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# REPORT

OF THE

## COCHITUATE WATER BOARD

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TO THE

CITY COUNCIL OF BOSTON,

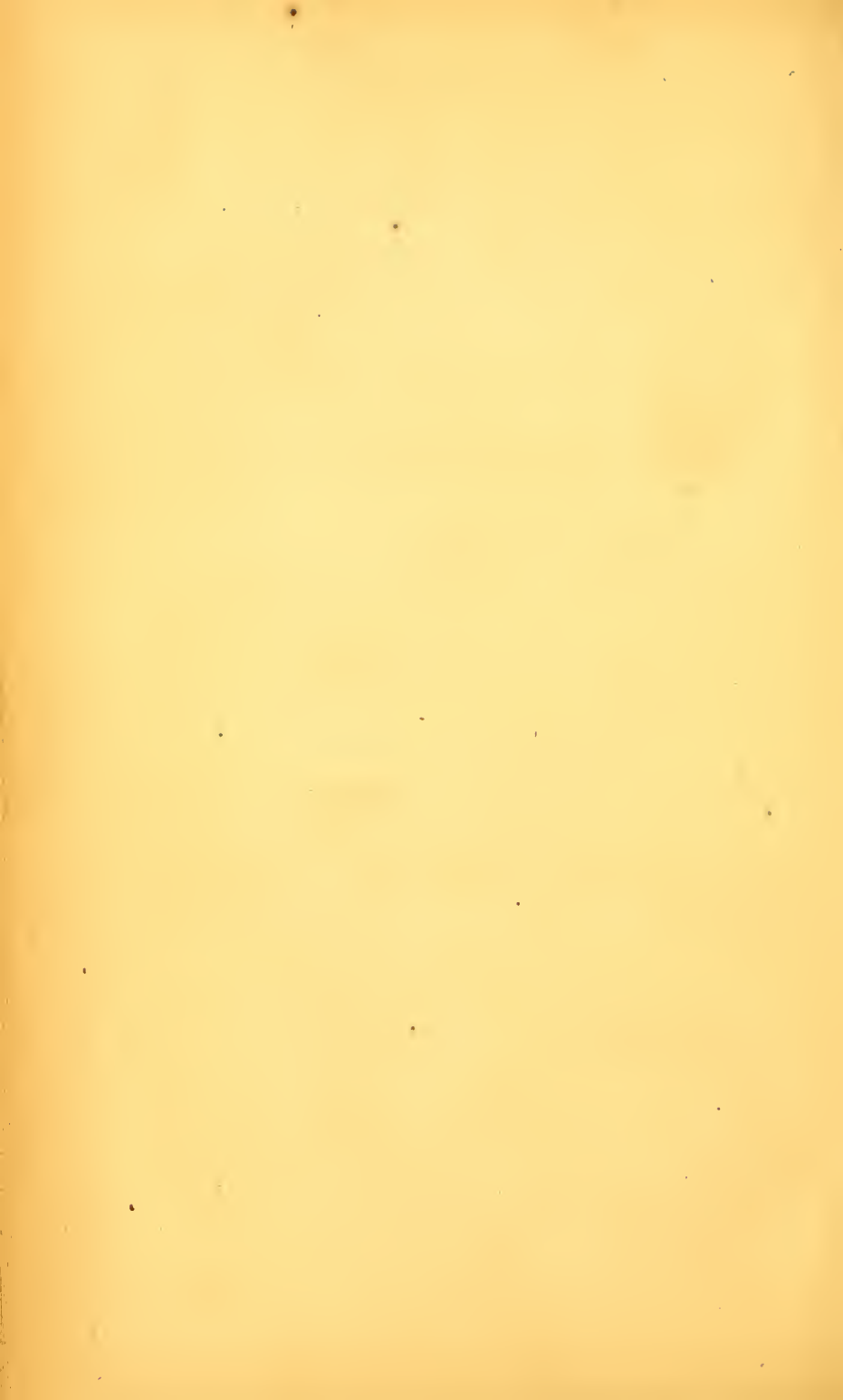
FOR THE YEAR ENDING

APRIL 30, 1874.

BOSTON:

ROCKWELL & CHURCHILL, CITY PRINTERS,  
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1874.





## CITY OF BOSTON.




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*City Document No. 80.*


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REPORT OF THE COCHITUATE WATER BOARD  
FOR THE YEAR ENDING APRIL 30, 1876.

OFFICE OF THE COCHITUATE WATER BOARD,  
May 20, 1876.

*To the City Council of the City of Boston:—*

The Cochituate Water Board, in compliance with the provisions of the City Ordinance, respectfully submits its annual report for the year ending April 30, 1876, together with the reports of the Clerk of the Board, the City Engineer, the Water Registrar and the Superintendents of the Eastern and Western Divisions of the Water Works. To these reports the Board would refer the City Council for the detailed statements of the condition and progress of the works during the year.

The Board has the pleasure of reporting that the general condition of the works is entirely satisfactory.

In the previous report of the Board it was mentioned that an additional 40-inch siphon pipe was to be laid across Charles river at Newton Lower Falls. This pipe has been successfully laid, and proves to be of great service, not only giving great relief to the conduit above, but also permitting the height of the water to be kept up in the Chestnut Hill and Brookline reservoirs. While this pipe was being laid an opportunity was afforded to examine the conduit, the water being drawn out July 27th to make the siphon connections, and it was found to be apparently in no worse condition than when examined in 1874. The Board hopes that, with care, it may perform its work until the new conduit is completed, when it should be thoroughly repaired.

The supply of water during the past year has been ample to meet all the requirements for which it was introduced, the average height above the bottom of the conduit having been  $10\frac{11}{100}$  feet.

In March, 1875, upon application of the residents, the

Mystic water was shut off from East Boston, and the Cochituate water was turned on to supply that section of the city. It was thus supplied until December 2d, at which time the weather being extremely cold, and, in consequence, the consumption and waste of water in the city proper very great, the head in East Boston was so reduced that parties living on the high lands of that district were unable to get water except at certain hours of the day; for these reasons the Mystic water was again let on, and has remained on up to the present time, making about five months' supply by the Mystic, and about seven months' by the Cochituate, for East Boston during the year. Application has since been made to have the Cochituate water let on, provided the head would be sufficient for fire purposes in the high sections; but the change has not been made.

The total receipts from all sources for the year ending April 30, 1876, are as follows, viz. : —

From sales of water . . . . .	\$1,036,187 98
From turning off and on water and fees . . . . .	15,093 25
Sundry receipts by Water Board . . . . .	75,678 96
Instalment on land, received by Collector and paid to Treasurer . . . . .	386 00
	<hr/>
	\$1,127,346 19

The total amount charged to Water Works for the year ending April 30, 1876, is as follows, viz. : —

To current expenses . . . . .	\$269,576 65
To interest and premium on water debt . . . . .	833,364 81
Amount paid the Mystic Water Board for water furnished East Boston . . . . .	31,246 75
	<hr/>
	1,134,188 21

Showing an excess of expenditures over in- come of . . . . .	<hr/> \$6,842 02
---	---------------------

The total amount charged to construction during the year ending April 30, 1876, is \$1,326,230 90

The actual cost of the Water Works to May 1, 1876, as shown by table prepared by the clerk, with the approval of the Auditor, is \$11,994,579 78

The interest charged by the Treasurer to Water Works interest account is largely increased for the past year over the actual amount paid during the year, by the discovery of the fact that the remittances of interest to London on the City Water Loan for two previous years were charged by the late Treasurer to the general interest account, instead of to the Water Works account.

The amount thus paid was \$164,104.72, which has been transferred to its proper account, and is included in the \$833,364.81 charged to interest and premium for the year ending April 30, 1876.

Had it not been for this mistake in a previous year the works would have shown an excess of income over expenditures of \$157,262.70 for 1875.

#### EASTERN DIVISION.

This division is under charge of Mr. E. R. Jones, and embraces all that portion of the works lying east of the Brookline and Chestnut-Hill reservoirs, and also the iron pipes of the Western Division. During the past year some 34 $\frac{1}{4}$  miles of pipe have been laid, the largest part of which was in the West Roxbury and Brighton districts. This is a much larger amount than has been laid in any one year since the introduction of the water.

The length and size of pipe laid were as follows:—

1,435 feet of 40-inch; 16,164 feet of 16-inch; 74,714 feet of 12-inch; 670 feet of 9-inch; 40,670 feet of 8-inch; 43,987 feet of 6-inch and 3,455 feet of 4-inch; and 314 stopcocks have been put in during the same time.

The total length of pipe laid from the commencement of the works up to May 1, 1876, is 320 miles 311 feet; the total number of stopcocks is 3,439, and the total number of hydrants 3,653.

The number of service-pipes laid during the year is 1,237, making a total to May 1, 1876, of 41,325.

A detailed statement of the pipes laid and other particulars accompany the report of the Superintendent.

#### DISTRIBUTING RESERVOIRS.

The three low-service reservoirs, the East Boston, the South Boston and Beacon Hill, are in good condition; they are kept partially filled with water in case of an emergency, but usually are not in service.

The high-service reservoir on Parker Hill is in excellent

condition, and has been in constant service during the year. Since the last report the land account has been settled for the sum of \$86,928.91, making the total cost of the reservoir when completed, \$228,246.17.

#### WESTERN DIVISION.

This division comprises the lake and all that portion of the works lying between the lake and the gate-house of the Brookline reservoir, and is under the charge of Mr. Desmond FitzGerald. All the works belonging to this division are in as good condition as usual.

With the help of the temporary connection with Sudbury river, the lake has been kept well filled during the whole year, 2,171,000,000 gallons having been run into it from Sudbury river, from time to time.

A new cast-iron weir has been put in at the lower dam to measure the waste at the lake, a full description of which will be found in the report of the Superintendent.

The lands owned by the city about Dug pond have been sold to the town of Natick for the sum of \$3,644.13, which was the amount the land cost the city originally.

#### RECEIVING RESERVOIRS.

Chestnut-Hill reservoir and its surroundings are in a very satisfactory condition.

In October, 1875, the water in this reservoir was shut off on account of the bad taste, and remained shut off until April 1st, 1876, when it was again turned on for distribution, having gradually purified itself.

The Brookline reservoir is in good condition, except that it needs cleaning out; but it is unsafe to attempt it at present, or until another 48-inch main is laid from the Chestnut-Hill reservoir around the Brookline, connecting with the main pipes leading to the city.

#### WATER REGISTRAR'S DEPARTMENT.

This department is under the charge of Mr. William F. Davis, who has held the position of Water Registrar since the year 1855, at which time the total number of water-takers was 19,998, and the receipts \$266,302.77.

The present number of water-takers is 46,885; being an increase of 26,887 in 20 years, and 2,209 over the previous year.

The total amount of water-rates received for the past year was \$1,036,187.98.

The total number of cases where the water was turned off for non-payment of dues during the year ending January 1st, 1876, is 1,888; of this number, 1,435 have been turned on, leaving a balance of 453 still remaining off.

The total number of meters now applied to the premises of water-takers is 1,120; of this number, 731 are  $\frac{5}{8}$ -inch, 329 1-inch, 44 2-inch, 14 3-inch, and 2 4-inch.

#### ADDITIONAL SUPPLY.

During the past year much progress has been made towards obtaining an additional supply of water from Sudbury river. The conduit from Farm pond, in South Framingham, to Chestnut-Hill reservoir, about  $15\frac{3}{4}$  miles long, was divided into twenty sections, each forming the basis of a contract, and early in May, 1875, the Board commenced to advertise for proposals to build the various sections, with the exception of Section No. 1, which was reserved to build by days' labor. Section No. 20, which includes the Beacon-street tunnel, and which was placed under contract in August, 1873, was completed last December, the amount paid the contractors, Messrs. Lobdell & Phelps, being \$336,630.70. Sections 2 to 19, inclusive, were placed under contract at intervals from June 12th to December 30th, 1875. The proposals were all publicly opened and read at the office of the Board, and in all cases the contracts were awarded to the lowest responsible bidders.

A table showing the time at which the contracts were executed, the names of the contractors, the range of bids, etc., will be found in the report of the Engineer.

The papers prepared for the seizure of lands on the line of the conduit were signed June 26th, and the Engineer was authorized to set the stakes, and give the contractors for the sections then ready, the necessary information to *proceed at once* with the work.

The work upon the whole line of the conduit has progressed very favorably, thirty-one per cent. of the work on all the sections under contract being done on the 1st of January, 1876, and the contractors are now fairly under way for another season's work. The time allowed for the completion of the contracts expires August 1st, 1877, and from present prospects there is no reason to doubt but that they will all be finished within the required time. By an order of the City Council approved October 30th, 1875, the Board was authorized to build Section No. 1, and the foundations

of the dams for Basins Nos. 1, 2 and 3, by days' labor, and on November 11th the Engineer was authorized to proceed with the work under the direction of the Committee on New Supply. Section No. 1 crosses the Boston and Albany Railroad at South Framingham. The piles for supporting the tracks over the trench for the conduit have been driven, and considerable progress has been made in constructing the coffer dam for the gate-house, and the portion of the conduit which extends into Farm pond.

Active preparations are also being made to commence work on the foundations of the dams for Basins 1, 2 and 3, at an early day.

A contract was made October 21st, with John Brown, of Mohawk, New York, for building a road in Framingham, made necessary by the proposed flowing of a portion of the old county road, known as the Worcester Turnpike, leading from Framingham to Southboro'. This road is in a fair way to be completed within the time specified in the contract (July 1st, 1876).

In constructing the above road it became necessary to place a bridge across Stony Brook in Framingham. The building of the abutments was included in the contract for the road, and a contract was made February 3d, 1876, with Thomas Leighton, of Rochester, New York, for building and erecting the iron-work of the superstructure for the sum of \$1,150. This bridge is now nearly completed.

On December 30, 1875, the Board adopted plans for the seizure of lands for Basins Nos. 1 and 3, and signed the necessary papers for the seizure.

Owing to the construction of a portion of the conduit in the town of Needham, it became necessary to change the location of Wellesley avenue in that town. This change was made by the city, and a settlement effected with the town for the sum of \$900 damages, and the release of a small strip of land between the old and new locations.

The Committee on New Supply have devoted much time during the past year to the consideration of damages on the line of the new works. Long and protracted meetings have been held for the purpose of hearing claimants and adjusting claims, and many visits have necessarily been made to view the premises of the land-owners to ascertain the actual amount of damage done. In all cases of settlement the committee has endeavored to obtain the fee of the land. In many cases the demands made appeared so exorbitant to the committee that no settlement could be effected. Notwithstanding the difficulties which the committee has had to

contend with, quite a number of important claims have been adjusted.

On December 30, 1875, a settlement was made with the Wameset Power Co., of Lowell, for damages in full by the taking of the water of Sudbury river, for the sum of \$55,000. This amount also includes the retainer for the personal legal services of General Benj. F. Butler for any and all suits which may be brought against the city on account of the taking of the water of the Sudbury river.

A number of other claims for water damages have also been made, but the above is the only case that has been settled up to this date.

On January 13, 1876, the Board, on recommendation of General Butler, engaged the services of Linus M. Child, as junior counsel in the defence and care of all suits against the city, relating to the taking of the water of Sudbury river under the Act of the Legislature.

On March 22d, 1876, "An Ordinance to establish the Boston Water Board" was passed by the City Council. This action was in accordance with the views and recommendations of the Board, which has felt for some time that the varied and widely extending interests connected with the Water Works demanded more time and a closer supervision in their administration. The adoption of this Ordinance by the City Council practically abolishes the Cochituate Water Board, and this will probably be the last of the annual reports of that organization.

The first meeting of the Cochituate Water Board was held January 2d, 1851, and it is a matter of just pride to the present Board, in turning over the Works to its successors, to be able to feel in reviewing the twenty-five years that the care of the Water Works has been entrusted to its keeping, that the city's interests have been guarded, the growing demands of the people promptly met, and the works of maintenance and enlargement executed in a manner to reflect honor upon the city.

L. MILES STANDISH, *President*,  
LEONARD R. CUTTER,  
EDWARD A. WHITE,  
CHAS. E. POWERS,  
S. B. STEBBINS,  
N. M. MORRISON,  
AUGUSTUS PARKER.

## REPORT OF THE CLERK.

OFFICE OF THE COCHITUATE WATER BOARD,  
BOSTON, May 1, 1876.

L. MILES STANDISH, Esq.,

*President of the Cochituate Water Board:—*

SIR,—The following is a statement of the expenditures and receipts of this department for the year commencing May 1, 1875, and ending April 30, 1876:—

## EXPENDITURES.

Damage . . . . .	\$264 50
Advertising . . . . .	22 75
Stable . . . . .	5,764 42
Taxes . . . . .	545 94
Tools . . . . .	5,563 84
Fountains . . . . .	1,154 69
Postage and express . . . . .	25 00
Aqueduct repairs . . . . .	4,404 05
Printing for all departments . . . . .	1,412 14
Stationery for all departments . . . . .	716 39
Eastern-avenue wharf (rent and salary of agent) . . . . .	2,999 98
Telegraph, repairing instruments and wires . . . . .	484 99
Salaries . . . . .	24,284 00
Shutting off and letting on water for repairs . . . . .	12,797 20
Inspectors . . . . .	7,612 98
Upper yard (Albany street) . . . . .	8,261 40
Miscellaneous expenses . . . . .	4,008 77
Lake Cochituate . . . . .	6,701 46
Maintaining meters . . . . .	1,502 75
Meters . . . . .	3,871 19
Hydrant and stopcock boxes (repairs) . . . . .	1,515 85
Blacksmith shop . . . . .	138 41
Service pipe . . . . .	13,919 72
Proving yard . . . . .	1,909 65
High service . . . . .	6,730 38
<i>Carried forward</i> . . . . .	<u>\$116,612 45</u>



<i>Brought forward</i>	.	.	.	.	\$116,612	45
Chestnut-Hill reservoir	.	.	.	.	8,835	19
Beacon " "	.	.	.	.	477	11
Parker " "	.	.	.	.	8,610	95
East Boston " "	.	.	.	.	1,366	23
South " "	.	.	.	.	360	25
Brookline " "	.	.	.	.	1,949	20
Repairing main pipe	.	.	.	.	16,620	84
" hydrants	.	.	.	.	10,489	67
" stopcocks	.	.	.	.	970	11
" service pipe	.	.	.	.	18,762	27
" streets	.	.	.	.	13,916	61
Wages laying service pipe	.	.	.	.	10,485	15
" blacksmith shop	.	.	.	.	3,573	10
" proving yard	.	.	.	.	11,003	47
" high service	.	.	.	.	4,508	54
Laying service pipe	.	.	.	.	7,894	34
Relaying main pipe	.	.	.	.	33,141	17
Main pipe	.	.	.	.	56,863	92
Laying main pipe	.	.	.	.	61,914	59
Hydrants	.	.	.	.	10,173	18
Stopcocks	.	.	.	.	6,642	44
Hydrant and stopcock boxes	.	.	.	.	3,002	74
Charles-river siphon	.	.	.	.	26,532	35
Parker-Hill reservoir (construction)	.	.	.	.	89,449	16
Chestnut-Hill driveway	.	.	.	.	7,233	14
Water Works, Wards 17 and 19	.	.	.	.	288,039	03
Additional supply	.	.	.	.	783,613	49

Total amount drawn for by Water Board \$1,603,040 69

And which is charged as follows:—

To Water Works	.	.	.	\$408,173	52
" Charles-river siphon	.	.	.	26,532	35
" Parker-Hill reservoir	.	.	.	89,449	16
" Chestnut-Hill driveway	.	.	.	7,233	14
" Water Works, Wards 17 and 19	.	.	.	288,039	03
" additional supply	.	.	.	783,613	49
				<u>\$1,603,040</u>	69

Amount charged to Water Works . . . \$1,595,807 55

*Details of Expenditures on Additional Supply for the year  
ending April 30, 1876.*

Temporary connection with Lake Cochituate .	\$878 75
Maintaining " " " " .	3,847 13
Engineering . . . . .	51,862 49
Engineering expenses . . . . .	3,566 83
Engineers' instruments and repairs . . . . .	2,633 04
Land damages . . . . .	45,506 34
Water damages . . . . .	55,525 00
Miscellaneous expenses . . . . .	5,391 87
Storage basins . . . . .	2,561 56
Office expenses . . . . .	3,082 25
Advertising . . . . .	3,064 50
Printing . . . . .	2,167 04
Stationery . . . . .	1,336 34
Travelling expenses . . . . .	2,429 52
Sudbury-river Conduit, Section No. 1 . . . . .	3,037 19
" " " " " 2 . . . . .	6,388 00
" " " " " 3 . . . . .	37,810 51
" " " " " 4 . . . . .	38,055 35
" " " " " 5 . . . . .	19,263 72
" " " " " 6 . . . . .	34,525 38
" " " " " 7 . . . . .	44,520 27
" " " " " 8 . . . . .	35,790 24
" " " " " 9 . . . . .	26,129 60
" " " " " 10 . . . . .	2,257 60
" " " " " 11 . . . . .	16,907 27
" " " " " 12 . . . . .	66,635 16
" " " " " 13 . . . . .	17,092 91
" " " " " 14 . . . . .	22,721 32
" " " " " 15 . . . . .	3,402 12
" " " " " 16 . . . . .	24,499 98
" " " " " 17 . . . . .	30,161 36
" " " " " 18 . . . . .	7,956 98
" " " " " 19 . . . . .	13,461 64
Beacon-street tunnel, " " 20 . . . . .	139,354 41
Contract No. 21, roadway in Framingham . . . . .	7,999 26
Additional work on conduit . . . . .	1,790 56
	<hr/>
	<u>\$783,613 49</u>

*Details of Expenditures in the West Roxbury and Brighton Districts, for the year ending April 30, 1876.*

Main pipe . . . . .	\$155,069 24	
Laying main pipe . . . . .	100,746 71	
Hydrants . . . . .	21,220 54	
Stopcocks . . . . .	9,089 64	
Hydrant and stopcock boxes . . . . .	1,912 90	
	<hr/>	\$288,039 03
		<hr/> <hr/>

The total amount expended for construction for the year ending April 30, 1876, is as follows, viz.:—

Water Works . . . . .	\$138,596 87	
West Roxbury and Brighton Districts . . . . .	288,039 03	
Additional supply . . . . .	783,613 49.	
Parker-Hill reservoir . . . . .	89,449 16	
Charles-river siphon . . . . .	26,532 35	
	<hr/>	1,326,230 90
		<hr/> <hr/>

The total amount expended for maintaining the Chestnut-Hill driveway, in care of the Water Board but not chargeable to the Water Works, for the year ending April 30, 1876, is . . . . .	\$7,233 13
	<hr/> <hr/>

Amount charged to Water Works . . . . . 1,595,807 55

RECEIPTS BY WATER BOARD.

Fire Department, for use of hydrants . . . . .	\$39,540 00	
Fire and elevator pipes, repairs, etc., . . . . .	14,927 23	
Off and on water . . . . .	2,582 75	
Fines for waste . . . . .	126 00	
Sale of old material . . . . .	13,376 48	
Rent of part of Eastern-avenue wharf . . . . .	300 00	
Sale of grass at Chestnut Hill . . . . .	187 50	
	<hr/>	
<i>Carried forward</i> . . . . .	\$71,039 96	\$1,595,807 55

<i>Brought forward</i> . . . . .	\$71,039 96	\$1,595,807 55
Sale of coal at Lake Cochituate . . . . .	140 00	
“ “ stone bounds . . . . .	7 00	
“ “ land about Dug pond, to the town of Natick . . . . .	3,644 13	
Rent of pastures at Lake Cochituate . . . . .	91 00	
Rent of house, No. 7 Waverley place, from Feb. 1, 1875, to Feb. 1, 1876 . . . . .	731 87	
Rent of house in Wellesley for Feb. 1876 . . . . .	25 00	
	<hr/>	75,678 96
Net amount charged to Water Works		<u><u>\$1,520,128 59</u></u>

Amount charged to Water Works, not including additional supply, "Water Works, Wards 17 and 19," Parker-Hill reservoir, Charles-river siphon, or Chestnut-Hill driveway . . . . . 408,173 52

The amount expended for construction on Water Works is as follows, viz. :—

Main pipe . . . . .	\$56,863 92	
Laying main pipe . . . . .	61,914 59	
Hydrants . . . . .	10,173 18	
Stopcocks . . . . .	6,642 44	
Hydrant and stopcock boxes . . . . .	3,002 74	
	<hr/>	138,596 87
Current expenses for the year ending April 30, 1876 . . . . .		<u><u>\$269,576 65</u></u>

*Expenditures and Receipts on account of the Water Works to May 1, 1876.*

Amount drawn by Commissioners . . . . .	\$4,043,718 21
Amount drawn by Water Board in 1850 . . . . .	366,163 89
Amount drawn by Cochituate Water Board from Jan. 1, 1851, to May 1, 1875 . . . . .	8,990,331 28
Amount drawn from May 1, 1875, to May 1, 1876, for Water Works . . . . .	1,595,807 55
	<hr/>
<i>Carried forward</i> . . . . .	\$14,996,020 93

<i>Brought forward</i> . . . . .		\$14,996,020 93
Amount paid the City Treasurer by Commissioners . . . . .	\$47,648 38	
Amount paid by the Water Board, 1850 . . . . .	8,153 52	
Amount paid by the Cochituate Water Board to May 1, 1875 . . . . .	513,762 30	
Amount paid from May 1, 1875, to May 1, 1876 . . . . .	75,678 96	
	<hr/>	645,243 16
Net amount drawn from Treasurer . . . . .		<u>\$14,350,777 77</u>

Gross payments (including interest, premiums, etc.), for account of Water Works to May 1, 1875 . . . . .	\$24,402,332 12	
Gross payments from May 1, 1875, to May 1, 1876 . . . . .	2,429,172 36	
	<hr/>	26,831,504 48

Total earnings of the Water Works to May 1, 1875 . . . . .	\$12,263,592 93	
Amount raised by taxation on outstanding loans from May 1, 1860, to May 1, 1871, and heretofore charged under the gross income of the Water Works . . . . .	1,352,000 00	
Total earnings from May 1, 1875, to May 1, 1876 . . . . .	\$1,127,346 19	
Less amount paid Mystic Water Board for water furnished E. Boston . . . . .	31,246 75	
	<hr/>	1,096,099 44
	<hr/>	14,711,692 37
Net cost to May 1, 1876 . . . . .		<u>\$12,119,812 11</u>

*Cost of the Works to May 1, 1876.*

Cost of Water Works to January 1, 1850, as per final report of Water Commis- sioners . . . . .	\$3,998,051 83
Extension to East Boston . . . . .	281,065 44
Jamaica-pond Aqueduct . . . . .	45,237 50
New dam at Lake Cochituate . . . . .	10,940 08
Raising lake two feet, including damages . . . . .	28,002 18
Dudley pond, Lower dam and making con- nections with lake . . . . .	18,982 23
New main from Brookline reservoir . . . . .	304,991 83
Land and water rights, since January 1, 1850 . . . . .	58,331 40
Land damages since January 1, 1850 . . . . .	15,511 62
New pipe yard and repair shop . . . . .	25,666 51
Upper yard, buildings, etc., . . . . .	9,165 63
New water-pipes East Boston . . . . .	20,999 43
New main East Boston . . . . .	24,878 08
Water to Deer Island . . . . .	75,000 00
Pumping works at Lake Cochituate . . . . .	15,000 00
High service, stand-pipe, engine-house and engines . . . . .	83,829 53
High service, South Boston . . . . .	27,860 29
Chestnut-Hill reservoir, including land . . . . .	2,449,982 07
Parker-Hill reservoir, " " . . . . .	228,246 17
Charles-river siphon . . . . .	26,532 35
Additional supply of water, including land damages and all expenses . . . . .	1,186,254 58
Cost of main pipe, since January 1, 1850 . . . . .	830,310 96
“ “ laying main pipe since January 1, 1850 . . . . .	454,233 70
Cost of hydrants, stopcocks and boxes, and setting same . . . . .	251,376 63
Cost of main pipe for extension in Roxbury, Dorchester, Brighton and West Roxbury Districts . . . . .	877,197 81
Cost of laying main pipe for extension in Roxbury, Dorchester, Brighton and West Roxbury Districts . . . . .	358,429 04
Cost of hydrants, stopcocks and boxes, and setting same in above districts . . . . .	344,859 74
<i>Carried forward</i> . . . . .	<u>\$12,050,936 63</u>

<i>Brought forward</i> . . . . .	\$12,050,936 63	
Cr. By sale of Jamaica-pond		
Aqueduct . . . . .	\$32,000 00	
By sale of land to May 1, 1876	24,356 85	
	<hr/>	56,356 85
		<hr/>
		\$11,994,579 78

Respectfully submitted,

W. E. SWAN,  
*Clerk of the Cochituate Water Board.*

## REPORT OF THE CITY ENGINEER.

OFFICE OF THE CITY ENGINEER, CITY HALL,  
BOSTON, May 1, 1876.

L. MILES STANDISH, Esq.,

*President of the Cochituate Water Board:—*

SIR,—In compliance with the terms of the ordinance relating to the City Engineer's Department, the following report is respectfully submitted.

## SUDBURY RIVER AND LAKE COCHITUATE.

An order of the City Council authorizing the Water Board to take the waters of the Sudbury river was approved Jan. 20, 1875.

On the 21st of that month water from the river was turned into the lake (its water surface at that date standing below the conduit bottom, and the supply to the conduit being kept up by pumping) and allowed to flow till March 18th. The connection between the two sources has been kept open during the year, from January 21st to March 18th, from March 26th to April 4th, from April 6th to 14th, from May 3d to 10th, from June 3d to 10th, from July 14th to August 26th, and from October 2d to 11th, or 143 days in all; the total flow being 2,555,800,000 gallons, equal to a supply of 7,000,000 gallons per day for the whole year. It has been open this year (1876) from January 12th to 18th, and from January 21st to Feb. 19th.

No water was wasted at the overflow of the lake during 1875.

On January 1st, 1875, the lake surface stood at 2 feet  $\frac{3}{4}$  inch above the bottom of the conduit, and on January 30th, it stood  $9\frac{1}{2}$  inches below in the northern division; in the middle division, at the latter date, it stood at 1 foot 8 inches above; and in the southern division, at 3 feet 10 inches above. These differences of level were controlled by the heights and widths of the channels connecting the various divisions.

From January 30th, the surface rose steadily, till it reached high-water mark on May 11th, previously to which



date, 1,506,700,000 gallons had been turned into the lake from the river.

From May 11th to September 1st the water stood at or near high-water mark; June 1st, it was 12 feet  $8\frac{3}{4}$  inches above the bottom of the conduit; July 1st, 12 feet  $11\frac{1}{2}$  inches; August 1st, 12 feet 5 inches; September 1st, 12 feet  $2\frac{1}{2}$  inches. From this date it slowly fell till the 1st of January, when it stood at 9 feet  $\frac{1}{2}$  inch. The water turned into the lake during January and February of this year, and the very severe storms which occurred in March, brought the surface to high-water mark again on March 26th; and since that date there has been a large waste over the lake-dam.

No water has been drawn either from Dug or Dudley ponds.

Mr. Fitzgerald has set a cast-iron weir at the overfall of the lower dam, that the waste water may be measured more accurately than it has been possible to measure it heretofore.

In the last report it was stated that upon the refusal of the Legislative Committee upon Water Supply and Drainage, to report a bill for diverting the waters of Pegan brook into Charles river, a bill to divert it into the Sudbury river, below Saxonville, was introduced and referred to the succeeding Legislature.

This bill was also rejected, and in its place the following act was passed:—

“CHAPTER 228 OF THE ACTS OF 1875.

“*An Act to preserve the purity of the Water of Lake Cochituate.*

“SECTION 1. It shall be lawful for the Supreme Judicial Court, upon the application of the City of Boston, to grant an injunction against the discharge of any drainage or sewage matter, or pollution of any kind, into Lake Cochituate, or Pegan brook, or any waters flowing into said lake or brook; *provided*, that this shall not be held to destroy the prescriptive right of any person or persons to discharge such matter into said lake or brook.

“SECT. 2. The town of Natick shall have the right to divert the waters of any brook, rivulet or stream now running into Lake Cochituate, into which the sewerage or drainage of Natick now empties; *provided*, that nothing in this act shall be construed so as to give any right to said town to divert such brook, rivulet or stream into Charles river.

"SECT. 3. This act shall take effect upon its passage.  
"Approved May 19, 1875."

Nothing has yet been done to divert the brook.

#### CONDUIT.

The table on page 49 will show the depths of water for the year at the head of the conduit. The clear height of the conduit is 6 feet 4 inches. It will be seen that it has been run under a head, or as a pipe, 338 days.

During the past year the capacity of the conduit has been materially increased by the laying of a 40-inch siphon pipe across Charles river, at Newton Lower Falls.

The work of laying the pipes was commenced May 10th, that of building the pipe chambers, June 14th, and on July 28th the whole was so far completed that the siphon was put into constant service. The new chambers are located some 75 or 100 feet further away from the river valley than the old ones. To build them a section of the conduit on each side of the river was stripped bare of its earth covering, and suspended by chains from strong overhead beams; the masonry of the chambers was then laid to enclose these sections, which were afterwards cut out. The conduit was flowing nearly full while suspended, and although the mortar of the section on the east side of the river had never properly set, and was of little service except as a packing to the joints between the bricks, it was found that the leakage could be easily controlled, or entirely stopped, by driving wedges between the chains and masonry. While the sections were being cut out the water was shut off for one day, which was the only interruption to the flow during the time of construction.

It is estimated that the new pipe increases the capacity of the conduit, when flowing under a 4-foot head, nearly 2,000,000 gallons per day. The advantage of this increase was felt last winter during the colder days, when much water was wasted to prevent freezing in the pipes; the consumption at such times often being even greater than the enlarged capacity of the conduit could furnish.

An examination of the interior of the conduit from the lake to Chestnut-Hill reservoir was made July 27th, when the water was drawn out to make the siphon connections. It was found to be in about the same condition as at the times of the examinations in 1874. There has been no opportunity to repair the leaks in the bottom through which

the copious springs in the vicinity of the lake find their way.

#### LOW-SERVICE RESERVOIRS.

The tables on page 44 give the monthly and yearly average heights above tide-marsh level of the water in the Chestnut-Hill and Brookline reservoirs.

The average height in Chestnut-Hill reservoir has been, for the year, 122.23 feet or 1.65 feet higher than in 1874. Owing to a bad taste in the water of this reservoir, it was shut off from the distributing pipes late in October and the gates were not again opened till about a month since.

The average height in the Brookline reservoir was 121.72 feet, or 1.76 feet higher than last year, and 0.51 foot lower than in Chestnut-Hill reservoir.

The Beacon Hill, South Boston and East Boston reservoirs are kept partially filled with water, to be used in an emergency, but usually are not in service.

#### DISTRIBUTING SYSTEM, PIPE PLANS, ETC.

Plans for the high and low service system of pipes in Brighton and West Roxbury were prepared early in the year, and as soon as the pipes were received from the foundries the work of laying was begun, and was continued till the close of the season.

About 19 miles of pipes have been laid and 240 hydrants have been set in those districts, at a cost of about \$265,000. The principal streets of Jamaica Plain and Brighton, with the exception of those in the latter district, which are too high to be reached by the low service, are now piped.

The Brighton low-service main (16 inches dia.) passes from the mill-dam, through Brighton ave. to Union square, passing over the Boston and Albany R. R. at Cottage Farm. Plans for a pipe bridge at that point were prepared early in the season, but the work of building was delayed in various ways, and was not completed till near the close of the year. In the mean time the supply to Brighton was carried over the railroad in an 8-inch pipe temporarily laid on the road bridge.

The superstructure of the new bridge consists of two plate girders, each 137½ feet long, continuous over the centre pier. The girders are 5 feet deep, and are placed 5 feet 6 inches apart, and are fitted with wood-work in such manner that the pipe is surrounded by a double boxing to prevent freezing. The stone pier and northerly abutments were built by the Boston and Albany R. R. Co., and the iron-work by the National Bridge and Iron Works. The retain-

ing wall of the road bridge was used for the southerly abutment, and by agreement with the railroad company this wall is to be maintained at the joint expense of the company and the city.

A bridge has also been built to carry a pipe over the New York and New England R. R. at Washington street, in Dorchester. This bridge is a box, the sides of which are iron girders 42 feet long, and 2 feet 6 inches deep, the pipe being laid between the girders on a plank flooring supported by the lower flanges, and covered by planking laid on top of the girders.

In the older districts of the city, principally in Roxbury Highlands and Dorchester, a little over 12 miles of pipes have been laid.

In the new districts of the city it has been decided to place Lowry hydrants at the intersections of street and post hydrants at intermediate points. The post hydrants are made in the machine shops of the Water Works, under the direction of Mr. Jones, and are of superior strength and workmanship.

There are now 170 plans showing the locality and size of pipes, hydrants, stopcocks, etc., in the streets. These have been corrected from time to time during the year, and new plans have been made, showing the pipes as laid in West Roxbury and Brighton, copies of which have been furnished to the Water Board and to the Superintendent of the Eastern Division of the Water Works, who has also been furnished with working plans of the streets where pipes were to be laid, showing the sizes of pipes, proposed location of gates and hydrants, etc.

In reply to an order of the City Council, a report upon a new low-service main from Chestnut-Hill reservoir was made last November, and will be found embodied in this report on following pages.

#### HIGH-SERVICE RESERVOIR AND PUMPING WORKS.

Parker-Hill reservoir has been in constant service through the year, and the average height of the surface of the water in it has been 216.75 feet above tide-marsh level.

The roadway leading around it has been paved and gravelled, and the slopes of the banks have been dressed and seeded.

*Pumps.* — The pumping-engines have worked satisfactorily during the year, and are now in good condition.

The following table will show the total and monthly work done by the engines, and the quantity of coal consumed in doing it: —

Statement of Operations at the High-Service Pumping Works for the year 1875.

1875.	Total pumping time.		Daily average pumping time.		Daily average amt pumped.	Hourly average amt pumped.	Ave. maximum hourly draft.	Ave. minimum hourly draft.	Greatest hourly draft.	Least hourly draft.	Ave. load on pump.	Ave. No. of revolutions per minute.	Ave. amt coal used per day.	Per cent. ashes and cinders.	Quantity pumped per lb. coal.
	Days.	Hrs.	Min.	Hrs.											
January . . . . .	30	22	..	23	56	68,567	78,634	56,605	86,950	45,120	81.5	24.38	4,831	13.11	341
February . . . . .	28	..	..	24	..	77,363	87,873	64,239	97,995	54,050	80.8	27.43	6,315	14.67	294
March . . . . .	30	21	35	23	55	60,808	71,281	49,501	92,120	39,480	81.4	21.63	4,630	14.89	311
April . . . . .	29	21	..	23	52	45,018	53,463	38,070	79,900	28,200	81.3	16.03	3,677	15.03	294
May . . . . .	31	..	..	24	..	43,158	51,344	35,485	68,620	25,145	81.1	16.30	2,984	16.99	347
June . . . . .	29	12	..	23	36	43,182	52,538	36,041	65,800	23,970	79.7	15.57	2,060	17.40	330
July . . . . .	30	21	..	23	54	47,476	57,226	33,820	65,565	23,030	79.7	16.30	2,819	15.65	404
August . . . . .	31	..	..	24	..	45,033	52,739	33,214	61,805	34,075	80.5	15.97	2,900	15.74	373
September . . . . .	30	..	..	24	..	49,188	57,755	40,671	69,325	32,900	80.5	17.44	2,931	15.53	403
October . . . . .	30	23	..	23	58	49,929	57,408	43,134	64,625	37,600	80.5	17.73	3,431	17.23	347
November . . . . .	29	23	..	23	58	49,080	55,753	41,454	64,390	31,020	80.5	17.41	3,478	17.49	338
December . . . . .	31	..	..	24	..	57,754	65,171	49,395	80,840	40,300	80.5	20.48	4,386	15.05	316
Average and Totals . . . . .	263	23	35	23	55½	53,042	61,766	44,302	..	..	80.7	18.85	3,785	15.73	343

Total amount pumped . . . . .	463,516,585 gals.
“ number of revolutions . . . . .	9,862,055
“ amount of coal used . 1,376,095 lbs., =	614.3 tons.
“ “ ashes and clinkers . . . . .	213,617 lbs.

Average pressure on force main, lbs. . . . .	80.7
“ “ supply main, lbs. . . . .	35

Pressure used in computing duty of engines, lbs. 45.7

Approximate duty per pound of coal (no deduction for clinkers or ashes), 295,781 lbs. feet.

#### COST OF PUMPING.

Salaries . . . . .	\$4,416 50
Fuel . . . . .	4,730 33
Gas . . . . .	356 70
Miscellaneous repairs . . . . .	981 73
Small supplies . . . . .	249 57
<b>Total . . . . .</b>	<b>\$10,734 83</b>

Cost per million gallons raised one foot high, 22 cents.

The average daily quantity pumped has been 1,269,908 gallons, an increase of  $\frac{3}{4}$  per cent. above the quantity in 1874.

Brighton is not yet furnished with a supply from the high service, although a large portion of its territory and population is above grade 60.

A very long and expensive main would be required to bring water from Parker-Hill reservoir, and as it is expected the high-service pumps will be removed to Chestnut Hill within a few years, and that a new high-service reservoir will be built in that vicinity, when the main from Parker Hill would be of no service, it was recommended that a temporary reservoir (or tank) and pumps be provided for the supply of Brighton. An appropriation of \$10,000 for this purpose has been made by the City Council, and the work of building has already begun.

An order was passed by the City Council, in May of last year, requiring the City Engineer to report upon a new high-service system of works, and upon a new low-service main. The report was made in November, and as it gives the outlines of the scheme of works which it is expected will be eventually adopted, and which will be kept in view, as far as practicable, in making the pipe extensions in the

high-service districts, it is thought best, for easy reference, to reproduce it in this, the annual report.

### “REPORT ON HIGH-SERVICE SYSTEM.

“CITY HALL, BOSTON, NOV. 17th, 1875.

“OFFICE OF CITY ENGINEER.

“L. MILES STANDISH, ESQ., *President of the Cochituate Water Board*:—

“The following order of the City Council was referred to me by your Board on the 13th of May last, —

“*Ordered*, That the Cochituate Water Board be requested to consider and report to the City Council what changes are necessary in the system of high-service works to meet the present and prospective wants of those depending upon that service for a water-supply; also to consider and report upon the subject of laying a new main from Chestnut-Hill reservoir.’

“In explanation of the late date of this report, I may be permitted to say that a large amount of work has been required of this department during the past season, which has so fully occupied the time of myself and assistants that none could well be spared for the consideration of subjects which would bear postponement.

#### “HIGH SERVICE.

“Before suggesting any changes in the high-service system of water-supply, a brief description of it, as it now exists, will be in place.

“The 30 and 36 inch low-service mains, leading from the Brookline reservoir to the city, pass along Boylston street in Brookline, and Tremont street in Boston, to the Common.

“The water for the high-service supply is taken from these mains at the corner of Tremont and Pyncheon streets, and is conducted in a 16-inch pipe to the pumping-station on Elmwood street, and thence pumped through 16 and 24 inch mains to the stand-pipe on Fort Hill, and the reservoir on Parker Hill, from which points it is distributed over the high-service territory by a system of cast-iron pipes.

“The pumping machinery consists of two engines, each with a rated capacity of 2,400,000 gallons in 24 hours. They are non-condensing, horizontal, fly-wheel engines, with the pump and steam pistons on the same rod. The steam is supplied by two vertical tube boilers, each rated at 100 horse-power.

“The duty of the engines is about 260,000 ft.-lbs. per pound of coal, that is to say, for each pound of coal burnt in the boilers the engines will lift 260,000 lbs. of water to a height of one foot.

“Allowing for leakage of valves, the speed required to obtain a delivery of 2,400,000 gallons per day is 36 or 37 revolutions per minute; but it is not considered safe to run continuously at a speed of more than 26 or 27 revolutions per minute, which will effect a delivery of about 1,800,000 gallons per day.

“The engines are supplied from a single line of pipes 16-inches in diameter, and the force mains immediately after leaving the engine-house are brought by a Y-branch into a single line of pipes, also 16 inches in diameter. It is found impracticable to work the engines together at much more than half speed, as they react through the pipes, one upon the other; in fact, the working capacity of the main itself is but little greater than that of a single engine.

“The capacity of the existing works is then about 1,800,000 gallons per day.

“If new suction and delivery mains are laid, so that both engines may be operated at the same time, the capacity of the works will be about  $2\frac{3}{4}$  million gallons. This is assuming that no accident will happen to either engine which will require more than five or six days to repair, the supply during the time of such repair being kept up by the delivery from the other engine and the water in store in the reservoir.

“The cost of the new mains would be about \$6,500.00.

“These works were built to supply the highlands of Roxbury alone, and they were designed with a capacity amply sufficient to provide, for years to come, for the wants of that rapidly-growing section; but they were not intended and are entirely inadequate to supply the demand for water that will arise, in the near future, from the extension of the distribution to Beacon Hill and the high grounds of South Boston, and the rapid increase of the population living upon the large areas of elevated lands in Dorchester, West Roxbury and Brighton.

“The area which the works were designed to supply is about 760 acres; the area of high-service territory now within the limits of the city is about 10,720 acres, and the population of this territory, as approximately estimated from the census of this year, is 36,600, divided as follows:—

Beacon Hill High Service	.	.	.	.	6,000
South Boston “ “	.	.	.	.	3,000
Roxbury “ “	.	.	.	.	12,000
Dorchester “ “	.	.	.	.	5,800
West Roxbury “ “	.	.	.	.	7,400
Brighton “ “	.	.	.	.	2,400

“The average daily rate of consumption from the Cochituate works last year was about 70 gallons per head, and the rate during the months of maximum consumption (July, August and September) was nearly 80. If we allow for the high-service supply a rate of 70 gallons per head for the months of maximum consumption it will be seen that, were the street pipes extended through the whole high-service territory, the required supply would be a little over 2,500,000 gallons per day,—a quantity which is in excess of the present capacity of the works.

“As has been before stated, if new force and supply mains be laid, the capacity of the works will be increased to about 2,750,000 gallons per day; but, with the rate of increase of population which



obtains in the high-service districts, the maximum consumption will reach this quantity in two or three years.

“It is evident, therefore, that in a few years the present works must be either enlarged or replaced by a new system of greater capacity and better adapted to fulfil the new conditions that will then exist; and when it is considered that the high-service territory includes more than half the area of Boston lying south of the Charles river, and contains a yet larger proportion of the vacant land desirable for residences, it is further evident that this new system must be designed on a scale to provide for the wants of a very large population.

“The cost of extending the distributing mains and pipes, and the cost of new reservoirs, if equal storage capacity be provided in each case, will be practically the same whether new works are built or the old ones are enlarged.

“The chief difference of cost will be in the pumping machinery, its buildings, and supply and delivery mains. The pumping machinery and its location are, therefore, the points to be considered in deciding what changes it is best to make.

“There are a number of forcible reasons why no considerable enlargement of the pumping capacity should be made at the present location of the engines on Elmwood street.

“There is want of room at this point. The present buildings are fully occupied by the machinery now in them, and new engines will necessitate new buildings. The ground needed for this purpose can be obtained by the removal of a dwelling-house; but the vicinity is thickly built over, and in part with wooden houses, rendering the engine-houses liable to destruction by fire originating on neighboring premises. The burning of these buildings, and the consequent injury to the machinery, would deprive the high-service territory of its water-supply for a considerable time.

“The situation is such that a satisfactory arrangement of new supply and delivery mains cannot be had; also the cost of operating the present engine is much too great. Engines are now in use in other cities that are doing the same amount of work with an expenditure of only one-third the quantity of coal.

“Parker-Hill reservoir has not the proper elevation for the principal reservoir, or as a source of supply to other reservoirs located at distant points.

“The location is an unfavorable one, on account of the cost of supplying the pumps with water. It will be necessary to convey it to them from the Brookline reservoir, a distance of over two miles, at a large cost for mains, and with a considerable loss of head, that will occasion additional expense for pumping. With the amount of water that is now used the average loss of head is about 10 feet during the day hours, and after the water is pumped a portion of it is to be conveyed back, with an equal or greater loss, in the direction of, and in the case of Brighton to points beyond, the reservoir.

“The location is also objectionable from the fact that it is so low that the water is received in the pumps under a pressure of over 30 lbs. per square inch, which causes a harsh action of the ma-

chinery and greatly impairs its efficiency, To have a smooth action of the pumps the water should be drawn from a well or basin of still water through a short suction main; this condition cannot be secured at Elmwood street, without destroying the head of 70 or 80 feet under which the water is received, and thus increasing, by an equal amount, the height to which it is afterwards to be raised.

“These reasons, and others of less importance, make it desirable to choose another site for the new engines when they shall be required, and the best site is near the Chestnut-Hill reservoir, on land now owned by the city.

“At this point the buildings will be isolated, and may easily be protected from fire; there is plenty of room for future extensions; the water may be received in an open well, without appreciable loss of head, and the coal can be delivered in the coal-house directly from the cars, as the site is on the line of the Woonsocket division of the New York and New England R. R.

“The general character of the distributing system should be the same, wherever the pumping machinery may be located.

“The territory to be supplied consists of various districts, more or less isolated, and with the extreme ones at distances of about six miles from one another, measured either in a westerly or southerly direction. That is, the west end of Brighton and the south end of Dorchester are about six miles from Beacon Hill, and also about six miles from each other.

“Distinct systems of distribution are required for these various areas, involving the use of long connecting mains; and unless reservoirs are used as the centres of distribution these mains should be in duplicate, to prevent any interruption to the supply from accidents, or while repairs or additions are being made.

“A considerable reservoir capacity is essential for security in case of accidents to the machinery, for furnishing a prompt and liberal supply during large fires, etc., and if this capacity be provided in a number of small reservoirs, rather than in one of larger size, a notable saving will be effected in the cost of the connecting and distributing mains.

“The reservoirs will also maintain a more uniform head or pressure, and will admit of the use of somewhat smaller pipes in the distributing system.

“The scheme of works that I would recommend may be briefly described as follows:—

“A pumping-station near Chestnut-Hill reservoir, provided with two engines, each of capacity to raise 10,000,000 gallons in twenty-four hours, to a height of about 120 feet.

“The water for the supply of the engines to be received in an open well, and to be drawn from the 5-foot pipe which it is proposed to lay around the reservoir to join the Sudbury-river conduit with the 48-inch delivery mains. This pipe can be supplied either from the reservoir, from the Cochituate conduit, or from the Sudbury-river conduit, as may be desired.

“A 30-inch force main leading to a reservoir (No. 1) located upon one of the hills in the vicinity of the pumping-station. This

reservoir to have its water surface at an elevation of about 240 feet above tide level, and a capacity of about 15,000,000 gallons.

“A 30-inch supply main from the reservoir passing through Brookline to the corner of Prince and Perkins streets, in West Roxbury, and there branching into two lines of pipes, one 20 inches in diameter running to the Parker-Hill reservoir (No 2), the other 24 inches in diameter passing to a reservoir (No. 3) so located as to command the supply to Dorchester and neighboring portions of West Roxbury.

“Also a 16-inch supply main running from the main reservoir (No. 1) to Brighton, for the supply of the high lands of that division of the city.

“Reservoir No. 3 to have its water surface at an elevation of about 220 feet, or level with that of Parker Hill, and a capacity of 8 or 10 millions of gallons. From this reservoir a 20-inch main to lead to the Dorchester District.

“The 24-inch main is to supply Jamaica Plain and the western and southern portion of West Roxbury as well as reservoir No. 3.

“This system will command all the lands below elevation 170, giving to each house an ample pressure, and will furnish a supply to the lower stories of houses at elevation 200 or 210.

“In West Roxbury there are about 630 acres of land (the summits of various hills) situated above elevation 200, and about 1,250 acres above grade 170.

“Until the exact locations of the reservoirs are decided upon, and surveys and estimates of quantities have been made, it is impossible to give more than a roughly approximate estimate of the cost of the proposed works.

“The following estimate is based upon liberal prices and allowance for contingencies, and will rather exceed than fall short of a more exact one:—

“ESTIMATE OF COST.

Engine buildings, wells, engine foundations, supply pipe, etc.	\$120,000 00
Two engines, capacity 10,000,000 gals. each	210,000 00
Lands and reservoir (No. 1) capacity 15,000,000 gallons	200,000 00
Lands and reservoir (No. 3) capacity 10,000,000 gallons	150,000 00
Pipe mains	340,000 00
	<hr/>
	\$1,020,000 00
Superintendence and contingencies	80,000 00
	<hr/>
Total	\$1,100,000 00

“If thought advisable the first outlay may be somewhat reduced by omitting one engine, a portion of the mains, and the building of reservoir No. 3, though the land for it should be taken at once.

“The estimate thus reduced amounts to \$825,000.

“ It should be understood, however, that the expenditure of the balance can be delayed for a few years only ; that by the time the work represented by the estimate of \$825,000 is completed, that which is at first omitted should be begun.

“ With the extension of the high-service supply pipes that will be made, and the increase of population in the territory supplied that it is fair to suppose will take place, the existing works, even after their enlargement by the laying of new mains, as before indicated, cannot be safely relied upon to furnish an adequate supply for more than three years longer.

“ The maximum safe capacity of the old works after the laying of the new mains will be about  $2\frac{3}{4}$  million gallons daily, equal to a supply during the months of greatest consumption for a population of about 40,000. There are to-day over 36,000 people living in the territory to be supplied, and the yearly increase of this population has been about 6 per cent. during the last few years. At this rate the total increase, including the growth of 1875, would be over 8,000 before the new works would be put in operation.

“ It will require two working seasons to construct new works, and their construction must be authorized by act of Legislature.

“ After the act is obtained there is required a great deal of preliminary work, in the way of survey, plans and specifications, etc., before the work can be put under contract ; so that very little can be done in actual construction during the following season.

“ It will be seen, therefore, that it is important that an early decision should be made as to what shall be done ; and, if the plan for new works be adopted, that the necessary legislative action be applied for this winter.

“ Even if it should not be decided to begin the preliminary work during the coming year, it is still important as a matter of economy in the work now going on, that a decision as to what is to be done should be reached at an early day, for the pipes are being rapidly extended through the new districts, and it is impossible to determine what sizes should be used, and through what streets mains and sub-mains should be laid, until some design for the works of the future is adopted.

“ At present there are no means of supplying the high lands of Brighton. A long and expensive main is required to connect them with Parker-Hill reservoir, which main would become useless should the proposed new works be built.

“ As at best it will be some time before these works can be available it is necessary to resort to temporary means for the supply of that territory.

“ A small masonry reservoir, to be located on Academy Hill, in the school-house yard, can be cheaply built, which may be supplied by small steam-pumps placed at some convenient point, as, for instance, in the fire-engine-house on Chestnut-Hill avenue.

“ The reservoir to have a capacity of 30 or 40 thousand gallons, or sufficient for ordinary fires, and an elevation of about 170 feet above tide. The pumps to be two in number, each with a capacity of 200,000 gallons.

“ The estimated cost of this work is \$5,500 ; and I would rec-

commend that it be done early next season, as a large proportion of the most valuable buildings in Brighton are situated above the reach of the low-service supply.

“NEW LOW-SERVICE MAIN.

“All the water supplied by the Cochituate works is brought to the city from the distributing reservoirs (Brookline and Chestnut Hill) by three supply mains, 30, 36 and 40 inches in diameter. The only pipe laid from the Chestnut-Hill reservoir is one 48 inches in diameter, which terminates at a point a few hundred feet north of the Brookline reservoir, and is there connected with the 30, 36 and 40 inch mains.

“These mains pass through Boylston street in Brookline, and as far as Brookline avenue together; at this point they separate, the 40-inch passing through Brookline avenue, the Mill-dam, and Beacon street, and across the Common, to near the corner of Tremont and Boylston streets. The 30 and 36 inch mains continue on together through Tremont street in Boston (the 36-inch reducing to 30-inch at Dover street), until they unite with the 40-inch on the Common. The distance from Brookline reservoir to the point of junction of the mains on the Common is  $4\frac{1}{10}$  miles by the 40-inch pipe route, and  $4\frac{1}{10}$  miles by the 30-inch and 36-inch pipe route.

“The 30 and 36 inch mains were laid at the time the Cochituate works were built, and being uncoated pipes are badly tuberculated; the 40-inch was laid in 1859 with coated pipes, and probably is not much obstructed by tubercles.

“Near the Roxbury station of the Providence Railroad a 24-inch branch main connects with the 30 and 36 inch supply mains, and passes through short portions of Pyncheon and Roxbury streets, and along Dudley, Stoughton, Pleasant and Commercial Streets to Dorchester avenue in Dorchester. This branch-main supplies the low service of Roxbury, Dorchester, and a part of South Boston, being connected with the South Boston reservoir by a 20-inch pipe laid through Boston, Dorchester and Telegraph streets. Another sub-main, 20 inches in diameter, laid through Dover and West Fourth streets, and passing over Dover-street bridge, aids in the low-service supply of that section of the city.

“The sectional area of the supply mains that should be provided for a given population varies between wide limits, depending upon a variety of circumstances.

“In the case of Boston, where the mains are long and the distributing reservoirs at a rather low elevation, a large capacity is needed. An area that will give an initial velocity of a flow of 2 feet per second, for the average consumption of the day hours, would usually be considered a large one.

“The average daily consumption from the Cochituate works may be taken in round numbers at 19,000,000 gallons. The consumption during the day hours is about one-fourth greater than the average for the whole day, or say at the rate of 37 cubic feet per second. With a velocity of 2 feet per second, the sectional area

of mains that is required to provide for this rate of consumption is 18.5 square feet. The combined sectional area of the 30, 36 and 40 inch is 20.7 square feet, or 12 per cent. greater.

“To ascertain what the actual losses of head due to friction in the mains and sub-mains are, I have had observations taken at a number of points, the results of which will be found in the following table.

“The slight discrepancies that are noticeable between the losses at the same hours, at different points, are due to the facts that the gauges could not be read to small fractions of pounds, and that the readings of all the gauges observed in one day were not taken at exactly the same moment.

“Table showing Loss of Head due to Friction in Mains and Sub-Mains.

1875.

	TUESDAY, Oct. 12. Water in Reservoir, 122.80.			WEDNESDAY, Oct. 13. Water in Reservoir, 122.80.			THURSDAY, Oct. 14. Water in Reservoir, 122.80.			MONDAY, Oct. 18.
	Tremont St., cor. Waltham.	Dover-st. Bridge.	Fourth St., bet. O & P.	Tremont St., cor., Waltham.	Boston Common.	Warren Bridge.	Roxbury Crossing.	Commercial St., near Glover's Corner.	Milton Lower Mills.	Boston Common.
A. M.										
7.30	..	..	..	..	..	..	..	..	..	15.3
8.	15.6	16.	17.5	13.3	13.	15.8	15.4	..	..	17.6
8.30	17.9	17.2	17.5	15.6	15.3	19.2	15.4	..	..	19.9
9.	17.9	18.3	17.5	15.6	15.3	..	15.4	17.1	..	18.7
9.30	16.8	17.2	19.8	15.6	15.3	17.	15.4	14.	..	17.6
10.	15.6	18.3	17.5	15.6	13.	17.	13.1	16.	23.4	18.7
10.30	15.6	17.2	19.8	13.3	13.	14.7	14.2	16.	16.5	19.9
11.	15.6	17.2	17.5	13.3	13.	17.	13.1	16.	21.1	17.6
11.30	16.8	16.	17.5	13.3	13.	15.8	12.	13.7	21.1	16.4
12.	12.2	16.	12.9	13.3	13.	15.8	10.8	11.4	16.5	15.3
12.30	12.2	13.7	12.9	12.2	10.7	11.2	10.8	10.2	16.5	..
P. M.										
1.	13.3	13.7	15.2	11.	10.7	13.5	12.	11.4	16.5	..
1.30	13.3	14.8	12.9	11.	10.7	14.7	10.8	11.4	13.8	..
2.	13.3	14.8	15.2	11.	10.7	17.	10.8	11.4	14.2	..
2.30	12.2	14.8	15.2	11.	10.7	15.8	10.8	11.4	18.8	..
3.	13.3	14.8	12.9	11.	10.7	15.8	10.8	12.5	16.5	..
3.30	11.	11.4	12.9	11.	10.7	12.5	13.1	13.7	16.5	..
4.	9.	12.5	12.9	9.8	..	13.5	10.8	12.5	18.8	..
4.30	11.	..	12.9	..	..	..	..	..	14.2	..

“ The greatest loss of head during a week is ordinarily between the hours of 8 and 10 of Monday morning.

“ It will be seen from the table that the loss on Monday, Oct. 18th, at the junction of the mains on the Common, was from 17 to 20 feet. (During the summer months this loss is somewhat greater.)

“ On Wednesday, the 13th, the loss at the same hours and place was about 15 feet; at Warren bridge it was from 17 to 19 feet, and at the corner of Waltham and Tremont streets about 15½ feet. On Tuesday, the 12th, at the corner of Waltham and Tremont streets it was from 15 to 18 feet; at Dover-street bridge, from 17 to 18 feet, and at Fourth street, between O and P streets, in South Boston, from 17½ to 20 feet. On Thursday, the 14th, at the Roxbury crossing, it was about 15½ feet; at Commercial street, near Glover's corner, from 14 to 17 feet; and at Milton Lower Mills, 23½ feet (one observation at 10 A.M.).

“ It will be noticed, first, that the losses of head are practically the same at all points along the line of the 30 and 36 inch pipes from the Roxbury crossing to the Common. This is due to the effect of the 40-inch main which joins them at the latter point. Second, that nearly the whole loss at any point where observations were taken, except at Milton Lower Mills, takes place in the large supply mains, or, in other words, only a small portion of the loss is due to friction in the sub-mains.

“ Thus the loss at the northerly part of South Boston is very little greater than at the corner of Tremont and Waltham streets in Boston proper. So at Warren bridge, the loss is only from 2 to 4 feet greater than on the Common.

“ It becomes evident from these figures that, to reduce the loss of head due to friction to any large extent, a new supply main must be laid from the reservoir, as not much can be gained by enlargement of the sub-mains.

“ The following table, which gives the results of daily observations extending over a long period of time, will show the day and night losses at a number of points in the city, where the pressures have been taken on the small street pipes.

“ *Table showing Night and Day Loss of Head due to Friction in Mains and the Smaller Street Pipes.*

*The figures given are the monthly averages of daily observations.*

**MAY, 1874.**

BROOKLINE RESERVOIR, 121.70.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	
Federal St. Pipe Yard . . . . .	6.3	16.7	12.8	..	..
Water Board Office . . . . .	..	..	..	..	..
Wall St. Engine House . . . . .	1.3	17.4	11.2	..	..

## JUNE, 1874.

BROOKLINE RESERVOIR, 121.83.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	12, P.M.
Federal St. Pipe Yard . . . . .	5.3	20.1	15.7	..	..
Water Board Office . . . . .	..	22.4	15.3	..	..
Wall St. Engine House . . . . .	2.1	21.	13.2	..	..
Salem St. Engine House . . . . .	7.2	28.4	16.6	..	..
Dorchester St. Engine House . . . . .	..	29.8	21.5	..	3.6
Dorchester Ave. Engine House . . . . .	..	22.2	20.6	5.7	..

## JULY, 1874.

BROOKLINE RESERVOIR, 121.08.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	
Federal St. Pipe Yard . . . . .	2.5	21.9	16.09	..	..
Water Board Office . . . . .	..	23.6	16.3	..	..
Wall St. Engine House . . . . .	2.	21.9	14.4	..	..
Salem St. Engine House . . . . .	5.5	23.3	17.5	..	..
Dorchester St. Engine House . . . . .	..	27.	21.9	4.8	..
Dorchester Ave. Engine House . . . . .	..	26.8	22.1	8.8	..

## AUGUST, 1874.

BROOKLINE RESERVOIR, 120.50.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	12, P.M.
Federal St. Pipe Yard . . . . .	..	21.3	15.5	..	..
Water Board Office . . . . .	..	22.5	15.7	..	..
Wall St. Engine House . . . . .	2.3	19.2	12.9	..	..
Salem St. Engine House . . . . .	7.2	24.3	17.8	..	..
Dorchester St. Engine House . . . . .	..	27.8	23.1	..	5.9
Dorchester Ave. Engine House . . . . .	..	29.7	15.6	15.3	..

## SEPTEMBER, 1874.

BROOKLINE RESERVOIR, 118.65.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	11, P.M.
Federal St. Pipe Yard . . . . .	2.4	22.6	15.9	..	..
Water Board Office . . . . .	..	22.5	16.4	..	..
Wall St. Engine House . . . . .	2.1	18.7	14.5	..	..
Salem St. Engine House . . . . .	7.9	22.9	18.7	..	..
Dorchester St. Engine House . . . . .	..	28.7	20.4	..	6.3
Dorchester Ave. Engine House . . . . .	..	15.7	18.1	6.1	..



## OCTOBER, 1874.

BROOKLINE RESERVOIR, 117.60.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	11, P.M.
Federal St. Pipe Yard . . . . .	1.3	17.7	13.	. . .	. . .
Water Board Office . . . . .	. . .	20.3	14.5	. . .	. . .
Wall St. Engine House . . . . .	.63	17.7	9.6	. . .	. . .
Salem St. Engine House . . . . .	5.9	21.2	15.2	. . .	. . .
Dorchester St. Engine House . . . .	16.8	21.	. . .	. . .	4.3
Dorchester Ave. Engine House . . .	. . .	15.7	16.4	2.5	. . .

## NOVEMBER, 1874.

BROOKLINE RESERVOIR, 118.43.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	11, P.M.
Federal St. Pipe Yard . . . . .	.54	9.5	7.4	. . .	. . .
Water Board Office . . . . .	. . .	12.3	7.9	. . .	. . .
Wall St. Engine House . . . . .	.77	15.7	8.3	. . .	. . .
Salem St. Engine House . . . . .	4.7	13.	10.	. . .	. . .
Dorchester St. Engine House . . . .	. . .	16.7	13.	. . .	2.2
Dorchester Ave. Engine House . . .	. . .	13.5	6.1	. . .	. . .

## DECEMBER, 1874.

BROOKLINE RESERVOIR, 120.17.	3, A.M.	9, A.M.	3, P.M.	10, P.M.	11, P.M.
Federal St. Pipe Yard . . . . .	1.5	5.5	6.3	. . .	. . .
Water Board Office . . . . .	. . .	11.1	7.6	. . .	. . .
Salem St Engine House . . . . .	4.5	12.	8.7	. . .	. . .
Dorchester St. Engine House . . . .	. . .	12.7	10.6	. . .	2.5
Dorchester Ave. Engine House . . .	. . .	27.8	6.7	. . .	. . .

## JANUARY, 1875.

BROOKLINE RESERVOIR, 121.41.	3, A.M.	9, A.M.	3, P.M.	11, P.M.	
Federal St. Pipe Yard . . . . .	2.1	9.1	7.6	. . .	. . .
Water Board Office . . . . .	. . .	13.3	8.8	. . .	. . .
Salem St. Engine House . . . . .	6.5	13.7	12.5	. . .	. . .
Dorchester St. Engine House . . . .	. . .	20.	16.	8.4	. . .

## FEBRUARY, 1875.

BROOKLINE RESERVOIR, 120.17.	3, A.M.	9, A.M.	3, P.M.	11, P.M.	
Federal St. Pipe Yard . . . . .	...	12.4	10.1	...	...
Water Board Office . . . . .	...	16.1	10.8	...	...
Salem St. Engine House . . . . .	8.7	17.3	14.	...	...
Dorchester St. Engine House . . . . .	...	18.7	17.7	9.2	...

## MARCH, 1875.

BROOKLINE RESERVOIR, 118.98.	3, A.M.	9, A.M.	3, P.M.	11, P.M.	
Federal St. Pipe Yard . . . . .	3.4	10.1	9.6	...	...
Water Board Office . . . . .	...	14.5	9.9	...	...
Salem St. Engine House . . . . .	8.7	15.4	13.5	...	...
Dorchester St. Engine House . . . . .	...	18.2	14.	6.4	...

## APRIL, 1875.

BROOKLINE RESERVOIR, 121.45.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	5.1	11.9	7.7	...	...
Water Board Office . . . . .	...	15.4	9.8	...	...
Salem St. Engine House . . . . .	9.6	15.6	12.8	...	...

## MAY, 1875.

BROOKLINE RESERVOIR, 122.84.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	6.57	11.6	9.3	...	...
Water Board Office . . . . .	...	15.1	10.7	...	...

## JUNE, 1875.

BROOKLINE RESERVOIR, 122.82.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	2.1	10.9	7.4	...	...
Water Board Office . . . . .	...	13.5	9.3	...	...

JULY, 1875.

BROOKLINE RESERVOIR, 121.64.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	...	...	...	...	...
Water Board Office . . . . .	...	16.5	11.4	...	...

AUGUST, 1875.

BROOKLINE RESERVOIR, 121.69.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	1.2	14.6	10.	...	...
Water Board Office . . . . .	...	16.3	10.	...	...

SEPTEMBER, 1875.

BROOKLINE RESERVOIR, 122.45.	3, A.M.	9, A.M.	3, P.M.		
Federal St. Pipe Yard . . . . .	2.	16.3	11.4	...	...
Water Board Office . . . . .	...	15.2	14.7	...	...

“It will be observed that as a rule the loss of head during the night is inconsiderable, and that the losses at 9 A. M. during 1875, or since important changes have been made in the pipe system, have been not very different from those given in the first table for the mains and sub-mains.

“With few exceptions, all houses situated above grade 60 are supplied from the high-service works; and as the water in the Brookline reservoir is now kept at an elevation of at least 120 feet, the pressure, without loss by friction, would be equivalent to a head of 60 feet on the highest grounds of the low-service territory. The loss by friction at the hour of maximum consumption varies from 10 to 20 feet, as shown by the foregoing tables; hence the actual pressure on the higher grounds, at that hour, is from 40 to 50 feet, or sufficient for the supply of ordinary dwelling-houses. During the night-hours tanks at elevations less than about 10 feet lower than the reservoir, or below grade 110, would be filled.

“About one and a quarter million gallons per day on an average are now required to supply the high-service pumps, and this quantity will be largely increased during the next two or three years on account of the recent annexations.

“The removal of the high-service machinery to the vicinity of Chestnut-Hill reservoir, as proposed, will admit of an increase in the low-service consumption equal to the quantity required for the high-service supply, without further loss of head.

“From the foregoing the conclusion is reached that there is at present ample capacity of mains and sub-mains for the domestic

supply ; and I find, by estimate, there is also sufficient capacity to deliver a large quantity for extinguishing fires in addition to this supply.

“ The completion of the Sudbury-river works will, however, give the city an abundant, instead of its present limited, supply, and a considerable increase of consumption is probable. Increase of consumption will necessitate a new main, the route and cost of which are questions to be considered.

“ An examination of the map of the city suggests two routes. The first follows Beacon street, from the reservoir to West Chester Park street, where the new main would join with the 40-inch ; from here a 30-inch branch main would pass along West Chester Park street to Tremont street, joining there the 30 and 36 inch pipes, and eventually be extended to South Boston through Hammond and Swett streets.

“ The second follows Beacon street to Harvard street in Brookline, and thence passes through Harvard street, Longwood avenue, Parker and Prentiss streets, to Tremont, where the new main would join the 30 and 36 inch.

“ It has already been pointed out that the loss of head is practically the same at all points on Tremont street from the Roxbury crossing of the Providence R. R. to the Common, from which it follows that if any increase of capacity of mains is needed it should be made between the reservoir and the crossing.

“ The rebuilding and widening of Dover-street bridge (with probably a change in the position of the draw-opening) may require a temporary discontinuance of the South Boston 20-inch low-service and 12-inch high-service supply pipes, and consequently necessitate the laying of a new main to that section. This new main will naturally pass through Swett street, and may have its point of beginning near the Roxbury crossing, and follow Vernon, Washington, Hammond and Albany streets to Swett street. This will relieve the Tremont-street mains, from the crossing to Dover street, of about one-half the supply of South Boston, or say of a supply for 30,000 people.

“ With this relief it is not probable that any increase of the capacity of the mains north of the crossing will be needed for the supply of the city proper for many years, if ever.

“ The following estimate is for a 48-inch pipe laid on the second route above described, which, from what precedes, appears to be the better of the two : —

18,000 feet of 48-inch pipe laid, at \$16.80 . . .	\$302,400 00
4,000 cubic yards of rock, at \$3.00 . . .	12,000 00
Extra for sheeting and pumping . . .	9,000 00
Stop-valves, specials, bridge crossing, etc., . . .	20,000 00
	<hr/>
	\$343,400 00
Add 10 per cent. for contingencies . . .	34,340 00
	<hr/>
	\$377,740 00

Say \$375,000.00.

“I add an estimate of cost of a 30-inch main from the corner of Vernon and Tremont streets to the corner of Dorchester and Fourth streets, in South Boston :—

15,200 lin. feet of 30-inch pipe laid, at \$8.30 . . .	\$126,160 00
Stop-valves, specials, bridge crossing, etc. . . . .	8,500 00
	<hr/>
	\$134,660 00
Add 10 per cent. for contingencies . . . . .	13,466 00
	<hr/>
	\$148,026 00
Say \$150,000.00.”	

### CONSUMPTION OF WATER.

The table on page 45 gives the average daily consumption of water from the Cochituate works for each month for several years.

The average daily consumption for the year has been 19,267,700 gallons.

During the latter part of the year, East Boston (till Dec. 2) and portions of West Roxbury and Brighton were supplied from the Cochituate works, these being in addition to the divisions of the city supplied in 1874. West Roxbury and Brighton have had no public supply heretofore, and as the laying of pipes was begun only last season they had little effect in increasing the consumption.

### QUALITY OF WATER.

Early in October complaints began to be made, at the office of the Water Board, that the Cochituate water tasted badly, and was unfit for use. The taste was variously described; some persons thought it like cucumbers, others like fish oil, still others like dead leaves, etc.; but as a rule it was spoken of as a “cucumber taste.”

At first the complaints came from persons living at the South End and on the Back Bay lands, later they came from the West and North Ends as well, and finally from South and East Boston. Even after the taste became very wide-spread people living where there was little circulation of water in the pipes, as in some parts of Dorchester, reported that the water supplied to them was unusually clear and sweet.

On Oct. 23 the lake was visited, and samples of water were taken at various points and at all depths, but not the slightest trace of the peculiar taste could be discovered. Samples taken where the water was shallow, and some from

points near the bottom in deep water, had the earthy taste which usually accompanies pond water, but the greater portion of them were clear and tasteless.

On Oct. 26 the Brookline and Chestnut-Hill reservoirs were visited, but the cucumber taste could not be detected in the water contained in them. Water taken in front of the screens of the efflux gate-house of the Chestnut-Hill reservoir was tasteless, but a sample taken from behind them, or at the mouth of the outlet pipe, was found to have the cucumber taste in a slight degree.

At that date the taste may be said to have been confined to the water in the pipes, but on the next day it was discovered in all parts of the Bradlee basin of Chestnut-Hill reservoir, having spread through that large volume of about 500,000,000 gallons of water in one night apparently. During the night there was a thunder-shower accompanied with violent winds, and agitation of the water may have aided in developing the taste.

The reservoir was immediately shut off from the distribution and in a short time no taste could be detected in the water delivered in the city, indicating that the trouble originated in this reservoir, or at least showing that the conditions necessary to develop the taste existed there.

On the night of Dec. 3 the gate was opened about one foot and some three or four million gallons of water let into the distributing pipes, but such an exceedingly disagreeable effect was produced that the gate was closed on the following morning. At this time the Brookline reservoir was lowering rapidly, owing to the excessive night waste to prevent freezing of service-pipes.

The taste in the Chestnut-Hill reservoir gradually disappeared, and on April 1 the gate was again opened and the water let on to the city, without causing any noticeable change in the water delivered to the consumers. The reservoir has been in constant service since that date.

Prof. Wm. R. Nichols, of the Mass. Institute of Technology, was requested to make thorough investigations to ascertain the cause of the trouble, that its recurrence might be prevented if possible; and he engaged Mr. Edward Burgess, Secretary of the Boston Society of Natural History, and Dr. W. G. Farlow, Assistant Prof. of Botany in Harvard University, to aid him.

These gentlemen have made a very complete study of the matter, but are unable to assign any cause for the taste. Their reports will be found appended to this.

## ADDITIONAL SUPPLY.

Early in 1875 the necessary orders were passed by the City Council to enable the Water Board to take the waters of Sudbury river, and to proceed with the building of the Sudbury-river works, as originally designed. On Jan. 21 the papers for the taking of the river were signed by the Mayor and by the members of the Water Board. A large portion of the work has been placed under contract, and considerable progress in construction has been made.

The conduit from Farm pond to Chestnut-Hill reservoir, about  $15\frac{3}{4}$  miles long, was divided into 20 sections, each section forming the basis of a contract.

Section 20, which includes the Beacon-street tunnel, was put under contract in August, 1873, and was completed last December.

The following table shows the times at which the contracts for the various sections were executed, the names of the contractors, the range of bids, etc. :—

SECTION.	Number of Bidders.	Range of Bids.		Name of Contractor.	Residence of Contractor.	Date of Contract.
2	13	\$108,353 00	\$271,675 00	John F. Ward	Jersey City, N. J.	June 16, 1875.
3	13	146,270 00	367,380 00	John F. Ward	Jersey City, N. J.	June 16, 1875.
4	22	90,060 00	145,710 00	John F. Ward	Jersey City, N. J.	June 19, 1875.
5	19	64,232 00	272,865 00	James MacDonald	Willsboro, N. Y.	June 30, 1875.
6	19	112,488 00	271,397 50	W. L. & B. Hoblitzell	New York City	June 12, 1875.
7	21	136,640 00	261,865 00	Beckwith & Quackenbush	Herkimer, Mohawk Co., N. Y.	June 14, 1875.
8	23	82,551 80	181,734 00	W. L. & B. Hoblitzell	New York City	June 12, 1875.
9	28	112,537 00	201,345 00	Charles Linnehan	East Cambridge, Mass.	June 19, 1875.
10	12	171,990 00	236,691 00	Boynon Bros.	Boston and Providence	Dec. 30, 1875.
11	26	114,800 00	212,810 00	John F. Ward	Jersey City, N. J.	June 19, 1875.
12	29	147,650 00	276,000 00	John F. Ward	Jersey City, N. J.	June 19, 1875.
13	29	96,205 00	162,735 00	C. McCallan & Son	Chitopee, Mass.	Sept. 17, 1875.
14	31	141,705 00	240,700 00	Charles Linnehan	East Cambridge, Mass.	June 19, 1875.
15	14	198,722 50	292,050 00	G. W. Phelps	Springfield, Mass.	Nov. 29, 1875.
16	29	87,190 00	144,775 00	Charles Linnehan	East Cambridge, Mass.	July 9, 1875.
17	31	87,480 00	148,125 00	Frye, Kittredge & Page	Lowell, Mass.	June 15, 1875.
18	16	20,067 00	49,070 00	Frye, Kittredge & Page	Lowell, Mass.	June 15, 1875.
19	27	71,530 00	119,000 00	Charles Linnehan	East Cambridge, Mass.	July 9, 1875.
20	4	339,380 00	630,925 00	Lobbell & Phelps	Mattapoisett and Springfield	Aug. 30, 1873.

Section 1 to be done by days' labor.



On Oct. 21 a contract was made with Mr. John Brown, of Mohawk, New York, for building a road in Framingham. This road was laid out by the County Commissioners, and was made necessary by the proposed flowing of a portion of the old county road leading from Framingham to Southboro'.

On Oct. 30 an order of the City Council was approved, authorizing the Water Board to build Section 1, and the foundations to Dams Nos. 1, 2 and 3, by day labor. Section 1 crosses the Boston and Albany Railroad at Framingham, and includes the gate-house in Farm pond. The piles for supporting the tracks over the trench for the conduit have been driven, and considerable progress has been made in constructing the coffer-dam for the gate-house and the portion of the conduit which extends into the pond.

The following table will show, among other things, the value of the contracts, and the cost of the work done, and materials delivered up to Dec. 31, 1875, the date of the last estimate for that year:—

Table showing the Amount of Work done from the beginning up to December 21, 1875.

NO. OF SECTION.	Length of conduit built.	Length of tunnel open.	Length of trench open.	No. of culverts under construction.	Cost of work by contract prices.	Cost of work done and materials delivered.	Percentage of work done on contract.
Section No. 1 . . . . .					*\$100,000 00	\$1,750 00	0.0175
“ 2 . . . . .			3,450		108,500 00	4,122 00	0.038
“ 3 . . . . .	1,525 ft.		5,300	1	146,270 00	40,125 00	0.274
“ 4 . . . . .	1,600 “		4,120	1	90,060 00	43,581 00	0.484
“ 5 . . . . .			3,050	1	99,540 35	17,275 00	0.1735
“ 6 . . . . .		415	2,146	2	112,488 00	25,779 00	0.228
“ 7 . . . . .	957 “		5,475	3	139,725 00	47,014 00	0.336
“ 8 . . . . .	512 “	609	1,560	2	82,551 80	27,966 00	0.338
“ 9 . . . . .	1,035 “		4,555	2	112,587 00	25,760 00	0.228
“ 10 . . . . .					170,990 00		
“ 11 . . . . .			3,950	1	114,800 00	18,879 00	0.164
“ 12 . . . . .	2,950 “		7,700	5	165,400 00	73,472 00	0.444
“ 13 . . . . .			4,000	1	96,090 00	12,830 00	0.133
“ 14 . . . . .			4,800	1	141,705 00	21,197 00	0.149
“ 15 . . . . .			100		198,722 50	70 00	0.0003
“ 16 . . . . .	1,145 “		2,725	2	90,372 50	22,990 00	0.255
“ 17 . . . . .	1,320 “		4,225	2	83,057 50	33,123 00	0.376
“ 18 . . . . .	50 “	243	100	1	20,067 00	5,229 00	0.261
“ 19 . . . . .	535 “		1,400	1	72,015 00	15,201 00	0.211
“ 20 . . . . .	510 “	4,635	510		336,630 70	336,631 00	100.
Totals . . . . .	12,139 ft.	5,902	59,166	26	\$2,486,522 00	\$772,994 00	
Road in Framing- ham for Basin No. } III. . . . . }			5,300	4	17,760 00	5,179 30	
			64,466	30	\$2,504,282 00	\$778,173 30	

31 per cent. of the work on all the conduit sections is done.  
The total length of the conduit line from Farm Pond to Chestnut-Hill Reservoir is 83,200 feet.

\* Estimated.

During the summer the average number of men employed on the work, by the contractors, was 1,200, and the average number of horses 175.

#### RAINFALL.

The usual tables, giving the rainfall at various points for the year 1875, will be found appended.

JOS. P. DAVIS,  
*City Engineer.*

*Average Monthly and Yearly Heights, in feet and decimals, of the Reservoirs above "tide-marsh level," 1865-1875.*

## BROOKLINE.

Maximum high-water line, 124.60.

MONTH.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.*	1874.	1875.
January . . .	123.31	122.28	122.00	123.29	122.58	122.83	121.89	118.64	120.46	121.06	121.41
February . . .	122.82	122.47	123.12	122.79	122.64	122.60	122.54	120.48	119.86	119.52	120.17
March . . . .	123.26	123.19	123.05	122.33	122.48	122.77	122.08	122.04	119.71	119.27	118.95
April . . . . .	123.38	123.45	123.00	123.04	122.60	122.56	122.00	122.10	121.36	119.59	121.45
May . . . . .	122.65	123.04	123.07	123.04	122.77	122.75	121.79	122.29	121.84	121.70	122.84
June . . . . .	123.23	123.29	122.34	122.77	121.85	122.64	121.98	122.25	120.90	121.83	122.82
July . . . . .	123.33	122.97	122.98	122.77	122.10	122.50	122.19	121.25	118.79	121.08	121.64
August . . . .	123.39	122.80	122.23	122.75	122.19	122.23	122.06	122.14	118.48	120.50	121.69
September . .	123.29	122.81	122.52	122.12	122.50	122.35	121.50	123.44	119.04	118.65	122.45
October . . . .	123.29	123.03	122.65	122.31	122.58	122.64	119.54	122.96	119.09	117.60	122.81
November . . .	123.38	122.75	122.89	122.56	122.46	122.60	116.94	120.98	119.69	118.43	123.03
December . . .	123.24	122.64	122.37	123.00	122.92	122.50	117.71	121.06	119.71	120.17	121.38
Yearly Average	123.21	122.89	122.69	122.65	122.48	122.58	121.02	121.63	119.91	119.96	121.72

\* New gauge put in, with a zero point .08 of a foot higher than that of the old gauge.

## CHESTNUT HILL.

Maximum high-water line, 125.00.

MONTH.	1870.	1871.	1872.	1873.*	1874.	1875.
January . . . . .	. . .	102.00	116.90	120.76	121.32	121.79
February . . . . .	. . .	102.81	120.46	120.26	120.19	120.86
March . . . . .	. . .	105.19	122.29	120.11	119.95	119.90
April . . . . .	. . .	110.48	122.52	121.55	120.16	121.80
May . . . . .	. . .	116.21	122.54	122.03	121.93	123.11
June . . . . .	. . .	121.46	122.35	121.24	122.11	123.19
July . . . . .	. . .	122.40	121.77	119.65	121.50	122.13
August . . . . .	. . .	122.02	122.15	119.32	121.00	122.03
September . . . . .	. . .	121.44	122.77	119.74	119.75	122.70
October . . . . .	. . .	119.67	122.08	119.70	119.15	123.09
November . . . . .	100.80	117.08	122.42	120.21	119.32	123.24
December . . . . .	101.29	115.35	121.40	120.21	120.61	122.95
Yearly Average . . .	101.04	114.67	121.64	120.40	120.58	122.23

\* New gauge put in, with a zero point .18 of a foot higher than that of the old gauge.

*Consumption of Water.*

MONTH.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
January . . . . .	17,000,000	16,112,000	18,954,000	13,412,000	14,850,000	13,611,000	15,992,000	15,426,000	12,625,000	14,110,000	12,203,900	17,639,100	16,651,300	18,978,300
February . . . . .	17,000,000	17,828,000	18,846,000	13,318,000	13,385,000	13,831,000	16,927,000	14,731,000	14,052,000	15,070,000	15,172,000	18,461,000	19,103,850	20,991,700
March . . . . .	17,300,000	16,681,000	16,841,000	12,027,000	12,284,000	13,100,000	13,722,000	14,789,000	14,646,000	10,162,000	15,788,500	15,983,700	17,667,300	17,878,100
April . . . . .	15,300,000	15,125,000	16,506,000	11,975,000	11,251,000	12,770,000	12,636,000	14,650,000	14,703,000	11,814,000	12,281,000	14,781,800	15,929,600	15,852,000
May . . . . .	14,300,000	15,407,000	16,094,000	13,660,000	11,076,000	12,501,000	13,846,000	13,902,000	13,759,000	12,222,000	13,830,600	17,637,400	16,731,900	17,164,500
June . . . . .	16,600,000	16,138,000	17,730,000	14,391,000	11,878,000	13,625,000	14,351,000	14,252,000	14,824,000	15,695,000	14,617,600	20,100,600	19,239,750	19,923,400
July . . . . .	16,400,000	15,954,000	18,112,000	13,207,000	12,668,000	14,250,000	14,676,000	18,378,000	16,392,000	15,748,000	16,377,100	20,917,100	21,386,200	20,396,400
August . . . . .	17,000,000	16,380,000	16,188,000	13,426,000	12,441,000	14,546,000	14,479,000	17,632,000	17,107,000	16,019,000	15,017,900	19,544,600	20,127,800	19,085,200
September . . . . .	17,000,000	17,035,000	16,798,000	12,624,000	11,842,000	13,186,000	16,072,000	15,741,000	16,785,000	16,512,000	15,072,600	19,572,700	20,022,600	20,497,400
October . . . . .	17,300,000	15,779,000	15,479,000	11,273,000	12,396,000	13,518,000	14,954,000	14,096,000	16,528,000	13,856,000	15,544,800	17,113,800	19,320,900	19,470,700
November . . . . .	17,100,000	16,028,000	14,079,000	11,750,000	11,262,000	12,707,000	13,975,000	13,608,000	14,677,000	13,574,000	17,591,400	16,633,400	14,319,500	19,076,400
December . . . . .	17,000,000	16,295,000	14,547,000	10,877,000	11,412,000	15,434,000	15,600,000	13,640,000	14,094,000	12,564,000	17,263,700	15,727,100	16,407,950	21,898,500
Average for year.	16,600,000	15,238,500	16,681,900	12,662,000	12,229,000	13,565,000	14,769,167	15,070,400	15,007,700	13,945,500	15,063,400	17,842,700	14,074,900	19,267,700

Statement showing amount of Rainfall on Water-shed of Lake Cochituate, amount of Water consumed and wasted, available amount received into Lake, available percentage of Rainfall, etc., from 1852 to 1875, inclusive. Water-shed of Lake = 12,077 acres.

YEAR.	Rainfall. <i>Inches.</i>	Amount of rain-fall on Water-shed of Lake Cochituate.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Total amount consumed and wasted.	Rise of Lake during the year.	Fall of Lake during the year.	Total amount of Rainfall received into Lake.	Daily ave'ge amt of rain-fall received into Lake.	Percentage of Rainfall rec'd into Lake.
	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	
1852*	47.93	15,759,207,000	2,974,042,800	4,020,566,885	6,994,609,685	.....	261,360,000	6,733,249,685	18,396,857	43 per cent.
1853	55.73	18,366,561,000	3,117,939,500	3,166,417,500	6,284,357,000	239,580,000	.....	6,523,937,000	17,873,800	35 per cent.
1854	43.15	14,187,562,000	3,614,230,000	4,187,733,020	7,801,963,020	.....	217,800,000	7,584,163,020	20,778,529	53 per cent.
1855	34.96	11,494,719,000	3,776,399,500	No acc't kept.	.....	.....	326,700,000	.....	.....	.....
1856	40.80	13,414,892,000	4,409,787,600	No acc't kept.	.....	598,950,000	.....	.....	.....	.....
1857	63.10	20,747,052,000	4,644,990,000	10,625,900,000	15,270,890,000	32,670,000	.....	15,303,560,000	41,927,562	74 per cent.
1858	48.66	15,999,232,000	4,689,155,000	1,984,500,000	6,623,655,000	.....	141,570,000	6,482,085,000	17,759,013	40 per cent.
1859†	49.02	16,117,602,000	4,808,875,000	7,569,000,000	12,377,875,000	283,140,000	.....	12,661,015,000	34,687,712	78 per cent.
1860	55.44	18,228,471,000	6,309,108,000	None.	6,309,108,000	174,240,000	.....	6,483,348,000	17,714,083	35 per cent.
1861	45.44	15,269,303,000	6,639,095,900	3,377,558,966	10,016,654,866	.....	1,459,260,000	8,557,394,866	23,444,917	56 per cent.
1862	49.69	16,337,890,000	6,059,000,000	33,200,000	6,092,200,000	1,306,800,000	.....	7,399,000,000	20,271,283	45 per cent.
1863	69.30	22,785,586,000	5,927,052,500	2,165,606,470	8,092,748,970	762,300,000	.....	8,855,048,970	24,260,408	39 per cent.
1864	42.60	14,006,726,000	6,105,306,700	1,368,746,000	7,474,052,700	.....	1,848,577,000	5,625,475,700	15,370,152	40 per cent.
1865	49.46	16,262,266,000	4,621,630,000	1,688,120,674	6,309,750,674	743,242,500	.....	7,052,993,174	19,323,270	43 per cent.
1866	62.32	20,490,455,000	4,463,585,000	None.	4,463,585,000	743,242,500	.....	5,206,827,500	14,265,280	23 per cent.
1867	56.25	18,494,795,000	4,951,225,000	2,482,041,000	7,433,266,000	.....	698,811,000	6,734,455,000	18,450,600	36 per cent.

1868	49.71	16,459,544,000	5,405,515,000	2,507,684,000	7,913,199,000	346,371,000	. . . . .	8,259,570,000	22,567,160	50 per cent.
1869	64.34	21,099,808,000	5,500,696,000	1,685,570,000	7,139,821,000	480,882,000	. . . . .	7,620,203,000	20,877,300	36 per cent.
1870	55.89	18,328,694,000	5,477,810,000	4,818,971,000	10,296,781,000	. . . . .	1,736,085,000	8,560,696,000	23,453,900	47 per cent.
1871	45.39	14,885,300,000	5,223,500,000	None.	5,223,500,000	. . . . .	250,933,000	4,972,567,000	13,623,470	33 per cent.
1872	48.47	15,895,364,000	5,775,151,200	None.	5,775,151,200	†1,543,995,500	. . . . .	5,642,480,300	15,416,610	35 per cent.
1873	45.43	14,898,419,000	6,511,826,900	2,917,977,000	9,429,803,900	. . . . .	515,132,000	8,914,671,900	24,423,760	60 per cent.
1874	35.93	11,782,907,000	6,623,972,900	1,145,851,700	7,769,824,600	. . . . .	1,367,715,000	6,402,109,600	17,540,030	54 per cent.
1875	45.40	14,918,096,000	\$7,092,955,500	None.	7,092,955,500	\$1,222,885,000	. . . . .	5,760,040,500	15,780,930	39 per cent.

Average . 50.19	Average daily waste for 22 years . . . . . 6,925,390	Average daily yield of Lake water-shed for 22 years, 20,827,570.	45 per cent.
"	" " " 6 years, '52-59 . 14,378,900		
"	" " " last 16 years, '60-75 . 4,130,975		

\* Observation of rainfall at Lake Cochituate commenced 1852, and these observations are assumed as correct for the whole district.  
 † Lake raised two feet.  
 ‡ Amount received from Sudbury river in 1872, 1,676,666,400 gallons.  
 § " " " 1875, 2,553,800,000 " "

Table of the average monthly and yearly heights of water in the Lake above the bottom of the Aqueduct.

MONTH.	1854.	1855.	1856.	1857.	1858.	1859*	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
January . . . . .	10.54	10.16	8.06	9.53	10.75	10.80	10.83	11.93	6.09	11.33	13.88	6.41	8.37	12.14	10.29	12.27	13.25	5.29	4.23	12.53	11.54	0.52
February . . . . .	10.95	10.65	7.59	10.28	10.06	12.17	11.36	12.77	6.87	12.85	13.71	8.24	8.73	13.14	9.75	12.96	13.19	5.40	2.52	12.31	12.71	0.92
March . . . . .	10.93	10.68	6.96	10.67	9.35	12.45	12.67	13.21	8.65	13.95	14.33	12.28	10.58	13.57	10.96	13.21	12.81	7.96	1.19	12.06	12.98	6.83
April . . . . .	10.66	11.57	10.24	12.30	9.36	12.06	12.72	14.14	12.40	14.59	14.32	14.00	11.96	13.50	13.29	13.40	13.33	9.31	4.19	13.17	13.12	11.83
May . . . . .	10.87	11.35	12.05	12.05	10.67	12.06	11.52	13.88	14.45	14.01	14.26	14.00	12.01	13.44	13.67	13.65	13.12	10.37	5.10	13.17	13.33	13.00
June . . . . .	10.33	10.69	11.78	12.14	11.72	11.96	10.83	12.99	14.43	13.29	13.51	13.41	12.72	13.20	13.37	13.23	13.02	9.27	5.79	12.04	13.29	13.08
July . . . . .	9.00	9.86	10.67	11.41	11.74	10.22	10.42	11.50	14.05	12.82	11.33	12.28	11.84	12.12	12.46	12.62	12.12	7.83	6.33	10.25	12.25	12.50
August . . . . .	6.67	9.01	11.59	11.70	11.30	10.24	9.42	10.27	12.97	13.73	9.65	11.18	11.79	12.17	11.70	11.04	10.37	6.27	7.04	8.87	10.94	12.67
September . . . . .	6.64	7.52	10.82	11.72	10.40	9.84	9.42	8.71	11.33	13.43	7.91	10.09	11.59	12.00	11.61	9.73	8.67	5.00	10.02	7.60	9.37	11.25
October . . . . .	5.90	6.42	10.10	11.10	8.72	10.15	10.35	7.79	10.30	12.94	6.46	9.02	11.72	11.10	11.83	10.58	8.10	3.81	11.46	7.29	7.50	10.31
November . . . . .	6.09	6.28	10.80	11.16	9.01	9.98	10.44	7.22	10.24	13.26	5.48	8.74	11.41	11.03	11.75	11.21	7.10	3.60	12.67	7.60	5.42	9.87
December . . . . .	8.38	7.29	10.97	11.02	9.85	10.54	11.17	6.88	11.70	14.06	5.41	8.48	11.68	10.51	12.33	11.77	6.40	3.83	12.40	9.08	3.60	9.67
Yearly average . . . . .	9.00	9.29	10.14	11.26	10.24	11.04	11.93	10.94	11.10	13.52	10.84	10.76	11.29	12.33	11.92	12.15	10.96	6.50	6.91	10.50	10.50	9.37

\* High-water mark raised two feet.



Table showing the depths of water in the conduit at the gate-house, Lake Cochituate, the number of days it was running at those depths, and the average depth for each month:—

1875.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total Days.
0-0 . . .	..	1	..	..	..	..	1	..	..	..	..	..	2
3-11 . . .	1	..	..	..	..	..	..	..	..	..	..	..	1
4-3 . . .	..	1	..	..	..	..	..	..	..	..	..	..	1
4-4 . . .	..	1	..	..	..	..	..	..	..	..	..	..	1
4-6 . . .	..	1	..	..	..	..	..	..	..	..	..	..	1
4-8 . . .	..	2	..	..	..	..	..	..	..	..	..	..	2
5-4 . . .	1	..	..	..	..	..	..	..	..	..	..	..	1
5-6 . . .	..	..	2	..	..	..	..	..	..	..	..	..	2
5-9 . . .	..	..	..	..	..	..	1	..	..	..	..	..	1
5-10 . . .	..	..	3	..	..	..	..	..	..	..	..	..	3
5-11 . . .	..	..	8	..	..	..	..	..	..	..	..	..	8
6-0 . . .	..	..	2	..	..	..	..	..	..	..	..	..	2
6-1 . . .	1	..	..	..	..	..	..	..	..	..	..	..	1
6-3 . . .	..	..	..	..	..	..	1	..	..	..	..	..	1
6-4 . . .	..	..	..	..	..	..	1	..	..	..	..	..	1
6-5 . . .	..	1	..	..	..	..	1	..	..	..	..	..	2
6-6 . . .	1	..	1	..	..	..	..	..	..	..	..	..	2
6-11 . . .	..	..	..	..	..	..	1	..	..	..	..	..	1
7-0 . . .	27	20	14	30	7	15	25	3	..	..	..	..	141
7-1 . . .	..	..	..	..	2	1	..	..	..	..	..	..	3
7-2 . . .	..	..	..	..	1	..	..	..	..	..	..	..	1
7-3 . . .	..	..	..	..	10	..	..	..	..	..	..	..	10
7-4 . . .	..	1	..	..	..	..	..	1	..	..	..	..	2
7-6 . . .	..	..	..	..	11	14	..	9	..	..	..	..	34
7-7 . . .	..	..	1	..	..	..	..	18	30	31	30	2	112
7-8 . . .	..	..	..	..	..	..	..	..	..	..	..	2	2
7-10 . . .	..	..	..	..	..	..	..	..	..	..	..	1	1
8-0 . . .	..	..	..	..	..	..	..	..	..	..	..	20	20
8-1 . . .	..	..	..	..	..	..	..	..	..	..	..	1	1
8-6 . . .	..	..	..	..	..	..	..	..	..	..	..	5	5
													365

Average Monthly Depths.

1875.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Av. for Year.
	6'-9"	6'-6"	6'-6"	7'-0"	7'-3"	7'-3"	6'-11"	7'-6"	7'-7"	7'-7"	7'-7"	8'-0"	7'-2½"

*Annual Amount of Rainfall, in Inches, at Lake Cochituate, Boston and vicinity, 1849 to 1875, inclusive.*

YEAR.	PLACES AND OBSERVERS.						
	Lake Cochituate, by Supt of Western Division, B. W. W.	Boston, by J. P. Hall, to 1865, by W. H. Bradley since 1865.	Cambridge, by the Director of the Observatory.	Waltham, by Agent Boston Manufacturing Company.	Lowell, by Merrimac Manufacturing Co.	Lowell, by Locks and Canals Company, J. B. Francis.	Providence, by A. Caswell.
1849 . . . . .	. .	40.30	40.97	40.74	41.91	. .	34.69
1850 . . . . .	. .	53.98	54.07	62.13	51.09	. .	51.49
1851 . . . . .	. .	44.31	41.97	41.00	45.68	. .	43.33
1852 . . . . .	*47.93	47.94	40.51	42.24	42.78	. .	38.58
1853 . . . . .	*55.73	48.86	53.83	45.04	43.92	. .	53.27
1854 . . . . .	43.15	45.71	45.17	41.29	42.08	. .	46.25
1855 . . . . .	34.96	44.19	47.59	40.63	44.89	48.41	39.05
1856 . . . . .	40.80	52.16	53.79	42.33	42.49	45.97	40.97
1857 . . . . .	63.10	56.87	57.92	44.04	49.38	52.02	44.75
1858 . . . . .	48.66	52.67	45.46	37.40	37.73	35.80	44.51
1859 . . . . .	49.02	56.70	. .	48.49	47.51	48.41	45.16
1860 . . . . .	55.44	51.46	46.95	45.97	46.91	46.67	38.44
1861 . . . . .	45.44	50.07	50.14	36.51	43.32	42.95	44.25
1862 . . . . .	49.69	61.06	57.21	46.42	44.26	44.61	50.14
1863 . . . . .	69.30	67.72	56.42	53.66	52.37	57.81	55.17
1864 . . . . .	42.60	49.30	39.46	36.56	38.11	40.64	36.83
1865 . . . . .	49.46	47.83	43.59	35.84	37.38	38.82	44.69
1866 . . . . .	62.32	50.70	. .	43.46	38.18	41.36	46.02
1867 . . . . .	56.25	55.64	41.71	41.40	45.54	45.87	47.04
1868 . . . . .	49.71	64.11	39.89	44.65	47.96	49.58	53.52
1869 . . . . .	64.34	66.28	47.98	47.30	47.30	48.96	47.70
1870 . . . . .	55.89	59.73	41.53	39.40	46.30	48.71	49.02
1871 . . . . .	45.39	48.33	40.56	36.82	44.45	44.17	47.91
1872 . . . . .	48.47	58.04	52.73	45.80	44.32	48.67	48.71
1873 . . . . .	45.43	54.94	46.81	42.58	39.86	45.05	52.56
1874 . . . . .	35.93	41.09	38.73	32.32	35.68	41.75	43.39
1875 . . . . .	45.49	51.01	51.00	40.30	40.29	43.63	52.22

Table showing the Rainfall in Boston for the year 1875, and the days on which it occurred, from observations by Wm. H. Bradley, Esq., Superintendent of Sewers.

DAY.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1 . . . . .		.21	1.18							.03		
2 . . . . .	.72				.34					.44		
3 . . . . .		.12	1.24	.36				1.42				
4 . . . . .		.36		2.07				.24	.03			
5 . . . . .				.33				.40				
6 . . . . .			.03				1.50	.08	.08			
7 . . . . .	.76				2.53	.48	.22			2.53		
8 . . . . .			.88			.47		.32				
9 . . . . .		.02		.02	.18	.42						.06
10 . . . . .	.02		.03		.02	5.30			.45		.53	
11 . . . . .		1.08								.14	1.57	
12 . . . . .					.08			.02				
13 . . . . .	.16			.56		.24			.35			.04
14 . . . . .			.02	.72							.28	
15 . . . . .			1.44		.12					.21	.44	
16 . . . . .			.04	.40			.12	.40	.12	.05	.52	.03
17 . . . . .							.08		1.44			.15
18 . . . . .						.48	.30	.48				
19 . . . . .	.04	.02			.22	.29		.02	.17		.02	
20 . . . . .		.36	.70					.05				
21 . . . . .									.20			
22 . . . . .	.54				.40			.07				.04
23 . . . . .							1.32				.30	
24 . . . . .			.16								.99	.45
25 . . . . .	.48	1.01										
26 . . . . .			.04				.02		.36			.13
27 . . . . .		.44				.03	.08			.30	.62	
28 . . . . .											.35	.03
29 . . . . .	.34								.12	.01		
30 . . . . .	.16					.02	.20					.04
31 . . . . .	.02									1.35		
Total .	3.24	3.62	5.76	4.46	3.89	7.73	3.84	3.50	3.32	5.06	5.62	0.97

Total for the year . . . . . 51.01 inches.

REPORT ON A PECULIAR CONDITION OF THE  
WATER SUPPLIED TO THE CITY OF BOSTON.

BY PROF. NICHOLS, DR. FARLOW, AND MR. BURGESS.

JOS. P. DAVIS, Esq., *City Engineer*:—

DEAR SIR, — In the latter part of October, 1875, I was requested by you to investigate the condition of the water supplied to the city, with reference to which there were numerous and well-founded complaints, and to ascertain, if possible, the cause of the peculiar taste then affecting the water. On October 27th, in company with Mr. FitzGerald, I visited the lake and the several reservoirs, and found that the bad taste was entirely confined to the Bradlee basin of the Chestnut-Hill reservoir. The water of the lake and that in the Brookline reservoir were free from the peculiar "cucumber" taste which was so strongly marked in the city and at Chestnut Hill. As far as I was able to observe, the taste was nearly uniformly diffused throughout the Bradlee basin; the Lawrence basin, separated at the connecting gatehouse by an embankment only 100 feet wide, was perfectly free. On Saturday, October 30, the gates were closed and no water was supplied to the city from the Bradlee basin until April 1, 1876. For some time after the reservoir was thus isolated there seemed to be no change, but after some weeks the taste became less marked, and then gradually passed away. The taste seemed to pass away first from the surface near the office, and to remain the longest in the coves on the north side. On February 21 it had disappeared from the water in the neighborhood of the gatehouse and about the margin of the basin, and on the 1st of April the water was let into the pipes.

The taste to most persons seems like that of "cucumbers;" other persons, and indeed the same persons at other times, have pronounced it a "fishy" taste. At Brookline reservoir, especially at the screens, a "fishy" taste may usually be noticed; at Chestnut Hill I never distinguished anything but the "cucumber" taste.

When the water was allowed to stand in an open vessel, the taste soon passed away; when boiled an unpleasant odor was perceived, and the water when cold was found to have lost the peculiar taste. When the water was distilled something of the same taste was observed in the condensed water, but it was almost overpowered by the disagreeable earthy

taste which is always to be perceived in water produced by distilling a soft water containing vegetable matter. Filtration through bone-black did not remove the taste completely, although even a sponge-filter would retain some odorous and unpalatable matter.

I must frankly confess that as yet I am quite in the dark as to the cause of the trouble, although I have made a careful examination of the circumstances which would seem able to throw any light on the subject. Various theories have been proposed to account for the occurrence, most of which are untenable. It may be well to allude to some of them and to point out the bearing of our observations upon them. I may say, however, what is well known to those who have professionally to do with the water-supply of cities, that many reservoirs, perhaps most reservoirs of considerable size, are liable at times to be affected in some way, by which the water for a longer or shorter period is rendered unpleasant and sometimes absolutely unfit for use. In the fall and winter of 1854, Lake Cochituate itself was affected by a trouble, the cause of which was never satisfactorily ascertained, but which manifested itself by a "cucumber" or "fishy" taste, precisely similar, as far as I can learn, to that which has been observed the present winter.

In many cases where examination has been made of an affected water, certain things have been regarded as causes which are probably accidental accompaniments, or which would be found also, if sought for, in the water when unaffected; and the individual observer, considering only the conditions of his particular case, conceives that he has, without doubt, discovered the cause of the trouble, and in some instances the theories advanced are not unreasonable. It is not necessary to suppose that the cause is the same in every case.

I have had correspondence and personal intercourse with a number of persons in charge of water works, and am now examining other cases where trouble has occurred. At some future time I hope to communicate to the Board the results of my efforts to collect all available information in the matter, together with the results of experiments now in progress, and others planned for the summer months when I have more time at my command.

#### THEORIES THAT HAVE BEEN SUGGESTED.

*First.* Many persons are confident that the dead body of some animal decaying in the pond is the cause of the bad taste. I am convinced that this solution of the problem is

out of the question. Repeated chemical examination of the water could hardly have failed to detect an abnormal amount of ammonia and of nitrogenized animal matter, if such were the case, even supposing that nothing either sooner or later was noticed by those employed about the works. If dead fish were the cause they would also be discovered at the screens and at the borders of the reservoir. None such have been observed.

*Second.* — Some assign the cause to decaying vegetable matter. This was the theory to which some who investigated the question in 1854 seemed to lean. While it is not impossible that this may be directly or indirectly the cause, it is to be considered that the Bradlee basin is the most free of all the reservoirs from vegetable deposit, and that its bed was prepared with great care; and if this water was bad from this cause, we should expect to find that of the Lawrence basin and the Brookline reservoir much worse. Moreover, I have been unable to produce any similar taste from the leaves of the various species of trees which grow in the neighborhood, from the mud taken from the bottom of the reservoir, or from rotten wood, by soaking these various articles in water.

In some cases, as at Holyoke, Mass., where the muck bottom of the pond has been recently disturbed, and at Keene, N. H., where there is a large amount of shallow water resting on ground somewhat recently cleared from growing trees and shrubs, and where, consequently, much vegetable matter is undergoing decay, it is not unnatural to assign the cause to vegetable decomposition. In these instances, the taste and odor are distinctly "fishy," and not those of cucumbers. But even here I am not prepared to say that vegetable decay is the actual cause.

*Third.* — It was firmly believed by some that the trouble in 1854 was caused by an abnormal condition of the minute crustacea (principally cyclops) which was then observed.\* Whatever may have been the case then, this is certainly not the cause of the recent trouble, as these little creatures were, if anything, less abundant than usual, and in no abnormal condition. In order that any statement on this point might be made with authority, I requested Mr. Edward Burgess, Secretary of the Boston Society of Natural History, who has made a special study of crustacea, to investigate the matter, which he kindly consented to do. His statement of the

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\* Rankine's Civil Engineering (edition of 1874), page 737, refers to such a case (this same case of Cochituate lake?), which was examined by H. D. Rogers. It is said that the remedy was to stock the lake with fish. I am informed that there is no deficiency of fish in the Bradlee basin.

results of his examination of the water and of various deposits collected from the bottom of the pond, from the screens and the gate-house, and from sponge-filters, through which a quantity of water had been passed, will follow this report.

*Fourth.* — It has been suggested that the cause was the abnormal growth of some low order of vegetable life. This opinion has considerable weight, as there are a number of places where the bad taste has been accompanied by, and by many believed to be caused by, an abundant growth of microscopic plants. Such has been the case at the Ludlow reservoir (Springfield water supply), where a copious growth of a member of the Nostoc family was accompanied by a marked odor and taste of "green corn." Such is the case on the filter-beds at Poughkeepsie, N. Y., where certain oscillatoriæ develop in the heat of the summer to a great extent; such is the case at New Britain, Conn., where the trouble occurs periodically; at Albany, N. Y., and in some of the reservoirs in London, England. In fact, I do not remember to have encountered a case, except our own, where the "cucumber" taste has been distinctly noticed, without some such accompanying growth. In the case of Jamaica pond, there was a disagreeable taste and odor to the water (not that of cucumbers, however), with reference to which, it is stated by Mr. S. Dana Hayes,\* who examined the water: "By filtration through paper, the water becomes clear and brilliant, the odor and taste of the filtered water being natural; and it is possible in this way to separate the offensive matter from the water, and retain it for examination. This substance, which gives odor, taste, and additional weight to the impurities, consists of organized and vegetating bodies, which, as seen with the lens, are short, white threads, somewhat like conferva in form; but the threads are very short and perfectly white, differing in these respects from the green or brown confervoid growth of the summer months.

. . . "Crustaceous animalculæ, common in the water usually, are not to be found, while there is an extraordinary growth of subaqueous vegetation, of a low order of organized forms, emitting a repulsive odor." In this case, boiling did not remove the offensive odor and taste.

In order that the present investigations on this point might be perfectly conclusive, application was made to Dr. W. G. Farlow to conduct the observations. Dr. Farlow is Assistant Professor of Botany in Harvard University, and is acknowledged to be one of the first authorities in the United States on the lower order of plants, to which he has specially devoted

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\* American Chemist, II. (1872), p. 323.

himself. His report, which follows, shows that nothing was discovered either in the water or in the sediment from the bottom and sides of the reservoir, or in the slime which collects on the screens, which can be accused of being the cause of the evil. I may say, also, that since the conclusion of the trouble I have collected some more of these slimy deposits, and had them submitted to Dr. Farlow. No essential difference was discovered between the slime in its present tasteless condition, and that previously examined.

Other theories than those which I have mentioned have been proposed, to which it is not necessary to allude. I do not feel that we possess sufficient evidence as yet to lead to the adoption of any theory. In conducting the chemical examinations I have, as a rule, compared, in every point, the water possessing taste, from Bradlee basin, with tasteless water from the lake, or from the Brookline reservoir, or with the water delivered in Boston. With the exception of the very volatile or easily decomposed matter which gives the "cucumber" taste, and which we have not succeeded in isolating, there is nothing in which the water of the Bradlee basin has been inferior to the water delivered in Boston. I have examined, at various times, the water itself, samples of the deposit from the bottom of the reservoir taken at different points, as well as the material collected on sponge-filters and on the screens. I have been able to detect no essential difference which could be regarded as the cause of the trouble. I have made experiments on the oily matter referred to in the reports of Dr. Farlow and Mr. Burgess, but I have not discovered any difference between the two waters in this respect, unless possibly there has been a trifle more in the Bradlee basin than in the Brookline reservoir (and even this I doubt). I have extracted the oil by various means from the water, and for comparison, from several species of plants growing in the reservoir, also from the deposit on the bottom and on the sponge-filters. I cannot see any reason to regard it as the cause of the trouble, nor when isolated does it have the taste in question. The oil is certainly in part of vegetable origin; no doubt some comes from animal sources, but what proportion it is impossible to tell. I have also compared the two reservoirs with reference to the dissolved oxygen in the water, but no marked difference exists.

I do not regard it as at all impossible that the taste may have been due to some cause which had passed away before systematic observations were begun, and as there was no discharge of the water from the Bradlee Basin after October 30, it required considerable time for so large a body of water



to lose the taste, although a small amount of the water in a pitcher or other vessel became tasteless after a short time.

In comparing my first observation of the water in the basin with your observation of the water in the pipes on the preceding day, there would seem to be no doubt that the trouble originated in the pipes themselves, and that the impregnation (if I may use the word) of the whole basin required not more than twenty-four hours. It was a consideration of this sudden development, which made me think that the trouble might be due to the rapid multiplication of some low order of animal or vegetable life; but when the microscopical examination began, nothing was discovered to bear out this idea.

It would seem desirable to watch the reservoirs rather closely during the coming summer and fall, in order that if the trouble should occur again, we might be able to investigate it in its early stages. In addition to collecting such further data on the subject as I may be able, I propose to keep such a watch myself. I may further state that Dr. Farlow has promised, during the coming spring and summer, to make some experiments on the taste communicated to water by different varieties of microscopic plants, a matter of great interest, and one about which we know very little. I shall be very glad to lay before the Water Board such information as we may be able to obtain.

As there is yet no certainty as to the cause of the trouble, it is not, of course, possible to suggest any means either of prevention or cure. There is no proof that the water would be actually injurious to a healthy person, although it was certainly very unpalatable. It is a matter of congratulation that the whole water-supply was not affected, and that it was possible to avoid using the affected water.

Yours, very respectfully,

WM. RIPLEY NICHOLS.

MASS. INSTITUTE OF TECHNOLOGY,  
April 3, 1876.

*Memoranda of some Partial Examinations of Cochituate Water.*

[Results expressed in parts per 100,000.]

DATE.	LOCALITY.	UNFILTERED.		FILTERED.		SOLID RESIDUE.			REMARKS.
		Ammonia.	"Albuminoid" Ammonia."	Ammonia.	"Albuminoid" Ammonia."	Inorganic.	Organic and Volatile.	Total at 212° F.	
July — Dec. 1873 . . .		{ . . . . .	{ . . . . .	0.0035	0.0113	2.84	2.06	4.90	No taste. Mean of seven samples taken at different times.
October 25, 1875 . . .	Boston. Laboratory of Mass. Institute of Technology,	0.0033	0.0157	0.0035	0.0148	. . . . .	. . . . .	. . . . .	Cucumber taste.
October 26, 1875 . . .		0.0033	0.0192	0.0033	0.0187	. . . . .	. . . . .	. . . . .	Cucumber taste.
October 30, 1875 . . .		0.0033	0.0240	0.0033	0.0133	3.56	1.48	5.04	Cucumber taste.
November 1, 1875 . . .		0.0033	0.0173	0.0033	0.0176	3.24	1.32	4.56	No taste.
December 17, 1875 . . .		{ . . . . .	{ . . . . .	. . . . .	. . . . .	2.56	1.80	4.36	No taste.
October 27, 1875 . . .	Gate-house at Lake . . .	0.0059	0.0197	0.0059	0.0165	3.04	1.14	4.18	No taste.
October 27, 1875 . . .	Gate-house at Bradlee Basin . . . . .	0.0048	0.0177	0.0048	0.0155	2.92	1.28	4.20	Cucumber taste.
October 27, 1875 . . .	Gate-house at Brookline Reservoir . . . . .	{ . . . . .	{ . . . . .	. . . . .	. . . . .	3.40	1.36	4.76	No taste.
April 1, 1876 . . . . .	Bradlee Basin, centre, 12 feet from surface . . . . .	0.0020	0.0160	0.0024	0.0128	2.40	1.64	4.04	No taste.
April 1, 1876 . . . . .	Gate-house, Bradlee Basin, at surface . . . . .	0.0032	0.0200	0.0036	0.0172	2.64	1.64	4.28	No taste.

## REPORT OF DR. FARLOW.

To PROF. W. R. NICHOLS:—

DEAR SIR,—I have the honor to transmit the results of the examinations made by me at your request, by order of the Board of Water Commissioners of the City of Boston. The object of the examination was to ascertain, if possible, whether the peculiar taste of the Cochituate water, known as the "cucumber" taste, arose from any vegetable matter or organism, which could be detected by the microscope. Having been informed by you that the taste was confined to the water of the Bradlee basin, I went to Chestnut Hill to examine that basin. The arrangements for surface drainage were explained to me by Mr. FitzGerald, and it seemed highly improbable that anything could have been washed into the reservoir from the surrounding land; and, as the taste was not found in the water of the aqueduct above, it was evident that the cause of the trouble must be looked for in the Bradlee basin itself. I tasted of the water at the surface, and at the bottom in different parts of the basin. It seemed to me that the taste was decidedly stronger on the surface than at the bottom; but this opinion was not confirmed by Mr. FitzGerald, who was with me at the time. I took away with me a quantity of water and some of the deposit at the bottom for examination. Since, I have examined two cloths which had been allowed to remain some hours on the gratings of the Bradlee basin and the Brookline reservoir [*i. e.*, on the wire-screens in the gate-houses. W. R. N.]; a number of bottles containing specimens of water, and the deposit from the last-named reservoir; and, finally, material collected on sponge-filters at Brookline and at Chestnut Hill. As would naturally be supposed, the largest amount of floating material was collected by the sponge-filters, but, except as regards quantity of material, the results were the same. It will be borne in mind that I am speaking only of the *vegetable matter* in the water.

*First.* In neither reservoir, the Bradlee basin nor Brookline, was there found any peculiar vegetable organism such as might not be expected in any fresh-water pond of this region.

*Second.* The plants found in both reservoirs were practically the same, consisting mainly of unicellular and filamentous algæ and fragments of higher plants. The algæ belonged, principally, to the orders *Palmellaceæ*, *Diatomaceæ* and

*Conjugatæ*. Of the *diatoms*, which were more numerous than any other plants, I need mention only *Stephanodiscus Niagara*, *Asterionella formosa* and a small *Melosira*, which were much more abundant than any other species, both floating, and in the deposits of the Brookline reservoir as well as of the Bradlee basin. The *Conjugatæ* were principally *desmids* belonging to the common genera *Desmidium*, *Sphærozozma*, *Xanthidium*, *Closterum*, *Micrasterias*, besides a species of *Spirogyra*, the largest alga found, which occurred in small quantities in the water of both reservoirs, but which was found, at one time, in a considerable mass by Mr. FitzGerald in the Bradlee basin. Of flowering plants, with the exception of a *Potamogeton* found in the Bradlee basin, only fragments were seen. From the enumeration just given, it will be seen that there is nothing which, under ordinary circumstances, could produce the cucumber taste. The algæ which most commonly produce disagreeable odors and tastes belong to the order *Nostochineæ*, but none of these were seen in the water examined microscopically, nor have they been observed in any part of the reservoir. The alga vulgarly called "frog-spawn," *Batrachospermum moniliforme*, being unusually abundant in brooks in the town of Newton, it occurred to me that there might be a quantity of this plant growing concealed in the Bradlee basin. Experiments with the frog-spawn, however, show that when decaying, the plant gives to water a peculiar taste, but not that complained of in the Cochituate water.

*Third.* — Looking at the relative quantity of vegetable matter, much more was found in the Brookline reservoir than in the Bradlee basin. This is accounted for by the fact, of which I was not aware at the beginning of my observations, that the Brookline reservoir has not been cleaned out for quite a number of years, and has a large deposit on the bottom. The water of the Bradlee basin is unusually clear and free from vegetable matter, particularly fragments of leaves.

*Fourth.* — Although the species of plants in the Bradlee basin are not such as would naturally produce any "cucumber" taste in the water, the question arose whether it might not be caused by them when in a state of decomposition. It was, principally, for the purpose of settling this point that comparative examinations were made of the water in the Bradlee basin and that in the Brookline reservoir. The vegetable matter in *both* cases was often far advanced in decomposition, as was shown by the presence of oil in the cells of the algæ. Some of the oil in the water was undoubtedly

due to other causes than vegetable decomposition but some must certainly be attributed to that cause. The quantity of oil seemed to me somewhat greater in the Bradlee basin than in the Brookline reservoir, but on the supposition that the oil causes the cucumber taste, how are we to account for the lack of taste in the Brookline reservoir?

In conclusion, I would give it as my opinion that the cucumber taste is not caused by the presence of any living plant nor by any plant undergoing any form of decomposition which can be detected by the microscope. Repeated examinations of the water and deposit have shown practically the same result in the case of the Bradlee basin where the taste is very marked and in the the Brookline reservoir where it is entirely wanting. As no additional light seems likely to be thrown upon the subject by further botanical investigation, I should hardly think it advisable to spend more money in that direction. Certainly, if any further investigations are to be made, there is no probability of obtaining any definite results from the botanical side of the question, unless a long time — several months, or even years — is devoted to the subject.

Respectfully submitted.

(Signed)

W. G. FARLOW.

Dec. 14, 1875.

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## REPORT OF MR. BURGESS.

To PROFESSOR W. R. NICHOLS:—

DEAR SIR:—I beg to present the following report in answer to the question you have asked me to consider, viz.: "Is there any reason to attribute the disagreeable taste of the water in the Bradlee basin at Chestnut Hill to its animal inhabitants?"

As nothing abnormal in the condition of the fishes of the basin is known, my attention has been wholly devoted to the smaller animals and, chiefly, to the crustacea, since in 1854 some of the gentlemen busied with the solution of the so-called "cucumber taste" question asserted that a species of cyclops, a very common genus of Entomostraca, was the cause of the trouble. They believed that the cyclopes in the Cochituate water then examined, contained an unusual amount of oily matter, and they stated that if a few of these animals were crushed and placed in distilled water, the "cucumber taste" was produced. Without opening the question

as far as concerns that time, the following examinations show that this theory fails to adapt itself to present facts.

Specimens of Entomostraca were collected between November 6 and November 8 in both the Bradlee basin, to which the cucumber taste is confined, and in Lake Cochituate, whose water is tasteless, and sent to me in bottles of their respective waters for comparison. It may be observed here that Entomostraca are scarce in our water-supply this season, while I have known seasons when it was impossible to draw a glass of water without obtaining some of these little animals. In the bottle of lake water I found Entomostraca belonging to the genera *Latona*, *Bosmina*, *Daphnia*, *Diaptomus* and *Cyclops*, while the water from the Bradlee basin contained the last two genera only: in later specimens from the basin, however, *Latona* and *Daphnia* were also found. The species of these genera were alike from both localities and the individual specimens showed no distinguishing peculiarities while the cyclops from the lake were quite as oily\* as those from the basin. I crushed several of the latter and placed them on my tongue but could detect no taste of any kind. It is interesting also to note that the water sample from the basin, although tasting strongly when given to me, had, by December 20, become perfectly tasteless, while living specimens of cyclops and diaptomus were quite as numerous as at first.

For the sake of further comparison, I have also examined specimens of water and sediment from the bottoms of the Bradlee basin and the Brookline reservoir. The former sample (*i. e.* from the Bradlee basin) contained cyclops, fairly abundant, and a few infusoria. The sediment consisted chiefly of inorganic matter with a small amount of vegetable matter, for the most part in a state of decomposition. The sample from the Brookline reservoir contained an equally large number of cyclops and swarmed with a small species of *Cypris* (also a genus of Entomostraca), besides containing various infusorians, insect larvæ, etc.: in short, the amount of animal life was very large in comparison with the basin sample. The sediment was chiefly vegetable matter and contained common desmids, diatoms and other algæ living and dead, but of which it is unnecessary to speak, as I understand the botany of our water-supply is being investigated by Dr. Farlow. This sediment also contained plenty of entomostracan remains.

I have also examined the following material from the Bradlee basin with similar negative results.

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\*All Entomostraca contain oil, the amount varying with supply of food.

November 10. Sample of surface water containing a large quantity of cinders and tasting strongly. Latona, daphnia, and cyclops were present, but of perfectly normal appearance. A sample of bottom sediment of about the same date seemed to contain little besides vegetable matter with a very few infusoria and a very few remains of Entomostraca.

A quantity of slime, collected by a sponge-filter, November 20, was also found to be almost exclusively vegetable matter, which seemed to me, I may observe, rather unusually oily. A few living cyclops, rotifers and infusoria were found here, as well as a small amount of entomostracan remains, but neither living or dead Entomostraca were as abundant as I have usually found them while collecting these animals by filters from our water in previous years.

Samples of slime scraped, November 29, from the wooden bars crossing the screens in the gate-house and which gave an extremely strong cucumber taste, like the last sample, contained little else than desmids, diatoms and other vegetable organisms; while of animals a few infusoria, rotifers, a worm or two, and portions of latona shells were alone noticed.

Besides the samples already referred to, pieces of cloth which had been placed over the screens at the outlets of the Brookline reservoir and Bradlee basin were also given me, but these had already become dry before I saw them, and a soaking revealed only a small quantity of entomostracan remains, with a few insect larvæ, etc., and showed no difference between the cloths from the two localities in these respects.

I should state that repeated examinations have been made of each sample referred to, in order to be sure of a fair average result.

It will, therefore, be seen that all examination, so far, has been unable to detect either the presence of unusually large numbers of microscopic animals of any kind, or any abnormal appearances in those which have been noticed. The theory that a peculiarly oily condition of any species of Entomostraca is correlated with the "cucumber taste" is, in this case at least, entirely without foundation.

To your question, heading this report, I am obliged to give a decided negative answer.

Yours very truly,

(Signed)

EDWARD BURGESS.

Boston, Dec. 29, 1875.

REPORT OF THE SUPERINTENDENT OF THE  
WESTERN DIVISION.

WESTERN DIVISION BOSTON WATER WORKS,  
May 1, 1876.

HON. L. MILES STANDISH,

*President of the Cochituate Water Board:—*

SIR,—In compliance with the rules of the Board, I respectfully submit the following report for the past official year.

LAKE COCHITUATE.

Owing to the temporary connection with Sudbury river, we have had practically a full lake during the whole year. On May 1st, 1875, the water stood at 12 feet 4 inches; but before the middle of the month it had risen to high-water mark. This level was held till the 1st of July, from which time a gradual decline carried the water to 8 feet 9 inches on January 13, 1876, the lowest point reached during the year.

An inspection of the following table of the quantity of water received from the Sudbury will show that if it had not been for this source of supply, the city would have been in as bad a position during the past winter as it was the year before, when pumping was resorted to for three months.

Water was run into the lake from the Sudbury river during—

8 days in May . . . . .	203,100,000 gallons.
8 “ “ June . . . . .	144,300,000 “
18 “ “ July . . . . .	323,100,000 “
25 “ “ August . . . . .	393,100,000 “
10 “ “ October . . . . .	158,800,000 “
18 “ “ January . . . . .	435,200,000 “
19 “ “ February . . . . .	491,400,000 “
4 “ “ March . . . . .	22,000,000 “
Total . . . . .	<hr/> 2,171,000,000 “



On the 21st of March, 1876, occurred the first of a series of freshets. The amount of rain and snow at the lake was only 2.27 inches, but the water ran off the surface of the ground so rapidly, that it rose from 11 feet 1 inch on the 21st, to 12 feet 10 inches on the 25th; a gain of 21 inches in four days. During a part of this time the lake filled thirteen inches in twenty-four hours. The succeeding large rainfalls, which caused so much damage throughout the country, passed over our dams without doing any injury. The amount of waste at the lower dam varied from 10 inches to 21 inches, covering a period of eighteen days.

The lake now stands five inches below high-water.

In the autumn of 1875, an iron weir was put in at the lower dam to measure more accurately the waste from the Cochituate water-shed in times of flood when we are unable to store the water.

The weir is cast in one piece, 23 feet in length. A brass bushing at the top forms the overflow. The work was done in a most creditable manner by the Boston Machine Company. The weir was carefully levelled and straightened before bolting to the masonry. A gate was added in the centre compartment of the dam. It is worked from a bridge spanning the opening, and is arranged to travel on a screw without interfering with the flow over the weir. We were not obliged to open it during the recent floods.

The negotiations for the sale of the lands around Dug Pond to Natick, which were pending last year, were consummated February 19, 1876, by the payment of \$3,644.13.

Some slight improvements have been made at the lake in the way of fences and the setting out of trees.

### THE AQUEDUCT

has been run under a head during nearly the whole year to keep up with the increased consumption. The head has varied from 14 inches during the summer and autumn to 26 inches during the winter.

The water has been shut off for examination and repairs but twice: on July 13, the gates were closed for six hours, at which time the water was wasted only between Grantville and Newton Lower Falls; on July 27, the connections were made with the siphon-chambers of the new 40-inch pipe, and a careful examination made of the whole aqueduct.

The following reports from Messrs. Stearns and Rice, who made the examinations, will show that there has been no material change in the brick-work since the previous inspection:—

*Examination, by Mr. F. P. Stearns, of Cochituate Conduit from Dedman's Brook to Grantville Waste Weir, July 27, 1875.*

STATION.	HEIGHT.	WIDTH.	REMARKS.
			Entered Conduit, at Dedman's, at 10.20 A.M.
157	6.33	5.07	
158	6.34	5.05	
			Slight crack in top from Station 157 + 05 to 158 + 40.
162	6.35	5.04	
			Slight crack in top from 163 + 50 to 163 + 75.
164	6.32	5.09	
167 + 10	6.36	5.16	Crack in side 10 feet long.
168	6.31	5.13	
			Slight crack in top from 169 + 05 to 170 + 65.
172	6.30	5.23	
173	6.32	5.14	
173 + 75	6.21	5.23	Cracks in top and bottom from 173 + 20 to 174 + 40. Widest at 174 + 10.
174	6.18	5.31	
174 + 10	6.21	5.30	
175	6.26	5.18	
177	6.33	5.05	There are cracks in the top from 177 + 85 to 181 + 50, but the form is good.
179	6.31	5.10	
180	6.35	5.07	
182	6.33	5.05	
183	6.32	5.06	Slight crack in top from 182 + 55 to 183 + 50
184	6.31	5.02	
194	6.31	5.00	
			Piles of mud and telegraph wire between 194 and 195.
196 + 15	6.38	5.02	
200	6.34	5.00	
207	6.30	5.06	Slight crack in top from 206 + 60 to 208 + 20.
208	6.31	5.11	
216	6.33	5.03	
223	6.32	5.10	
241	6.31	5.03	
			Slight crack in top from 240 + 70 to 241 + 40.
242	6.39	4.99	Slight crack in top from 245 + 40 to 245 + 70.
246	6.29	5.17	
247 + 05	6.27	5.15	

*Examination by Mr. F. P. Stearns. — Continued.*

STATION.	HEIGHT.	WIDTH.	REMARKS.
			Slight crack in top from 247 + 30 to 247 + 80.
			Slight crack from 248 + 40 to 249.
249	6.33	5.04	
253	6.28	5.05	
254	6.24	5.21	
255	6.33	5.09	
255 + 40	6.27	5.16	
256	6.33	5.07	
257	6.32	5.04	
258	6.32	5.02	
273	6.32	5.16	
297	6.23	5.11	
298	6.33	5.06	
			SECOND DIVISION.
			Large springs, bringing in but little sand, from 0 to 1.
1	6.17	5.05	
2	6.19	5.02	
3 + 35	6.19	5.06	Spring.
5	6.28	5.03	
12 + 60	6.20	5.15	Large springs.
13	6.15	5.19	
13 + 55	6.13	5.20	Large spring.
			Crack in top from 13 + 10 to 13 + 80.
16	6.13	5.19	Crack in top from 15 + 90 to 16 + 40.
16 + 50	6.18	5.13	
17 + 50	6.19	5.15	Large crack in top from 17 + 50 to 18.
18 + 50	6.13	5.19	Crack in top from 18 to 18 + 70.
20	6.33	5.00	
			Arrived at Grantville Waste Weir at 3.50 P.M.

NEWTON CENTRE, MASS., July 27, 1875.

MR. D. FITZ GERALD, *Supt. Western Division*: —

DEAR SIR, — At your request have made an examination of the Cochituate conduit from the east siphon chamber, Newton Lower Falls, to the intermediate gate-house at Chestnut-Hill reservoir, and find the conduit in about the same condition as at a previous examination in April, 1874.

The only noticeable changes are the more cleanly condition of the conduit, and the comparatively small amount of water running in from the outside through the joints, cracks, etc.

Entered the east siphon chamber with two assistants at 10½ o'clock, A.M., there being about nine inches of water in the conduit. Commenced to take readings (with same rod used in 1874) of the maximum depths and widths of the conduit, at Station 145, and made the following notes of the changes, etc., not previously reported: —

STATION.	DATE.	SIZE.	REMARKS.
145 . . . . .	July 27	6.36 × 5.05	
176 to 182 + 83	"	. . . . .	Roots.
200 . . . . .	"	6.32 × 5.00	
210 . . . . .	"	6.29 × 4.99	
224 . . . . .	"	. . . . .	Roots.
230 . . . . .	"	6.31 × 5.00	
231 + 63 . . .	"	. . . . .	Crack in top for 20 feet.
244 . . . . .	"	. . . . .	Cracks north and south of manhole.
250 . . . . .	"	6.32 × 5.06	
254 . . . . .	"	. . . . .	Crack has increased in width.
254 to 262 . . .	"	. . . . .	No water running in from outside.
260 . . . . .	"	6.32 × 5.07	
			Arrived at Newton Centre Waste Weir at 2.10 P.M. Re-entered Conduit at 3 P.M.
20 . . . . .	"	6.30 × 5.04	
30 . . . . .	"	6.34 × 5.09	
35 + 85 . . . .	"	. . . . .	Small stream left side.
40 . . . . .	"	6.34 × 5.09	
41 + 40 . . . .	"	. . . . .	No water from manhole.
			<i>Newton Tunnel.</i> —No springs from manhole west of tunnel. Several inches of mud whole length of tunnel; more than at previous examination in 1874.
89 + 65 . . . .	. . . . .	. . . . .	Roots.
90 . . . . .	. . . . .	6.35 × 5.03	
100 . . . . .	. . . . .	6.37 × 5.06	
118 to 129 + 20	. . . . .	. . . . .	Cracked the whole length.

Arrived at the intermediate gate-house at 6 P.M.

Yours truly,

GEORGE S. RICE.

The flap-gates at the east-pipe chamber were repaired while the water was shut off. They were in bad order. The joints on the inside of the chamber were thoroughly filled and pointed. Pipe-gauges corresponding to that at the lake were put in at the same time, and lead pipes conducted to points beyond the junctions of the 40-inch main, giving the levels of the water at those places. During the summer the boundary lines on the aqueduct, between Wellesley and Brookline reservoir, were run out and stone bounds set at all the corners. A list of encroachments on the city property has been presented to the Board.

#### CHESTNUT-HILL RESERVOIR.

This reservoir has been shut off from the city for five months. On Oct. 30, the bad taste to the water, which had caused some annoyance, was located at Chestnut Hill. The water was shut off, and the bad taste, resembling cucumber, ceased. During the time that the gates at the reservoir remained closed a trial was made of the water by letting a small amount pass into the pipes, but it was quickly noticed in the city and the gates were again closed. The water in the reservoir gradually purified itself, and on April 1 it was turned on permanently to the distribution.

On July 8, a heavy plank platform was sunk, by a diver, over the reservoir inlet to the drain-pipe chamber of the lower basin. It is so arranged as to be readily found and dragged off whenever it becomes necessary. A heavy ox-chain loop 11 feet long is attached to one end, and a 4-inch by 4-inch pole, 15 feet long, fastened to the other. There is an iron ring 12 inches in diameter at the extremity of the pole.

Another of the revolving screens has been replaced in the effluent gate-house.

The outfall to the large sewer has been improved by digging out the brook channel and walling up the sides for a short distance. The fence around the reservoir grounds needs rebuilding. Lengths of it are blown down every little while by the wind. It is built of spruce posts 4 inches by 4 inches, sharpened, and driven into the ground 18 inches with a maul.

Some preparations have been made this spring for a systematic course of tree-planting in certain portions of the grounds, both at Chestnut Hill and the lake. I am much indebted to Prof. C. S. Sargent, for valuable advice on this subject, and also for the present of a thousand rare trees

and shrubs for this purpose. More than six thousand trees have been set out, at very little cost to the city. A row of centennial elms has been set out around the county road.

### BROOKLINE RESERVOIR

is in as good condition as usual. Nothing in the way of improvement has been done to this reservoir, except by removing some trees which were injuring others and planting handsomer ones in better locations.

The usual list of property is added.

Very respectfully yours,

DESMOND FITZGERALD,  
*Supt. West. Div.*

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### SCHEDULE OF PROPERTY AT LAKE COCHITUATE.

1 parlor-table, 1 looking-glass, 1 stove, 1 extension-table, 18 chairs, 1 map, 1 oil-cloth carpet, 1 cooking-range, 1 marble-slab and wash-bowl, 1 horse, 1 buffalo-robe, 1 carry-all, 1 express-wagon, 1 pung, 1 express-harness, 1 light harness, 1 tipcart harness, 1 rain-gauge, 1 scale, 3 lanterns, 5 pair rubber boots, 5 bars, 5 hand drills, 6 steel points, 2 sledge-hammers, 2 hand-hammers, 7 picks, 2 grub-hoes, 2 iron rakes, 6 hoes, 1 coal-shovel, 2 spades, 2 square-point shovels, 2 long-handle shovels, 4 stop-plank hooks, 2 ice-hooks, 8 buckets, 8 brooms, 7 wheelbarrows, 2 gravel-screens, 2 sieves, 2 boats, 2 pump-frames, 1 double pulley, 3 ox-chains, 1 telegraph battery, 1 hand-saw, 1 manure-fork, 2 hay-forks, 1 stone-roller, 1 grindstone, 1 scythe, 2 brushes, 1 spirit-level, 3 axes, 1 drain-mould, 2 engines, 3 18-inch pumps, 3 12-inch pumps, 1 7-inch pump, 1 pair of hedge-shears, 2 ice-chisels, 7 lamps, 14 chimneys, 4 lamp tops, 2 reflectors, 4 carriage-lamps, 14 glass oil-cups, 1 pair lamp-shears, 1 bitt-punch, 4 doz. wicks, 2 steam-gauges, 8 lamp-brackets, 2 lamps, 9 reflectors, 6 engine-belts.

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### SCHEDULE OF PROPERTY AT CHESTNUT-HILL RESERVOIR.

1 two-horse express-wagon, 1 single ditto, 1 water-cart, 2 two-horse water-carts, 2 iron road-rollers, 1 single horse

pung, 1 two-horse pung, 1 horse truck, 1 horse power, 3 horse carts, 1 hay-wagon, 2 hand-carts, 1 pair large wheels, 1 two-horse sled, 1 two-horse plow, 1 drag, 1 Concord wagon, 1 carryall, 1 top-buggy, 10 harnesses, 9 blankets, 1 rubber horse-covering, 7 horses, 1 tank, 7 gravel-screens, 15 ox-tie chains, 1 7-inch pump, 2 5-inch pumps, 1 house force-pump, 1 raking-pump, 1 feed-pump, 1 force-pump, 1 garden-engine, 2 Johnson's pumps, 4 clay-knives, 1 stone-crushing machine and castings, 1 blacksmith's forge and tools, 1 derrick and rigging, 1 man-head, 2 grub-axes, 35 picks, 42 shovels, 13 spades, 6 hoes, 27 iron bars, 12 iron-rakes, 9 stone-hammers, 18 wooden rakes, 4 border-knives, 1 root-puller, 7 snaiths, 2 scythes, 10 scythe-stones and rifles, 3 lawn-mowers, 8 hay-forks, 6 lanterns, 6 oil-cans, 3 reflectors, 8 peat-knives, 6 tin dippers, 35 drills, 9 tin candlesticks, 18 fire-buckets, 10 pails, 12 rattan-brooms, 6 wooden rammers, 8 wheelbarrows, 8 ladders, 2 grindstones, 2 jack-screws, 1 window-brush, 10 paint-brushes, 1 telegraph battery, 7 rubber coats and caps, 11 pairs of rubber boots, 1 rain-gauge, 1 set scales, 1 safe, 1 clock, 2 bushel baskets, 1 4-bushel basket, 2 hay ropes, 1 20 h. p. engine, 1 12 h. p. engine, 1 6 h. p. engine and pump, 6 ft. 18 in. Scotch pipe, 42 ft. 15 in. ditto, 9 ft. 30 in. cement pipe, 30 gals. of raw linseed oil, 1 gal. of varnish, 150 lbs. of green paint, 1 gal. of Japan, 1 sand pump, 21 lbs. of candles, 10 padlocks, 2 boats, 9 ice-hooks, 3 ice-chisels, 6 brooms, 1 ice-saw, 25 gals. of asphaltum. Carpenter tools as follows: 15 bits, 2 chisels, 5 planes, 2 saws, 1 hand ax, 6 augers, 1 cross-cut saw, 3 kegs of nails.

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#### SCHEDULE OF PROPERTY AT BROOKLINE RESERVOIR.

1 writing-desk, 1 book, 1 pen-stand, 1 ink-bottle, 1 pitcher and glass, 1 spittoon, 1 lamp, 1 stove, 1 coal-hod, 1 fire-shovel, 1 poker, 1 stove-brush, 2 settees, 4 iron rods, 2 towels, 2 floor-mats, 1 scythe, 2 shovels, 1 pick, 1 lawn-mower, 1 iron rake, 1 wooden rake, 1 hoe, 1 sickle, 1 scuffler, 1 pail, 2 ladders, 1 sponge, 1 pair clipping shears, 1 dust pan and brush, 1 bushel basket, 1 border-knife, 1 wheelbarrow, 1 dusting-brush, 1 spade, 1 common broom, 1 coarse broom, 3 scrubbing-brushes, 1 sprinkler, 1 axe, 1 chair.



## WATER REGISTRAR'S REPORT, 1875-76.

WATER REGISTRAR'S OFFICE,  
BOSTON, May 1, 1876.

L. MILES STANDISH, Esq.,

*President of the Cochituate Water Board: —*

SIR, — The undersigned, in compliance with the provisions of the ordinance providing for the care and management of the Cochituate Water Works, respectfully report: —

The total number of water-takers now entered for the year 1876 is 46,885, being an increase since January 1, 1875, of 2,209.

The total number of cases where the water has been turned off for non-payment of rates during the year ending January 1, 1876, is 1,888.

Of this number, 1,435 have been turned on, leaving a balance of 453 still remaining off.

The total amount of water-rates received from April 30, 1875, to May 1, 1876, is	\$1,036,187 98
Of this amount there was received for water used in previous years the sum of	\$67,320 42
Leaving the receipts for water furnished during the year ending April 30, 1876, the sum of	968,867 56
Amount paid Mystic Water Board for the year ending April 30, 1876, as per contract	31,246 75
In addition to the above there has been received for turning on water in cases where it had been off for non-payment of rates, the sum of	2,900 00
<i>Carried forward</i>	\$1,039,087 98

<i>Brought forward</i> . . . . .		\$1,039,087 98
Received for summons from April 30, 1875, to May 1, 1876 . . . . .	2,197 25	
Received for summons issued in previous years, the sum of . . . . .	9,996 00	
	<hr/>	12,193 25
		<hr/>
		\$1,051,281 23

The increased amount of income for the year ending April 30, 1876, over the previous year is . . . . .		48,228 13
The total amount of assessments now made for the present year is . . . . .		855,080 69
The estimated amount of income from the sales of water during the financial year 1876 and 1877 is . . . . .		1,075,000 00
The expenditures of my office during the year 1875 have been ; . . . .		24,328 17

The total number of meters now applied to the premises of water-takers is 1,120. Of this number 731 are  $\frac{5}{8}$ -inch, 329 1-inch, 44 2-inch, 14 3-inch, 2 4-inch.

#### DRINKING FOUNTAINS.

There are 34 drinking-fountains now established within the city limits.

\*Common (6).

Tremont street, near Clarendon street.

Beacon street, near Charles street.

Washington street, near Blackstone square.

Charles street, near Boylston street.

“ “ between Boylston and Beacon streets.

“ “ opposite jail.

Commercial street, junction Atlantic avenue.

Albany street, opposite City Hospital.

Mt. Washington avenue, near the bridge.

Foundry street, near First street.

Washington Village, junction Dorchester avenue and Dorchester street.

Telegraph hill, South Boston.

Eustis street, corner Washington street.  
\*Eliot square, opposite Norfolk House.  
Pyncheon street, opposite Roxbury street.  
Tremont street, junction of Cabot street.  
Beacon street, junction of Brookline avenue.  
Commercial street, opposite Beach street, Dorchester.  
Upham's Corner, Dorchester.  
Glover's Corner,        "  
Grove Hall,            "  
Maverick square, East Boston.  
Central square,        "  
Bennington street, junction Chelsea street, East Boston.  
Albany street, junction of Dearborn street.  
Washington street, near Elm street.  
Neponset avenue, corner Walnut street.

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Those marked thus \* are arranged for a continuous flow of water. The balance have automatic fixtures, operating the flow of water when required.

The following table exhibits the class of premises to which meters are attached, together with the amount of revenue received during the year 1875:—

NAME.	CLASS.	Indicator.					TOTAL.	GALLONS.	REVENUE.
		5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.			
Revere House . . . . .	Hotel . . . . .		3			1	4	11,016,997	\$3,305 08
American House . . . . .	" . . . . .		2	1	1		4	7,325,382	2,197 57
Parker House . . . . .	" . . . . .		1	4			5	11,329,079	3,398 71
U. S. Hotel . . . . .	" . . . . .		3				3	3,969,749	1,190 91
Tremont House . . . . .	" . . . . .		2	3			5	9,978,749	2,933 61
Young's Hotel . . . . .	" . . . . .		1	2			3	3,054,581	916 35
Adams House . . . . .	" . . . . .		2	1			3	3,033,671	910 09
Hotel Berkley . . . . .	" . . . . .		1	1	1		3	3,502,326	1,050 68
Marlboro' House . . . . .	" . . . . .		1				1	1,716,674	514 99
Albion Building . . . . .	" . . . . .		1				1	695,351	208 60
Central House . . . . .	" . . . . .		1				1	224,587	67 37
Hotel Pelham . . . . .	" . . . . .		1	3			4	1,405,417	421 60
Hotel Boylston . . . . .	" . . . . .		1				1	1,991,863	597 54
La Grange House . . . . .	" . . . . .		1	1			2	319,806	95 91
St. Cloud . . . . .	" . . . . .		2				2	573,794	172 11
Hotel Clarendon . . . . .	" . . . . .		1			1	2	2,616,007	784 78
Seaver House . . . . .	" . . . . .		1				1	259,393	77 81
Evans House . . . . .	" . . . . .		2				2	1,288,491	386 52
William Pfaff . . . . .	" . . . . .		1				1	274,057	82 20
Hotel Kempton . . . . .	" . . . . .		1	1		1	3	1,113,312	333 99
Hotel Hamilton . . . . .	" . . . . .		1	1		1	3	1,743,847	523 14
Hotel Vendome . . . . .	" . . . . .		2				2	2,721,127	816 31
Coolidge House . . . . .	" . . . . .		5			2	7	1,042,754	312 81
Hancock House . . . . .	" . . . . .		1				1	133,626	40 07
Merrimac House . . . . .	" . . . . .		1				1	433,709	130 10
Temple House . . . . .	" . . . . .		3				3	727,334	218 17
Hotel Belmont . . . . .	" . . . . .		1				1	790,754	237 21
Hotel Alexander . . . . .	" . . . . .		1			1	2	183,757	55 12
Hotel Brunswick . . . . .	" . . . . .		1				1	243,007	72 90
Park's Hotel . . . . .	" . . . . .		2				2	417,294	125 17
Derby House . . . . .	" . . . . .		3				3	494,009	148 18
<i>Amount carried forward.</i> . . . .								74,620,514	\$22,385 60

NAME.	CLASS.	Indicator.				TOTAL.	GALLONS.	REVENUE.
		5-8 inch.	1 inch.	2 inch.	3 inch.			
<i>Amount brought forward</i> . . . . .							74,620,514	\$22,385 60
Merchants' Hotel . . . . .	Hotel . . . . .	1	.	.	.	.	198,179	59 44
M. J. Flatley . . . . .	" . . . . .	1	.	.	.	.	180,007	53 98
New England House . . . . .	" . . . . .	.	1	.	.	.	556,709	167 00
Winthrop House . . . . .	" . . . . .	1	.	.	.	.	451,859	135 53
Dooley's Hotel . . . . .	" . . . . .	1	.	.	.	.	69,112	20 72
Commercial House . . . . .	" . . . . .	.	2	.	.	.	408,157	122 43
Job A. Turner . . . . .	" . . . . .	.	1	.	.	.	425,369	127 60
Milliken House . . . . .	" . . . . .	.	3	.	.	.	526,401	157 90
Sherman House . . . . .	" . . . . .	.	3	.	.	.	1,586,894	476 04
Everett House . . . . .	" . . . . .	.	1	.	.	.	222,209	66 64
Metropolitan House . . . . .	" . . . . .	.	2	.	.	.	936,783	281 01
Commonwealth Hotel . . . . .	" . . . . .	.	2	.	.	.	2,083,962	625 18
Thomas L. Robinson . . . . .	" . . . . .	1	.	.	.	.	25,244	7 57
St. James Hotel . . . . .	" . . . . .	.	4	.	.	.	5,173,681	1,552 08
Massachusetts House . . . . .	" . . . . .	1	.	.	.	.	81,486	24 42
Bay State House . . . . .	" . . . . .	1	1	.	.	.	447,411	134 20
Mariners' House . . . . .	" . . . . .	1	.	.	.	.	166,003	49 79
Robertson House . . . . .	" . . . . .	.	2	.	.	.	237,193	71 14
Boston Hotel . . . . .	" . . . . .	.	3	.	.	.	780,389	234 10
Creighton House . . . . .	" . . . . .	.	2	.	.	.	667,079	200 10
Van Rensselaer . . . . .	" . . . . .	.	2	.	.	.	438,809	131 62
Quincy House . . . . .	" . . . . .	.	3	2	.	.	2,307,089	692 11
Marston House . . . . .	" . . . . .	1	.	.	.	.	755,526	226 63
Stumcke & Goodwin . . . . .	" . . . . .	.	3	.	.	.	3,345,764	1,003 71
Pavilion House . . . . .	" . . . . .	.	1	.	.	.	449,478	134 82
Norfolk House . . . . .	" . . . . .	1	.	.	.	.	872,347	261 69
National House . . . . .	" . . . . .	.	1	.	.	.	466,605	139 96
Hotel Agassiz . . . . .	" . . . . .	.	1	.	.	2	1,617,801	485 32
Phillips House . . . . .	" . . . . .	1	.	.	.	.	103,177	30 94
Stinson House . . . . .	" . . . . .	1	.	.	.	.	103,596	31 07
Rutland House . . . . .	" . . . . .	1	.	.	.	.	530,746	159 20
John D. Miller . . . . .	" . . . . .	.	2	.	.	.	184,262	55 27
Hotel Marion . . . . .	" . . . . .	.	2	.	.	.	314,819	94 44
Moody Merrill . . . . .	" . . . . .	1	1	.	.	.	1,182,682	354 79
Old Colony and Newport Railroad Co. . . . .		6	3	2	.	.	23,401,176	7,020 31
<i>Amount carried forward</i> . . . . .							125,918,518	\$87,774 35

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									125,918,518	\$37,774 35
Boston and Albany Rail- road Co. . . . .		13	7	2				22	31,837,260	9,551 17
Boston and Maine Railroad Co. . . . .		1	3					4	4,853,287	1,455 97
Boston and Lowell Rail- road Co. . . . .			3	1		1		5	5,888,817	1,766 63
Fitchburg Railroad Co. . . . .			1	1				2	3,997,469	1,199 23
Eastern Railroad Co. . . . .		1	3	1				5	8,957,204	2,687 16
New York and New Eng- land Railroad Co. . . . .			1	1				2	9,618,997	2,885 68
Boston and Providence Railroad Co. . . . .		3	2	3				8	13,527,419	4,058 20
Boston, Revere Beach and Lynn Railroad Co. . . . .				2				2	871,290	261 38
Boston Gas Light Co. . . . .		1	4	1	1			7	37,362,734	11,208 81
South Boston Gas Light Co. . . . .		1	1					2	2,852,549	855 75
East Boston Gas Light Co. . . . .			1					1	1,312,303	393 68
Roxbury Gas Light Co. . . . .		2	1					3	1,767,042	530 07
Dorchester Gas Light Co. . . . .			1					1	1,070,064	321 00
Standard Sugar Refinery, Granite street . . . . .		1	3	1				5	53,693,295	16,107 96
Standard Sugar Refinery, Eastern Avenue . . . . .			1	1				2	948,165	284 44
Continental Sugar Refinery . . . . .				2				2	23,786,700	7,136 00
Bay State Sugar Refinery . . . . .				1				1	11,697,375	3,509 20
Oxnard Sugar Refinery . . . . .			3					3	4,286,774	1,286 01
Boston Sugar Refinery . . . . .				1				1	21,525,300	6,457 57
American Sugar Refinery . . . . .			1					1	991,336	297 38
Bay State Rolling Mill . . . . .			4	1	1			6	17,272,149	5,181 62
Norway Iron Works . . . . .		1	7	1				9	25,112,238	7,533 65
Highland Spring Brewery . . . . .	Brewery		1	2				3	6,780,642	2,034 17
Edward Habich . . . . .	"		1					1	3,503,116	1,050 91
Crystal Spring Brewery. Vacant . . . . .	"			1				1		
H. & J. Pfaff . . . . .	"			1				1	4,486,050	1,345 81
A. J. Houghton & Co., Hal- lock st. . . . .	"		1					1	668,151	200 42
A. J. Houghton & Co., Sta- tion st. . . . .	"		1					1	38,205	11 46
Boylston Brewery . . . . .	"		1					1	75,915	22 77
<i>Amount carried forward</i> . . . . .									424,700,364	\$127,408 45

NAME.	CLASS.	Indicator.					TOTAL.	GALLONS.	REVENUE.
		5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.			
<i>Amount brought forward</i> . . . . .							424,700,364	\$127,408 45	
Gottlieb Burkhardt . . . . .	Brewery . . . . .		1				871,342	261 39	
John Roessle . . . . .	" . . . . .		1				3,253,364	975 99	
Jones, Johnson & Co. . . . .	" . . . . .		1	1			4,430,556	1,329 14	
Boston Beer Co. . . . .	" . . . . .			2			5,082,547	1,524 74	
Conrad Decker . . . . .	" . . . . .		1				698,556	209 55	
Suffolk Brewing Co. . . . .	" . . . . .			1			3,157,575	947 26	
Burton Brewery . . . . .	" . . . . .		1				935,782	280 73	
Standard Brewery . . . . .	" . . . . .		1				1,370,431	411 12	
Vincent & Hathaway . . . . .	Beer Factory . . . . .		1				695,602	208 66	
Moses Fairbanks & Co. . . . .	" . . . . .		1				604,281	181 26	
Coburn, Lang & Co. . . . .	" . . . . .		1				443,737	133 11	
Comstock, Gove & Co. . . . .	" . . . . .		1				249,037	74 69	
Isaac Pratt, Jr. . . . .	Building . . . . .		1	1			1,018,987	305 68	
Wesleyan Association . . . . .	" . . . . .		3				596,797	179 01	
Tremont Temple . . . . .	" . . . . .		1	1			1,641,336	492 39	
S. S. Houghton & Co. . . . .	" . . . . .		1				847,349	254 18	
P. McAleer . . . . .	" . . . . .		2				394,457	118 31	
Smith & Porter . . . . .	" . . . . .		2				1,332,667	399 78	
T. H. Carter . . . . .	" . . . . .		2				886,304	265 87	
Boston Journal . . . . .	" . . . . .			1			1,598,737	479 61	
Joseph Byers . . . . .	" . . . . .		2				839,609	251 87	
N. E. Mut. Life Ins. Co., 39 State st. . . . .	" . . . . .		1				648,217	194 44	
N. E. Mut. Life Ins. Co., 70 State st. . . . .	" . . . . .		2				126,339	37 90	
N. E. Mut. Life Ins. Co., Milk st. . . . .	" . . . . .		1	1			166,935	50 08	
Horticultural Hall . . . . .	" . . . . .			1			294,472	88 32	
Suffolk National Bank . . . . .	" . . . . .		2	1			348,607	104 57	
Benjamin Leeds . . . . .	" . . . . .		2				434,204	130 24	
Stone, Bier & Weiss . . . . .	" . . . . .		2				277,777	83 32	
John Rayner, heirs . . . . .	" . . . . .		2				527,488	158 24	
Otis T. Ruggles . . . . .	" . . . . .		2				222,232	66 65	
B. B. Appleton, heirs . . . . .	" . . . . .		1				208,506	62 54	
J. W. Merriam . . . . .	" . . . . .		2				372,291	111 66	
R. H. Spaulding . . . . .	" . . . . .		2				308,309	92 47	
<i>Amount carried forward</i> . . . . .							459,584,844	\$137,873 22	

NAME.	CLASS.	5-8	1	2	3	4	Indicator.	TOTAL.	GALLONS.	REVENUE.
		inch.	inch.	inch.	inch.	inch.				
<i>Amount brought forward</i> . . . . .			1						459,584,844	\$137,873 22
Mrs. Ellen Brooks . . . . .	Building . . . . .							1	159,960	47 97
Oriental Tea Co. . . . .	" . . . . .	1						1	255,119	76 51
S. D. Hicks . . . . .	" . . . . .	2						2	1,344,045	403 19
John Stetson . . . . .	" . . . . .	1						1	1,155,356	346 59
Macullar, Williams & Parker . . . . .	" . . . . .	1						1	458,612	137 56
John F. Mills . . . . .	" . . . . .	1						1	323,819	97 12
Joshua Sears, estate . . . . .	" . . . . .	1						1	763,087	228 91
Lilly, Young, Pratt & Brackett . . . . .	" . . . . .	1						1	1,019,714	305 91
J. I. Brown & Son . . . . .	" . . . . .	1						1	320,616	96 17
Hogg, Brown & Taylor . . . . .	" . . . . .	1	1				1	3	3,054,254	916 25
A. Wentworth . . . . .	" . . . . .	2	1					3	270,667	81 18
William Ropes, estate . . . . .	" . . . . .	4	1					5	2,608,986	782 68
A. D. Puffer . . . . .	" . . . . .	1						1	329,369	98 80
Eastern Express Co. . . . .	" . . . . .	1						1	539,820	161 93
Grand Lodge of Masons . . . . .	" . . . . .	1	1					2	305,752	91 71
James W. Rollins . . . . .	" . . . . .	1						1	573,209	171 94
Haley, Morse & Co., 615 Washington st. . . . .	" . . . . .	2						2	211,371	63 39
Mass. Inst. of Technology . . . . .	" . . . . .	1						1	1,285,552	385 64
S. N. Brown, jr. . . . .	" . . . . .	1						1	290,992	87 23
A. H. Vinton . . . . .	" . . . . .	1						1	259,379	77 80
J. W. Pierce . . . . .	" . . . . .	1						1	279,435	83 82
B. F. Bradbury . . . . .	" . . . . .	1						1	319,881	95 95
Shepard, Norwell & Co. . . . .	" . . . . .	4						4	440,510	132 13
D. J. Hastings . . . . .	" . . . . .	1						1	299,871	89 94
C. U. Cotting, 628 Wash. st. . . . .	" . . . . .	5						5	479,879	143 94
C. U. Cotting, 7 Court sq. . . . .	" . . . . .	1	1					2	326,699	98 00
W. H. Mann . . . . .	" . . . . .	2						2	424,424	127 31
Hallett & Davis . . . . .	" . . . . .	1						1	157,342	47 13
P. Donahoe . . . . .	" . . . . .	1						1	616,379	184 90
Jonas Fitch . . . . .	" . . . . .	1						1	79,206	23 75
Samuel A. Way, estate . . . . .	" . . . . .	2						2	121,499	36 44
H. C. Stephens . . . . .	" . . . . .	1						1	905,032	271 49
Jordan, Marsh & Co., Washington st. . . . .	" . . . . .	4						4	584,947	175 46
<i>Amount carried forward</i> . . . . .									480,149,627	\$144,042 03



NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward . . . . .</i>									480,149,627	\$144,042 06
G. T. Burnham & Co. . . . .	Building . . . . .		1					1	286,532	85 94
G. D. Dowes & Co., vacant . . . . .	" . . . . .	1						1		
Stephen H. Bennett, heirs . . . . .	" . . . . .	2						2	734,271	220 27
J. P. Dimond . . . . .	" . . . . .	1						1	364,990	109 48
Taylor Page . . . . .	" . . . . .	1						1	193,499	58 02
Franklin Evans . . . . .	" . . . . .	2						2	331,207	99 34
J. Zane & Co. . . . .	" . . . . .	2						2	436,094	130 82
Metropolitan R.R. Co. . . . .	" . . . . .	1						1	50,459	15 12
Art Garden . . . . .	" . . . . .	1						1	2,033,939	610 16
Allen & Woodworth . . . . .	" . . . . .	1						1	157,326	47 18
Merchants' Exchange . . . . .	" . . . . .	1	1					2	2,095,019	628 49
J. J. Stevens . . . . .	" . . . . .	2						2	166,282	49 86
J. T. Brown & Co. . . . .	" . . . . .	1						1	327,434	98 18
J. C. Gray . . . . .	" . . . . .	3	1					4	587,721	176 29
C. F. Hovey . . . . .	" . . . . .	3	1					4	911,684	273 49
Adams, Taylor & Co. . . . .	" . . . . .	1						1	457,184	137 13
Globe Publishing House . . . . .	" . . . . .	1						1	499,822	149 93
J. M. Smith & Co. . . . .	" . . . . .	1						1	30,052	9 00
Charles Rollins . . . . .	" . . . . .	1						1	627,824	188 32
Adams Express Co. . . . .	" . . . . .	2	1					3	1,949,449	584 82
Wright & Potter . . . . .	" . . . . .	1						1	1,516,565	454 95
W. Blenkinsop . . . . .	" . . . . .	2						2	491,032	147 30
Boston Gas Light Co. . . . .	" . . . . .	2						2	112,341	33 68
Bellows & Wilson . . . . .	" . . . . .	1						1	286,282	85 86
L. P. Ober . . . . .	" . . . . .	1						1	467,692	140 29
R. T. Boardman . . . . .	" . . . . .	1						1	120,993	36 29
Young Men's Christian Association . . . . .	" . . . . .	1						1	150,845	45 23
A. A. Miner . . . . .	" . . . . .	1						1	200,022	59 98
Henry F. Miller . . . . .	" . . . . .	1						1	102,922	30 87
Art Building . . . . .	" . . . . .	1						1	8,655	2 59
Equitable Life Ins. Co., . . . . .	" . . . . .	2						2	102,096	30 62
Jordan, Marsh & Co., Kingston st. . . . .	" . . . . .	1						1	431,624	129 46
H. S. Lawrence . . . . .	" . . . . .	1						1	266,257	79 86
J. M. Beebe . . . . .	" . . . . .	1						1	84,847	25 44
<i>Amount carried forward . . . . .</i>									496,732,588	\$149,016 32

NAME.	CLASS.	Indicator.				TOTAL.	GALLONS.	REVENUE.
		5-8 inch.	1 inch.	2 inch.	3 inch.			
<i>Amount brought forward.</i>						496,732,588	\$149,016 32	
F. Tudor	Building	3				3	308,196 92 43	
Studio Building		1	2			3	639,014 191 69	
Boston Post Building			1			1	418,019 125 38	
Traveller Building		2	1			3	618,906 185 66	
Union Building		5				5	767,181 230 13	
Wentworth Building		1				1	331,791 99 53	
Rice Building			1			1	658,109 197 41	
Carter Building		2				2	275,053 82 49	
Edmunds Building		1				1	278,167 83 44	
Washington Building		3				3	650,504 195 13	
Niles Building			2			2	897,449 269 21	
Palmer's Building		1				1	419,361 125 80	
Joy's Building		3				3	270,502 81 14	
Sears Building		2	1			3	847,799 254 32	
Advertiser Building			1			1	877,859 263 34	
Charity Building		2				2	175,536 52 64	
Codman Building		7				7	862,335 258 69	
Transcript Building		1	1			2	517,694 155 28	
Merchants' Bank Building		1	1			2	1,627,770 488 31	
Paine Memorial Hall			1			1	69,082 20 71	
Chauncy Hall School		1				1	147,157 44 12	
Mass. General Hospital		2	4	1		7	4,268,901 1,280 66	
City Hospital		3	4			7	6,611,219 1,983 35	
Lunatic Hospital		1	3			4	2,569,919 770 96	
New England Hospital		1				1	584,369 175 29	
Notre Dame Academy		1				1	281,002 84 28	
St. Mary's Institute		2				2	106,192 31 85	
House of the Angel Guardian		1				1	361,207 108 35	
House of the Good Shepherd		1				1	178,455 53 52	
Home for Catholic Children			1			1	1,021,214 306 35	
Church Home		1				1	852,104 255 61	
Sailors' Home			1			1	500,917 150 26	
Temporary Home		1				1	328,439 98 51	
Somerset Club		2				2	1,186,336 355 88	
<i>Amount carried forward.</i>						527,240,346	\$158,168 04	

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									527,240,346	\$158,168 04
Union Club . . . . .		1						1	538,574	161 55
Temple Club . . . . .			1					1	369,764	110 91
Central Club . . . . .		1						1	111,914	33 55
Boston Music Hall . . . . .		3						3	986,316	295 88
Beethoven Hall . . . . .		1						1	58,529	17 53
City Hall . . . . .		1	2					3	1,010,609	303 17
State of Massachusetts . . . . .	State House	2	1					3	618,667	185 58
United States of America . . . . .	Post Office			1				1	990,000	296 98
Howard Athenæum . . . . .		1						1	104,924	31 45
Boston Theatre . . . . .		1	4					5	319,701	95 88
Globe Theatre . . . . .		4						4	350,925	105 25
Boylston Museum . . . . .		3						3	623,179	186 94
Boylston Market . . . . .		5						5	294,884	88 45
Washington Market . . . . .		1	1					2	926,134	277 82
Suffolk Market . . . . .		4						4	777,228	233 15
Franklin Market . . . . .		1						1	207,711	62 30
Williams Market . . . . .		3						3	1,480,566	444 15
Tremont Market . . . . .		1						1	138,389	41 50
Medical College . . . . .		1						1	188,541	56 55
Boston College . . . . .		1	1					2	291,277	87 37
Mary Stearns . . . . .	Boarding	1						1	79,650	23 89
Mrs. C. C. Annable . . . . .	"	2						2	251,631	75 47
Mrs. R. W. Prescott . . . . .	"	1						1	281,282	84 37
Mrs. M. E. Sawyer . . . . .	"	1						1	220,837	66 23
Mrs. W. A. Colson . . . . .	"	2						2	235,854	85 74
F. E. Ruggles . . . . .	"	2						2	329,512	98 83
A. Carr . . . . .	"	1						1	103,664	31 08
George Odin, heirs . . . . .	"	1						1	247,251	74 15
James F. Goodwin . . . . .	"	2						2	312,936	93 86
Mrs. A. P. Cleverly . . . . .	"	2						2	165,907	49 75
M. E. Knowlton . . . . .	"	1						1	284,767	85 40
Mrs. C. Farley . . . . .	"	1						1	419,119	125 73
Mrs. C. Cummings . . . . .	"	1						1	272,901	81 85
James Knowlton . . . . .	"	1	1					2	1,049,939	314 96
Ruel Philbrook . . . . .	"	2						2	254,077	76 21
<i>Amount carried forward.</i> . . . .									542,187,505	\$162,651 52 :

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									542,187,505	\$162,651 52
Moore & Sargent . . . . .	Boarding . . . . .		1					1	254,842	76 44
Mrs. G. A. Winn . . . . .	" . . . . .	1						1	190,566	57 14
Mrs. N. F. Chapin . . . . .	" . . . . .	1						1	320,488	96 13
William Evans . . . . .	Model . . . . .	3						3	911,864	273 55
E. Cutler, 147 Kneeland st.	" . . . . .	2						2	218,534	65 54
E. Cutler, 146 Kneeland st.	" . . . . .	2						2	449,724	134 90
Michael Doherty . . . . .	" . . . . .	5						5	495,051	148 49
Job A. Turner . . . . .	" . . . . .	1						1	239,377	71 79
James Chisholm . . . . .	" . . . . .	1						1	285,741	85 71
J. Collins . . . . .	" . . . . .	2						2	234,367	70 29
D. L. Webster . . . . .	" . . . . .	1						1	490,634	147 17
Thomas Cantlon . . . . .	" . . . . .	1						1	213,051	63 89
W. B. Mendum . . . . .	" . . . . .	2						2	180,374	54 09
Henry B. Williams . . . . .	" . . . . .	1						1	135,915	40 77
William A. Brown . . . . .	Factory . . . . .	3						3	807,719	242 30
Jacob J. Storer. Vacant . . . . .	" . . . . .	1						1		
Joseph Nickerson & Co. . . . .	" . . . . .	1						1	1,233,303	369 97
J. Morrill, Jr., & Co. . . . .	" . . . . .	1						1	176,437	52 91
Pearson Bros. & Co. . . . .	" . . . . .	1						1	1,889,136	566 72
J. Morse . . . . .	" . . . . .	1						1	112,288	33 67
L. Whittaker . . . . .	" . . . . .	1						1	310,049	93 00
C. Wright & Co. . . . .	" . . . . .	1						1	446,369	133 89
Howard Watch and Clock Co	" . . . . .			2				2	1,368,884	410 64
Haley, Morse & Co. . . . .	" . . . . .	1						1	526,604	157 96
Roxbury Carpet Co. . . . .	" . . . . .	1						1	3,570,000	1,070 98
George C. Pearson . . . . .	" . . . . .	1						1	524,285	157 26
S. S. Putnam . . . . .	" . . . . .	1	1					2	2,124,832	637 43
John Preston . . . . .	" . . . . .	1						1	55,095	16 52
Union Elastic Goods Co. . . . .	" . . . . .	2						2	8,790	2 63
Mason & Hamlin . . . . .	" . . . . .	3						3	261,397	78 41
William Carleton . . . . .	" . . . . .	3						3	449,054	134 71
Murphy, Leavens & Co. . . . .	" . . . . .	1						1	357,402	107 23
H. M. Richards . . . . .	" . . . . .	1						1	565,575	169 65
Charles E. Kershaw . . . . .	" . . . . .	1						1	749,000	224 63
E. Straln & Co. . . . .	" . . . . .	1						1	57,959	17 37
<i>Amount carried forward</i> . . . . .									562,402,211	\$168,715 35

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward . . . . .</i>									562,402,211	\$168,715 35
Hasse & Pratt . . . . .	Factory	1						1	619,484	185 83
Byam, Carlton & Co. . . . .	"	1						1	59,384	17 79
H. F. Miller . . . . .	"	1						1	106,552	31 95
Stephen Smith & Co. . . . .	"	1						1	342,142	102 63
Chickering & Sons . . . . .	"		3					3	300,329	90 08
Mace & Keyes . . . . .	"	1						1	214,424	64 31
Bagnall & Loud . . . . .	"	1						1	246,352	73 89
Boston Car Spring Co. . . . .	"		1					1	996,149	298 82
Wassineus & Whittle . . . . .	"	1						1	157,694	47 30
A. Folsom & Sons . . . . .	"		1					1	488,699	146 59
Dwinell & Co. . . . .	"	1						1	530,204	159 05
Standard Vinegar Works . . . . .	"	1						1	46,528	13 94
J. M. Cook, estate . . . . .	"		1					1	707,550	212 25
Hallett & Davis . . . . .	"		1					1	374,699	112 38
W. Wolf & Co. . . . .	"	1						1	650,902	195 26
S. D. & H. W. Smith, Mont- gomery st. . . . .	"		1					1	845,115	253 52
S. D. & H. W. Smith, Al- bany st. . . . .	"		1					1	982,154	294 63
Harrison, Beard & Co. . . . .	"	1						1	1,007,241	302 16
William Underwood & Co. . . . .	"		2					2	500,064	150 00
G. D. Dowes & Co. . . . .	"		1					1	545,497	163 64
D. Wilcox . . . . .	"		1					1	426,554	127 95
George & Proctor . . . . .	"	1						1	255,157	76 54
Boston Belting Co. . . . .	"		1					1	33,572	10 06
C. H. Bacon . . . . .	"		2					2	77,534	23 26
Morton & Chesley . . . . .	"		1					1	196,380	58 91
A. Zeigler . . . . .	"		1					1	43,282	12 98
Cummings & Carlisle . . . . .	"		1					1	1,390,037	417 00
Leigh Manufacturing Co. . . . .	"		1					1	1,377,479	413 22
Walworth Manufact. Co. . . . .	"		1					1	431,917	129 56
Newton, Morton & Co. . . . .	"		1					1	211,709	63 50
A. J. Morse & Co. . . . .	"		2					2	398,000	119 40
Seth W. Fowle & Son . . . . .	"		1					1	47,370	14 19
Oscar Foote & Co. . . . .	"		1					1	935,271	280 57
A. R. Whittier . . . . .	"		1					1	248,685	74 59
<i>Amount carried forward . . . . .</i>									578,196,321	\$173,453 10

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									578,196,321	\$173,453 10
W. P. Emerson Plano Co. . . . .	Factory . . . . .	1						1	391,694	117 47
Hallett & Cumston . . . . .	" . . . . .	1						1	312,029	93 59
P. Lally . . . . .	" . . . . .		1					1	749,692	224 89
S. G. Underhill . . . . .	" . . . . .	1						1	531,059	159 30
Amer. Moulded Collar Co. . . . .	" . . . . .	1						1	538,147	161 42
Kittredge & Co. . . . .	" . . . . .	1						1	41,414	12 42
John Clark . . . . .	" . . . . .	1						1	356,841	107 04
Christopher Blake . . . . .	" . . . . .	1						1	570,089	171 01
G. H. Dickerman . . . . .	" . . . . .	1						1	292,379	87 80
J. L. Ross . . . . .	" . . . . .		2					2	239,361	71 79
R. Estabrook & Son . . . . .	" . . . . .	1						1	149,586	44 85
A. D. Nichols . . . . .	" . . . . .	1						1	168,202	50 44
F. King & Co. . . . .	" . . . . .	1						1	509,857	152 93
Grover & Baker Sewing Machine Co., Albany st. . . . .	" . . . . .		1					1	208,116	62 41
Grover & Baker Sewing Machine Co., Wash. st. . . . .	" . . . . .		3					3	2,172,654	651 78
C. F. Whittemore . . . . .	" . . . . .	1						1	47,512	14 25
Peet Valve Co. . . . .	Machinist . . . . .	1						1	884,324	265 28
G. F. Waldron . . . . .	" . . . . .	1						1	160,537	48 14
A. K. Young . . . . .	" . . . . .		2					2	504,029	151 20
Harrison Loring . . . . .	" . . . . .		2	1				3	362,834	108 83
S. A. Woods & Co. . . . .	" . . . . .	1						1	937,716	281 29
George F. Blake . . . . .	" . . . . .	1						1	1,106,489	331 92
E. H. Ashcroft . . . . .	" . . . . .		1					1	624,555	187 35
L. M. Ham . . . . .	" . . . . .		2					2	448,784	134 61
Eyelet Tool Co. . . . .	" . . . . .	1						1	43,671	13 08
L. A. Bigelow . . . . .	" . . . . .		1					1	623,677	187 08
William Evans . . . . .	" . . . . .		3	1				4	825,780	247 71
Smith & Lovett . . . . .	" . . . . .	1						1	302,271	90 66
Am. Tool and Machine Co. . . . .	" . . . . .	1						1	777,607	233 27
J. Souther & Co. . . . .	" . . . . .	1						1	353,054	105 90
Boston Machine Co. . . . .	" . . . . .	1	1					2	1,130,273	339 06
Hersey Brothers . . . . .	" . . . . .	1						1	279,464	83 83
Hinckley Locomotive Works . . . . .	" . . . . .	1	3					4	1,213,378	364 00
Atlantic Works, Chelsea st. . . . .	" . . . . .	1						1	1,159,439	347 82
<i>Amount carried forward</i> . . . . .									597,212,835	\$179,157 52

NAME.	CLASS.	5.8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									597,212,835	\$179,157 52
Atlantic Works, Border st.	Machinist . . . . .			1				1	1,596,975	479 08
H. S. Robinson . . . . .	" . . . . .		1					1	446,826	134 03
Geo. T. McLaughlin . . . . .	" . . . . .		2					2	723,764	217 10
South-Boston Iron Co. . . . .	Foundry . . . . .	3	2	2				7	1,378,274	413 47
Holmes & Blanchard . . . . .	" . . . . .	1						1	336,501	100 93
Dyer & Gurney . . . . .	" . . . . .	1						1	155,474	46 63
William Blake & Co. . . . .	" . . . . .		1					1	1,233,494	370 03
Whiting Foundry Co. . . . .	" . . . . .	1						1	495,367	148 60
Tremont Foundry Co. . . . .	" . . . . .	1						1	63,847	19 13
Fulton Iron Foundry Co. . . . .	" . . . . .		1					1	171,723	51 49
Chelmsford Iron Foundry Co. . . . .	" . . . . .		1					1	408,029	122 38
John Lally . . . . .	Boiler Maker . . . . .	1						1	266,894	80 05
Downer Kerosene Oil Co. . . . .	Oil Works . . . . .	2	1					3	6,645,000	1,993 48
F. H. Jenney . . . . .	" . . . . .		2					2	1,108,839	332 63
Wilkinson, Carter & Co. . . . .	" . . . . .		1					1	450,637	135 17
Farrar, Pierce & Canterbury . . . . .	" . . . . .		1					1	1,442,661	432 78
Kidder, Vaughan & Co. . . . .	" . . . . .		1					1	103,222	30 95
Bowker, Torrey & Co., Bowker street . . . . .	Marble Works . . . . .	1	1					2	3,508,747	1,052 61
Bowker, Torrey & Co., Foundry street . . . . .	" . . . . .	1	1					2	2,199,636	659 87
Torreys & Co. . . . .	" . . . . .	2	1					3	4,067,624	1,220 26
C. E. Hall & Co. . . . .	" . . . . .	2	1					3	3,508,004	1,052 38
A. Wentworth & Co. . . . .	" . . . . .	4						4	3,159,922	947 96
Richard Power & Son . . . . .	" . . . . .	2						2	688,446	206 51
Jeremiah Carew . . . . .	Stone Yard . . . . .	2						2	618,877	185 65
E. F. Meaney . . . . .	" . . . . .	2	1					3	1,052,902	315 85
John Lynch . . . . .	" . . . . .	1						1	115,687	34 70
Geo. F. Chapin & Co. . . . .	Vinegar Works . . . . .	1						1	149,181	44 74
C. D. Brooks . . . . .	Pickle Fact'y . . . . .		1					1	365,226	109 56
Horace H. Lewis . . . . .	" . . . . .	1						1	229,559	68 85
W. K. Lewis & Bros. . . . .	" . . . . .	1						1	228,202	68 45
B. M. Clark . . . . .	" . . . . .	1						1	199,364	59 79
E. T. Cowdry & Co. . . . .	" . . . . .	2						2	548,804	164 63
Warren & Freeman . . . . .	Salt Works . . . . .	1						1	465,412	139 60
<i>Amount carried forward</i> . . . . .									635,345,958	\$190,596 86

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									635,345,958	\$190,596 86
Fobes, Hayward & Co. . . . .	Confectionery	1						1	569,744	170 90
Chase & Co. . . . .	"	2						2	1,657,754	497 31
Charles Copeland . . . . .	"	4						4	2,866,304	859 86
Messenger Brothers . . . . .	Restaurant . .	1						1	393,855	118 14
Mrs. G. F. Harrington . . . . .	" . .	1						1	393,389	118 00
Marston & Cunio . . . . .	" . .	1						1	421,994	126 59
Adams & Chapman . . . . .	" . .	1						1	182,512	54 73
W. L. Egerton . . . . .	" . .	1						1	406,919	122 06
Kendall & Dearborn . . . . .	" . .	1						1	483,419	145 01
Geo. Fera . . . . .	" . .	2						2	550,749	165 21
D. T. Copeland . . . . .	" . .	1						1	1,125,404	337 61
F. E. Weber . . . . .	" . .	1						1	425,218	127 54
R. B. Brigham . . . . .	" . .	1						1	2,024,226	607 25
J. G. Pennyquick . . . . .	" . .	1						1	74,755	22 41
John Kleasa . . . . .	" . .	1						1	46,106	13 83
C. A. Belia . . . . .	" . .	1						1	126,959	38 07
J. L. Reichardt . . . . .	" . .	1						1	157,170	47 14
W. F. Bacon . . . . .	" . .	1						1	414,763	124 40
A. W. Fisher . . . . .	" . .	1						1	207,800	62 34
Phillips & Co. . . . .	" . .	1						1	142,867	42 84
Ingalls & Wesley . . . . .	" . .	1						1	222,414	66 71
Campbell & Coverly . . . . .	" . .	1						1	666,450	199 92
Severance & Co. . . . .	" . .	1						1	345,164	103 54
W. Rosendale . . . . .	" . .	1						1	82,282	24 68
O. A. Jones . . . . .	" . .	1						1	301,491	90 43
O. S. Edgerly . . . . .	" . .	1						1	163,872	49 14
A. E. Nash . . . . .	" . .	1						1	63,304	18 97
C. H. Bailey . . . . .	" . .	1						1	177,282	53 17
R. M. Waitt . . . . .	" . .	1						1	176,336	52 90
C. E. Bacon . . . . .	" . .	1						1	310,631	93 19
G. A. Pollard . . . . .	" . .	1						1	124,099	37 21
Mrs. Miranda Fogg . . . . .	" . .	1						1	277,325	83 18
N. C. Severance . . . . .	" . .	1						1	44,797	13 43
J. C. Murphy . . . . .	" . .	1						1	105,787	31 73
J. Gallagher . . . . .	" . .	1						1	139,116	41 71
<i>Amount carried forward</i> . . . . .									651,218,265	\$195,358 01



NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									651,218,265	\$195,358 01
V. Stahl . . . . .	Restaurant . .	1	.	.	.	.	.	1	207,672	62 29
M. C. Clark & Co. . . . .	" . .	1	.	.	.	.	.	1	237,395	71 36
M. Pearson & Co. . . . .	" . .	1	.	.	.	.	.	1	226,419	67 91
Bartlett & Embree . . . . .	" . .	1	.	.	.	.	.	1	243,366	73 00
Stumcke & Goodwin, 5 Ex- eter Place . . . . .	" . .	1	.	.	.	.	.	1	361,734	108 51
Walter Grieve . . . . .	" . .	1	.	.	.	.	.	1	141,148	42 32
A. Dunning (3 mos.) . . . . .	" . .	1	.	.	.	.	.	1	33,532	10 05
A. F. Copeland . . . . .	" . .	1	.	.	.	.	.	1	537,050	161 09
Marston, Woodbury & Co. . . . .	" . .	1	.	.	.	.	.	1	350,480	105 13
W. S. Mathews . . . . .	" . .	1	.	.	.	.	.	1	327,164	98 13
Brock & Coy . . . . .	" . .	1	.	.	.	.	.	1	451,251	135 36
W. C. Cahoon & Son . . . . .	" . .	1	.	.	.	.	.	1	381,786	114 53
Durgin, Park & Co. . . . .	" . .	1	.	.	.	.	.	1	360,944	108 26
James Brown . . . . .	" . .	1	.	.	.	.	.	1	481,619	144 46
Smith & Underwood . . . . .	" . .	1	.	.	.	.	.	1	1,188,157	356 42
J. M. Learned . . . . .	" . .	1	.	.	.	.	.	1	733,327	219 98
Wm. Englehardt . . . . .	" . .	1	.	.	.	.	.	1	374,722	112 39
Tibbetts & Russell . . . . .	" . .	2	.	.	.	.	.	2	407,399	122 19
J. D. Gilman . . . . .	" . .	1	.	.	.	.	.	1	682,536	204 75
R. R. & J. S. Higgins . . . . .	Saloon . . . . .	2	.	.	.	.	.	2	758,467	227 52
Atwood & Bacon . . . . .	" . . . . .	1	.	.	.	.	.	1	262,867	78 84
B. J. Wright & Co. . . . .	" . . . . .	1	.	.	.	.	.	1	625,919	187 75
Felton & Stone . . . . .	Distillery . . . .	2	.	.	.	.	.	2	926,999	278 07
Jonas H. French . . . . .	" . . . . .	1	.	.	.	.	.	1	2,385,249	715 56
C. H. Graves . . . . .	Rectifier . . . . .	1	.	.	.	.	.	1	258,351	77 49
James Edmond & Co. . . . .	Fire Brick . . . .	1	.	.	.	.	.	1	259,176	77 74
E. L. Perkins . . . . .	Card Factory . . .	1	.	.	.	.	.	1	584,002	175 18
A. Hale & Co. . . . .	Rubber Works . . .	1	.	.	.	.	.	1	233,219	69 95
Suffolk Wood Preserving Co. . . . .	. . . . .	1	.	.	.	.	.	1	131,384	39 40
W. H. Swift & Co. . . . .	Fertilizers . . . .	1	1	.	.	.	.	2	333,209	99 94
W. L. Bradley . . . . .	" . . . . .	1	.	.	.	.	.	1	3,038,226	911 45
B. Randall . . . . .	" . . . . .	1	.	.	.	.	.	1	396,794	119 02
Committee on Bathing . . . . .	Baths . . . . .	.	1	.	.	.	.	1	1,228,425	368 52
C. W. Blodgett . . . . .	" . . . . .	.	1	.	.	.	.	1	751,042	225 29
<i>Amount carried forward</i> . . . . .									671,119,795	\$201,327 8

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward.</i>									671,119,795	\$201,327 86
Boston Dye Wood & Chemical Co.	Chemicals		2					2	10,744,734	3,223 40
W. H. Whitmore	"		1					1	1,138,724	341 59
M. Crocker & Co.	"		2	1				3	1,414,229	424 25
G. W. & F. Appleton	"		1					1	19,424	5 82
Preston & Merrill	Extracts			1				1	1,071,525	321 45
Quirin & Edwards	Tannery		1					1	643,005	192 89
F. S. Merritt	"		1					1	239,929	71 96
Guild White & Co.	"		1					1	244,515	73 32
R. W. Ames & Son	"		1					1	171,505	51 44
F. Frampton	"		1					1	24,500	7 35
Boston Forge Co.				1				1	1,974,529	592 34
Boston Lead Co.			1	1				2	1,687,192	506 14
National Bridge Co.			1	1				2	393,040	117 91
American Steam Safe Co.			1					1	162,510	48 74
Suffolk Glass Co.			1					1	848,287	254 46
Washington Pipe Works			1					1	1,139,294	341 77
East Boston Pottery			1					1	165,967	49 78
H. W. Knowles & Son	Bacon Works		1					1	6,585	1 97
Simpson's Dry Dock Co.			1					1	559,732	167 91
Munson & Co.	{ Supplying Locomotive.		1					1	563,985	169 19
Cunard Steamship Co.					1			1	3,510,009	1,052 98
Hingham Steamboat Co.					1			1	4,076,100	1,222 82
Portland Steam Packet Co.					1			1	1,033,504	310 04
Union Freight Railway Co.					1			1	684,375	205 29
J. B. Crosby	Carving		1					1	330,209	99 05
Farrar Follett & Co.	Wire Works		1					1	445,492	133 64
Butchers' Slaughtering & Melting Association			1					1	136,890	41 06
Metropolitan Railroad Co.	Stables	11	5					16	8,041,048	2,412 30
So. Boston Railroad Co.	"			3				3	3,964,576	1,189 34
Highland Railroad Co.	"			3				3	1,573,865	472 10
Draper and Hall	Stable		3					3	920,092	276 00
Martin Hayes	"		2					2	460,109	138 01
T. F. McHugh	"		1					1	82,747	24 81
<i>Amount carried forward.</i>									719,592,022	\$215,868 98

NAME.	CLASS.	6-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									719,592,022	\$215,868 98
Smith & Porter . . . . .	Stable . . . . .	2						2	265,994	79 77
J. Austin Rogers . . . . .	" . . . . .	1						1	317,543	95 25
Norfolk House Stable . . . . .	" . . . . .	1						1	157,607	47 26
Northend & Foster . . . . .	" . . . . .	1						1	355,656	106 67
Henry Hunt . . . . .	" . . . . .	1						1	211,612	63 47
Robert H. Douglass . . . . .	" . . . . .	1						1	274,499	82 33
T. H. Seavey . . . . .	" . . . . .	1						1	128,856	38 65
C. & J. F. Baker . . . . .	" . . . . .	2						2	124,897	37 46
W. P. Pierce . . . . .	" . . . . .	1						1	82,026	24 59
J. Pratt . . . . .	" . . . . .	1						1	100,717	30 19
L. E. Hartshorne . . . . .	" . . . . .	1						1	42,209	12 66
J. P. Barnard, 108 Chestnut street . . . . .	" . . . . .	1						1	526,911	158 05
J. P. Barnard, cor. Brimmer and Chestnut street . . . . .	" . . . . .	1						1	659,985	197 97
J. P. Barnard, Joy street . . . . .	" . . . . .	3						3	765,367	229 59
A. Garcelon . . . . .	" . . . . .	1						1	183,254	54 96
C. S. Godfrey . . . . .	" . . . . .	1						1	202,872	60 84
G. W. Sherburne . . . . .	" . . . . .	1						1	153,899	46 16
Northend & Foster . . . . .	" . . . . .	1						1	207,847	62 33
A. Goss . . . . .	" . . . . .	1						1	173,174	51 93
Adams Express Co. . . . .	" . . . . .	1						1	363,261	108 95
John Eaton, jr. . . . .	" . . . . .	1						1	235,402	70 61
F. S. Merritt . . . . .	" . . . . .	1						1	44,054	13 19
L. W. Porter & Co. . . . .	" . . . . .	1						1	320,572	96 16
Warner & Richardson . . . . .	" . . . . .	2						2	597,006	179 08
Geo. M. King . . . . .	" . . . . .	1						1	473,474	142 03
Milo Whitney . . . . .	" . . . . .	1						1	129,727	38 90
Daniel Wood . . . . .	" . . . . .	1						1	334,686	100 39
T. D. Sullivan . . . . .	" . . . . .	1						1	145,446	43 61
Ham & Co. . . . .	" . . . . .	2						2	161,759	48 50
F. E. Russell . . . . .	" . . . . .	1						1	220,357	66 09
Edgar Snow . . . . .	" . . . . .	1						1	116,804	35 03
G. D. Pattee . . . . .	" . . . . .	1						1	215,692	64 69
James Jellison . . . . .	" . . . . .	1						1	229,513	68 84
William Carey . . . . .	" . . . . .	1						1	161,622	48 47
<i>Amount carried forward</i> . . . . .									728,276,322	\$218,473 65

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									728,276,322	\$218,473 65
Shorey & Co. . . . .	Stable	2						2	658,057	197 40
J. N. Harwood . . . . .	"	1						1	328,671	98 59
H. C. Nims, Mason ct. . . . .	"	3						3	458,428	137 51
J. A. Riedell & Co. . . . .	"	2						2	332,354	99 69
E. W. Murray, Berkeley st. . . . .	"	1						1	52,956	15 87
E. W. Murray, Stanhope st. . . . .	"	1						1	290,297	87 08
A. B. Atherton & Co. . . . .	"	1						1	627,262	188 16
Geo. S. Johnson & Co., 920 Washington street . . . . .	"		1					1	262,506	78 73
Geo. S. Johnson & Co., 1046 Washington street . . . . .	"		1					1	108,164	32 42
T. Thaxter . . . . .	"	1						1	111,501	33 43
James Monroe . . . . .	"	1						1	158,774	47 62
Miller & Robinson . . . . .	"	2						2	356,570	106 95
L. L. Howland . . . . .	"	2						2	124,514	37 33
P. E. Murray . . . . .	"	1						1	193,124	57 92
J. E. Maynard . . . . .	"	1						1	589,672	176 88
John Rice . . . . .	"	3						3	820,185	246 05
Geo. P. Fogg & Co. . . . .	"	2						2	672,547	201 75
J. M. Dow . . . . .	"	1						1	241,627	72 48
New York Express Co. . . . .	"	1						1	426,327	127 88
Moses Coleman & Son . . . . .	"	1						1	118,686	35 59
Boston Hotels Coach Co. . . . .	"	2						2	1,275,471	382 63
W. Hutchings . . . . .	"	1						1	90,397	27 11
Eastern Express Co. . . . .	"		1					1	247,911	74 36
J. O. Barnard . . . . .	"	1						1	57,194	17 15
Riverside Club Stable . . . . .	"	1						1	112,169	33 63
Club Stable, Chardon st. . . . .	"	1						1	135,547	40 64
Beacon Club Stable . . . . .	"	1						1	125,227	37 54
F. A. Phelps . . . . .	"	1						1	437,393	131 20
V. H. Covill . . . . .	"	1						1	176,024	52 79
Dean & Burgess . . . . .	"	1						1	111,502	33 43
Parker Bryant . . . . .	"	1						1	145,686	43 68
G. H. Hayden . . . . .	"	1						1	76,664	22 98
A. P. Wheelock . . . . .	"	1						1	182,838	54 83
F. Davis & Son, 609 Fifth-st. . . . .	"	1						1	80,879	24 24
<i>Amount carried forward</i> . . . . .									738,463,451	\$221,529 19

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									738,463,451	\$221,529 19
F. Davis & Son, 125 Emerson st. . . . .	Stable . . . . .	1						1	115,273	34 56
S. F. Draper . . . . .	" . . . . .	2						2	202,639	60 77
J. Rice . . . . .	" . . . . .	1						1	290,631	87 18
M. & W. Ham . . . . .	" . . . . .	1						1	176,378	52 90
John Quinn . . . . .	" . . . . .	1						1	279,847	83 93
J. H. Pote . . . . .	" . . . . .	1						1	280,691	84 19
Sumner & Dickinson . . . . .	" . . . . .	1						1	251,977	75 58
J. B. Cassidy & Bro. . . . .	" . . . . .	1						1	159,532	47 83
L. C. Chase . . . . .	" . . . . .	1						1	128,962	38 67
Peck & Hall . . . . .	" . . . . .	1						1	87,000	26 08
T. H. Ayres . . . . .	" . . . . .	1						1	34,670	10 40
J. Hale . . . . .	" . . . . .	1						1	270,554	81 14
J. M. Smith . . . . .	" . . . . .	1						1	97,240	29 15
C. R. Webster . . . . .	" . . . . .	1						1	337,926	101 36
Club Stable, 75 Chestnut st. . . . .	" . . . . .	1						1	128,699	38 59
B. T. Wrightington . . . . .	" . . . . .	1						1	152,625	45 77
Clark & Brown . . . . .	" . . . . .	2						2	280,679	84 19
H. C. Nims, 8 Lime st. . . . .	" . . . . .	1						1	188,302	56 47
John Sawyer . . . . .	" . . . . .	1						1	184,694	55 39
Cilley & Stimson . . . . .	" . . . . .	1						1	223,765	67 11
Club Stable, 44 Joy st. . . . .	" . . . . .	1						1	151,327	45 38
Aea Critchett . . . . .	" . . . . .	1						1	173,249	51 96
Patrick Morrison . . . . .	" . . . . .	1						1	47,256	14 17
L. A. Noyes . . . . .	" . . . . .	1						1	116,954	35 06
A. S. Eaton . . . . .	" . . . . .		1					1	137,977	41 37
Geo. D. Brown . . . . .	" . . . . .	1						1	130,394	39 11
J. H. Hathorne . . . . .	" . . . . .	1						1	821,212	246 34
Henry K. Wing . . . . .	" . . . . .	1						1	457,038	137 09
National Tube Works . . . . .		1	2					3	666,741	200 01
Globe Nail Works . . . . .			1					1	1,562,009	468 58
Farrington & Hunnewell . . . . .	Silversmiths . . . . .	1						1	162,801	48 81
B. M. Cunningham . . . . .	Laundry . . . . .	1						1	655,326	196 59
Manley Howe . . . . .	Chemist . . . . .		1					1	519,974	155 98
L. Prang & Co. . . . .	Chromos . . . . .		1					1	459,667	137 88
<i>Amount carried forward</i> . . . . .									748,397,460	\$224,508 78

NAME.	CLASS.	5-8 inch.	1 in. b.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									748,397,460	\$224,508 78
Morse & Jordan . . . . .	Engine . . . . .	1						1	442,702	132 79
E. Brooks . . . . .	" . . . . .	1						1	289,597	86 86
Walworth Manuf. Co. . . . .	" . . . . .	1						1	906,892	272 05
H. G. Denny . . . . .	" . . . . .	1						1	193,484	58 03
Porter & Co. (6 mos.) . . . . .	" . . . . .	1						1	172,440	51 72
C. U. Cotting (6 mos.) . . . . .	" . . . . .		1					1	259,070	77 71
Moses B. Wilde (3 mos.) . . . . .	" . . . . .	1						1	81,067	24 32
John Foster (3 mos.) . . . . .	" . . . . .	1						1	113,667	34 10
Briggs & Robinson . . . . .	Mill . . . . .	1						1	568,679	170 58
Carpenter, Woodward & Morton . . . . .	" . . . . .		1					1	1,198,027	359 33
S. B. Stebbins . . . . .	" . . . . .		1					1	764,969	229 48
L. W. Pickens . . . . .	" . . . . .	1						1	510,967	153 27
C. E. Folsom . . . . .	" . . . . .	1						1	313,649	94 07
Boston City Flour Mills . . . . .	" . . . . .		1					1	2,219,564	665 85
J. J. McNutt . . . . .	" . . . . .			2				2	1,333,709	400 10
Glendon Co. . . . .	" . . . . .		1					1	1,757,107	527 12
Manson Peterson . . . . .	" . . . . .			2				2	743,312	224 48
W. W. Bennett . . . . .	" . . . . .	1						1	784,465	235 32
Cross & Gilman . . . . .	" . . . . .	1						1	531,329	159 38
McQuesten & Fogg . . . . .	" . . . . .	1						1	315,269	94 55
J. F. Paul & Co. . . . .	" . . . . .	1	2					3	1,592,166	477 63
Bugbee & Spooner . . . . .	" . . . . .	1						1	703,371	210 99
J. A. Robertson . . . . .	" . . . . .	1						1	777,216	233 14
Stetson & Pope . . . . .	" . . . . .		1					1	129,599	38 87
Chauncy, Page & Co. . . . .	" . . . . .		1					1	861,307	258 38
S. H. L. Pierce . . . . .	" . . . . .	1						1	1,188,141	356 42
A. J. Stearns & Son . . . . .	" . . . . .		1					1	71,804	21 51
Palmer, Parker & Co. . . . .	" . . . . .	1						1	642,809	192 83
J. F. Keating . . . . .	" . . . . .	1						1	442,766	132 82
Watson & Bisbee . . . . .	" . . . . .	1						1	392,811	117 82
Laming & Drisko . . . . .	" . . . . .	1						1	610,454	183 12
Cressey & Noyes . . . . .	" . . . . .	1	1					2	1,149,967	344 93
Smith & Jacobs . . . . .	" . . . . .	1						1	141,750	42 52
B. D. Whitecomb . . . . .	" . . . . .	1						1	1,567,035	470 09
<i>Amount carried forward</i> . . . . .									772,173,621	\$231,641 06

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward.</i>									772,173,621	\$231,641 06
F. R. Jenkins	Mill	2						2	288,209	86 44
A. C. Hopkins	"	1						1	81,412	24 41
R. S. Gilmore	"	1						1	127,911	38 35
Glover & Jones	"	1						1	804,007	241 18
Whitney Dye Wood Mill	"	1						1	1,571,129	471 32
Knowles, Freeman & Co.	Fish Store	2						2	648,194	194 44
Curtis, Spaulding & Co.	Bacon Works	1						1	623,842	187 13
Bond, Blanchard, Worthen & Co.	Bakery	1						1	557,114	167 11
G. H. Withington	"	1						1	566,256	169 86
J. H. Chadwick	House & Fount'n	1						1	234,217	70 24
Horatio Harris	" "	1						1	751,725	225 50
W. V. Hutchings	Fountain	1						1	72,292	21 67
J. C. Nichols	Wharf purposes	1						1	35,579	10 66
House of Correction						1		1	14,884,940	4,465 47
Suffolk County Court House		1	1					2	5,788,372	1,736 51
Suffolk County Jail		2	3					5	1,610,617	483 17
Directors of Public Institutions		2	3	1				6	4,203,547	1,261 05
South Ferry			1	1				2	8,272,650	2,481 78
North Ferry				1				1	9,665,850	2,899 75
Board of Health	Public Urinals	1						1	876,688	262 98
Police Station No. 1		1						1	348,937	104 68
" " 2			1					1	787,439	236 23
" " 3			1					1	402,262	120 67
" " 4		1						1	361,740	108 52
" " 5		1						1	690,015	207 01
" " 6		1						1	205,928	61 76
" " 7		1						1	320,467	96 12
" " 8		1						1	107,844	32 34
" " 9		1						1	181,838	54 57
" " 10		1						1	286,678	86 02
" " 12		1						1	74,654	22 39
Cedar Grove Cemetery					1			1	1,103,400	331 00
First Church	Organ						1	1	323,661	97 08
King's Chapel	"						1	1	155,342	46 58
<i>Amount carried forward.</i>									829,188,377	\$248,745 05

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward.</i>									829,188,377	\$248,745 05
St. Mary's Church	Organ		1					1	228,936	68 67
Tremont-st. M. E. Church	"		1					1	127,072	38 10
South Cong'l Church	"						2	2	72,493	21 73
First Universalist Church	"						1	1	104,516	31 33
Columbus-av. Univ. Church	"		1					1	66,284	19 86
Shawmut Cong'l Society	"			1				1	236,392	70 90
Church of the Holy Redeemer	"		1					1	74,520	22 34
Church of the Immaculate Conception	"						1	1	441,008	132 28
Clarendon-st. Baptist Church	"						1	1	137,462	41 22
Second Church Society	"						1	1	63,381	18 99
St. James' Church	"						1	1	78,303	23 47
Brattle-st. Church	"						1	1	39,606	11 87
Boston Soc'y New Jerusalem	"						1	1	80,595	24 16
Second Hawes Unit. Soc'y	"		1					1	47,948	14 37
Old South Church Society	"						1	1	56,340	16 90
Bancroft & Boyden	Elevator		1					1	644,234	193 24
John L. Gardner	"			1				1	48,525	14 54
Job F. Bailey	"			1				1	609,217	182 75
George O. Hovey	"			1				1	26,550	7 96
E. Williams	"						1	1	112,500	33 74
Sidney Squires	"			1				1	242,549	72 74
Henry G. Denny	"						1	1	38,242	11 46
William Clafin	"			1				1	53,025	15 90
Mrs. S. S. Dunn	"			1				1	47,278	14 16
Goldthwait, Snow & Knight	"		1					1	31,635	9 48
Thomas Richardson, heirs (not used)	"				1			1		
Chickering & Sons	"						2	2	1,671,750	501 51
Odd Fellows' Building	"						1	1	207,750	62 32
Davis & Co	"						1	1	420,650	126 19
J. C. Tucker & Co.	"						1	1	587,950	176 38
A. W. Clapp	"						1	1	579,650	173 89
Rufus Gibbs & Co.	"						1	1	133,350	40 00
James Tucker & Co.	"						1	1	780,900	234 27
Boston Rubber Shoe Co.	"						1	1	510,750	153 22
<i>Amount carried forward.</i>									837,789,738	\$251,324 99



NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									837,789,738	\$251,324 99
Skilton Dole & Co. . . . .	Elevator						1	1	465,750	139 71
Lamkin & Foster . . . . .	"						1	1	625,850	187 73
E. H. Sampson . . . . .	"						1	1	639,750	191 92
J. A. Bacon . . . . .	"						1	1	90,400	27 11
J. C. Haynes . . . . .	"						1	1	457,450	137 23
Lewis, Brown & Co. . . . .	"						1	1	1,414,125	424 22
Field, Thayer & Co. . . . .	"						1	1	793,698	238 09
McConnell & Gardner . . . . .	"						1	1	514,500	154 34
F. Shaw & Bro. . . . .	"						1	1	258,000	77 40
W. E. Putnam & Co. . . . .	"						1	1	801,750	240 52
Henry Bond & Co. . . . .	"						1	1	674,250	202 27
J. S. Stone . . . . .	"						1	1	534,750	160 42
Dennison & Co. (9 mos.) . . . . .	"						1	1	780,000	234 00
W. H. Mawhinney & Co. . . . .	"						1	1	1,291,500	387 44
R. H. White & Co. . . . .	"						1	1	1,896,750	569 01
Clement & Colburn . . . . .	"						1	1	821,616	246 48
Jewett & Bush . . . . .	"						1	1	631,500	189 45
Smith, Richardson & Cor- son (6 mos.) . . . . .	"						1	1	147,750	44 32
Henry A. Gould . . . . .	"						1	1	571,575	171 46
F. H. Dodge, vacant . . . . .	"						1	1		
Mitchell, Green & Stevens (6 mos.) . . . . .	"						1	1	747,750	224 32
R. W. Kendall (6 mos.) . . . . .	"						1	1	63,250	20 47
Mrs. Harris (3 mos.) . . . . .	"						1	1	46,500	13 95
S. C. Bixby & Co. (6 mos.) . . . . .	"						1	1	30,000	8 99
A. A. Pope & Co. (3 mos.) . . . . .	"						1	1	108,000	32 40
Dale Bros. & Co. (1 mo.) . . . . .	"						2	2	26,234	7 87
Abram French & Co. (1 mo.) . . . . .	"						2	2	25,584	7 67
Talbot, Wilmarth & Co. . . . .	"						1	1	309,750	92 92
John Shepard (6 mos.) . . . . .	"						1	1	28,500	8 54
Geo. Plaisted & Sons . . . . .	"						1	1	168,000	50 39
F. Upton & Co. . . . .	"						1	1	383,250	114 97
Perry, Wendall, Fay & Co. . . . .	"						1	1	413,250	123 97
Continental B'k B'ld'g (6mo.) . . . . .	"						1	1	633,225	189 96
C. D. Swain & Co. . . . .	"						1	1	180,000	54 00
<i>Amount carried forward</i> . . . . .									854,368,995	\$256,298 53

NAME.	CLASS.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	TOTAL.	GALLONS.	REVENUE.
<i>Amount brought forward</i> . . . . .									854,368,995	\$256,298 53
F. M. Johnson . . . . .	Elevator . . . . .						1	1	1,303,500	391 05
Minot, Hooper & Co. . . . .	" . . . . .						1	1	959,700	287 90
J. P. Paine . . . . .	" . . . . .						1	1	113,250	33 97
Miss C. D. Brewer . . . . .	" . . . . .						1	1	11,355	3 40
J. M. Beebe (3 mos.) . . . . .	" . . . . .						1	1	17,107	5 13
Barker Bros. & Gardner, vacant . . . . .	Factory . . . . .	1						1		
Paul Knowles and Others . . . . .	Marine Water- men, as per contract . . . . .				3			3	1,933,917	1,547 13
<b>Total</b> . . . . .									858,707,824	\$258,567 11

The following table exhibits the yearly revenue from the sale of Cochituate water since its introduction into the city, October 25th, 1848 : —

Received by Water Commissioners, as per Auditor's Report, in 1848, . . . . .	\$972	81
From January 1, 1849, to January 1, 1850, . . . . .	71,657	79
“ “ 1850, “ 1851, . . . . .	99,025	45
“ “ 1851, “ 1852, . . . . .	161,052	85
“ “ 1852, “ 1853, . . . . .	179,567	39
“ “ 1853, “ 1854, . . . . .	196,352	32
“ “ 1854, “ 1855, . . . . .	217,007	51
“ “ 1855, “ 1856, . . . . .	266,302	77
“ “ 1856, “ 1857, . . . . .	282,651	84
“ “ 1857, “ 1858, . . . . .	289,328	83
“ “ 1858, “ 1859, . . . . .	302,409	73
“ “ 1859, “ 1860, . . . . .	314,808	97
“ “ 1860, “ 1861, . . . . .	334,544	86
“ “ 1861, “ 1862, . . . . .	365,323	96
“ “ 1862, “ 1863, . . . . .	373,922	33
“ “ 1863, “ 1864, . . . . .	394,506	25
“ “ 1864, “ 1865, . . . . .	430,710	76
“ “ 1865, “ 1866, . . . . .	450,341	48
“ “ 1866, “ 1867, . . . . .	486,538	25
“ “ 1867, “ 1868, . . . . .	522,130	93
“ “ 1868, “ 1869, . . . . .	553,744	88
“ “ 1869, “ 1870, . . . . .	597,328	55
“ “ 1870, “ 1871, . . . . .	708,783	68
“ “ 1871, “ 1872, . . . . .	774,445	70
“ “ 1872, “ 1873, . . . . .	806,102	51
“ “ 1873, “ 1874, . . . . .	859,436	55
“ “ 1874, “ 1875, . . . . .	914,748	73
“ “ 1875, “ 1876, . . . . .	944,680	94
“ “ 1876, to May 1, 1876, . . . . .	717,698	93
	<hr/>	
	\$12,616,127	55

Statement showing the number of houses, stores, steam engines, etc., in the City of Boston, supplied with water to the 1st of January, 1876, with the amount of water-rates received for 1875 :—

30,056 Dwelling-houses . . . . .	\$480,234 00
46 Boarding-houses . . . . .	2,112 66
1,021 Model-houses . . . . .	29,588 13
12 Lodging-houses . . . . .	389 67
15 Hotels . . . . .	1,119 00
5,856 Stores and shops . . . . .	62,905 24
449 Buildings . . . . .	21,554 66
696 Offices . . . . .	5,973 56
45 Printing offices . . . . .	944 92
37 Banks . . . . .	584 72
28 Halls . . . . .	514 50
1 Museum . . . . .	45 50
30 Private schools . . . . .	590 67
17 Asylums . . . . .	1,118 00
4 Hospitals . . . . .	249 50
48 Greenhouses . . . . .	1,144 33
113 Churches . . . . .	1,808 00
7 Markets . . . . .	1,187 50
94 Cellars . . . . .	657 50
831 Restaurants and saloons . . . . .	18,083 60
14 Club-houses . . . . .	307 84
36 Photographers . . . . .	1,077 37
33 Packing-houses . . . . .	1,327 83
1,647 Stables . . . . .	13,087 74
41 Factories . . . . .	1,436 62
5 Bleacheries . . . . .	117 50
1 Brewery . . . . .	105 00
3 Beer factories . . . . .	172 50
112 Bakeries . . . . .	1,261 75
1 Boat-house . . . . .	49 00
10 Freight-houses . . . . .	242 50
4 Gasometers . . . . .	54 00
3 Ship-yards . . . . .	51 00
1 College . . . . .	40 00
1 Mill . . . . .	50 00
1 Cemetery . . . . .	10 00
1 Bath-house . . . . .	10 42
63 Shops and engines . . . . .	3,222 76
49 Stores and engines . . . . .	4,229 29
<i>Carried forward</i> . . . . .	<u>\$657,658 78</u>

<i>Brought forward</i>	.	.	.	\$657,658	78
18 Factories and engines	.	.	.	1,111	25
1 Foundry and engine	.	.	.	92	50
6 Printing and engines	.	.	.	745	38
3 Bakeries and engines	.	.	.	124	00
3 Ship-yards and engines	.	.	.	81	25
1 Dry dock and engine	.	.	.	34	00
11 Buildings and engines	.	.	.	983	00
24 Stationery engines	.	.	.	1,667	43
78 Discharging and pile-driving engines	.	.	.	914	00
15 Armories	.	.	.	249	92
741 Hand-hose	.	.	.	5,070	00
16 Fountains	.	.	.	237	00
58 Tumbler-washers	.	.	.	870	00
52 Water-pressures	.	.	.	260	00
15 Laundries	.	.	.	288	54
2 Commercial colleges	.	.	.	99	00
1 Laboratory	.	.	.	50	00
1 Milk Company	.	.	.	55	00
Custom-House	.	.	.	85	00
Branch post-offices	.	.	.	88	00
11 Aquariums	.	.	.	135	00
Filling gasometers	.	.	.	178	26
Filling cisterns	.	.	.	8	50
1 Ice company (washing ice)	.	.	.	30	00
1 Gymnasium	.	.	.	50	00
1 Depot	.	.	.	36	00
7 Railroad stations	.	.	.	92	92
67 Steamboats	.	.	.	11,979	62
Office (City Scales)	.	.	.	11	00
Lockup Ward 24	.	.	.	6	00
District Court-Houses	.	.	.	67	50
Probate Building	.	.	.	75	00
House of Reception	.	.	.	10	00
44 Fire-engines, hose and hook and ladder houses	.	.	.	940	00
3,197 Fire-hydrants	.	.	.	57,546	00
98 Reservoirs	.	.	.	1,764	00
Fire-boat "Wm. M. Flanders"	.	.	.	200	00
385 Public schools	.	.	.	3,364	00
City stables	.	.	.	226	25
Washing-carts	.	.	.	125	00
Offal station	.	.	.	225	00
Faneuil Hall	.	.	.	40	00
Public Library	.	.	.	50	00
<i>Carried forward</i>	.	.	.	\$747,924	10

<i>Brought forward</i>	.	.	.	.	.	\$747,924	10
Branch Libraries	.	.	.	.	.	43	50
Paving Department	.	.	.	.	.	327	75
Common Sewer Department	.	.	.	.	.	250	00
Lamp Department	.	.	.	.	.	17	25
Public urinals	.	.	.	.	.	170	00
Street sprinkling	.	.	.	.	.	500	00
Street watering	.	.	.	.	.	73	05
Drinking fountains	.	.	.	.	.	455	00
Steamer "Samuel Little"	.	.	.	.	.	100	00
Small-pox Hospital	.	.	.	.	.	25	00
Building purposes	.	.	.	.	.	2,440	27
Metered water (9 months)	.	.	.	.	.	192,355	02
						<u>\$944,680</u>	94

*Statement showing the number and kind of Water Fixtures contained within the premises of Water-takers in the City of Boston to January 1, 1876, as compared with previous years.*

1873.	1874.	1875.	REMARKS.
6,768	7,266	7,271	Taps. These have no connection with any drain or sewer.
67,089	72,310	72,897	Sinks.
32,690	36,141	37,611	Wash-hand basins.
11,580	12,040	12,725	Bathing-tubs.
16,222	18,877	20,575	Pan water-closets.
17,081	18,765	2,584	Hopper water-closets.
	201	17,569	“ “ automatic.
248	291		“ “ pull.
223	188		“ “ self-acting.
589	606	564	“ “ waste.
590	648		“ “ door.
2,445	2,851	1,636	Urinals.
	459	1,693	“ automatic.
12,779	14,300	15,055	Wash-tubs. These are permanently attached to the building.
734	680	633	Shower-baths.
419	363	330	Private hydrants.
712	754	805	Slop-hoppers.
112	134	113	Foot-baths.
170,281	186,874	192,061	

Respectfully submitted,

WM. F. DAVIS,

*Water Registrar.*

REPORT OF SUPERINTENDENT OF THE EAST-  
ERN DIVISION.

MAY 1st, 1876.

L. MILES STANDISH, Esq.,

*President of the Cochituate Water Board: —*

SIR, — My report for the year ending with April 30th, I hereby submit.

MAIN PIPE.

The whole number of feet of main-pipe of the various sizes laid and relaid during the past season is 181,095 feet, equal to  $34\frac{1}{5}\frac{5}{2}\frac{7}{8}\frac{5}{0}$  miles, a much larger amount than has been laid since the introduction of the water, the largest part of which was laid in the Brighton and West Roxbury districts. The lengths, sizes, and in what streets, may be found in the tables below.

The additional line 40 inches diameter across the Charles river, at Newton Lower Falls, was laid early in the season and up to the present time no leak has been discovered.

SERVICE-PIPES.

The whole number of services put in is . . . . .	1,237
Length in feet . . . . .	35,362

Upwards of two hundred of those frozen the previous winter were lowered to the now established depth, — five feet.

LEAKS.

There have been fewer leaks this season than in the past four years. The only ones of any magnitude were, one, the 30-inch main (old) on Boylston street, Brookline, and one on the 16-inch high-service pipe (new) on Centre street, Roxbury. The one in Brookline was caused by a crack in the bell which loosened the lead packing so the pressure of the water forced it out. The one on Centre street was caused by the breaking out of about six feet in length and one-third of the circumference of the pipe. But little damage was done however, other than the expense of the repairs of the pipe and street.



Of the relaying of mains of enlarged sizes with Lowry hydrants connected throughout the city proper, South and East Boston, the following table shows the changes in sizes : —

STREET.	BETWEEN WHAT STREETS.	Size now.	No. of feet.	Size formerly.
<b>BOSTON.</b>				
Beacon . . . . .	Dartmouth and Parker . . . . .	12	2,459	6
Beach . . . . .	Washington st. and Harrison ave.	12	459	6
Gloucester . . . . .	Beacon and Marlboro . . . . .	12	260	6
Somerset . . . . .	Pemberton sq. and Ashburton pl. .	8	150	6
Merchants' row . . . . .	State and North . . . . .	8	650	6
Commercial wharf . . . . .	From Atlantic ave. . . . .	8	658	4
Hamburg . . . . .	Harrison ave. and Mystic st. . . .	6	373	4
East Lenox . . . . .	Washington st. and Harrison ave. .	6	273	4
Newcomb . . . . .	Washington and Reed . . . . .	6	242	4
<b>SOUTH BOSTON.</b>				
First . . . . .	D and Dorchester . . . . .	8	1,143	6
Athens . . . . .	B and C . . . . .	6	17	4
<b>EAST BOSTON.</b>				
White . . . . .	Marion and Brooks . . . . .	12	87	6
Meridian . . . . .	Maverick sq. and White st. . . . .	12	3,900	6
Lewis . . . . .	Marginal st. and the Ferry . . . .	12	460	6
Bennington . . . . .	Brooks and Chelsea . . . . .	8	1,600	6
<b>BOSTON HIGHLANDS.</b>				
Lansing . . . . .	Warren and Sherman . . . . .	8	293	4
Putnam . . . . .	Roxbury and Dudley . . . . .	6	125	4

## MAIN PIPE RELAID.

## BOSTON PROPER.

Harrison ave., between Union Park and B. & A. R. R. Bridge.....	12 inch.	2,550 feet.
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## SOUTH BOSTON.

Dorchester ave., between Sixth and Seventh streets.....	12 inch.	48 feet.
Athens st., between B and C.....	4 "	42 "

## EAST BOSTON.

Putnam st., between Bennington and Chelsea.....	6 inch.	159 feet.
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## BOSTON HIGHLANDS.

Parker st., between Centre and Bromley Park.....	6 inch.	600 feet.
Bromley Park, between Albert and Parker.....	4 "	440 "

## RAISED.

Harrison ave., between Dedham and Union Park st.....	12 inch.	568 feet.
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## LOWERED.

Third st., between N and P.....	6 inch.	240 feet.
Athens " " B and C.....	4 "	130 "
Lexington st., between Eagle and Putnam.....	6 "	380 "
Clifford st., between Blue Hill ave. and Warren.....	6 "	250 "
Gore ave., between Tremont and Parker.....	4 "	212 "
Blanchard place, between Bartlett and Norfolk.....	4 "	75 "
Parker place, from Parker.....	4 "	150 "

## TAKEN UP AND ABANDONED.

6 inch iron pipe.....	11,448 feet.
4 " " ".....	2,064 "
1½ " " ".....	1,316 "
1¼ " lead ".....	314 "
Extended ⅜ pipes.....	161 "

Statement of Location, Size and Number of Feet of Pipe laid in 1875.

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>NEWTON LOWER FALLS.</b>			
Across Charles river . . .	North and South Chambers . . . . .	40	1,435
	Total 40-inch . . . . .		1,435
In Valley for blow-offs . .	North and South Chambers . . . . .	12	130
	Total 12-inch . . . . .		130
<b>BOSTON PROPER.</b>			
Exeter . . . . .	Marlboro' and Newbury . . . . .	16	570
Beacon . . . . .	Dartmouth and Exeter . . . . .	"	41
Exeter . . . . .	Beacon and Marlboro' . . . . .	"	12
	Total 16-inch . . . . .		623
Columbus ave. . . . .	Berkeley and Grenville place . . . . .	12	665
Beacon . . . . .	Dartmouth and Parker . . . . .	"	2,459
Berkeley . . . . .	Chandler and Cortes . . . . .	"	108
Beach . . . . .	Washington and Harrison ave. . . . .	"	454
Exeter . . . . .	Beacon and Charles river . . . . .	"	200
Gloucester . . . . .	Beacon and Marlboro' . . . . .	"	260
Harrison ave. . . . .	Union Park st. and B. and A. R. R. bridge . .	"	2,550
Atlantic ave. . . . .	Oliver and Purchase . . . . .	"	3
Tremont . . . . .	Springfield and Worcester . . . . .	"	3
Albany . . . . .	Bristol and Brookline . . . . .	"	25
	Total 12-inch . . . . .		6,727
Stoughton . . . . .	Harrison ave. and Albany . . . . .	9	12
Mason . . . . .	West and Avery . . . . .	"	7
Columbus ave. . . . .	Berkeley and Ferdinand . . . . .	"	24
Beacon . . . . .	Dartmouth and Parker . . . . .	"	70
Albany . . . . .	Bristol and Brookline . . . . .	"	48
Lenox . . . . .	Washington and Harrison ave. . . . .	"	8
	Total 9-inch . . . . .		169

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

IN WHAT STREET.	BETWEEN WHAT STREET.	Diam. of Iron Pipes in In.	Feet of Pipe.
<b>BOSTON PROPER. — Continued.</b>			
Somerset . . . . .	Pemberton sq. and Ashburton pl. . . . .	8	150
Merchants' row . . . . .	State and North . . . . .	"	680
Richmond . . . . .	Mercantile and Atlantic ave. . . . .	"	207
Harrison ave. . . . .	Union Park st. and B. and A. R. R. bridge . . . . .	"	36
Beach . . . . .	Washington and Harrison ave. . . . .	"	9
	Total 8-inch . . . . .		1,082
Stoughton . . . . .	Albany and Harrison ave. . . . .	6	320
Commonwealth ave. . . . .	Dartmouth and Exeter . . . . .	"	128
Auburn . . . . .	Livingston and Leverett . . . . .	"	106
West Chester park . . . . .	Columbus ave. and Providence R. R. . . . .	"	254
Rutland sq. . . . .	Columbus ave. and Providence R. R. . . . .	"	180
Hamburg . . . . .	Harrison ave. and Mystic . . . . .	"	373
Lenox . . . . .	Harrison ave. and Washington . . . . .	"	273
Newcomb . . . . .	Washington and Reed . . . . .	"	242
N. Y. and N. E. R. R. . . . .	From Federal st. in depot . . . . .	"	546
Clinton . . . . .	Mercantile and Atlantic ave. . . . .	"	255
Haverhill . . . . .	Charlestown and Travers . . . . .	"	3
Charlestown . . . . .	Stillman and Cooper . . . . .	"	3
Albany . . . . .	Bristol and Brookline . . . . .	"	20
Berkeley . . . . .	Appleton and Cortes . . . . .	"	6
	Total 6-inch . . . . .		2,709
Russia wharf . . . . .	Atlantic ave. and bridge . . . . .	4	420
Atlantic ave. . . . .	Olver and Purchase . . . . .	"	4
Willow . . . . .	Leverett and Lowell . . . . .	"	3
Exeter . . . . .	Marlboro' and Newbury . . . . .	"	12
Tremont . . . . .	Junction of Concord . . . . .	"	4
Tremont . . . . .	Northampton and Camden . . . . .	"	6
Harrison ave. . . . .	Dedham and Union park . . . . .	"	12
Long wharf . . . . .	Commercial and Atlantic ave. . . . .	"	4
	Total 4-inch . . . . .		465

Statement of Location, Size, etc. — Continued.

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>SOUTH BOSTON.</b>			
D . . . . .	First and Second . . . . .	12	233
N . . . . .	Second and Third . . . . .	"	300
Dorchester ave. . . . .	Sixth and Seventh . . . . .	"	48
	Total 12-inch . . . . .		581
First . . . . .	D and Dorchester . . . . .	8	1,143
	Total 8-inch . . . . .		1,143
Athens . . . . .	B and C . . . . .	6	17
Third . . . . .	N and P . . . . .	"	600
	Total 6-inch . . . . .		617
Athens . . . . .	B and C . . . . .	4	42
D . . . . .	First and Second . . . . .	"	12
	Total 4-inch . . . . .		54
<b>EAST BOSTON.</b>			
White . . . . .	Marlon and Brooks . . . . .	12	87
Meridian . . . . .	Maverick sq. and White . . . . .	"	3,900
Lewis . . . . .	Marginal and Ferry . . . . .	"	460
	Total 12-inch . . . . .		4,447
Meridian . . . . .	Maverick sq. and White . . . . .	9	36
Bennington . . . . .	Brooks and Chelsea . . . . .	"	36
	Total 9-inch . . . . .		72
Bennington . . . . .	Brooks and Chelsea . . . . .	8	1,600
	Total 8-inch . . . . .		1,600
Putnam . . . . .	Bennington and Chelsea . . . . .	6	159
Prescott . . . . .	Trenton and Lexington . . . . .	"	100
Bremen . . . . .	Bennington and Glendon alley . . . . .	"	720
Sumner . . . . .	Border and New . . . . .	"	8
Lexington . . . . .	Putnam and Prescott . . . . .	"	8
	Total 6-inch . . . . .		995

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

IN WHAT STREETS.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<i>EAST BOSTON.— Continued.</i>			
Eutaw place . . . . .	Marion and Meridian . . . . .	4	180
Glendon alley . . . . .	Junction Chelsea . . . . .	"	2
	Total 4-inch . . . . .		182
<i>BOSTON HIGHLANDS.</i>			
Parker . . . . .	New Heath and Centre . . . . .	16	1,372
Centre . . . . .	Parker and West Roxbury line . . . . .	"	2,285
	Total 16-inch . . . . .		3,657
Lamartine . . . . .	Centre and West Roxbury line . . . . .	12	665
New Heath . . . . .	Day and Tremont . . . . .	"	565
Walnut ave. . . . .	Seaver and Walnut park . . . . .	"	71
Hunneman . . . . .	Albany and Harrison ave. . . . .	"	678
Pyncheon . . . . .	Cedar and New Heath . . . . .	"	18
Warren . . . . .	Edgewood and Bower . . . . .	"	390
Blue Hill ave. . . . .	Edgewood and Woodbine . . . . .	"	395
Ruggles . . . . .	Halleck and Parker . . . . .	"	460
Parker . . . . .	Ruggles and Greenleaf . . . . .	"	842
Edgewood . . . . .	Warren and Blue Hill ave. . . . .	"	1,143
Egleston sq. . . . .	Weld ave. and Walnut ave. . . . .	"	566
St. James . . . . .	Regent and Warren . . . . .	"	127
Egleston sq. . . . .	Walnut ave. and Washington . . . . .	"	688
	Total 12-inch . . . . .		6,608
Palmer . . . . .	Eustis and Winslow . . . . .	9	8
Hunneman . . . . .	Fellows and Harrison ave. . . . .	"	9
Fellows . . . . .	Hunneman and Northampton . . . . .	"	22
Blue Hill ave. . . . .	Woodbine and Maywood . . . . .	"	24
Edgewood . . . . .	Warren and Blue Hill ave. . . . .	"	34
Walden . . . . .	Heath and Centre . . . . .	"	25
Quincy . . . . .	Cherry and Blue Hill ave. . . . .	"	11
Cabot . . . . .	Weston and Windsor . . . . .	"	11
	Total 9-inch . . . . .		144

Statement of Location, Size, etc. — Continued.

IN WHAT STREETS.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of pipe.
<i>BOSTON HIGHLANDS.— Continued.</i>			
Alaska . . . . .	Perrin and Blue Hill ave. . . . .	8	425
Lansing . . . . .	Warren and Sherman . . . . .	"	380
Warren . . . . .	Edgewood and Dale . . . . .	"	657
Blue Hill ave. . . . .	Edgewood and Quincy . . . . .	"	1,002
Walden . . . . .	Heath and Centre . . . . .	"	1,214
Quincy . . . . .	Blue Hill ave, and Dorchester Line . . . . .	"	500
Dove . . . . .	Blue Hill ave. and Cherry . . . . .	"	296
	Total 8-inch . . . . .		4,474
Atherton ct. . . . .	From Atherton . . . . .	6	161
Atherton . . . . .	Arcadia and Washington . . . . .	"	36
Palmer . . . . .	Eustis and Winslow . . . . .	"	499
Vine . . . . .	Forest and Mt. Pleasant ave. . . . .	"	323
Dale . . . . .	Bainbridge and Rockland . . . . .	"	510
Catawba . . . . .	Laurel and Sherman . . . . .	"	146
Bainbridge . . . . .	Wilmont and Walnut ave. . . . .	"	427
Bowe . . . . .	From Centre . . . . .	"	602
Fellows . . . . .	Hunneman and Northampton . . . . .	"	1,093
Downer . . . . .	From Tremont . . . . .	"	263
Douglass ave. . . . .	Webber and Hall . . . . .	"	289
Sheridan ave. . . . .	From Centre . . . . .	"	30
Ballard . . . . .	From Schuyler . . . . .	"	174
Rand . . . . .	Blue Hill ave. and Rand sq. . . . .	"	362
Rand sq. . . . .	From Rand . . . . .	"	76
Greenleaf . . . . .	From Parker . . . . .	"	398
Peabody . . . . .	Binney and Brookline ave. . . . .	"	250
Putnam . . . . .	Roxbury and Dudley . . . . .	"	302
Cherry . . . . .	From Quincy . . . . .	"	539
King . . . . .	Roxbury and King-st. pl. . . . .	"	184
Cabot . . . . .	Ruggles and Stealing . . . . .	"	646
Huckins ave. . . . .	Dennis and Blue Hill ave. . . . .	6	143
Parker . . . . .	Fisher ave. and Billings pl. . . . .	"	657
	<i>Amount carried forward.</i> . . . . .		7,830

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

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipes in In.	Feet of Pipe.
BOSTON HIGHLANDS. — <i>Continued.</i>			
<i>Amount brought forward.</i>			7,830
Rockland . . . . .	Walnut ave. and Rockland ave. . . . .	6	280
Egleston sq. . . . .	Weld ave. and Walnut ave. . . . .	"	14
Fisher ave. . . . .	From Parker . . . . .	"	18
Parker . . . . .	New and Old Heath . . . . .	"	43
Parker . . . . .	Centre and Bromley park . . . . .	"	600
Bower . . . . .	Laurel and Sherman . . . . .	"	378
Total 6-inch . . . . .			9,443
Newman pl. . . . .	From Dudley . . . . .	4	151
Chadwick pl. . . . .	From Chadwick . . . . .	"	174
Culvert . . . . .	Tremont and Ruggles . . . . .	"	337
Forest court . . . . .	From Forest . . . . .	"	146
Copeland pl. . . . .	From Copeland . . . . .	"	147
Way pl. . . . .	From Copeland . . . . .	"	148
Bromley park . . . . .	Albert and Parker . . . . .	"	440
Regent court . . . . .	From Regent . . . . .	"	202
Total 4-inch . . . . .			1,745
DORCHESTER.			
Ashmont . . . . .	Ocean and Train . . . . .	12	3,762
Howard . . . . .	Howard ave. and Hartford . . . . .	"	554
Bowdoin . . . . .	Green and Bowdoin sq. . . . .	"	75
Washington . . . . .	Euclid and Welles ave. . . . .	"	154
Hancock . . . . .	Commercial and Winter . . . . .	"	14
Total 12-inch . . . . .			4,559
Welles ave. . . . .	Washington and Harley . . . . .	9	12
Harley . . . . .	Welles ave. and Roslin . . . . .	"	22
Roslin . . . . .	Harley and Ocean . . . . .	"	13
Ocean . . . . .	Roslin and Ashmont . . . . .	"	24
Alban . . . . .	Ashmont and Welles ave. . . . .	"	11
Austin . . . . .	Commercial and Downer ave. . . . .	"	12
<i>Amount carried forward</i>			94



Statement of Location, Size, etc. — Continued.

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>DORCHESTER. — Continued.</b>			
<i>Amount brought forward</i> . . . . .			94
Charles . . . . .	Dorchester ave. and Freeman . . . . .	9	22
Howard ave. . . . .	Sargent and Howard . . . . .	"	21
Ashmont . . . . .	Carruth and Train . . . . .	"	77
Howard . . . . .	Howard ave. and Hartford . . . . .	"	10
Train . . . . .	King and Boutwell ave. . . . .	"	30
Boutwell ave. . . . .	Train and Neponset ave. . . . .	"	10
Quincy . . . . .	Howard and Roxbury Line . . . . .	"	21
Total 9-inch . . . . .			285
Welles ave. . . . .	Washington and Harley . . . . .	8	508
Alban . . . . .	Ashmont and Welles ave. . . . .	"	482
Charles . . . . .	Ditson and Dorchester ave. . . . .	"	926
Howard ave. . . . .	Sargent and Howard . . . . .	"	780
Ashmont . . . . .	Train and Neponset ave. . . . .	"	242
Howard . . . . .	Quincy and Howard ave. . . . .	"	215
Train . . . . .	Ashmont and King . . . . .	"	1,588
Boutwell ave. . . . .	Train and Neponset ave. . . . .	"	400
Quincy . . . . .	Howard and Roxbury Line . . . . .	"	537
Wheatland ave. . . . .	Washington and Millet . . . . .	"	1,328
Savin Hill ave. . . . .	Midland and Spring . . . . .	"	15
Total 8-inch . . . . .			7,016
Sagamore . . . . .	Elton and Belfast . . . . .	6	310
Moseley ave. . . . .	From Crescent ave. . . . .	"	128
Buttonwood court . . . . .	From Buttonwood . . . . .	"	179
Leonard . . . . .	Clayton and Duncan . . . . .	"	181
Harley . . . . .	Welles ave. and Roslin . . . . .	"	657
Roslin . . . . .	Harley and Ocean . . . . .	"	330
Ocean . . . . .	Rosliu and Ashmont . . . . .	"	697
Avondale pl. . . . .	From Richmond . . . . .	"	325
Austin . . . . .	Commercial and Downer ave. . . . .	"	363
Upham ave. . . . .	Hancock and New . . . . .	"	259
<i>Amount carried forward</i> . . . . .			3,429

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

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>DORCHESTER. — Continued.</b>			
<i>Amount brought forward</i> . . . . .			
			3,429
New . . . . .	From Upham ave. . . . .	6	83
Wood-st. court . . . . .	Walnut and Wood . . . . .	“	253
Myrtle . . . . .	Quiney and Myrtle place . . . . .	“	56
Clark . . . . .	Bellevue and Hamilton ave. . . . .	“	267
Sargent . . . . .	Hartford and Howard ave. . . . .	“	757
Cook . . . . .	From Washington . . . . .	“	174
Minot pl. . . . .	From Minot . . . . .	“	389
Wheatland ave. . . . .	Washington and Whitfield . . . . .	“	9
Whitfield . . . . .	Washington and Park . . . . .	“	201
Millet . . . . .	Washington and Park . . . . .	“	157
Bowdoin sq. . . . .	From Bowdoin . . . . .	“	367
Total 6-inch . . . . .			6,142
Court . . . . .	From Hancock . . . . .	4	187
Stoughton-st. pl. . . . .	From Stoughton . . . . .	“	180
Holden pl. . . . .	From Dudley . . . . .	“	160
Total 4-inch . . . . .			527
<b>WEST ROXBURY.</b>			
Centre . . . . .	Perkins and Pond . . . . .	16	2,916
Total 16-inch . . . . .			2,916
Lamartine . . . . .	Roxbury Line and Green . . . . .	12	3,058
New Boylston . . . . .	Lamartine and Washington . . . . .	“	1,854
Green . . . . .	Lamartine and Washington . . . . .	“	1,311
Washington . . . . .	Green and New Boylston . . . . .	“	1,921
“ . . . . .	School and Atherton . . . . .	“	451
“ . . . . .	Walk Hill and South . . . . .	“	3,695
Walnut . . . . .	School and Seaver . . . . .	“	407
Centre . . . . .	Pond and South . . . . .	“	1,911
South . . . . .	Centre and Jamaica . . . . .	“	1,289
“ . . . . .	Jamaica and Morton . . . . .	“	1,905
<i>Amount carried forward</i> . . . . .			17,802

Statement of Location, Size, etc. — Continued.

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
WEST ROXBURY. — Continued.			
<i>Amount brought forward</i> . . . . .			17,802
Pond . . . . .	Centre and May . . . . .	12	2,700
Starr . . . . .	Green and Keyes . . . . .	"	1,970
Keyes . . . . .	Starr and South . . . . .	"	1,103
Walk Hill . . . . .	Morton and Washington . . . . .	"	651
Total 12-inch . . . . .			24,226
Green . . . . .	Lamartine and Centre . . . . .	8	1,626
Elliot . . . . .	Centre and Pond . . . . .	"	1,849
Greenough ave. . . . .	Centre and Elm . . . . .	"	1,121
Elm . . . . .	Walker and Revere . . . . .	"	785
Chestnut . . . . .	Boylston and Cedar ave. . . . .	"	1,505
Spring park . . . . .	Centre and Chestnut . . . . .	"	1,661
Jamaica . . . . .	From South . . . . .	"	286
Boylston ave. . . . .	Green and New Boylston . . . . .	"	2,476
Curtis . . . . .	Boylston and Wyman . . . . .	"	907
Total 8-inch . . . . .			12,216
Lamartine . . . . .	Boylston and Lamartine sq. . . . .	6	43
Boylston . . . . .	Lamartine and Chestnut . . . . .	"	459
New Boylston . . . . .	Boylston ave. and Bismarck . . . . .	"	10
Green . . . . .	Lamartine and Washington . . . . .	"	25
Washington . . . . .	Green and New Boylston . . . . .	"	36
" . . . . .	Atherton and School . . . . .	"	22
" . . . . .	Walk Hill and South . . . . .	"	15
Beethoven . . . . .	Washington and Arcadia . . . . .	"	553
Arcadia . . . . .	School and Atherton . . . . .	"	404
Chemical ave. . . . .	Washington and Brookside ave. . . . .	"	553
School . . . . .	Walnut and Arcadia . . . . .	"	1,881
Centre . . . . .	Perkins and South . . . . .	"	54
South . . . . .	Centre and Jamaica . . . . .	"	37
Elliot . . . . .	Centre and Pond . . . . .	"	16
Greenough ave. . . . .	Centre and Elm . . . . .	"	15
<i>Amount carried forward</i> . . . . .			4,123

Statement of Location, Size, etc. — Continued.

IN WHAT STREETS.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
WEST ROXBURY. — <i>Continued.</i>			
<i>Amount brought forward</i> . . . . .			4,123
Elm . . . . .	Greenough ave. and Revere . . . . .	6	9
Pond . . . . .	Centre and May . . . . .	“	54
Chestnut . . . . .	Green and Cedar ave. . . . .	“	729
Cedar ave. . . . .	Chestnut and Lamartine . . . . .	“	352
Spring park . . . . .	Centre and Chestnut . . . . .	“	26
Starr . . . . .	Green and Caroline ave. . . . .	“	9
Keyes . . . . .	Starr and South . . . . .	“	41
Boylston ave. . . . .	Porter and Green . . . . .	“	36
Burroughs . . . . .	Centre and Pond . . . . .	“	1,563
Harris ave. . . . .	Centre and Alveston . . . . .	“	698
Seaverns ave. . . . .	Centre and Alveston . . . . .	“	595
Alveston . . . . .	Seaverns ave. and Greenough ave. . . . .	“	912
Brewer . . . . .	Elliot and Burroughs . . . . .	“	625
Thomas . . . . .	Centre and Brewer . . . . .	“	508
Walker . . . . .	Elm and John A. Andrew . . . . .	“	333
B . . . . .	Boylston and Spring park . . . . .	“	594
Gordon . . . . .	Starr and Depot . . . . .	“	341
Weld ave . . . . .	School and Egleston sq. . . . .	“	471
Revere . . . . .	Alveston and Elm . . . . .	“	578
John A. Andrew . . . . .	Walker and Newberne . . . . .	“	36
Brookside ave. . . . .	Green and Chemical ave. . . . .	“	629
Orchard . . . . .	Centre and Pond . . . . .	“	1,612
Jamaica . . . . .	From South . . . . .	“	8
Curtis . . . . .	Boylston and Wyman . . . . .	“	14
South . . . . .	Keyes and Morton . . . . .	“	16
Walk Hill . . . . .	Morton and Washington . . . . .	“	237
Total 6-inch . . . . .			15,154
Green . . . . .	Lamartine and Union ave. . . . .	4	20
Court . . . . .	From Lamartine . . . . .	“	161
“ . . . . .	From Curtis . . . . .	“	206
Washington . . . . .	Walk Hill and South . . . . .	“	30
Total 4-inch . . . . .			417

Statement of Location, Size, etc. — Continued.

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>BRIGHTON.</b>			
Brighton ave. . . . .	St. Mary's and Cambridge . . . . .	16	8,589
North Beacon . . . . .	Cambridge and Everett . . . . .	"	379
	Total 16-inch . . . . .		8,968
North Beacon . . . . .	Everett and Parson . . . . .	12	4,422
Harvard ave. . . . .	Cambridge and Brookline line . . . . .	"	2,596
Cambridge . . . . .	North Beacon and Washington . . . . .	"	3,042
" . . . . .	Harvard ave. and Beacon park . . . . .	"	2,357
Market . . . . .	Western ave. and Hill . . . . .	"	3,277
Washington . . . . .	Cambridge and Nonantum . . . . .	"	2,977
" . . . . .	Cambridge and Union . . . . .	"	1,245
Foster . . . . .	Washington and South . . . . .	"	2,158
North Harvard . . . . .	Cambridge and Western ave. . . . .	"	2,390
Chestnut Hill ave. . . . .	Washington and the Ledge . . . . .	"	2,072
	Total 12-inch . . . . .		27,436
Chester . . . . .	Brighton ave. and Gardner . . . . .	8	461
Cambridge . . . . .	Brighton ave. and Harvard ave. . . . .	"	1,419
Market . . . . .	Washington and Hill . . . . .	"	1,706
Lincoln . . . . .	Cambridge and Market . . . . .	"	4,651
Franklin . . . . .	Lincoln and North Harvard . . . . .	"	1,764
North Harvard . . . . .	Western ave. and Cambridge bridge . . . . .	"	2,431
Winship . . . . .	Union and Chestnut Hill ave. . . . .	"	224
Rockland . . . . .	Vernon and Chestnut Hill ave. . . . .	"	58
Union . . . . .	Winship and Lexington . . . . .	"	425
	Total 8-inch . . . . .		13,139
Brighton ave. . . . .	Essex and Webster . . . . .	6	111
North Beacon . . . . .	Cambridge and Lyman . . . . .	"	60
Harvard ave. . . . .	Farrington and Holmes ave. . . . .	"	42
Allston . . . . .	Brighton ave. and Allston sq. . . . .	"	1,020
Cambridge . . . . .	Washington and Beacon park . . . . .	"	123
Market . . . . .	Washington and School . . . . .	"	55
	<i>Amount carried forward</i> . . . . .		1,411

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

IN WHAT STREET.	BETWEEN WHAT STREETS.	Diam. of Iron Pipe in In.	Feet of Pipe.
<b>BRIGHTON. — Continued.</b>			
<i>Amount brought forward . . . . .</i>			1,411
Lincoln . . . . .	Cambridge and Market . . . . .	6	50
Franklin . . . . .	Pearl and Vernon . . . . .	“	7
Washington . . . . .	Winship and Nonantum . . . . .	“	62
“ . . . . .	Cambridge and Union . . . . .	“	19
Gardner . . . . .	Chester and Harvard ave. . . . .	“	1,122
Foster . . . . .	Washington and South . . . . .	“	41
Winship . . . . .	Washington and Union . . . . .	“	1,145
Chestnut Hill ave. . . . .	Washington and The Ledge . . . . .	“	36
Rockland . . . . .	Washington and Chestnut Hill ave. . . . .	“	21
Shepard . . . . .	Washington and Union . . . . .	“	943
Pleasant . . . . .	Franklin and Everett . . . . .	“	971
Vernon . . . . .	Franklin and Everett . . . . .	“	1,202
Oakland . . . . .	Washington and Faneuil . . . . .	“	533
Waverley . . . . .	Market and Western ave. . . . .	“	1,250
North Harvard . . . . .	Cambridge and Willard pl. . . . .	“	114
Total 6-inch . . . . .			8,927
Brighton ave. . . . .	St. Mary and Norfolk . . . . .	4	50
Harvard ave. . . . .	Washburn and Holmes ave. . . . .	“	15
Total 4-inch . . . . .			65

RECAPITULATION.

SECTION.	DIAMETER OF PIPES IN INCHES.										Totals.
	40	16	12	9	8	6	4				
<b>1875-76</b>											
Boston . . . . .		623	6,727	169	1,082	2,709	465				
“ . . . . .		2	7		1	8	12				
South Boston . . . . .			581		1,143	617	54				
“ . . . . .					5	7	1				
East Boston . . . . .			4,447	72	1,600	995	182				
“ . . . . .			4		2	8	6				
Boston Highlands . . . . .		3,657	6,608	144	4,474	9,443	1,745				
“ . . . . .		1	13		8	20	7				
Dorchester . . . . .			4,559	285	7,016	6,142	527				
“ . . . . .			3		10	18	3				
West Roxbury . . . . .		2,916	24,226		12,216	15,154	417				
“ . . . . .		1	31		18	30	7				
Brighton . . . . .		8,908	27,436		13,139	8,927	65				
“ . . . . .		5	37		17	17	2				
Newton Lower Falls . . . . .	1,435		130								
“ . . . . .			1								
Brookline . . . . .	1		1								
Sums of Pipes . . . . .	1,435	16,164	74,714	670	40,670	43,987	3,455				181,095 feet.
Sums of Stopcocks . . . . .	1	9	97		61	108	38				314

Statement of the Length of different Sizes of Pipes laid, and the Number of Stopcocks put in, to May 1, 1876.

		DIAMETER OF PIPES IN INCHES.											Aggregate.			
		48	40	36	30	24	20	16	12	10	9	8	6	4	3	
Feet of Pipe laid in Brookline, Boston Highlands and Boston Proper	Number of Stopcocks in same	6	6	8	11	11	5	20,069	111,161	..	655	32,177	310,503	94,130	..	1,689,911 feet, equal to 320 miles 311 feet. 3,439
	Feet of Pipe laid in Boston Highlands	..	..	185	109	11,427	5,801	10,825	83,397	..	..	98	148,351	27,977	238	
	Number of Stopcocks in same	..	..	1	2	9	13,206	..	47,444	..	..	11	317	119	2	
	Feet of Pipe laid in South Boston	..	..	..	..	..	..	..	..	..	105	5,156	125,627	36,828	..	
	Number of Stopcocks in same	..	..	..	..	..	5	..	74	..	..	9	233	109	..	
	Feet of Pipe laid in East Boston	..	..	..	..	1,463	15,972	2,152	36,535	9,923	218	23,074	83,657	6,094	..	
	Number of Stopcocks in same	..	..	..	..	..	8	5	45	3	..	15	149	51	..	
	Feet of Pipe laid in Dorchester	..	..	..	..	7,784	3,698	456	91,630	..	1,340	10,444	91,934	3,977	..	
	Number of Stopcocks in same	..	..	..	..	5	1	1	107	..	..	16	182	25	..	
	Feet of Pipe laid in West Roxbury	..	..	..	..	..	..	2,916	24,226	..	..	12,216	15,154	417	..	
	Number of Stopcocks in same	..	..	..	..	..	..	1	31	..	..	18	30	7	..	
	Feet of Pipe laid in Brighton	..	..	..	..	..	..	..	8,968	27,436	..	13,139	8,927	65	..	
	Number of Stopcocks in same	..	..	..	..	..	..	..	5	37	..	17	17	2	..	
	Feet of Pipe laid in Newton and Needham	..	1,435	1,074	2,140	..	..	..	..	1,489	..	..	..	..	..	
Number of Stopcocks in same	..	..	..	..	..	..	..	..	3	..	..	2	..	..	..	
Totals -- Length of Pipe laid	7,283	24,601	21,329	29,019	26,447	44,500	46,386	422,718	9,923	3,234	101,832	783,913	169,488	238		
Number of Stopcocks put in.	6	6	9	13	25	20	74	652	3	..	184	1,728	717	2		



Statement of Service Pipes laid in 1875.

DIAMETER IN INCHES.	BOSTON.		SOUTH BOSTON.		EAST BOSTON.		BOSTON HIGHLANDS.		DORCHESTER.		WEST ROXBURY.		BRIGHTON.		TOTALS.		
	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	Number of Pipe.	Length in Feet.	
2	.....	.....	.....	.....	1	23	.....	.....	.....	.....	.....	.....	.....	.....	1	23	
1½	.....	.....	2	63	1	21	.....	.....	.....	.....	.....	.....	.....	.....	3	84	
1	9	245	.....	.....	.....	.....	7	140	1	3	2	72	2	65	21	525	
¾	8	297	3	115	.....	.....	3	57	1	28	1	303	2	128	18	928	
½	145	4,880	76	2,977	76	2,335	312	7,953	195	6,103	261	6,589	127	3,908	1,192	33,745	
¼	.....	.....	.....	.....	.....	.....	1	27	1	30	.....	.....	.....	.....	2	57	
Aggregate . . . . .																1,237	35,352
Making total number up to May 1st, 1876 . . . . .																41,325	

*Repairs of Pipes during the Year 1875.*

WHERE.	DIAMETER OF PIPES IN INCHES.															Totals.			
	36	30	24	20	16	12	9	8	6	4	3	2	1½	1¼	1		¾	½	
Boston . . . . .	2	4	1	9	10	19	.	6	36	52	3	6	80	3	15	15	361	8	630
South Boston . . . . .	.	.	.	7	.	5	.	.	4	1	.	5	.	2	7	2	65	11	109
East Boston . . . . .	.	.	.	2	.	3	.	.	3	1	.	1	.	.	2	.	50	3	65
Boston Highlands . . . . .	1	.	2	1	2	2	3	1	6	5	.	.	.	.	1	.	65	2	91
Dorchester . . . . .	.	.	1	1	.	2	6	.	4	.	.	.	.	.	.	.	12	.	26
West Roxbury . . . . .	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	6	.	7
	3	4	4	20	12	31	9	8	53	59	3	12	80	5	25	17	559	24	928

Of the leaks that have occurred on pipes of 4-inch and upwards — joints, 135; settling of earth, 11; defective pipe, 16; defective packing, 11; defective gate, 5; blasting, 1; burst by frost, 2.

Total . . . . . 181

Stoppages — by fish, 21; by frost, 1. Total . . . . . 22

Of 3-inch and on service pipes — joints, 23; settling of earth, 139; settling of wall, 2; settling of boxing, 1; defective pipe, 58; defective packing, 13; defective coupling, 23; defective gate, 1; defective faucet, 6; stiff connections, 80; faucet pulled out, 7; faucet loose at main, 6; faucet broken at main, 2; faucet punched out, 5; gnawed by rats, 15; struck by pick, 50; burst by frost, 25; pipes not in use, 9; nail-hole, 1; blasting, 6.

Total . . . . . 472

Stoppages — fish, 110; rust, 92; dirt, 9; gasket, 1. Frost from inside of house, 17; frost outside, 24.

Total . . . . . 253

Total . . . . . 928

*Statement of Number of Leaks, 1850-1875.*

YEAR.	DIAMETER OF.		TOTALS.
	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	324	401
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	769	926
1871 . . . . .	185	1,380	1,565
1872 . . . . .	188	1,459	1,647
1873 . . . . .	153	1,076	1,229
1874 . . . . .	434	2,120	2,554
1875 . . . . .	203	725	928

## HYDRANTS.

During the year 484 hydrants have been established, and 77 abandoned, as follows:—

	Established.			Abandoned.			Dif.	
	Lowry.	Boston.	Post.	Lowry.	Boston.			
Boston	57	7		64	48	48	16	
South Boston	6			6	4	4	2	
East Boston	24	6		30	1	18	11	
Boston Highlands	45	10	2	57	3	2	5	
Deer Island			2	2			2	
Dorchester	45	13	2	60	1	1	59	
West Roxbury	54	3	77	134			134	
Brighton	47	1	83	131			131	
	<u>278</u>	<u>40</u>	<u>166</u>	<u>484</u>	<u>4</u>	<u>73</u>	<u>77</u>	<u>407</u>

*Total amount up to May 1, 1876.*

Boston	.	.	.	.	.	.	.	1,272
South Boston	.	.	.	.	.	.	.	467
East Boston	.	.	.	.	.	.	.	283
Boston Highlands	.	.	.	.	.	.	.	745
Dorchester	.	.	.	.	.	.	.	577
Brookline	.	.	.	.	.	.	.	9
West Roxbury	.	.	.	.	.	.	.	134
Brighton	.	.	.	.	.	.	.	131
Charlestown	.	.	.	.	.	.	.	11
Chelsea	.	.	.	.	.	.	.	8
Deer Island	.	.	.	.	.	.	.	16
								<u>3,653</u>

51 Hydrants have been taken out and replaced by new or repaired ones, and 134 boxes have been taken out and replaced by new ones. The hydrants have had the usual attention paid them.

## STOPCOCKS.

314 new stopcocks have been established this year. 99 boxes have been taken out and replaced by new ones. All the stopcocks have had the attention of former years paid them.

Statement of Pipes and other stock on hand, exclusive of Tools, May 1st, 1876.

	DIAMETER IN INCHES.															
	48	40	36	30	24	20	18	16	12	10	9	8	6	4	3	2
Pipes . . . . .	10	33	33	74	4	24	3	14	609	5		2,315	3,028	121	23	.
Blow-off Branches . . .		2	2	3	.	3	.	8	7	.		18	.	.	.	.
Y Pipes . . . . .		.	.	1	1	.	.	1	1	.		.	.	.	.	.
4 Way Branches . . . .		3	.	2	9	5	.	20	70	.		45	11	1	.	.
3 Way Branches . . . .	1	7	4	6	9	8	.	35	24	6		71	92	13	.	3
Flange Pipe . . . . .		1	1	1	1	1	.	.	3	.		.	.	1	.	.
Sleeves . . . . .	7	6	11	11	29	14	.	9	11	14		13	56	46	19	19
Clamp Sleeves . . . . .	3	2	6	12	1	.	.	4	3	.		.	20	7	8	.
Caps . . . . .	1	1	2	2	3	4	.	12	12	.		44	43	26	.	.
Reducers . . . . .		3	5	.	4	11	.	2	58	45		12	18	17	.	.
Bevel Hubs . . . . .		.	.	.	.	.	.	.	.	.		.	4	3	.	.
Curve Pipes . . . . .	5	.	3	20	19	8	.	2	38	.		57	29	71	2	.
Quarter Turns . . . . .		.	2	10	3	15	.	15	65	2		60	7	7	.	.
Double Hubs . . . . .		.	.	.	.	3	.	5	.	.		.	13	.	.	127
Offset Pipes . . . . .		.	.	.	.	.	.	.	36	.		57	11	44	.	.
Yoke Pipes . . . . .		.	.	.	.	.	.	.	18	.		18	27	2	.	.
Manhole Pipes . . . . .		2	.	2	.	.	.	.	.	.		.	.	.	.	.
One-eighth Turns . . . .		.	.	6	9	20	.	15	83	6		72	8	8	.	.
Pieces of Pipes . . . . .	2	3	7	5	5	.	.	2	32	.		78	9	.	.	.
Blow-offs and Manholes . . . . .		.	.	{ 30×12	1	.	.	.	.	.		.	.	.	.	.
Plugs . . . . .		.	.	.	.	.	.	.	.	.		.	.	.	20	.
Thawing Clamps . . . . .		.	.	.	.	.	.	.	29	.		13	25	21	.	.
Stopcocks . . . . .		1	1	2	1	2	.	5	24	.		36	62	10	16	.
Manhole Branches . . . .		.	1	1	.	.	.	.	.	.		.	.	.	.	.
Straps . . . . .		3	2	4	1	6	.	2	4	.		6	.	.	.	.
Branch Openings . . . . .		10	.	13	2	.	.	.	.	.		.	.	.	.	.

*Lowry Hydrants.*— 60 Lowry hydrants, 29 pots, 12 iron extensions, 8 screw extensions, 12 chucks, 2 caps, 16 frames and covers, 6 frames, 18 round covers, 1 sidewalk cover, 11 screws, 4 valve seats, 8 rubber valves, large, 23 do. small, 57 lbs. composition castings, 33 wastes.

*Post Hydrants.*— 16 post hydrants, 65 barrels, 10 pots with valve connected, 26 common pots, 17 halves of pots, 40 frames and covers, 136 post hydrant castings, 101 screws

and nuts, 23 wrought-iron rods, 83 large nipples, 43  $2\frac{1}{2}$ -inch nipples, 30 stuffing-boxes, 46 rings for same, 111 valve seats, 133 rubber valves, 154 packing rings, 159 bottom rubber rings, 637 lbs. composition castings, 50 cast-iron valves and crossbars, 24 iron tops, 30 large caps, 58 small do., 53 wrenches, 200  $6\frac{1}{4} \times \frac{7}{8}$ -inch bolts, 12 barrels unfinished, 8 pots with valves unfinished.

*Boston Hydrants.* — 18 Boston hydrants, 40 extensions, 7  $6 \times 4$  hydrant bends, 7 4-inch do., 40 frames and covers, 1 extra heavy frame, 7 heavy frames and covers, 18 covers, 109 screws, 20 nuts, 7 valve seats, 70 nipples, 22 rods, 8 caps.

*For Stopcocks.* — 2 36-inch screws, 1 30-inch do., 2 24-inch do., 20 12-inch do., 36 8-inch do., 24 6-inch do., 19 4-inch do., 1 4-inch do. for waste weir, 1 do. for Brookline reservoir, 12 3-inch do., 1 16-inch check valve, 1 12-inch valve, 2 8-inch do., 13 6-inch do., 21 4-inch do., 7 3-inch do., 12 30-inch rings, 26 8-inch do., 106 6-inch do., 50 4-inch do., 6 3-inch do., 67,512 lbs. iron castings for 16-inch, 12-inch, 8-inch and 6-inch stopcocks, 1 12-inch unfinished, 24 8-inch do., 90 lbs. lead washers, 520 lbs. malleable nuts, 78 lbs. composition castings for 8-inch gates, 30 do. for 4-inch do., 4 heavy frames and covers, 19 frames and covers, 14 blow-off covers, 15 elevator covers, 19 fire-pipe covers, 32 reservoir covers, 20 high-service covers, 160  $1\text{-inch} \times 5\frac{1}{2}$ -inch bolts, 404  $\frac{3}{4}$ -inch  $\times$   $3\frac{1}{2}$ -inch do., 250  $\frac{3}{4}$ -inch  $\times$  3-inch do., 150  $\frac{3}{4}$ -inch  $\times$  2-inch do., 339  $\frac{5}{8}$ -inch  $\times$   $2\frac{1}{4}$ -inch do., 1,325  $\frac{5}{8}$ -inch by  $3\frac{1}{2}$ -inch do.

*Meters in Shop.* — 1 4-inch, 3 3-inch, 9 2-inch, 3 1-inch, 21  $\frac{5}{8}$ -inch.

*Stock for Meters.* — 6 2-inch nipples, 4 1-inch do., 8  $\frac{5}{8}$ -inch do., 2 2-inch connection pieces, 4 1-inch do., 8  $\frac{5}{8}$ -inch do., 10 1-inch cocks, 26  $\frac{5}{8}$ -inch do., 1 4-inch clock, 3 3-inch do., 4 2-inch do., 3 1-inch do., 40  $\frac{5}{8}$ -inch do., 60 brass spindles, 50 rubber nipples, 5 fish-boxes, 13 covers, 15 frames, 15 glasses for clocks.

*For Service Pipe.* — 75 1-inch union cocks, 29  $\frac{3}{4}$ -inch do., 568  $\frac{5}{8}$ -inch do., 111  $\frac{5}{8}$ -inch unfinished do., 12 1-inch air cocks, 8 1-inch T cocks, 38  $\frac{3}{4}$ -inch do., 53  $\frac{5}{8}$ -inch do., 60  $\frac{1}{2}$ -inch do., 12  $\frac{5}{8}$ -inch Y cocks, 38  $\frac{5}{8}$ -inch thawing cocks, 37 inch crooked cocks, 22  $\frac{3}{4}$ -inch do., 103  $\frac{5}{8}$ -inch do., 39  $\frac{1}{2}$ -inch do., 63  $1\frac{1}{4}$ -inch tubes, 32 1-inch do., 415  $\frac{5}{8}$ -inch do., 14 2-inch couplings, 70 1-inch do., 122  $\frac{5}{8}$ -inch do., 30  $\frac{1}{2}$ -inch do., 37  $\frac{5}{8}$ -inch thawing do., 1,500 boxes, 38 T do., 36 Y do., 145 extension tubes, 860 tubes, 2,000 caps, 30  $4 \times 3$  flanges, 20 sets 1-inch tubes, caps and flanges, 18  $4 \times 2$  iron reducers, 20 composition hose

reducers, 14  $4 \times 2$  composition reducers, 36  $2 \times 1$  do., 36  $2 \times \frac{5}{8}$  do.

*Lead Pipe.* — 273 pounds 3-inch lead pipe, 350 lbs. 2-inch do., 2,016 lbs.  $1\frac{1}{2}$ -inch do., 695 lbs.  $1\frac{1}{4}$ -inch do., 892 lbs. 1-inch do., 1,575 lbs.  $\frac{3}{4}$ -inch do., 27,995 lbs.  $\frac{5}{8}$ -inch do., 4,895 lbs.  $\frac{1}{2}$ -inch do., 716 lbs. 1-inch tin-lined do., 195 lbs.  $\frac{5}{8}$ -inch do., 70 lbs.  $\frac{5}{8}$ -inch block tin do., 650 lbs. old 2-inch lead pipe, 55 lbs. solder.

*Blacksmith Shop.* — 1,510 pounds round iron, 783 lbs. flat do., 900 lbs. square do., 60 lbs. working pieces, 1,180 lbs. cast steel, 20 lbs. spring steel, 100 lbs. calking steel, 150 shoe shapes, 2 boxes horsenails, 200 lbs. shoes,  $3\frac{1}{2}$  dozen pick blanks, 1,000 lbs. Cumberland coal.

*Carpenter's Shop.* — 105 Lowry hydrant boxes, 121 Post do., 28 Lowry do. unfinished, 15 Post do. unfinished, 87 stopcock boxes, 20 do. unfinished, 5 hydrant boxes, 3 meter boxes, 1,300 lbs. spikes and nails, 1,500 feet pine plank, 1,500 feet  $1\frac{1}{2}$ -inch spruce batting, 40 1-foot pieces for raising hydrant boxes, 38 1-foot do. for raising stopcock boxes, 10 do. for Lowry hydrant boxes, 70 feet maple, 400 feet spruce joist.

*Tools.* — 1 steam engine, 1 large hoisting crane, 3 boom derricks, 7 hand-gearred do., 8 sets shears and rigging for same, 7 tool-houses, 3 tool-boxes, 7 nozzles, 2 platform scales, 1 portable blacksmith shop, 1 portable cover for Brewer fountain, 1 hand roller, 2 horse do., tools for laying main and service pipes, 2 engine lathes, 1 foot do., 1 hand do., 1 Pratt and Whitney taper do., 1 planer, 1 boring mill, 1 chain-hoisting gear, 1 upright drilling machine, 4 grindstones, 1 trip hammer, the necessary tools for carrying on the machine, blacksmith, carpenter and plumbing shops, 1 circular saw, 1 fan-blower, 1 40-inch proving press, 1 36-inch do., 1 small do., 9 wheelbarrows, 3 handbarrows, 1,600 feet hose, also a lot of patterns at foundries where we obtain castings.

*Stable.* — 15 horses, 12 wagons, 2 buggies, 6 pungs, 1 sled, 2 sets runners, 2 carts, 20 sets harness, 32 blankets, 3 buffalo robes, 2 sleighs, 30 bales hay, 87 bushels grain, 9 bales straw, 1 jigger, 4 lap robes.

*Beacon-Hill Reservoir.* — 1 large composition cylinder, 1 16-inch jet, 1 6-inch composition jet, 3 composition plates, 9 cast-iron plates, 2 4-inch composition jets, 5 swivel pipe patterns, 1 2-inch copper straight jet, 6 composition jets for small fountains.

*Miscellaneous.* — 43 tons pig lead, 30 gallons linseed oil, 10 gallons tallow oil, 10 gallons asphaltum, 1 barrel kerosene oil, 80 tons furnace coal, 2 tons paving stones, 130 tons

gravel, 600 brick, 86 cords wood, 1 iron fountain-basin, 3 stone troughs for drinking-fountains, 2 drinking-fountains, 1 hose-carriage, 34 bales gasket, 3 iron lamp-posts, 5 fountain-bottoms, 2 lawn-cutters, 1 garden-pump, 6 manhole covers, 5 bbls. cement, lot of old iron.

Respectfully submitted.

E. R. JONES,  
*Superintendent of Eastern Division.*



## CIVIL ORGANIZATION OF THE WATER WORKS, FROM THEIR COMMENCEMENT, TO MAY 1, 1875.

### WATER COMMISSIONERS.

NATHAN HALE, JAMES F. BALDWIN, THOMAS B. CURTIS. From May 4, 1846, to January 4, 1850.

### ENGINEERS FOR CONSTRUCTION.

JOHN B. JERVIS, of New York, Consulting Engineer. From May, 1846, to November, 1848.

E. S. CHESBROUGH, Chief Engineer of the Western Division. From May, 1846, to January 4, 1850.

WILLIAM S. WHITWELL, Chief Engineer of the Eastern Division. From May, 1846, to January 4, 1850.

### CITY ENGINEERS HAVING CHARGE OF THE WORKS.

E. S. CHESBROUGH, Engineer. From November 18, 1850, to October 1, 1855.

GEORGE H. BAILEY, Assistant Engineer. From January 27, 1851, to July 19, 1852.

H. S. MCKEAN, Assistant Engineer. From July 19, 1852, to October 1, 1855.

JAMES SLADE, Engineer. From October 1, 1855, to April 1, 1863.

N. HENRY CRAFTS, Assistant Engineer. From October 1, 1855, to April 1, 1863.

N. HENRY CRAFTS, City Engineer. From April 1, 1863, to November 25, 1872.

THOMAS W. DAVIS, Assistant Engineer. From April 1, 1863, to December 8, 1866.

HENRY M. WIGHTMAN, Resident Engineer at C. H. Reservoir. From February 14, 1866, to November, 1870.

JOSEPH P. DAVIS, City Engineer. From November 25, 1872, to present time.

A. FTELEY, Resident Engineer on construction of Sudbury-river conduit, from May 10, 1873, to present time.

After January 4, 1850, Messrs. E. S. CHESBROUGH, W. S. WHITWELL, and J. AVERY RICHARDS were elected a Water Board, subject to the direction of a Joint Standing Committee of the City Council, by an ordinance passed December 31, 1849, which was limited to keep in force one year; and in 1851 the Cochituate Water Board was established.

## COCHITUATE WATER BOARD.

*Presidents of the Board.*

THOMAS WETMORE, elected in 1851, and resigned April 7, 1856 **	Five years.
JOHN H. WILKINS, elected in 1856, and resigned June 5, 1860 **	Four years.
EBENEZER JOHNSON, elected in 1860, term expired April 3, 1865	Five years.
OTIS NORCROSS, elected in 1865, and resigned Jan- uary 15, 1867	One year and nine months.
JOHN H. THORNDIKE, elected in 1867, term expired April 6, 1868	One year and three months.
NATHANIEL J. BRADLEE, elected April 6, 1868, and resigned January 4, 1871	Two years and nine months.
CHARLES H. ALLEN, elected from January 4, 1871, to May 4, 1873	Two years and four months.
JOHN A. HAVEN, elected May 4, 1873, to Dec. 17, 1874 **	One year and seven months.
THOMAS GOGIN, elected Dec. 17, 1874, and re- signed May 31, 1875	Six months.
L. MILES STANDISH, elected August 5, 1875, to present time.	

*Members of the Board.*

THOMAS WETMORE, 1851, 52, 53, 54 and 55 **	Five years.
JOHN H. WILKINS, 1851, 52, 53, *56, 57, 58 and 59 **	Eight years.
HENRY B. ROGERS, 1851, 52, 53, *54 and 55	Five years.
JONATHAN PRESTON, 1851, 52, 53 and 56	Four years.
JAMES W. SEAVER, 1851 **	One year.
SAMUEL A. ELIOT, 1851 **	
JOHN T. HEARD, 1851	One year.
ADAM W. THAXTER, Jr., 1852, 53, 54, 55 **	Four years.
SAMPSON REED, 1852 and 1853	Two years.
EZRA LINCOLN, 1852 **	One year.
THOMAS SPRAGUE, 1853, 54 and 55 **	Three years.
SAMUEL HATCH, 1854, 55, 56, 57, 58 and 61	Six years.
CHARLES STODDARD, 1854, 55, 56 and 57 **	Four years.
WILLIAM WASHBURN, 1854 and 55	Two years.
TISDALE DRAKE, 1856, 57, 58 and 59 **	Four years.
THOMAS P. RICH, 1856, 57 and 58	Three years.
JOHN T. DINGLEY, 1856 and 59	Two years.
JOSEPH SMITH, 1856	Two months.
EBENEZER JOHNSON, 1857, 58, 59, 60, 61, 62, 63 and 64	Eight years.
SAMUEL HALL, 1857, 58, 59, 60 and 61 **	Five years.
GEORGE P. FRENCH, 1859, 60, 61, 62 and 63	Five years.
EBENEZER ATKINS, 1859 **	One year.
GEORGE DENNIE, 1860, 61, 62, 63, 64 and 65	Six years.

CLEMENT WILLIS, 1860** . . . . .	One year.
G. E. PIERCE, 1860** . . . . .	One year.
JABEZ FREDERICK, 1861, 62 and 63** . . . . .	Three years.
GEORGE HINMAN, 1862 and 63 . . . . .	Two years.
JOHN F. PRAY, 1862 . . . . .	One year.
J. C. J. BROWN, 1862 . . . . .	One year.
JONAS FITCH, 1864, 65 and 66 . . . . .	Three years.
OTIS NORCROSS, * 1865 and 66 . . . . .	Two years.
JOHN H. THORNDIKE, 1864, 65, 66 and 67 . . . . .	Four years.
BENJAMIN F. STEVENS, 1866, 67 and 68 . . . . .	Three years.
WILLIAM S. HILLS, 1867 . . . . .	One year.
CHARLES R. TRAIN, 1868 . . . . .	One year.
JOSEPH M. WIGHTMAN, 1868 and 69 . . . . .	Two years.
BENJAMIN JAMES, * 1858, 68 and 69 . . . . .	Three years.
FRANCIS A. OSBORN, 1869 . . . . .	One year.
WALTER E. HAWES, 1870 . . . . .	One year.
JOHN O. POOR, 1870 . . . . .	One year.
HOLLIS R. GRAY, 1870 . . . . .	One year.
NATHANIEL J. BRADLEE, 1863, 64, 65, 66, 67, 68, 69, 70 and 71 . . . . .	Nine years.
GEORGE LEWIS, 1868, 69, 70 and 71 . . . . .	Four years.
SIDNEY SQUIRES, 1871 . . . . .	One year.
CHARLES H. HERSEY, 1872 . . . . .	One year.
CHARLES H. ALLEN, 1869, 70, 71 and 72 . . . . .	Four years.
ALEXANDER WADSWORTH, * 1864, 65, 66, 67, 68, 69 and 72 . . . . .	Seven years.
CHARLES R. MCLEAN, 1867, 73 and 74 . . . . .	Three years.
EDWARD P. WILBUR, 1873 and 74 . . . . .	Two years.
JNO. A. HAVEN, 1870, 71, 72, 73 and 74** . . . . .	Five years.
THOMAS GOGIN, 1873, 74 and 75* . . . . .	Three years.
AMOS L. NOYES, 1871, 72 and 75 . . . . .	Three years.
WILLIAM G. THACHER, 1873, 74 and 75 . . . . .	Three years.
CHARLES J. PRESCOTT, 1875 . . . . .	One year.
EDWARD A. WHITE, 1872, 73, 74 and 75	} <i>Present Board.</i>
LEONARD R. CUTTER, 1871, 72, 73, 74 and 75	
L. MILES STANDISH, 1860, 61, 63, 64, 65, 66, 67, 74 and 75 . . . . .	
CHARLES E. POWERS, * 1875 . . . . .	
SOLOMON B. STEBBINS, 1876 . . . . .	
NAHUM M. MORRISON, 1876 . . . . .	
AUGUSTUS PARKER, 1876 . . . . .	

\* Mr. John H. Wilkins resigned Nov. 15, 1855, and Charles Stoddard was elected to fill the vacancy. Mr. Henry B. Rogers resigned Oct. 22, 1865. Mr. Wilkins was re-elected Feb., 1856, and chosen President of the Board, which office he held until his resignation, June 5, 1860, when Mr. Ebenezer Johnson was elected President; and July 2, Mr. L. Miles Standish was elected to fill the vacancy occasioned by the resignation of Mr. Wilkins. Otis Norcross resigned Jan. 15, 1867, having been elected Mayor of the city. Benjamin James served one year, in 1858, and was re-elected in 1868. Alexander Wadsworth served six years, 1864-69, and was re-elected in 1872. Thomas Gogin resigned May 31, 1875. Charles E. Powers was elected July 15 to fill the vacancy occasioned by the resignation of Mr. Gogin.

\*\* Deceased.

## COCHITUATE WATER BOARD, 1876.

L. MILES STANDISH, President.

SOLOMON B. STEBBINS, of the Board of Aldermen.

NAHUM M. MORRISON,	} Of the Common Council.
AUGUSTUS PARKER,	

*At Large.*

For One Year.

\*Terms expired May 1.

LEONARD R. CUTTER,  
CHARLES E. POWERS,L. MILES STANDISH,  
EDWARD A. WHITE.*Clerk.*

WALTER E. SWAN,

*Superintendent of the Eastern Division.*

EZEKIEL R. JONES.

*Superintendent of the Western Division.*

DESMOND FITZGERALD.

*Superintendent on Additional Supply of Water.*

ALBERT STANWOOD.

*Water Registrar.*

WILLIAM F. DAVIS.

*City Engineer.*

JOSEPH P. DAVIS.

*Resident Engineer on Additional Supply.*

A. FTELEY.

## STANDING COMMITTEES OF THE BOARD.

*Eastern Division.*

EDWARD A. WHITE, Chairman.

NAHUM M. MORRISON,

L. MILES STANDISH.

*Western Division.*

LEONARD R. CUTTER, Chairman.

SOLOMON B. STEBBINS,

AUGUSTUS PARKER.

*Water Registrar's Department.*

NAHUM M. MORRISON, Chairman.

AUGUSTUS PARKER,

L. MILES STANDISH.

*On New Supply.*

L. MILES STANDISH, Chairman.

LEONARD R. CUTTER,

CHARLES E. POWERS.

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\* Holding office until the "Boston Water Board" is appointed and organized.













