	41.419	18.775	45.33
1880.....	6,230,200,000	.....	11,290,000,000	.....	958,600,000	16,561,600,000	42,250,300	38.177	12.182	31.91
1881.....	8,845,300,000	.....	17,279,000,000	751,700,000	.....	26,876,000,000	73,633,900	44.160	20.565	46.56
1882.....	7,735,200,000	.....	16,273,900,000	.....	352,600,000	23,656,600,000	64,812,300	39.394	18.102	45.95
1883.....	8,455,000,000	.....	7,251,900,000	.....	1,086,400,000	14,620,500,000	40,056,200	32.780	11.188	34.13
1884.....	6,110,600,000	.....	23,228,900,000	1,744,600,000	.....	31,084,100,000	84,929,200	47.135	23.784	50.46
1885.....	5,224,700,000	61,800,000	19,878,800,000	.....	446,900,000	24,718,400,000	67,721,600	43.545	18.916	43.44
1886.....	5,266,600,000	76,600,000	23,023,000,000	1,464,500,000	.....	29,831,700,000	81,730,700	46.065	22.825	49.55
1887.....	6,124,100,000	87,500,000	25,334,500,000	117,400,000	.....	31,663,500,000	86,749,300	42.705	24.227	56.73

1888.....	7,224,700,000	61,500,000	39,040,500,000	390,600,000	.....	46,717,300,000	127,642,900	57.465	35.749	62.21
1889.....	6,363,900,000	59,500,000	31,550,400,000	.....	2,800,000	37,971,000,000	104,030,100	49.95	29.056	58.17
1890.....	6,596,000,000	74,500,000	28,667,100,000	.....	57,400,000	35,280,200,000	96,658,100	53.00	26.998	50.94
1891.....	8,306,600,000	80,500,000	28,799,600,000	.....	1,100,800,000	36,085,900,000	98,865,500	49.52	27.612	55.76
1892.....	10,535,500,000	82,800,000	11,143,000,600	.....	257,700,000	21,503,600,000	58,753,000	41.83	16.456	39.34
1893.....	11,737,900,000	103,000,000	17,405,500,000	.....	789,800,000	28,456,600,000	77,963,300	48.225	21.774	45.15
1894.....	12,412,800,000	117,000,000	6,715,900,000	1,901,600,000	.....	21,147,300,000	57,937,800	39.740	16.182	40.72
1895.....	13,805,300,000	132,200,000	15,545,600,000	1,137,920,000	.....	31,621,000,000	86,632,900	50.62	24.196	47.80
1896.....	14,892,800,000	139,300,000	15,528,600,000	.....	2,522,500,000	28,038,200,000	76,607,100	43.70	21.453	49.09
Averages	7,273,543,200	89,683,300	21,965,831,800	.....	.....	29,404,993,200	80,365,400	45.75	22.288	48.04

TABLE V.

Statement showing Amount of Water drawn from Mystic Lake; Amount wasted; Amount of Rainfall collected in Lake; Percentage of Rainfall collected, etc., 1876 to 1896; Water-shed of Lake, 17,200 Acres.

YEAR.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	STORAGE.		Total Amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
			Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1876	3,230,101,300	6,369,774,700	.....	32,583,000	9,567,293,000	26,140,100	47.00	20.49	43.6
1877	3,069,554,800	7,250,223,500	.....	16,291,400	10,303,486,900	28,228,700	43.095	22.06	51.2
1878	3,367,490,400	8,718,547,600	.....	26,000,000	12,060,038,000	33,041,200	64.065	25.82	47.8
1879	3,490,848,200	4,625,691,800	.....	203,000,000	7,913,540,000	21,680,900	35.30	16.94	48.0
1880	3,692,195,700	2,158,761,200	.....	113,500,000	5,703,756,900	15,584,000	34.42	12.21	35.5
1881	2,815,579,900	5,534,300,000	371,200,000	.....	8,721,079,900	23,893,400	41.91	18.67	44.5
1882	2,570,896,700	4,444,668,000	15,000,000	.....	7,030,564,700	19,261,800	39.165	15.05	38.4
1883	2,664,514,200	2,034,702,600	.....	347,579,000	4,351,637,800	11,922,300	31.22	9.32	29.84
1884	2,469,761,000	6,574,003,800	380,600,000	.....	9,424,364,800	25,749,600	44.39	20.18	45.46
1885	2,639,278,800	5,558,860,500	.....	33,200,000	8,194,939,300	22,451,900	44.50	17.55	39.43
1886	2,862,947,500	7,743,258,900	.....	28,400,000	10,577,806,400	28,980,300	45.56	22.65	49.71
1887	2,954,257,500	7,414,213,000	.....	11,000,000	10,357,470,500	28,376,600	46.42	22.17	47.77
1888	3,205,121,100	11,334,593,100	.....	6,000,000	14,533,714,200	39,709,600	56.745	31.12	54.84
1889	3,007,539,800	8,879,787,500	12,000,000	.....	11,899,327,300	32,600,900	50.395	25.48	50.56

1890.....	3,212,284,500	8,953,727,900	.....	3,000,000	12,163,012,400	33,323,300	49.37	26.04	52.75
1891.....	3,500,817,500	10,027,714,400	.....	171,000,000	13,357,531,900	36,600,000	47.40	28.60	60.34
1892.....	3 811,766,200	3,474,213,200	177,000,000	.....	7,462,979,400	20,390,700	39.115	15.98	40.85
1893.....	4,331,743,200	4,958,528,500	.....	95,000,000	9,195,271,700	25,192,500	44.20	19.69	44.54
1894.....	3,996,805,100	2,752,964,200	.....	23,000,000	6,726,769,300	18,429,500	39.24	14.40	36.70
1895.....	3,682,848,300	4,528,156,200	156,000,000	.....	8,367,004,500	22,923,300	48.73	17.91	36.8
1896.....	4,617,704,600	4,559,437,400	....	45,000,000	9,132,142,000	24,951,200	39.90	19.55	49.0
Averages.....	3,294,955,100	6,091,720,400	.....	.....	9,383,034,800	25,687,000	43.91	20.09	45.1

TABLE VI.

Average Maximum and Minimum Monthly and Yearly Heights, in Feet, above Tide Marsh Level, to which Water would rise at different Stations on the Boston Water Works.

1896.	Boston Common.		Engine-house No. 8, Salem street.		Engine-house No. 7, East street.		Engine-house No. 38, Congress street, So. Boston.		Engine-house No. 2, Fourth street, So. Boston.		Pumping station, Condor street, East Boston.		Engine-house No. 9, Paris street, East Boston.		Engine-house No. 16, River street, Dorchester.		Engine-house No. 32, Bunker Hill street, Charlestown, Mystic supply.		710 Albany street.		City Hall High service.		Engine-house No. 18, Harvard street, Dorchester, High service.	
Month.	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*
Jan.	110.8	94.2	107.1	87.8	108.0	90 4	108.6	90.7	106.1	86.8	104.8	83.8	98.2	70.3	108.8	88.1	{[3]101.9 / 132.0}	{79.2 / 117.7}	114.3	95.1	232.5	208.8	228.4	200.3
Feb.	111.0	94.7	106.9	88.6	107.3	91.5	109.7	90.0	105.6	86.6	104.2	84.8	97.7	71.0	109.2	89.0	131.9	117.1	111.1	95.2	233.0	206.5	229.6	203.2
March ..	112.7	96.0	113.3	94.9	107.5	91.9	111.0	92.7	108.5	89.2	107.4	85.9	102.4	73.1	110.0	90.1	135.1	119.6	113.9	96.7	232.8	207.2	230.3	201.1
April ...	116.7	98.1	117.6	96.6	113.9	93.7	115.6	95.0	113.9	92.3	112.0	88.1	111.0	78.1	114.6	91.4	140.1	120.3	116.9	98.9	235.4	210.1	230.2	197.1
May	117.8	96.9	118.4	95.3	114.2	93.7	116.7	95.1	114.9	91.2	114.6	88.8	110.6	74.8	116.6	91.1	141.1	121.0	117.8	98.9	234.7	211.8	229.1	181.5
June...	117.8	97.4	118.4	96.4	113.1	93.6	116.1	94.0	114.9	90.6	114.2	87.2	110.6	76.1	116.4	91.5	{141.5 / [3]112.5}	{121 2 / 82.6}	117.6	98.9	[4]237.3	225.7	226.7	190.5
July	116.7	94.7	116.5	92.4	112.0	91.5	115.4	93.1	114.5	91.4	110.9	85.6	109.7	73.0	114.7	86.7	141.2	119.5	117.3	98.1	237.8	226.6	228.4	181.6
August .	116.1	93.2	116.3	91.7	112.9	91.3	115.5	92.0	114.0	90.0	110 3	84.1	108.7	70.7	114.8	86.6	[3]112.4	81.7	116.8	97.3	237.5	228.2	230.3	194.4
Sept	116.8	96.1	116.9	96.0	.....	.....	115.9	95.3	114.8	92.5	110.0	86.8	110.5	76.4	[2]116.0	95.7	[3]112.9	85.4	117.1	99.2	[5]238.1	230.0	[5]231.7	201.7
Oct.	118.0	98.9	118.7	99.1	114.6	96.6	116.9	97.6	115.6	95.5	113.4	91.1	[1]113.8	84.5	116.9	97.9	141.3	123.1	118.4	101.7	{213.0 / [5]211.7}	{204.0 / 203.5}	211.9 / [5]210.7	189.4 / 184.4
Nov.	117.8	99.5	118.3	98.2	114.4	96.3	116.6	96.8	115.4	95.8	113.5	90.2	114.4	88.3	116.4	98.5	141.8	124.1	118.0	101.5	239.5	228.2	231.4	197.0
Dec.	115.3	96.2	114.5	94.6	112.8	93.1	112.9	94.9	111.0	90.3	108.6	85.9	108.6	82.9	112.6	94.1	136.8	119.0	115.5	98.1	238.9	231.8	231.2	202.1
Avrag's.	115.6	96.3	115.2	94.3	111.8	93.0	114.2	93.9	112.4	91.0	110.3	86.9	.....	.....	.....	.....	.....	.....	116.2	98.3	.....	.....	.....	.....

[1] 20-in. L. S. main laid from Condor st., through Border st., to Central sq. [2] 24-in. pipe, extended to Adams and Parkman sts.
[3] Charlestown, supplied from Cochituate. [4] 48-in. H. S. main, completed to Common. [5] 48-in. H. S. main, out of service.

TABLE VII.

Statement of Operations at Chestnut Hill Pumping Station for the Year 1896.

1896.	Engine No. 1.			Engine No. 2.			Total amount pumped, 2 per cent. being allowed for slip.	Daily average amount pumped.	Total amount of coal consumed.	Daily average amount of coal consumed.	Total amount of ashes and clinkers.	Per cent. of ashes and clinkers.	Quantity pumped per lb. of coal. No correction for lighting or heating.	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal.
	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.									
Month.	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Galls.*	*Feet.*	*Ft.-Lbs.*
January	114	50	40,481,375	104	25	37,903,075	78,384,450	13,064,100	107,733	17,955	9,220	8.6	727.6	123.18	74,745,900
February	5	00	1,733,125	.....	....	.....	1,733,125	1,733,125	2,900	2,900	400	13.9	598.0	120.0	59,810,700
March	82	45	31,370,300	60	30	23,091,125	54,461,425	13,615,400	72,618	18,155	6,105	8.4	750.0	120.40	75,307,500
April	257	20	97,150,875	191	20	71,069,925	168,220,800	12,940,100	210,159	16,166	19,165	9.1	800.4	120.89	80,702,700
May															
June															
July															
August	21	15	7,866,175	14	40	5,326,225	13,192,400	13,192,400	15,095	15,095	1,455	9.6	873.9	123.23	87,412,200
September	310	20	118,109,150	344	15	132,146,725	250,255,875	13,903,100	276,817	15,380	29,810	10.8	904.5	120.62	65,288,900
October															
November	13	15	4,849,800	43	25	16,840,075	21,689,875	7,230,000	30,065	10,022	3,375	11.2	721.4	119.15	71,688,000
December															
Totals and av'ages.	804	45	301,560,800	758	35	286,377,150	587,937,950	12,781,260	715,387	15,552	69,530	9.7	821.8	121.07	82,983,700

TABLE VII.

Statement of Operations at Chestnut Hill Pumping Station for the Year 1896. — (Concluded.)

1896.	ENGINE No. 3.												SUMMARY. ENGINES 1, 2 AND 3.		
	Total pumping time.		Amount pumped.	Daily average amount pumped.	Amount of Coal consumed.	Daily average amount consumed.	Amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of Coal; no correction for heating or lighting.	Average lift of water.	Duty in ft.-lbs. per 100 lbs. of Coal; no correction for heating or lighting.	Total amount pumped.	Daily average amount pumped.	Remarks.	
Month.	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gallons.*	*Feet.*	*Ft.-Lbs.*	*Gallons.*	*Gallons.*		
January...	511	50	355,453,300	13,164,900	346,555	12,835	38,769	11.2	1,025.5	123.53	105,669,300	433,837,750	13,994,800		
February..	567	50	405,341,700	13,977,300	417,921	14,411	44,160	10.6	969.9	122.86	99,381,100	407,074,825	14,037,100		
March....	524	35	372,526,000	13,797,300	371,857	13,772	40,830	10.9	1,001.8	123.06	102,816,700	426,987,425	13,773,800		
April.....	347	20	251,742,400	13,985,700	236,643	13,147	25,595	10.8	1,063.8	124.67	110,609,000	419,963,200	13,998,800		
May.....	627	10	451,115,000	14,552,100	399,432	12,901	44,160	11.0	1,127.9	122.88	115,597,500	451,115,000	14,552,100	Engines 1 and 2 did not run.	
June	638	05	458,738,000	15,291,300	398,467	13,282	45,186	11.3	1,151.3	123.83	118,895,200	458,738,000	15,291,300	Engines 1 and 2 did not run.	
July.....	590	50	478,242,800	15,427,200	433,125	13,972	46,610	10.7	1,104.4	124.32	114,483,300	478,242,800	15,427,200	Engines 1 and 2 did not run.	
August....	597	30	429,350,600	14,311,700	391,645	13,054	46,525	11.9	1,096.3	121.12	110,739,200	442,543,000	14,275,600		
September	229	15	164,840,200	13,736,700	148,945	12,412	19,065	12.8	1,106.7	123.07	113,594,000	415,096,075	13,836,500		
October ...	555	25	399,257,600	12,879,300	395,638	12,762	48,465	12.3	1,009.2	122.86	103,402,700	399,257,600	12,879,300	Engines 1 and 2 did not run.	
November.	528	51	381,551,800	13,157,000	395,665	13,644	41,736	10.5	964.3	123.43	99,268,800	403,241,675	13,441,400		
December.	676	20	446,713,400	14,410,100	491,275	15,848	45,295	9.2	909.3	122.31	92,754,000	446,713,400	14,410,100	Engines 1 and 2 did not run.	
Totals and av'gs	6,395	01	4,594,872,800	14,094,700	4,427,668	13,581	486,336	11.0	1,037.8	123.16	106,582,100	5,182,810,750	14,160,700		

TABLE VIII.

Statement of Operations at Mystic Pumping Station for the Year 1896.

1896.	Engine No. 1.			Engine No. 2.			Engine No. 3.			Total amount pumped.	Daily average amount pumped.	Total amount of coal consumed.	Daily average amount of coal consumed.	Total amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal. No correction for lighting or heating.	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal. No correction for lighting or heating.
	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.	Total pumping time.		Amount pumped.									
Month.	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Gallons.*	*Feet.*	*Ft.-Lbs.*
January.....	354	45	77,622,700	.....	.....	.....	668	30	226,225,700	303,848,400	9,801,600	737,500	23,790	83,435	11.3	412.0	146.82	50,448,100
February....	225	30	50,337,100	.....	.....	.....	683	30	231,707,100	282,044,200	9,725,700	685,500	23,638	74,471	10.9	411.4	148.44	50,936,200
March.....	232	00	49,483,600	.....	.....	.....	715	15	241,006,100	290,489,700	9,370,600	711,000	22,936	78,907	11.1	408.6	146.79	50,017,700
April.....	90	15	17,602,700	.....	.....	.....	568	45	187,281,900	204,884,600	6,829,500	498,000	16,600	60,538	12.2	411.4	146.13	50,140,200
May.....	121	30	28,257,900	.....	.....	.....	290	45	93,556,200	121,814,100	4,872,600	317,500	11,760	36,045	11.4	383.7	145.31	46,496,000
June.....	426	30	91,783,300	.....	.....	.....	682	00	235,150,900	326,934,700	11,273,600	761,000	25,367	85,106	11.2	429.6	145.27	52,049,700
July.....	173	45	37,864,200	198	30	42,196,000	720	00	247,638,000	327,698,200	10,570,900	750,500	25,017	90,838	12.1	436.6	144.25	52,529,800
August.....	15	15	2,335,700	190	45	39,550,500	739	00	252,445,200	294,331,400	9,494,600	686,000	22,129	84,763	12.4	429.1	144.97	51,874,800
September..	.....	....	.....	184	15	38,396,300	673	00	235,273,700	273,670,000	9,122,300	644,000	21,467	78,355	12.2	424.9	144.79	51,315,200
October.....	119	15	24,166,000	188	30	37,492,400	299	45	104,580,600	166,239,000	5,937,100	437,500	15,625	51,394	12.0	380.0	145.06	45,969,400
November...	58	30	13,100,800	43	00	8,575,600	110	45	40,162,300	61,838,700	3,435,500	184,870	7,110	22,020	11.9	334.5	144.77	40,293,900
December...	145	00	29,177,400	220	45	41,793,800	339	30	127,249,400	198,220,600	6,835,200	494,500	16,483	59,518	12.0	400.5	145.99	48,805,800
Totals and averages.	1,962	15	421,731,900	1,030	45	208,004,600	6,540	45	2,222,277,100	2,852,013,600	7,792,400	6,907,870	18,874	805,390	11.7	412.9	145.72	50,175,600

TABLE VIII.

Statement of Operations at Mystic Pumping Station for the year 1896.— (Concluded.)

1896.	Engine No. 4.											Summary of Engines 1, 2, 3 and 4.		
	Total pumping time.		Amount pumped.	Daily average amount pumped.	Amount of coal consumed.	Daily average amount consumed.	Amount of ashes and clinkers.	Per cent of ashes and clinkers.	Quantity pumped per lb. of coal.*	Average lift.	Duty in ft.-lbs. per 100 lbs. of coal.*	Total amount pumped.	Daily average amount pumped.	Remarks.
Month.	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	*Lbs.*	*Per cent.*	*Galls.*	*Feet.*	*Ft.-Lbs.*	*Gallons.*	*Gallons.*	
January.....	263	30	114,542,200	4,090,800	149,500	5,339	17,173	11.5	766.2	151.94	97,087,300	418,390,600	13,496,500	
February....	301	00	131,647,200	5,063,400	153,500	5,903	18,804	12.2	857.6	153.10	109,507,700	413,691,400	14,265,200	
March.....	292	45	129,966,500	5,198,700	152,900	6,116	15,189	9.9	850.0	154.30	109,382,400	420,456,200	13,563,100	
April.....	365	45	162,846,600	6,031,400	189,500	7,018	15,662	8.3	859.3	150.50	105,407,600	367,731,200	12,257,700	
May.....	562	15	252,942,400	9,033,700	298,500	10,661	31,248	10.5	847.4	152.18	107,547,700	374,756,500	12,088,900	
June.....	109	00	47,911,700	5,323,500	59,100	6,567	7,089	12.0	810.7	154.64	104,554,300	374,846,400	12,494,900	
July.....	25	00	10,714,600	5,357,300	12,500	6,250	1,212	9.7	857.2	154.91	110,741,800	338,412,800	10,916,500	
August.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	294,331,400	9,494,600	Engine 4 did not run.
September..	28	15	12,192,800	3,048,200	13,000	3,250	1,300	10.0	938.0	154.85	121,126,000	285,862,800	9,528,800	
October.....	413	00	183,708,600	6,561,000	216,000	7,714	27,961	12.8	850.5	153.39	108,802,500	349,947,600	11,288,600	
November...	603	45	268,665,400	9,595,200	313,000	11,179	40,815	13.0	858.4	150.18	105,062,000	330,504,100	11,016,800	
December....	466	15	207,461,300	7,409,300	234,600	8,379	28,411	12.1	884.3	149.71	110,414,600	405,681,900	13,086,500	
Totals and averages.	3,430	30	1,522,599,300	6,534,800	1,792,100	7,691	204,864	11.4	849.6	152.70	108,200,300	4,374,612,900	11,952,500	

* No correction for lighting or heating.

TABLE IX.

Statement of Operations at the East Boston Pumping-Station for the Year 1896.

1896.	ENGINES NOS. 1 AND 2.				ENGINE NO. 3.				Total amount of coal consumed.	Per cent. of ashes and clinkers.
	Total pumping time.		Total amount pumped to reservoir.	Daily average.	Total pumping time.		Total amount pumped to tank.	Daily average.		
Month.	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*
Jan....	426	15	18,390,820	593,200	131	30	2,049,360 [1]578,620	66,100	52,340	18.1
Feb ...	401	25	16,446,920	567,100	135	05	2,099,940 [1]781,480	92,400	51,120	17.9
March.	418	40	16,034,620	517,200	113	50	1,713,300	80,500	47,910	17.9
April..	337	25	14,037,100	467,900	108	30	1,664,520	55,500	39,490	17.9
May ..	353	35	15,305,080	493,700	104	30	1,659,780	53,500	40,032	17.6
June ..	336	25	14,409,920	480,300	106	00	1,686,420	56,200	38,500	17.5
July...	339	55	14,347,060	462,800	118	05	1,851,480	59,700	40,980	17.8
Aug ...	338	25	14,503,160	467,800	113	45	1,766,240	57,300	40,730	17.8
Sept...	304	45	12,820,080	427,300	97	30	1,404,990	46,800	35,885	17.9
Oct ...	315	00	12,842,760	414,300	90	30	1,261,470	40,700	36,150	18.1
Nov ...	312	15	12,915,700	430,500	83	30	1,121,640	37,400	37,880	18.9
Dec ...	355	00	14,731,220	475,200	96	30	1,404,540	45,300	47,000	20.0
Tot'ls & Avrg's,	4,239	05	176,784,440	483,000	1,799	15	21,053,780	57,600	508,017	18.1

[1] This amount was pumped to the tank by Engine 2.
Engines Nos. 1 and 2 pump to the reservoir.
Engine No. 3 pumps to the tank on Breed's Island.

TABLE X.

Statement of Operations at the West Roxbury Pumping-Station for the Year 1896.

1896.	Total pumping time.		Total amount pumped.	Daily average amount pumped.	Quantity pumped per lb. of coal.	Total amount of coal consumed.	Per cent of ashes and clinkers.	Average lift.
Month.	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*	*Feet.*
January.....	526	30	6,963,675	224,600	149.3	46,625	18.9	139.96
February.....	492	00	6,644,925	229,100	152.8	43,500	18.7	139.46
March.....	491	00	6,828,750	220,300	162.7	41,975	17.1	140.65
April	498	30	6,912,525	230,400	168.8	40,950	16.4	139.47
May.....	644	30	8,045,842	259,500	159.9	50,300	18.4	143.57
June.....	664	30	8,238,950	274,600	156.5	52,650	18.3	157.08
July	709	00	9,050,992	292,000	158.7	57,000	19.5	131.08
August.....	793	00	9,788,475	315,800	177.9	55,000	21.1	141.08
September...	725	00	7,137,030	237,900	151.6	47,075	20.9	139.02
October.....	680	00	7,255,785	234,100	153.4	47,285	19.8	145.36
November....	651	00	7,078,695	236,000	152.9	46,300	21.0	144.62
December...	676	00	7,740,750	249,700	156.1	49,575	21.5	138.85
Totals and averages,	7,551	00	92,684,694	253,200	158.4	578,235	19.3	141.68

TABLE XI.

Rainfall in Inches and Hundredths on Sudbury River Water-shed for the Year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1		0.50										
2				0.540				0.940		0.060		
3	0.015		1.420		0.035							
4			0.165						0.460			0.040
5					0.130		0.315				1.110	
6		2.515						1.030	3.145	0.565		
7	0.185		0.315	0.095						0.095		
8							0.305				0.135	
9		0.570			0.020	0.655	0.010					0.980
10	0.570					0.690			1.390			
11		0.025			0.045						0.100	
12	0.040		0.775									
13		0.480					0.010			1.445	0.155	
14								0.030	0.295			
15						1.735				0.470		
16		0.055					0.915					0.700
17			1.295			0.060		0.030	0.180			
18				0.430				0.025		0.085		0.070
19		0.425		0.200	0.625			0.010	1.175			
20	0.035		1.085									
21					0.090	0.060	0.150			0.030	0.445	
22				0.305				0.115	0.080			
23							0.115					0.335
24			0.025					0.130		0.990	0.025	
25							0.495					
26	1.520				0.135						0.325	
27							0.050					
28						0.020	0.010				0.225	
29		1.865			0.830						0.390	
30			0.925				0.135		0.995	0,025	0.110	
31					0.665			0.085				
Totals ...	2.365	6.435	6.005	1.570	2.575	3.220	2.510	2.395	7.720	3.765	3.020	2.125

Total rainfall during the year, 43.705 inches, being an average of two gauges located at Framingham and Ashland.

TABLE XII.

Rainfall in Inches and Hundredths at Lake Cochituate for the Year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	.....	0.500	0.660	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	0.580	.....	.....	.....	1.050	.....	0.060	.....	.....
3	0.010	0.030	0.640	.....	0.030	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	0.290	.....	.....	.....	.....	.....	0.430	.....	.....	0.030
5	.....	.....	.....	.....	0.070	.....	0.210	0.550	.....	.....	1.000	.....
6	.....	2.290	.....	.....	.....	.....	.....	0.060	3.600	0.400	.....	.....
7	0.180	.....	0.310	0.040	.....	.....	0.220	.....	.....	0.100	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.190	.....
9	.....	0.510	.....	.....	0.020	0.710	.....	.....	.....	.....	.....	0.920
10	0.730	.....	.....	.....	.....	0.580	.....	0.130	1.480	.....	.....	.....
11	.....	0.020	.....	.....	0.060	.....	.....	.....	.....	.....	0.080	.....
12	0.050	.....	0.780	.....	.....	.....	.....	.....	.....	.....	0.010	.....
13	.....	0.560	.....	.....	.....	.....	.....	.....	.....	.....	0.230	.....
14	.....	.....	.....	.....	.....	.....	.....	.....	0.460	.....	.....	.....
15	.....	.....	.....	.....	.....	1.600	0.450	.....	.....	1.790	.....	.....
16	.....	0.070	1.250	.....	.....	.....	0.200	0.060	.....	.....	.....	0.860
17	.....	.....	.....	0.220	.....	0.050	.....	.....	0.160	.....	.....	.....
18	.....	0.200	.....	.....	.....	.....	.....	0.050	.....	0.120	.....	0.150
19	.....	0.180	1.030	0.370	0.470	.....	.....	0.200	0.790	.....	.....	.....
20	0.010	.....	.....	.....	.....	.....	.....	.....	0.370	.....	.....	.....
21	.....	.....	.....	.....	0.070	0.070	0.220	0.120	.....	0.030	0.440	.....
22	.....	.....	.....	.....	.....	.....	0.130	0.020	0.100	.....	.....	.....
23	.....	.....	0.020	0.380	.....	.....	.....	.....	.....	.....	.....	0.290
24	.....	.....	.....	.....	.....	.....	.....	0.110	.....	0.980	0.040	.....
25	.....	.....	.....	.....	.....	.....	0.550	.....	.....	.....	0.260	.....
26	1.450	.....	0.010	.....	0.160	.....	.....	.....	.....	.....	.....	.....
27	.....	.....	.....	.....	.....	.....	0.120	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....	0.030	.....	.....	.....	.....	0.530	.....
29	.....	1.680	.....	.....	0.800	.....	.....	.....	.....	0.020	.....	.....
30	.....	.....	0.870	.....	.....	.....	0.120	.....	0.820	0.030	0.220	.....
31	.....	.....	.....	.....	0.590	.....	.....	0.080	.....	.....	.....	.....
Totals	2.430	6.040	5.860	1.600	2.270	3.040	2.220	2.430	8.210	3.530	3.000	2.150

Total rainfall during the year, 42.780 inches.

TABLE XIII.

Rainfall in Inches and Hundredths on Mystic Lake Water-shed for the year 1896.

1896.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1		0.625										
2								1.070		0.040		0.110
3	0.010		1.430	0.675	0.010							
4									0.555			
5					0.030		0.215			0.155		0.150
6		2.260						0.670	3.595		1.010	
7	0.165		0.290	0.025			0.265		0.140	0.350		
8					0.025		0.095	0.170			0.380	
9		0.400				0.650						1.195
10	0.535					0.455			1.550			
11					0.080						0.065	
12	0.035		0.500									
13		0.520										
14									0.115	0.930	0.375	
15						1.070				0.395		
16							0.330	0.035				0.590
17			1.100			0.025						
18				0.245				0.080		0.145		0.035
19	0.005			0.250	0.400			0.160				
20		0.430	0.630						1.155			
21					0.035	0.120	0.305			0.025		
22								0.110			0.390	
23			0.010	0.580			0.075		0.110			0.250
24								0.285		1.095	0.060	
25							0.750					
26	1.125										0.315	
27					0.200		0.120					
28						0.025						
29		0.610			0.700					0.050	0.555	
30			0.830				0.265		0.665	0.035	0.170	
31					0.530			0.030				
Totals	2.355	4.845	4.790	1.775	2.010	2.345	2.420	2.610	7.885	3.220	3.320	2.33

Total rainfall during the year, 39.905 inches, being an average of two gauges, located at Mystic Lake and Mystic Reservoir.

TABLE XIV.

Monthly Rainfall in Inches, during 1896, at Various Places in Eastern Massachusetts.

PLACE.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Framingham	2.43	5.85	5.91	1.85	2.83	3.14	2.14	2.74	7.39	3.84	2.92	2.17	43.21
Dam 4, Ashland	2.30	7.02	6.10	1.29	2.32	3.30	2.88	2.05	8.05	3.69	3.12	2.08	44.20
Cordaville	2.47	6.12	5.07	1 42	2.67	3.45	2.39	2.39	6.71	3.88	3.29	1.94	41.80
Lake Cochituate	2.43	6.04	5.86	1.60	2.27	3.04	2.22	2.43	8.21	3.53	3.00	2.15	42.78
Chestnut Hill	2.80	5.45	5.53	1.72	1.85	2.98	3.00	2.74	7.16	3.49	3.61	1.89	42.22
Mystic Lake	2.77	5.09	5.19	1.99	2.13	2.51	2.45	2.90	7.78	3.37	3.56	2.39	42.13
Winchester	1.94	4.60	4.39	1.56	1.89	2.18	2.39	2.32	7.99	3.07	3.08	2.27	37.68
Mystic Pumping Station	2.72	5.08	5.12	2.00	1.85	2.32	2.53	2.81	7.07	3.11	3.62	2.36	40.59
Cambridge Observatory	3.06	4.35	6.27	1.66	2.04	2.15	2.87	2.13	6.18	3.11	3.34	1.57	38.73
Waltham, Boston Manufacturing Company	2.77	4.56	6.29	2.15	2.01	2.65	2.54	2.35	7.22	3.23	3.41	1.24	40.42
Lowell, Locks and Canals Company	2.24	4.95	6.53	1.34	2.32	2.68	3.79	2.76	9.69	2.99	3.02	2.13	44.44
Average of above eleven places	2.54	5.37	5.66	1.69	2.20	2.76	2.65	2.51	7.59	3.40	3.27	2.02	41.65

TABLE XV.

Table showing the Temperature of Air and Water of Various Stations on the Water-Works.

	TEMPERATURE OF AIR.						TEMPERATURE OF WATER.	
	Chestnut-Hill Reservoir.			Framingham.			Brookline Reservoir.	Mystic Engine-House.
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Mean.	Mean.
January	45.5°	-11.5°	23.2°	42.0°	-11.0°	22.7°	35.2°	26.3°
February	55.5	-13.0	28.8	54.0	-12.0	27.5	35.7	31.2
March	66.0	7.0	32.1	63.0	7.0	31.8	35.9	31.9
April	87.0	23.0	48.4	86.0	22.0	48.5	46.6	48.4
May	92.0	31.0	61.3	94.0	32.0	62.1	61.8	62.1
June	92.5	43.5	64.1	92.0	44.0	65.9	67.0	67.2
July	94.5	49.5	72.6	93.0	50.0	72.7	73.3	74.2
August	97.0	45.5	70.8	97.0	45.0	71.1	73.9	73.2
September	92.0	35.0	62.1	89.0	32.0	61.5	63.7	63.3
October	75.0	25.5	48.5	74.0	25.0	48.6	54.2	60.2
November	71.0	20.0	45.2	70.0	18.0	44.2	47.5	48.5
December	57.5	-3.0	28.0	55.0	-7.0	27.3	38.3	29.9

Note. — The maximum and minimum air temperatures in above table are the highest and lowest temperatures in any one day of the month. The mean air temperature is the average of the maximum and minimum temperatures of the whole month. The water temperatures are the mean temperatures for the whole month.

TABLE XVI.

Rainfall in Inches on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months, July-Oct.
1863	4.10	4.38	3.57	11.34	2.66	1.98	14.12	5.61	3.39	4.56	8.54	5.05	69.30	27.68
1864	3.37	0.98	8.44	4.02	2.84	0.58	1.06	3.56	1.52	6.50	5.45	4 28	42.60	12.64
1865	4.99	4.45	5.48	2.18	8.25	0.91	3.10	3.36	1.66	6.99	4.78	3.31	49.46	15.11
1866	1.44	5.80	3.92	1.94	6.46	4.80	13.35	3.98	8.36	3.43	4.52	4.32	62.32	29.12
1867	2.76	5.40	5.65	2.43	6.46	2.95	5.36	12.36	1.08	7.27	2.63	1.90	56.25	26.07
1868	3.70	1.18	2.51	5.61	8.12	2.95	2.16	7.38	7.69	1.19	6.77	0.45	49.71	18.42
1869	3.71	7.07	7.52	2.57	7.59	3.68	2.63	2.34	8.49	9.50	3.26	5.98	64.34	22.96
1870	7.85	4.68	6.04	8.81	3.14	4.05	3.10	2.03	0.64	7.96	4.40	3.19	55.89	13.73
1871	1.31	2.30	5.02	2.29	5.66	5.96	2.20	3.56	1.46	5.38	7.01	3.24	45.39	12 60
1872	1.86	1.37	3.06	1.74	3.24	4.27	5.55	9.76	6.29	3.69	4.22	3.42	48.47	25.29
1873	4.24	2.43	3.98	2.69	3.24	0.38	4.08	7.17	2.62	6.11	4.54	3.95	45.43	19.98
1874	2.96	2.90	1.19	6.36	3.40	4.79	3.16	4.83	1.55	1.04	2.05	1.70	35.93	10.58
1875	2.42	3.15	3.74	3.23	3.56	6.24	3.57	5.53	3.43	4.85	4.83	0.94	45.49	17.38
1876	1.83	4.21	7.43	3.24	2.80	1.60	9.49	2.19	3.98	2.00	6.59	3.13	48.49	17.66
1877	3.19	0.53	7.79	3.24	3.73	2.64	2.77	3.35	0.46	8.14	6.94	1.02	43.80	14.72
1878	5.77	5.93	4.20	5.63	0.83	3.33	3.47	6.94	1.12	5.15	6.09	5.12	53.58	16.68
1879	2.00	3.05	3.90	4.69	1.20	4.14	3.38	6.43	1.74	0.90	2.98	3.60	38.01	12.45
1880	3.07	5.05	2.83	2.94	1.98	1.25	7.00	3.81	1.69	2.95	1.70	2.56	35.83	15.45

1881.....	5.56	4.43	4.79	1.71	3.18	4.83	2.78	1.13	2.13	2.87	3.85	3.83	41.09	8.91
1882.....	5.93	3.96	2.76	1.89	4.73	1.87	3.49	1.14	9.20	2.22	0.93	2.17	40.29	16.95
1883.....	2.88	3.59	1.76	2.27	3.95	1.81	2.88	0.39	1.31	5.16	2.06	3.14	31.20	9.74
1884.....	4.39	6.04	4.50	3.80	2.92	3.88	4.42	4.49	0.90	2.59	2.33	5.31	45.57	12.40
1885.....	5.25	3.98	1.09	3.71	3.46	2.96	1.73	7.01	1.63	5.26	5.26	2.32	43.66	15.63
1886.....	6.53	6.86	3.46	2.00	2.97	1.21	3.30	3.75	3.20	3.16	4.76	5.77	46.97	13.41
1887.....	5.29	5.34	5.10	4 45	1.02	2.58	3.77	3.70	1.28	2.49	2.76	3.80	41.58	11.24
1888.....	4.13	3.55	5.60	2.51	4.63	2.07	1.67	6.32	8.81	4.95	7.03	5.66	56.93	21.75
1889.....	5.46	1.56	2 28	3.19	3.64	3.17	9.10	4.57	4.92	3.85	5.79	2.70	50.23	22.44
1890.....	2.34	3.21	7.35	2.51	5.31	1.78	2.31	3.34	6.47	10.11	1.24	5.26	51.23	22.23
1891.....	6.67	5.02	5.49	3.62	1.67	3.78	2.99	4.91	2.12	4.14	2.84	3.17	46.42	14.16
1892.....	4.78	2.80	4.12	0.78	5.46	3.23	3.47	3.79	2.87	1.42	5.14	1.18	39.04	11.55
1893.....	2.61	7.26	3.13	3.21	5.45	2.75	2.40	5.86	1.76	3.74	2.08	5.03	45.28	13.76
1894.....	3.95	3.89	1.16	3.27	3.70	1.61	3.61	2.57	2.27	5.14	3.53	4.38	39.08	13.59
1895.....	3.93	1.70	3.11	5.03	2.03	3.12	4.71	3.96	2.77	9.57	6.32	2.71	48.96	21.01
1896.....	2.43	6.70	5.20	1.60	2.27	3.04	2.22	2.43	8.21	3.53	3.00	2.15	42.78	16.39
Totals.....	132.70	133 75	147.17	120.50	131.55	100.19	144.40	153.55	117.02	157.81	146.22	115.74	1,600.60	572.78
Averages.....	3.90	3.93	4.33	3.54	3.87	2.95	4.25	4.52	3.44	4.64	4.30	3.40	47.08	16.85

TABLE XVII.

Rainfall collected, in Inches, on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months. July–Oct.
1863	1.93	3.11	3.71	4.42	1.44	0.67	2.97	1.51	0.98	1.32	2.65	2.17	26.88	6.78
1864	2.39	1.56	4.05	2.65	1.62	0.49	0.41	0.68	0.49	1.43	1.25	1.33	18.35	3.01
1865	2.15	1.74	4.66	2.70	4.70	0.34	0.46	0.47	0.45	0.70	1.00	1.13	20.50	2.08
1866	0.73	2.84	1.76	1.63	1.29	1.10	1.20	0.64	1.34	0.93	0.99	1.56	16.01	4.11
1867	1.10	5.24	3.50	2.87	2.20	0.65	0.59	2.10	0.31	1.02	1.10	1.12	21.80	4.02
1868	1.22	1.12	3.84	3.48	6.17	1.59	0.45	1.18	1.85	0.95	1.96	1.17	24.98	4.43
1869	1.82	1.84	3.31	2.49	2.20	1.07	0.74	0.58	1.10	2.37	1.30	3.17	21.99	4.79
1870	4.71	3.93	3.38	6.87	1.66	0.97	0.53	0.41	0.86	1.11	0.88	0.77	26.08	2.91
1871	1.03	2.28	2.53	1.58	2.00	0.87	0.43	0.85	0.39	0.69	1.30	1.21	15.16	2.36
1872	1.15	0.93	1.41	3.08	1.10	1.49	0.14	1.32	1.70	1.69	2.00	1.21	17.22	4.85
1873	3.09	1.57	3.89	6.09	2.66	0.45	0.62	1.40	0.78	2.04	1.86	2.68	27.13	4.84
1874	3.55	2.19	1.84	3.19	2.78	1.96	0.95	0.92	0.53	0.52	0.58	0.51	19.52	2.92
1875	0.13	1.92	2.66	3.15	1.39	1.48	0.25	0.62	0.60	1.19	1.96	1.22	17.57	2.66
1876	1.09	1.78	5.19	4.20	1.43	0.51	0.84	0.29	0.88	0.49	1.85	0.99	19.54	2.50
1877	1.20	1.37	6.81	3.24	2.04	0.92	0.65	0.67	0.46	1.16	2.69	1.96	23.17	2.94
1878	3.25	3.97	5.40	2.86	1.66	0.76	0.47	0.84	0.29	0.73	2.07	4.04	26.34	2.33
1879	1.29	2.32	3.30	4.48	1.40	0.77	0.33	0.95	0.61	0.60	0.72	1.04	17.81	2.49
1880	1.47	2.24	1.79	1.57	0.44	0.06	0.33	0.32	0.24	0.49	0.83	0.61	10.30	1.29

1881.....	1.19	2.23	5.66	1.79	1.26	1.31	0.16	0.09	0.23	0.18	0.84	1.40	16.34	0.66
1882.....	1.84	3.00	3.67	0.93	1.55	0.62	0.06	0.07	0.97	0.84	0.58	0.92	15.05	1.94
1883.....	0.84	1.59	2.04	1.66	1.26	0.07	0.02	0.07	0.62	0.59	0.41	0.94	10.11	1.30
1884.....	1.84	2.86	4.67	4.00	1.39	0.67	0.26	0.61	0.13	0.34	0.62	1.82	19.21	1.34
1885.....	1.90	2.00	2.21	2.36	1.61	0.43	0.00	0.33	0.25	0.79	2.05	1.64	15.57	1.37
1886.....	2.28	7.93	3.51	2.52	1.09	0.18	0.25	0.14	0.30	0.42	1.20	2.10	21.92	1.11
1887.....	4.06	4.34	4.70	3.36	1.35	0.82	0.72	1.33	0.64	0.49	0.70	0.96	23.47	3.18
1888.....	1.13	2.77	4.76	3.45	2.37	0.53	0.47	0.94	2.31	2.57	4.21	5.46	30.97	6.29
1889.....	4.50	1.85	2.08	2.17	1.20	1.18	1.63	3.43	1.79	1.91	2.95	3.26	27.95	8.76
1890.....	1.92	2.04	5.87	2.23	1.85	1.41	0.33	0.46	1.40	3.40	1.49	2.11	24.51	5.59
1891.....	6.26	6.62	8.03	4.31	0.88	0.77	0.50	0.72	0.76	0.79	0.83	1.60	32.07	2.77
1892.....	3.18	1.64	3.12	0.90	2.03	0.49	0.33	0.56	0.60	0.57	1.09	0.84	15.35	2.06
1893.....	0.64	2.55	4.12	2.42	1.83	0.75	0.38	0.77	0.42	1.09	1.00	1.68	17.65	2.66
1894.....	1.27	1.69	2.55	2.15	0.91	0.45	0.38	0.41	0.46	0.66	0.92	1.14	12.99	1.91
1895.....	1.58	0.75	3.50	3.35	0.97	0.40	0.55	0.50	0.69	1.97	3.51	2.40	20.17	3.71
1896.....	1.72	3.69	5.52	2.01	0.62	0.71	0.37	0.47	1.03	1.28	1.39	1.30	20.14	3.15
Totals.....	69.45	90.50	129.04	100.16	60.35	26.94	18.77	26.56	26.46	37.32	50.78	57.46	693.82	109.11
Averages....	2.04	2.66	3.79	2.95	1.77	0.79	0.55	0.78	0.78	1.10	1.49	1.69	20.41	3.21

TABLE XVIII.

Percentage of Rainfall collected on Cochituate Water-shed, 1863 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly.	4 months. July-Oct.
1863	47.0	71.0	104.0	39.0	54.0	34.0	21.0	27.0	29.0	29.0	31.0	43.0	38.8	24.5
1864	71.0	159.0	48.0	66.0	57.0	84.0	39.0	19.0	32.0	22.0	23.0	31.0	43.0	23.8
1865	43.0	39.0	85.0	124.0	57.0	37.0	15.0	14.0	27.0	10.0	21.0	34.0	41.4	13.8
1866	51.0	49.0	45.0	84.0	20.0	23.0	9.0	16.0	16.0	27.0	22.0	36.0	25.7	14.1
1867	40.0	97.0	62.0	118.0	34.0	22.0	11.0	17.0	29.0	14.0	42.0	59.0	38.7	15.4
1868	33.0	95.0	153.0	62.0	76.0	54.0	21.0	16.0	24.0	80.0	29.0	261.0	50.2	24.0
1869	49.0	26.0	44.0	97.0	29.0	29.0	28.0	25.0	13.0	25.0	40.0	53.0	34.2	20.9
1870	60.0	84.0	56.0	78.0	53.0	24.0	17.0	20.0	134.0	14.0	20.0	24.0	46.7	21.2
1871	79.0	99.0	50.4	68.8	35.3	14.6	19.6	23.8	26.8	12.8	18.5	37.4	33.4	18.7
1872	61.8	67.8	46.0	177.3	33.8	34.8	2.6	13.5	27.0	45.7	47.4	35.3	35.5	19.2
1873	72.9	64.8	97.8	226.4	82.2	119.1	15.1	19.5	29.8	33.4	40.9	67.9	59.8	24.2
1874	120.0	75.5	154.7	50.2	81.7	40.8	30.0	19.1	34.3	50.3	28.4	29.9	54.3	27.6
1875	5.5	92.8	71.2	97.5	39.9	23.7	7.1	11.2	17.4	24.6	40.5	129.8	38.6	15.3
1876	59.3	42.4	69.9	129.7	50.9	31.6	8.9	13.3	22.2	24.3	28.1	31.5	40.3	14.2
1877	37.6	258.9	87.4	100.0	54.6	34.8	23.3	19.6	99.8	14.3	38.8	192.6	52.9	20.0
1878	56.3	66.9	128.6	50.7	200.0	23.2	13.5	12.0	25.8	14.3	34.0	78.8	49.2	14.0
1879	64.4	76.3	84.5	95.6	117.0	18.6	9.7	14.7	35.0	66.5	24.2	28.9	46.9	20.0
1880	47.9	55.3	63.3	53.3	22.2	4.5	4.7	6.1	14.3	16.6	48.9	23.8	28.7	8.3

1881.....	21.5	50.3	118.1	104.8	39.6	27.0	5.8	7.6	10.8	6.4	21.8	36.7	39.8	7.4
1882.....	31.0	75.9	133.0	49.3	32.8	33.1	1.7	6.2	10.5	37.9	62.4	42.3	37.4	12.1
1883.....	29.2	44.3	115.8	73.1	31.9	3.7	0.6	18.6	47.4	11.5	20.0	29.8	32.4	13.3
1884.....	41.8	47.4	103.9	105.1	47.5	17.3	5.0	13.6	14.9	13.1	26.7	34.2	42.2	10.8
1885.....	36.1	50.2	202.7	63.6	46.7	14.4	0.0	4.8	15.5	15.0	39.0	70.7	35.7	8.8
1886.....	36.6	107.3	101.9	154.3	43.0	35.5	11.1	7.8	10.7	13.4	21.7	29.7	49.7	8.3
1887.....	60.2	80.8	72.0	81.3	112.0	47.3	13.2	27.1	32.0	18.7	23.4	25.6	47.8	28.3
1888.....	27.5	78.0	85.0	137.3	51.2	25.8	28.1	14.9	26.2	51.9	59.9	96.4	54.4	28.9
1889.....	82.5	118.7	91.5	68.1	32.9	37.1	17.9	75.0	36.4	49.6	50.9	120.9	55.6	39.0
1890.....	82.0	63.4	79.9	88.9	34.9	79.1	14.2	13.9	21.6	33.7	120.0	40.2	47.9	25.1
1891.....	93.8	131.9	146.3	119.1	52.8	20.4	16.7	14.7	35.9	19.0	29.2	50.5	69.1	19.6
1892.....	66.6	58.5	75.7	115.5	37.1	15.3	9.5	14.7	21.1	40.2	21.2	71.1	39.3	17.8
1893.....	24.5	35.1	131.7	75.7	33.5	27.2	15.9	13.2	23.9	28.8	48.4	33.4	39.0	19.3
1894.....	32.3	43.5	219.7	65.8	24.6	27.9	10.4	16.1	20.0	12.8	26.1	26.1	33.3	14.1
1895.....	40.1	44.2	112.4	66.5	47.8	13.0	11.8	12.6	25.0	20.6	55.5	88.6	41.2	17.5
1896.....	70.9	55.0	106.2	125.8	27.5	23.5	16.9	19.4	12.5	36.4	46.5	60.6	47.1	21.3
Totals	1,775.3	2,604.2	3,346.6	3,211.7	1,793.4	1,100.3	475.2	587.0	1,000.8	932.8	1,250.4	2,053.7	1,470.2	630.8
Averages....	52.2	76.6	98.4	94.5	52.7	32.4	14.0	17.3	29.4	27.4	36.8	60.4	43.2	18.5

TABLE XIX.

Rainfall, in Inches, on Sudbury-river Water-shed, 1875 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months, July-Oct.
1875.....	2.420	3.150	3.740	3.230	3.560	6.240	3.570	5.530	3.430	4.850	4.830	0.940	45.490	17.380
1876.....	1.830	4 210	7.430	4.197	2.763	2.040	9.134	1.720	4.614	2.241	5.764	3.620	49.563	17.709
1877.....	3.216	0.739	8.357	3.435	3.702	2.425	2.951	3.682	0.323	8.515	5.803	0.870	44.018	15.471
1878.....	5.632	5.973	4.689	5.790	0.956	3.884	2.971	6.937	1.291	6.417	7.024	6.367	57.931	17.616
1879.....	2.478	3.562	5.140	4.716	1.579	3.789	3.933	6.509	1.878	0.809	2.682	4.344	41.419	13.129
1880.....	3.566	3.980	3.315	3.105	1.836	2.138	6.273	4.008	1.603	3.740	1.785	2.828	38.177	15.624
1881.....	5.558	4.646	5.730	2.000	3.511	5.395	2.350	1.358	2.617	2.955	4.091	3.958	44.169	9.280
1882.....	5.951	4.546	2.649	1.824	5.066	1.664	1.769	1.667	8.741	2.074	1.147	2.296	39.394	14.251
1883.....	2.810	3.865	1.780	1.845	4.185	2.400	2.680	0.735	1.520	5.600	1.810	3.550	32.780	10.535
1884.....	5.085	6.545	4.720	4.405	3.470	3.445	3.665	4.650	0.855	2.480	2.645	5.170	47.135	11.650
1885.....	4.710	3.865	1.070	3.605	3.485	2.865	1.425	7.185	1.425	5.095	6.095	2.720	43.545	15.130
1886.....	6.365	6.280	3.610	2.224	2.995	1.465	3.265	4.100	2.905	3.235	4.645	4.975	46.065	13.505
1887.....	5.200	4.780	4.960	4.265	1.165	2.650	3.760	5.280	1.320	2.835	2.670	3.880	42.705	13.195
1888.....	4.150	3.685	6.020	2.425	4.825	2.535	1.405	6.225	8.585	4.990	7.224	5.395	57.465	21.205
1889.....	5.370	1.655	2.365	3.410	2.945	2.800	8.940	4.175	4.605	4.255	6.290	3.140	49.950	21.975
1890.....	2.530	3.505	7.735	2.645	5.210	2.030	2.460	3.865	6.000	10.510	1.200	5.310	53.000	22.835
1891.....	7.020	5.235	6.475	3.905	2.010	3.770	3.395	4.725	2.380	3.830	3.090	3.685	49.520	14.330
1892.....	5.850	3.140	4.060	0.830	5.585	2.760	4.230	4.440	2.840	1.170	5.800	1.125	41.830	12.680
1893.....	2.925	8.195	3.670	3.605	6.616	2.380	2.570	5.415	1.735	4.065	2.195	4.860	48.225	13.785
1894.....	4.090	3.910	1.435	3.415	4.235	1.155	3.255	2.030	2.635	5.345	3.425	4.810	39.740	13.265
1895.....	4.060	1.395	2.980	5.250	2.020	2.770	5.040	4.150	2.300	10.680	6.625	3.350	50.620	22.170
1896.....	2.390	7.180	5.235	1.570	2.575	3.220	2.510	2.395	7.720	3.765	3.020	2.125	43.705	16.390
Totals..... ...	93.206	94.041	97.105	71.697	74.288	63.820	81.551	90.781	71.322	99.456	89.861	79.318	1006.446	343.110
Averages.....	4.236	4.275	4.414	3.259	3.377	2.901	3.707	4.125	3.242	4.521	4.085	3.605	45.748	15.596

TABLE XX.

Rainfall collected, in Inches, on Sudbury-river Water-shed, 1875 to 1896.

YEARS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months, July-Oct.
1875	0.184	2.411	2.862	5.263	2.119	1.501	0.573	0.706	0.358	1.152	2.248	1.041	20.418	2.789
1876	1.147	2.282	7.911	5.683	2.031	0.383	0.326	0.723	0.318	0.417	1.878	0.809	23.908	1.764
1877	1.174	1.529	8.586	4.132	2.482	1.031	0.360	0.216	0.103	1.127	2.447	2.300	25.487	1.806
1878	3.228	3.972	6.256	2.807	2.487	0.873	0.229	0.848	0.277	0.921	2.922	5.667	30.487	2.275
1879	1.249	2.756	4.156	5.379	1.987	0.713	0.281	0.705	0.243	0.126	0.355	0.825	18.775	1.355
1880	2.000	2.982	2.451	2.017	0.917	0.303	0.315	0.212	0.138	0.181	0.354	0.312	12.182	0.846
1881	0.740	2.491	7.142	2.669	1.721	2.309	0.493	0.264	0.340	0.331	0.682	1.383	20.565	1.428
1882	2.213	3.872	5.064	1.497	2.304	0.913	0.154	0.099	0.529	0.534	0.362	0.51	18.102	1.316
1883	0.597	1.664	2.873	2.330	1.673	0.518	0.206	0.140	0.157	0.331	0.354	0.345	11.188	0.834
1884	1.775	4.742	6.752	4.925	1.838	0.719	0.399	0.458	0.076	0.148	0.302	1.650	23.784	1.081
1885	2.203	2.182	2.805	3.133	2.383	0.735	0.111	0.429	0.209	0.599	2.033	2.094	18.916	1.348
1886	2.606	7.734	3.672	3.361	1.285	0.350	0.206	0.168	0.203	0.260	1.161	1.819	22.825	0.887
1887	4.619	4.558	5.116	4.522	1.799	0.714	0.204	0.382	0.191	0.339	0.636	1.147	24.227	1.116
1888	1.878	3.255	5.775	4.566	2.912	0.728	0.209	0.677	1.994	3.566	4.761	5.428	35.749	6.446
1889	4.963	1.926	2.388	2.434	1.569	1.128	1.130	2.554	1.422	2.194	3.351	3.997	29.056	7.300
1890	2.237	2.463	6.498	3.236	2.437	0.980	0.191	0.235	0.790	4.053	2.097	1.776	26.993	5.269
1891	5.383	5.616	7.944	4.138	1.039	0.714	0.266	0.290	0.350	0.375	0.526	0.971	27.612	1.281
1892	3.335	1.574	3.488	1.504	2.245	0.739	0.382	0.500	0.396	0.224	1.204	0.865	16.456	1.502
1893	0.773	2.485	5.789	3.668	5.143	0.759	0.282	0.322	0.187	0.395	0.550	1.421	21.774	1.186
1894	1.236	1.596	3.992	2.832	1.498	0.722	0.287	0.373	0.258	0.668	1.442	1.277	16.182	1.586
1895	1.844	0.871	4.299	4.341	1.134	0.301	0.411	0.409	0.153	2.460	4.794	3.179	24.196	3.433
1896	1.933	4.466	6.841	2.579	0.641	0.689	0.170	0.102	0.669	1.055	1.137	1.171	21.453	1.996
Totals	47.317	67.427	112.660	77.016	43.644	17.823	7.185	10.812	9.361	21.456	35.596	40.038	490.335	48.814
Averages	2.151	3.065	5.121	3.501	1.984	0.810	0.326	0.491	0.425	0.975	1.618	1.820	22.288	2.219

TABLE XXI.

Percentage of Rainfall collected on Sudbury-river Water-shed, 1875 to 1896.

YEAR.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.	4 months. July-Oct.
1875.....	7.6	76.5	76.5	162.9	59.5	24.0	16.0	12.8	10.4	23.8	46.5	110.7	44.9	16.0
1876.....	62.7	54.2	106.5	135.4	73.5	18.8	3.6	42.0	6.9	18.6	32.6	22.3	48.2	10.1
1877.....	36.5	206.9	102.7	120.3	67.0	42.5	12.2	5.9	31.9	13.2	42.2	264.4	57.9	11.7
1878.....	57.3	66.5	133.4	48.5	260.2	22.5	7.7	12.2	21.5	14.3	41.6	89.0	52.6	12.9
1879.....	50.4	77.4	80.9	114.1	125.8	18.8	7.1	10.8	12.9	15.6	13.2	19.0	45.3	10.3
1880.....	56.0	74.9	73.9	65.0	50.0	14.2	5.0	5.3	8.6	4.8	19.9	11.0	31.9	5.4
1881.....	13.3	53.6	124.6	133.4	49.0	42.8	21.0	19.4	13.0	11.2	16.7	34.9	46.6	15.4
1882.....	37.2	85.2	191.2	82.1	45.5	54.9	8.7	5.9	6.0	25.7	31.5	24.5	45.9	9.2
1883.....	21.2	43.0	161.4	126.3	40.0	21.6	7.7	19.1	10.4	5.9	19.5	9.7	34.1	7.9
1884.....	34.9	72.5	143.1	111.8	53.0	20.9	10.9	9.8	8.9	6.0	11.4	31.9	50.5	9.3
1885.....	46.8	56.4	262.1	86.9	68.4	25.7	7.8	6.0	14.7	11.8	33.3	77.0	43.4	8.9
1886.....	40.9	123.2	101.7	151.1	42.9	23.9	6.3	4.1	7.0	8.0	25.0	36.6	49.5	6.2
1887.....	88.8	95.3	104.4	106.0	154.5	26.9	5.5	7.2	14.5	12.0	23.8	29.6	56.7	8.5
1888.....	45.3	88.3	95.9	188.3	60.3	28.7	14.9	10.9	23.2	71.4	65.9	100.6	62.2	30.4
1889.....	92.4	116.4	100.9	71.4	53.3	40.3	12.6	61.2	30.9	51.6	53.3	127.3	58.2	33.2
1890.....	88.4	70.3	84.0	122.3	46.8	48.3	7.8	6.1	13.2	38.6	174.7	33.5	50.9	23.1
1891.....	76.7	107.3	122.7	106.0	51.7	18.9	7.8	6.1	14.7	9.8	17.0	26.3	55.8	8.9
1892.....	57.0	50.1	85.9	181.1	40.2	26.8	9.0	11.3	13.9	19.2	20.7	76.9	39.3	11.8
1893.....	26.4	30.3	157.7	101.7	77.8	31.9	11.0	5.9	10.8	9.7	25.1	29.2	45.2	8.6
1894.....	30.2	40.8	278.2	82.9	35.4	62.6	8.8	18.4	9.8	12.5	42.1	26.5	40.7	12.0
1895.....	45.4	62.5	144.2	82.7	56.1	10.8	8.2	9.9	6.7	23.0	72.4	94.9	47.8	15.5
1896.....	80.9	62.2	130.7	164.3	24.9	21.4	6.8	4.3	8.7	28.0	37.7	55.1	49.1	11.9
Totals.....	1096.3	1713.8	2862.6	2544.5	1535.8	647.2	206.4	294.6	298.6	434.7	866.1	1330.9	1056.7	287.2
Averages..	49.8	77.9	130.1	115.7	69.8	29.4	9.4	13.4	13.6	19.8	39.4	60.5	48.0	13.1

TABLE XXII.

Rainfall, in Inches, on Mystic Water-shed, 1878 to 1896.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	4 months, July-Oct.
1878.....	5.67	5.74	3.93	5.73	0.67	2.62	3.52	7.51	3.19	4.95	5.69	4.845	54.065	19.17
1879.....	1.82	2.73	3.52	4.65	1.86	3.98	2.39	5.48	1.60	0.77	2.76	3.74	35.30	10.24
1880..	2.62	4.23	2.49	2.18	2.02	1.49	7.23	3.64	1.42	2.70	1.90	2.50	34.42	14.99
1881.....	5.82	3.63	6.69	1.54	2.98	6.84	2.60	0.67	2.17	2.16	3.52	3.29	41.91	7.60
1882.....	5.545	4.68	2.49	2.11	4.58	2.09	2.34	1.065	8.35	1.94	1.745	2.23	39.165	13.695
1883.....	2.67	3.065	2.22	2.47	3.585	1.635	2.785	0.87	1.495	5.45	1.98	2.995	31.22	10.60
1884...	4.745	6.085	4.255	3.18	2.95	4.635	3.72	4.855	0.70	2.70	2.005	4.56	44.39	11.975
1885.....	4.83	3.40	1.175	3.445	3.945	4.41	2.04	5.90	1.425	5.52	6.31	2.10	44.50	14.885
1886.....	6.315	7.175	3.84	2.10	2.945	1.54	3.71	3.24	2.955	2.85	4.065	4.825	45.560	12.755
1887.....	5.245	4.47	5.00	4.605	1.69	2.695	6.585	4.965	1.50	3.04	3.05	3.575	46.42	16.090
1888.....	4.05	3.28	5.185	2.84	5.095	2.20	2.23	6.23	8.56	4.955	6.85	5.27	56.745	21.975
1889.....	5.505	1.86	2.285	3.61	4.64	3.315	8.455	3.92	4.705	3.59	5.65	2.86	50.395	20.67
1890.....	2.725	3.38	6.68	2.405	6.30	3.38	2.265	3.64	3.70	8.84	1.385	4.67	49.37	18.445
1891.....	6.245	5.075	6.07	3.15	2.46	4.43	3.18	3.88	2.16	4.735	2.605	3.41	47.40	13.955
1892.....	4.515	3.015	4.005	0.815	5.585	4.15	2.575	4.82	2.005	1.835	4.645	1.15	39.115	11.235
1893.....	2.26	7.50	2.55	3.37	6.26	2.10	2.04	5.41	2.01	4.10	2.25	4.35	44.20	13.56
1894.....	3.93	3.31	1.09	3.48	5.18	0.72	3.45	2.52	2.52	5.58	3.49	3.97	39.24	14.07
1895.....	3.535	0.655	3.00	4.185	3.150	3.630	4.345	5.435	2.040	10.195	7.260	2.300	48.73	22.015
1896.....	2.355	5.085	4.550	1.775	2.010	2.345	2.420	2.610	7.885	3.220	3.320	2.330	39.90	16.135
Totals.....	80.400	78.365	71.025	57.640	67.905	58.205	67.880	76.660	60.390	79.130	69.480	64.97	832.045	284.060
Averages.....	42.316	41.245	37.38	30.337	35.74	30.634	35.726	40.347	31.784	41.648	36.568	34.195	43.792	14.950

TABLE XXIII.

Rainfall collected, in Inches, on Mystic Water-shed, 1878 to 1896.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.	4 months, July-Oct.
1878	3.55	3.97	4.91	2.21	2.16	0.78	0.48	1.11	0.56	0.71	1.75	3.63	25.82	2.86
1879...	1.21	2.33	3.31	3.97	1.95	0.97	0.54	0.70	0.48	0.34	0.45	0.69	16.94	2.06
1880.....	1.70	2.54	1.95	1.50	0.96	0.51	0.67	0.54	0.45	0.36	0.44	0.59	12.21	2.02
1881.....	0.82	2.14	6.79	2.17	1.51	2.05	0.87	0.35	0.31	0.29	0.50	0.87	18.67	1.82
1882.....	1.37	3.03	4.19	1.16	1.85	0.81	0.35	0.22	0.53	0.58	0.39	0.57	15.05	1.68
1883.....	0.70	1.43	1.88	1.63	1.20	0.52	0.30	0.22	0.18	0.39	0.42	0.44	9.31	1.09
1884.....	1.49	3.89	5.42	3.85	1.48	0.85	0.58	0.60	0.23	0.27	0.35	1.17	20.18	1.68
1885.....	1.79	1.81	2.05	2.03	2.18	0.86	0.47	0.54	0.34	0.68	2.41	2.39	17.55	2.03
1886.....	2.31	7.70	3.91	3.24	1.27	0.55	0.41	0.25	0.32	0.38	0.88	1.43	22.65	1.36
1887.....	3.16	3.61	3.60	3.75	1.89	1.27	0.87	1.35	0.48	0.57	0.71	0.91	22.17	3.27
1888.....	1.43	3.32	4.28	3.27	2.88	0.84	0.39	0.54	1.31	2.74	5.04	5.08	31.12	4.98
1889.... ...	4.51	1.83	1.60	2.27	2.18	1.89	1.33	2.05	1.06	1.21	2.49	3.06	25.48	5.65
1890.....	2.07	2.23	5.37	2.93	3.00	1.92	0.43	0.46	0.58	2.61	1.95	2.49	26.04	4.08
1891.....	6.29	5.97	7.21	3.43	1.40	1.01	0.42	0.44	0.42	0.58	0.56	0.87	28.60	1.86
1892.....	2.49	1.76	3.03	1.33	2.10	1.17	0.66	0.49	0.56	0.45	1.07	0.87	15.98	2.16
1893.....	0.75	2.14	4.52	2.72	4.42	1.04	0.47	0.69	0.41	0.55	0.71	1.27	19.69	2.12
1894.....	1.37	1.87	3.05	2.27	1.31	0.91	0.49	0.38	0.36	0.58	0.91	0.90	14.40	1.81
1895.....	1.55	0.87	3.16	2.95	1.14	0.54	0.60	0.80	0.36	1.46	2.37	2.12	17.91	3.22
1896.....	1.85	3.40	4.50	3.26	0.77	0.75	0.39	0.34	1.06	0.89	1.11	1.24	19.55	2.68
Totals	40.41	55.84	74.73	49.94	35.65	19.24	10.72	12.07	10.00	15.64	24.51	30.59	379.32	48.43
Averages..	2.13	2.94	3.93	2.63	1.88	1.01	0.56	0.63	0.53	0.82	1.29	1.61	19.96	2.55

TABLE XXIV.

Percentage of Rainfall collected at Mystic Water-shed, 1878 to 1896.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.	4 months, July–Oct.
1878.....	62.6	69.2	125.0	38.6	322.9	29.6	13.5	14.8	17.7	14.3	30.8	74.9	47.8	14.9
1879.....	66.6	85.4	93.9	85.3	104.9	24.5	22.6	12.8	29.7	44.2	16.2	18.6	48.0	20.1
1880.....	64.9	60.1	78.4	68.8	47.3	34.3	9.2	14.7	31.7	13.5	22.9	23.8	35.5	13.5
1881.....	14.2	58.9	101.5	141.1	50.7	29.9	33.3	51.9	14.1	13.6	14.3	26.3	44.5	23.9
1882.....	24.8	64.8	168.4	55.0	40.4	38.6	14.9	20.8	6.3	30.0	22.2	25.5	38.4	12.3
1883.....	26.1	46.7	84.8	65.9	33.5	31.8	10.8	25.7	12.1	7.2	21.1	14.7	29.8	10.3
1884.....	31.5	63.9	127.3	121.2	50.2	18.3	15.5	12.4	33.5	9.9	17.4	25.6	45.5	14.0
1885.....	37.1	53.3	174.5	58.8	55.3	19.6	22.8	9.2	23.7	12.2	38.2	113.6	39.4	13.6
1886.....	36.6	107.3	101.9	154.3	43.0	35.5	11.1	7.8	10.7	13.4	21.7	29.7	49.7	10.7
1887.....	60.2	80.8	72.0	81.3	112.0	47.3	13.2	27.1	32.0	18.7	23.4	25.6	47.8	20.3
1888.....	35.2	101.3	82.5	115.2	56.6	38.1	17.5	8.8	15.3	55.3	73.6	96.4	54.8	22.7
1889.....	81.8	98.2	70.2	63.0	46.9	57.0	15.8	22.2	22.5	33.7	44.1	107.0	50.6	27.3
1890.....	75.6	66.0	80.4	121.8	47.6	56.9	19.0	12.7	15.6	29.5	141.2	53.5	52.8	22.1
1891.....	100.7	117.6	118.7	109.0	57.0	22.8	13.3	11.3	19.3	12.1	21.7	25.6	60.3	13.3
1892.....	55.0	58.5	75.7	163.6	37.5	28.3	25.7	10.2	27.7	24.3	23.1	75.2	40.9	19.2
1893.....	33.3	28.6	177.3	80.7	70.6	49.5	23.2	12.6	20.5	13.4	31.5	29.1	44.5	15.6
1894.....	34.8	56.5	280.1	65.4	25.3	125.8	14.2	15.1	14.3	10.5	26.0	22.7	36.7	12.9
1895.....	43.7	132.2	105.2	70.6	36.0	15.0	13.8	14.7	17.6	14.4	37.8	92.2	36.8	15.1
1896.....	78.7	66.8	98.9	183.5	38.5	31.9	16.2	12.9	13.5	27.5	33.4	53.1	49.0	17.5
Totals....	963.4	1416.1	2216.7	1843.1	1276.2	734.7	325.6	347.7	377.9	397.7	660.6	933.1	852.8	319.3
Averages,	50.71	74.53	116.67	97.01	67.17	38.67	17.14	18.30	19.89	20.93	34.77	49.11	44.88	16.81

TABLE XXV.

Yield of Sudbury-river Water-shed, 1875–1896. Area of water-shed used includes water surfaces.

YEAR.	Rainfall.	Daily Average Yield for Year.	Yield per Square Mile per Day.	Rainfall. July-Oct.	Daily Average Yield July-Oct.	Yield per Square Mile per Day.	Minimum Monthly Yield.				Minimum Yield in any Week.		
								Rainfall.	Daily Average Yield for Month.	Yield per Square Mile per Day.		Daily Average Yield for Week.	Yield per Square Mile per Day.
	Inches.	Gallons.	Gallons.	Inches.	Gallons.	Gallons.	Month.	Inches.	Gallons.	Gallons.	Week.	Gallons.	Gallons.
1875.....	45.490	75,599,200	972,200	17.380	30,650,400	394,100	January.....	2.420	8,000,000	102,900			
1876.....	49.563	88,278,400	1,135,200	17.709	19,603,300	252,100	July	9.134	14,229,000	183,000	.....	4,000,000	51,400
1877.....	44.018	94,369,200	1,213,500	15.471	19,832,100	255,000	September....	0.323	4,633,300	59,600	.....	1,800,000	23,100
1878.....	57.931	112,882,200	1,451,600	17.616	25,001,600	321,500	July.....	2.971	9,983,900	128,400	.....	5,300,000	68,200
1879.....	41.419	69,942,200	894,000	13.129	14,974,000	191,400	October	0.809	5,532,300	70,700			
1880.....	38.177	45,250,300	578,400	15.624	9,356,100	119,600	September...	1.603	6,280,000	80,300			
1881.....	44.169	73,633,900	979,200	9.280	15,178,900	201,800	August.....	1.358	11,135,500	148,100			
1882.....	39.394	64,812,300	861,900	14.251	13,977,200	185,900	August.....	1.667	4,158,100	55,300	Aug. 20–26	2,604,000	34,600
1883.....	32.780	40,056,200	532,700	10.535	8,870,700	118,000	August.....	0.735	5,906,500	78,500			
1884.....	47.135	84,929,200	1,129,400	11.650	11,487,000	152,800	September....	0.855	3,303,300	43,900	Sept. 14–20	51,300	700
1885.....	43.545	67,721,600	900,600	15.130	14,313,000	190,300	July.....	1.428	4,667,700	62,100			
1886.....	46.065	81,730,700	1,086,800	13.505	8,891,900	118,200	August.....	4.100	7,077,400	94,100			
1887.....	42.705	86,749,300	1,153,600	13.195	11,874,800	157,900	September....	1.320	8,346,700	111,000	Sept. 18-24	6,162,900	82,000
1888	57.465	127,642,900	1,697,400	21.205	68,478,000	910,600	July.....	1.405	8,825,800	117,400			

1889.....	49.950	104,030,100	1,383,400	21.975	77,563,400	1,031,400	July.....	8.940	47,645,200	633,600			
1890.....	53.000	96,650,400	1,285,200	22.835	55,975,600	744,400	July.....	2.460	8,064,500	107,200	July 13-19	3,446,800	45,800
1891.....	49.520	98,865,500	1,314,700	14.330	13,608,900	181,000	July.....	3.395	11,212,900	149,100			
1892.....	41.830	58,753,000	781,300	12.680	15,957,700	212,200	October.....	1.170	9,461,300	125,800			
1893.....	48.225	77,963,300	1,036,700	13.785	12,602,400	167,600	September....	1.735	8,126,700	108,100			
1894.....	39.740	57,937,800	770,400	13.265	16,856,900	224,200	September...	2.635	11,243,300	149,500			
1895.....	50.620	86,632,900	1,152,000	22.170	36,477,200	485,100	September...	2.300	6,673,300	88,700			
1896.....	43.705	76,607,100	1,018,700	16.390	21,214,600	282,100	August.....	2.395	4,312,900	57,400			
Averages..	45.748	80,365,400	.....	15.596									

SUMMARY OF STATISTICS.

REPORT FOR 1896.

Boston Water Works, Suffolk County, Massachusetts, supplies also the cities of Somerville, Chelsea, and Everett.

Population by census of 1895:	
Boston	496,920
Chelsea	31,264
Somerville	52,200
Everett	18,573
Total	598,957
Date of Construction:	
Cochituate Works	1848
Mystic	1864

By whom owned. — City of Boston.

Sources of supply. — Lake Cochituate, Sudbury river, and Mystic lake.

Mode of supply. — Sixty-five per cent from gravity works.
Thirty-five " " pumping "

PUMPING.

	COCHITUATE.	MYSTIC.
Builder of pumping machinery	Holly Mfg. Co. and Quintard Iron Works.	H. R. Worthington and G. F. Blake Mfg. Co.
Description of coal used:		
a Kind	Bituminous.	Bituminous.
c Size	Broken.	Broken.
e Price per gross ton, in bins	$3.90, $3.94, $4.15	$3.55, $3.63, $3.66, $3.81
f Per cent of ash	10.8	11.6
Coal consumed for year, in lbs.	5,143,055	8,699,970
Total pumpage for year, in gallons	5,182,810,750	4,374,612,900
Gallons pumped per lb. of coal	1007.7	502.9
Cost of pumping figured on pumping-station expenses, viz.:	$29,750.67	$34,445.37
Cost per million gallons raised to reservoir	$5.74	$7.88

CONSUMPTION.

	COCHITUATE.	MYSTIC.
Estimated population	481,700	135,400
Estimated number of consumers,	478,200	134,200
Total consumption, gallons	20,606,590,000	4,374,612,900
Passed through meters	4,804,020,000	784,800,000
Percentage metered	23.3	17.9
Average daily consumption gallons	56,288,200	11,951,100
Gallons per day, each inhabitant	116.9	88.3
Gallons per day, each consumer,	117.7	89.1

DISTRIBUTION.

Mains.

	COCHITUATE.	MYSTIC.
Kind of pipe used	Cast-Iron	Cast-Iron, Wrought-Iron, and Cement.
Sizes	48 in. to 4 in.	36 in. to 3 in.
Extended, miles	23.9	5.4
Total now in use	619.9	184.0
Distribution-pipes less than 4 in., length, miles	2.3	4.0
Hydrants added	253	96
Hydrants now in use	6,711	1,639
Stop-gates added	423	106
Stop-gates now in use	7,087	2,391

Services

Kind of pipe used	Lead,	Lead and Wrought-Iron.
Sizes	$\frac{5}{8}$ in. to 6 in.	$\frac{1}{2}$ in. to 4 in.
Extended, feet	59,325	18,840
Service-taps added	2,441	822
Total now in use	73,320	24,942
Meters now in use	4,358	469
Motors and elevators in use	534	21

[1] BOSTON WATER BOARD.

Organized July 31, 1876.

TIMOTHY T. SAWYER, from July 31, 1876, to May 5, 1879; and from May 1, 1882, to May 4, 1883.
LEONARD R. CUTTER, from July 31, 1876, to May 4, 1883.[2]
ALBERT STANWOOD, from July 31, 1876, to May 7, 1883.[2]
FRANCIS THOMPSON, from May 5, 1879, to May 1, 1882.[2]
WILLIAM A. SIMMONS, from May 7, 1883, to August 18, 1885.
GEORGE M. HOBBS, from May 4, 1883, to May 4, 1885.
JOHN G. BLAKE, from May 4, 1883, to August 18, 1885.
WILLIAM B. SMART, from May 4, 1885, to March 18, 1889.
HORACE T. ROCKWELL, from August 25, 1885, to April 25, 1888.
PHILIP J. DOHERTY, from March 18, 1889, to May 4, 1891.
THOMAS F. DOHERTY, from August 26, 1885, to May 5, 1890; and from May 4, 1891, to July 1, 1895.
ROBERT GRANT, from April 25, 1888, to July 18, 1893.
JOHN W. LEIGHTON, from May 5, 1890, to July 1, 1895.
WILLIAM S. MCNARY, from August 15, 1893, to November 5, 1894.
CHARLES W. SMITH, from January 23, 1895, to July 1, 1895.

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[1] *Water Commissioners.*

CHARLES W. SMITH, from July 1, 1895, to January 20, 1896.[3]
JEREMIAH J. MCCARTHY (Acting), from January 20, to February 1, 1896.
JOHN R. MURPHY, from February 1, 1896, to present time.

Assistant Water Commissioners.

JEREMIAH J. MCCARTHY, from July 1, 1895, to January 20, 1896.
EDWARD C. ELLIS, from February 17, 1896, to present time.

Chief Clerk and Secretary.

WALTER E. SWAN.

General Superintendent Income Division.

JOS. H. CALDWELL.

City Engineer and Engineer of the Department.

WILLIAM JACKSON.

General Superintendent of the Western Division.

DESMOND FITZGERALD.

General Superintendent of the Eastern Division.

HUGH MCNULTY.

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[1] Under Chap. 449 of the Acts of 1895 the Boston Water Board was abolished, and the Water-Supply and Water-Income Departments consolidated and placed under the charge of one Water Commissioner.
[2] Deceased.
[3] Resigned.

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