ANNUAL REPORT
OF THE
COCHITUATE WATER BOARD
FOR
1867-8.

City Document. — *No.* 78.

CITY OF BOSTON.

REPORT

OF THE

COCHITUATE WATER BOARD

TO THE

CITY COUNCIL OF BOSTON,

FOR THE YEAR 1867-68.

CITY OF BOSTON.

In Common Council, May 14, 1868.

ORDERED: That the Cochituate Water Board be authorized to report in print.

Sent up for concurrence.

CHARLES H. ALLEN, *President.*

In Board of Aldermen, May 18, 1868.

Concurred.

G. W. MESSINGER, *Chairman.*

Approved May 19, 1868.

NATH'L B. SHURTLEFF, *Mayor.*

REPORT.

COCHITUATE WATER BOARD OFFICE, May 19th, 1868.

To the City Council of the City of Boston:

The Cochituate Water Board, in compliance with the provisions of the City Ordinance, respectfully submit their annual report for the year ending April 30th, 1868, together with the reports of the Clerk of the Board, City Engineer, Water Registrar, and the Superintendents of the Eastern and Western Divisions of the Water Works to which they would refer the City Council for the detailed statements of all matters relating to the condition and progress of the Water Works during the year.

It gives us pleasure in being able to report that the general condition of the works in every department is entirely satisfactory.

The supply of water has been ample to meet all the requirements for which it was introduced, the average level of the water at the Lake having been $12\frac{13}{100}$ feet above the bottom of the Conduit, which is the highest average (with one exception) since the water was introduced in 1848. On February 10th, the Lake was at high-water mark, and the water commenced to run over the dam into the Sudbury River, and continued to do so until the 13th of June; wasting during that time, according to the estimate of the City Engineer, 2,482,041,363 gallons: by another year, however, we shall require a portion of the water that is usually wasted in the spring to fill the Chestnut Hill Reservoir.

The income, as it appears by the report of the Water Registrar has been,	$522,130 93
Being a gain over the previous year of	35,592 68
The estimated incomes from water rates for the year 1868,	550,000 00
The expenses have been as follows: —	
For current expenses, . . .	148,462 79
Interest and Premium on the Water debt, .	515,245 33
	$663,708 12
The Treasurer has credited the Water Works for the same year, . . .	551,839 36
The balance shows an expenditure over and above our receipts of . . .	111,868 76
Which with	451,124 65
Expended on the Chestnut Hill Reservoir during the year, adds to the cost of the Water Works,	562,993 41
Cost of the Water Works to May 1st, 1867, including interest and premium on debt, less amounts received for water rates, rents, etc.	7,114,709 14
Making the total cost, May 1st, 1868, . .	$7,677,702 55

Eastern Division.

This division is under the charge of Mr. E. R. Jones, and comprises that portion of the works lying east of the Brookline Reservoir, including the distributing pipes and reservoirs in the city. During the year, the last section (1,900 feet in length) of the Tremont Street 30 and 36 inch main has been successfully raised, at an expense of $15,929.06; there has been also 2,866 feet of 12-inch, 7,778 feet of 6-inch, and 1,952 feet of 4-inch pipe laid, making the total amount of pipe laid since the commencement of the works to May 1st, 141 miles 5,142 feet, to which are connected 1,370 gates and 1,604 Fire Hydrants. The

number of service pipes laid has been 723, making a total to May 1st of 26,924. The repairs on the pipes have been ten per cent less than the previous year, but as usual the largest number of breaks have been caused by the frost, and from the settling of the earth.

The most important work in this division is the laying of the main and service pipes in Wards 13, 14, and 15. An appropriation of $200,000 for this purpose having been made by the City Council on April 20th, specifications were immediately sent to the several foundries where such work is performed, and the proposals were received soon after, and the contracts awarded as follows: for the 24 and 12 inch pipe, to R. D. Wood & Co., at $3.33\frac{1}{3}$ per hundred for the 24-inch and $3.40 per hundred for the 12-inch; the 6-inch pipe to S. Fulton & Co., at $3.50 per hundred. The pipes are to be coated with coal pitch varnish, to prevent rust and ochreous accretions, and to be delivered as required.

For the general supply of this district, it is proposed to connect with the present 36-inch main, at the junction of Lowell and Washington streets, near the Providence Railroad crossing, a 24-inch main, and carry the same through Washington and Dudley streets to Hampden street (formerly East street), and then to branch off from this main with smaller pipes extending into the several streets on the high grounds where water is most needed; the principal avenues running north and south are to have 12-inch mains, and the intermediate streets 6 and 4-inch. The required gates, hydrants and service pipes will be put in as the mains are laid; considerable progress has already been made in this work.

The repairs on the East Boston Reservoir is another important work now under way. The plan adopted is thus described in the Report of the City Engineer: — "To remove the entire stone lining of the reservoir, and a sufficient amount of the subjacent soil to permit a lining eighteen inches thick of tem-

pered clay to be placed over the entire interior surface. This clay lining to be covered with from twelve inches to three feet of gravel, and the protection wall and paving to be replaced." This method was decided upon, after careful investigation of over two years, to ascertain the cause of the leaks.

Western Division.

This division is under the charge of Mr. Albert Stanwood, and includes the Lake, and that portion of the works lying between the Lake and the Gate-house at the Brookline Reservoir.

The surroundings of the Lake are in good condition, with the exception of the embankment near the Saxonville Branch Railroad, which is washing away, and orders have been given to have a slope wall built to prevent further injury.

The Filter Dam at Pegan Brook has been re-built in the most thorough manner; and it is proposed to build another dam of like construction, a short distance above the present one, as soon as the water is sufficiently low to permit it to be done. This, we believe, will effectually prevent the impurities of this brook from flowing into the Lake.

As encroachments had been made upon the land owned by the city around Lake Cochituate and on the line of the Conduit, Mr. Joseph Crafts was employed last summer to obtain releases from the several parties, and over one hundred were obtained, many of them covering two and three parcels of land, a few of the abutters only having objected to signing a release, and in a very few instances the parties who might claim they have possession cannot be found. These cases will be settled by setting fences on the boundary lines.

The marginal land around Dug Pond has been purchased and secured by deeds to the city, with the exception of a small piece where an ice-house now stands: as by courtesy of the

City this is used for its present purpose, it is not considered really necessary that the city should own it. By thus controlling the shore, the water is secured against impurities that might otherwise be carried into it, and it gives an opportunity for raising the water to a level five feet higher than the present high-water mark.

The Brookline Reservoir has not been cleaned out for over ten years, and is now in such a state that, were it possible to keep up the supply in the city, we should consider it our imperative duty to do so; but until the Chestnut Hill Reservoir is completed, it cannot be done without depriving the city of water for several days, as the small conduit around the reservoir is only sufficient to keep one of the mains supplied. The Gate-house is in a leaky condition, and cannot be repaired for the present, for the same reason.

Chestnut Hill Reservoir.

The work on this reservoir has been pushed forward with great energy during the past year, and considerable progress has been made towards its completion. Contracts have been made for the stone work for the three Gate-houses,—the whole to be delivered before October 1st. Nearly all the stone for the intermediate gate-house are already on the ground. The contract for the 48-inch main to connect the reservoir with the present mains at the Brookline Reservoir has been made with the Messrs. J. W. & J. F. Starr, of Camden, N. J., at 3.$\frac{52}{100}$c. per lb., and they have commenced on the work and will deliver a portion before 1st of July, and the whole before December 1st. The route for this main has been laid out and surveyed, and possession will be taken as soon as the papers can be prepared. The large drain, seven thousand nine hundred and eighty feet in length, for carrying off the surface water, has been built during the year; this drain commences on

the northerly side of the Lawrence meadow, and extends entirely around the westerly, southerly and easterly sides of the reservoir and continuing down Beacon Street to a short distance beyond Rockland Street, and varies in size from two to six feet in diameter, requiring in its construction 1,367,500 brick, and over 4,000 barrels of cement. In the City Engineer's report will be found a full description of the magnitude of this work.

The foundation for the intermediate gate-house has been successfully laid; to enable this to be done, it became necessary to remove a portion of the present conduit. In order to keep up the supply of water during its construction, a wooden flume was carried around the opening, so put together that it can be taken apart and used again in the event of any accident to the conduit.

An account of the amount of work done, and what remains to be finished, will be found in the very full report of the City Engineer.

Water Registrar Department.

By reference to the report of the Water Registrar, it will be seen that the total number of water takers for the year 1868 is 28,104, being an increase over the previous year of 350; of this number, 19,854 are for dwelling-houses, 4,395 for stores and shops, and 1,047 are for stables, the remaining 2,808 are for various purposes. There were 610 cases where the water was turned off for non-payment, being 33 less than the previous year; of this number, 116 are still remaining off. The number of meters now applied is 895; these meter accounts, although a continual source of trouble to the Board, are undoubtedly of great advantage to the city in increasing the income, and checking the waste. The great danger of waste can be readily perceived when it is borne in mind that on the first of January there were 100,352 water fixtures in use in this city,

being an increase of 6,025 over the previous year, and this will undoubtedly be largely increased by the annexation of Roxbury. As many of these fixtures require two taps, it would be fair to estimate that at the present time there are 150,000 places where there is liability of waste from carelessness or by the fixtures being out of order.

The average daily consumption of water during the year has been 13,565,000 gallons, being an increase over the previous year of 1,336,000 gallons. The least average in any one month was 12,301,000 gallons, in the month of May; and the largest average was 15,434,000 gallons in the month of December.

Respectfully submitted.

NATHANIEL J. BRADLEE.
BENJ. JAMES.
BENJ. F. STEVENS.
ALEXANDER WADSWORTH.
CHARLES R. TRAIN.
JOSEPH M. WIGHTMAN.
GEORGE LEWIS.

OFFICE OF THE COCHITUATE WATER BOARD,
BOSTON, MAY 5, 1868.

To the 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, 1867, and ending April 30, 1868:

EXPENDITURES.

Blacksmith shop, for stock, etc.	$331 63
Plumbing shop " "	87 60
Raising water pipes on Tremont Street	15,929 06
Land and water rights	2,619 37
Stable	1,198 50
Taxes	234 23
Tools	764 82
Travelling expenses	9 50
Fountains	308 54
Laying main pipes, etc., for stock, etc.	982 51
Postage and expresses	56 98
Reservoirs—Beacon Hill	1,081 49
" East Boston	1,431 51
" South Boston	340 75
" Brookline	1,394 65
Aqueduct repairs	343 01
Printing (including Water Registrar's and Superintendent's)	939 69
Carried forward,	$28,053 84

Brought forward,	$28,053 84
Stationery (including Water Registrar's and Superintendent's)	402 24
Salaries (including clerks and inspectors in Water Registrar's department)	10,619 18
Main pipe	36,960 64
Service pipe	11,457 05
Off and on water	4,852 94
Extra inspectors	8,625 55
Wages,—laying main pipe	2,922 99
" " service pipe, etc.	5,502 12
" blacksmith shop	1,308 70
" plumbing shop	126 00
" proving yard	4,712 30
Upper yard, finishing buildings, etc.	1,855 22
Miscellaneous expenses	2,030 64
Meters	627 80
Maintaining meters	1,964 78
Repairing main pipe	2,908 40
" service pipe	5,350 39
" hydrants	3,863 72
" streets	3,135 56
" stopcocks	646 83
Stopcocks	2,878 61
Hydrants	924 27
Lake	2,023 10
Proving yard, stock, etc.	1,379 17
Hydrant and stopcock boxes	1,498 25
Tolls and ferriage	75 00
Oil	61 50
Carting	96 00
Chestnut Hill Reservoir	451,124 65
Amount drawn for the Water Works	$597,987 44

Brought forward,	$597,987 44
Amount drawn for the drive-way around Chestnut Hill Reservoir	71,368 13
Total drawn for by the Board . .	$669,355 57
And which is charged as follows:	
To Chestnut Hill Reservoir	451,124 65
Water Works	146,862 79
Drive-way	71,368 13
Total from April 30, 1867, to May 1, 1868,	$669,355 57
Total amount charged Water Works . .	$597,987 44

RECEIPTS.

Cash Paid City Treasurer.

Received for grass and pasture,	$140 00	
" " fines for waste, etc.,	2,867 00	
" " off and on water, for repairs,	1,528 00	
" " Pipe, laying, repairing, etc.,	6,765 00	
" " wood, oxen, etc. sold Chestnut Hill Reservoir,	615 70	11,915 70
		$586,071 74

THE ABOVE IS CREDITED TO

Chestnut Hill Reservoir	$615 70
Water Works	11,300 00
	$11,915 70
Amount drawn for Water Works not including Chestnut Hill Reservoir	$146,862 79

EXTENSION OF THE WORKS.

Main pipe	$36,960 64	
Wages laying main pipe	2,992 99	
Laying main pipe, stock, etc.	982 51	$40,936 14
Amount of expenses from April 30, 1867, to May 1, 1868		$105,926 65

Expenditures and Receipts on Account of the Water Works, to May 1, 1868.

Amount drawn by Commissioners		$4,043,718 21
" " Water Board, in 1850		366,163 89
" " Cochituate Water Board, from January 1, 1851, to May 1, 1867		2,252,440 20
Amount drawn from April 30, 1867, to May 1, 1868, for Water Works		597,987 44
		$7,260,309 74
Amount paid the City Treasurer by the Commissioners	$47,648 38	
Amount paid by Water Board, 1850,	8,153 52	
" " Cochituate Water Board, to May 1, 1867	161,439 03	
Amount paid from April 30, 1867, to May 1, 1868	$11,915 73	
		$229,156 66
Net amount drawn from the Treasurer, by the Commissioners and Water Boards, for the Water Works		$7,031,153 08

Gross payments (including interest, premium, etc.), for ac't of the Water Works	14,141,028 50
Gross receipts	6,463,325 95
Net cost to the city, May 1, 1868	$7,677,702 55

SAM'L N. DYER,
Clerk Cochituate Water Board.

OFFICE OF CITY ENGINEER,
Boston, May 5th, 1868.

N. J. BRADLEE, Esq., *President Cochituate Water Board:*

SIR, — The following Report relating to the Water Works is presented in compliance with the ninth section of the ordinance relating to the Department of Engineering and Surveying :

EASTERN DIVISION.

The Report of the Superintendent will furnish the details of operations and the general condition of affairs in this division.

On page 33 will be found the usual table of the average monthly heights of the water in the Brookline and City Reservoirs above "tide-marsh level."

The East Boston and South Boston Reservoirs have been shut off from general circulation during the entire year, and the heights of water do not indicate the average head.

The condition of the East Boston Reservoir has been such that it was not deemed safe to raise the water above fifteen feet.

During the months of September and October, observations were made to determine the amount of leakage and the exact localities where it occurred. The result showed that, with fourteen feet of water, the leakage amounted to 19,000 gallons per day, and, with twenty feet, nearly 50,000 gallons.

The places where the water made its appearance on the outside indicated that the leakage was not confined to that portion of the bank which was built above the natural surface; but that a very large portion found its way through veins of sand and gravel in the natural soil, and below the bottom of the puddle-trench, which was built only three feet below the natural surface.

These observations confirmed my previously expressed opinions, and the plan which I had suggested the year before was adopted. This plan was, to remove the entire stone lining of the reservoir, and a sufficient amount of the subjacent soil to

permit a lining, eighteen inches thick, of tempered clay, to be placed over the entire interior surface, this clay lining to be covered with from twelve inches to three feet of gravel, and the protection wall and paving to be re-placed.

The work of repairs is now being executed in accordance with the aforesaid plan.

Extension of the Works in Roxbury.

In the early part of last year, the question of supplying the City of Roxbury with water, in case of annexation, was considered, and certain estimates of the cost of distribution were then made and submitted to your Board at the request of the Commissioners on Annexation. Although those estimates were hurriedly made, and the details of the system of distribution were not very fully considered, yet it is believed the actual cost will not vary materially from those figures.

Since the consummation of annexation, surveys, levels, and plans, have been made, and a general plan of distribution decided upon, as follows, viz:

The supply main is to be twenty-four inches in diameter, to be connected with the thirty-six-inch main in Tremont Street, near the Providence Railroad crossing, and to be laid through Washington and Dudley streets, as far as Hampden Street. This main will connect with twelve-inch distribution pipes at Tremont and Pynchon streets, at Shawmut Avenue and Washington street and at Hampden Street and Grove Hall Avenue. The principal avenues running North and South will be supplied with twelve-inch pipes, and the smaller intermediate streets with six and four inch pipe. It was originally proposed to make the supply main sixteen inches in diameter; but, for various reasons, it was finally deemed to be more prudent to make it twenty-four inches. This increase of size, while involving no additional loss of head in other sections of the city, will be a positive gain in

this respect to the Highland District. It will form, eventually, part of a new line to South Boston, and one that is really needed now, to secure a greater head and to provide a much needed safeguard in case of accident to the single line, which is now the only reliance of the citizens of that rapidly growing section.

Specifications and drawings of the pipes and special castings required for this district have been made, and contracts for furnishing the same, and also the hydrants and gates have been awarded, — all the pipes, etc., to be delivered before December first.

Work has been commenced by the Superintendent, in the vicinity of Mt. Pleasant and also in Highland Street and will be prosecuted with all possible despatch. In those sections where ledge occurs, the progress will be necessarily slow.

All the pipes contracted for will be coated with coal pitch varnish, prepared and applied substantially according to Dr. Smith's process, which is described as follows in the specifications, viz:

a. Every pipe and casting must be entirely free from dust, sand or rust when the varnish is applied.

b. The varnish or pitch is to be made from coal tar, distilled until all the naphtha is removed, the material deodorized, and the pitch reduced to about the consistency of wax or very thick molasses; pitch which becomes hard and brittle when cold will not answer for this use.

c. Pitch of the proper quality having been obtained, it must be heated in a suitable vessel, to a temperature of three hundred degrees Fahrenheit, and must be maintained at not less than that temperature during the dipping. As the material will deteriorate after a number of pipes have been dipped, fresh pitch must be frequently added, and at least eight per cent of heavy linseed oil must be added daily with the fresh pitch, and the vessel must be entirely emptied of the pitch and refilled with

fresh material as often as may be necessary to insure the perfection of the process.

d. Each casting shall be kept immersed from thirty to forty-five minutes, or until it attains the temperature of three hundred degrees Fahrenheit, and, if required by the engineer, shall be heated to such temperature as he may designate before it is dipped.

e. After the bath is completed, the castings will be removed and placed in such a position to drip that the thickness of the varnish shall be uniform.

f. The coating on the pipes and castings must be tenacious when cold, and not brittle, nor disposed to scale off, and when it shall appear to the inspector that the coating has not been satisfactorily applied, the pipe or casting shall be thoroughly scraped and cleaned and re-coated.

This process is generally adopted by engineers of Water Works in this country, where cast-iron is the material used for water pipes. It has been tested for over ten years, and pipes laid on our own works in 1858 are found to be almost entirely free from rust or ochreous accretions.

The hydrant adopted for the extensions is the one known as the "Lowry Hydrant," which, from observation and from inquiries made in localities where it has been tested, I believe to combine more advantages with fewer defects than any other. A contract for any number we may require, — from 100 to 300, has been made with the Boston Machine Co.

A contract has also been made with the aforesaid company for all the stop-gates required, the pattern being the kind called the "swing-valve," upon which the company has a patent. These gates, manufactured in the thorough style of workmanship characteristic of this company, are vastly superior to our old styles, and will, undoubtedly, supersede them eventually.

Lake Cochituate.

For details of the condition of affairs on the Western Division and at the Lake, see the report of the Superintendent.

Surveys have been made by this Department of the land contiguous to the shore of Dug Pond, which it was desirable that the city should own and control; and, during the Winter, soundings were taken of the depth of water in all parts of the Pond.

The annual examination of the interior of the Conduit from the Lake to Charles River was recently made, and it was found to be in excellent condition as to cracks and fissures, but very dirty and slimy, and should be cleaned before hot weather.

The following notes of the examination will give a good idea of the state of the Conduit:

First Division.

At Station 7 to 8 is a fine crack in top arch.

At Stations 17½, 96 and 97½, fissures with considerable water and sand running in.

At Stations 154 to 155 is a fine crack in top arch.

Between Stations 157 and 158 is a crack which has been repaired, and is now in good condition.

From Station 168 to 169, a repaired crack, in good order.

Near Station 169, a short crack, which should be pointed.

Stations 169½ to 170, small crack in top arch.

Station 172 to 175½, repaired crack, in good order, except a small portion near 174 which was left without pointing.

Stations 182½ to 183, a fine crack in top arch.

Stations 207½ to 208½, a fine crack in top arch.

Stations 245½ to 247½, cracks that have been repaired are all in good order; but there are several small cracks that have not been cemented.

Stations 254½ to 256, a very fine crack in top.

A little past 272 is a crack, — part of which has been cemented, — extending to about $274\frac{1}{2}$.

SECOND DIVISION.

At Stations $12\frac{1}{2}$ to 13, is a fine crack in top; also between 16 and 17.

This division is in better condition as to repairs and cleanliness than the first; and the repairs which were made of the very bad portion on the Ware's Valley embankment have stood remarkably well.

On the 1st of January, 1867, the water at the Lake was 12 feet 2 inches above the bottom of the Conduit and remained, with slight fluctuations, at about that height, until February 9th, when it began to rise; and on the 12th it had reached a level of 14 feet 1 inch, and we were obliged to run 17 inches in depth over the Outlet Dam. The Lake continued full until the 13th of June. August 1st, it stood at 11 feet 7 inches; August 24th, at 12 feet 8 inches; October 29th, at 10 feet $8\frac{1}{2}$ inches; December 25th, at 10 feet $1\frac{1}{2}$ inches, — the lowest point reached during the year, — and on the last day of the year it stood at 10 feet 5 inches.

It will be seen by reference to the table on page 30, that the average level of the water in the Lake during the past year was $12\frac{33}{100}$ feet above the bottom of the Conduit, the highest average on record, except in 1863.

The statement on page 27 shows that 35 per cent of the rainfall was actually received into the Lake, and that the average daily capacity of the Lake, as a source of supply for a period of fourteen years, is 21,716,700 gallons, and deducting the average daily waste for the same period, it will be seen that the supply actually available is about 18,000,000 gallons per day.

The following statement shows the amount of water wasted at the Outlet Dam during the year 1867:

February,	20 days	956,216,492	gallons.
March,	26 days	562,377,743	"
April,	25 days	678,461,904	"
May,	21 days	284,985,224	"
Total,	92 days . . .	2,482,041,363	"

Being about one-half the amount actually consumed.

Consumption of Water.

On pages 28 and 29 will be found the usual tables of the Consumption of Water; from which it appears that the average daily amount consumed in 1867 was 13,565,000 gallons, an increase over the previous year of 1,336,000 gallons. The least average in any one month was 12,301,000 gallons per day, in May, and the largest average was in December, amounting to 15,434,000 gallons.

Probably one-quarter of the water drawn from the Brookline Reservoir is wasted; and, if every one paid for water as they pay for gas, by meter measurement we should see my statement verified, and the consumption reduced to 10,000,000 gallons.

Chestnut Hill Reservoir.

Since the date of the last report, this work has been pushed with all possible energy, and as large a force of men and teams has been employed as could work to advantage.

The following is a statement of the average number of men and teams employed since the commencement of the work:

		MEN.	TEAMS.			MEN.	TEAMS.
1866.	April.....	182	9	1867.	May	406	49
"	May	327	18½	"	June	611	49
"	June	385	23	"	July	734	59
"	July	400	27	"	August ...	755	59
"	August....	424	32½	"	September,	652	64½
"	September	396	39½	"	October ..	594	65
"	October...	386	40	"	November,	522	65
"	November.	319	40	"	December,	413	65
"	December.	270	40	1868.	January ..	355	65½
1867.	January...	257	40	"	February .	.....	66
"	February..	240	40	"	March	.....	66
"	March	222	40	"	April	.....	66
"	April	373	45½	"	May	.....	.....

The work on the banks and slope wall was prosecuted from April 15th to Nov. 16th, and was resumed May 6th, and is now progressing well. The total number of lineal feet of bank completed amounts to about 10,250, of which about 8,820 feet is covered with the protection wall. There remains to be built about 4,065 feet, 375 of which is in the Lawrence meadow section, and can easily be finished the present summer. About 1,100 feet of the balance, in the lower section, will be very heavy embankment, being from 20 to 40 feet in height.

The drain alluded to in last year's report was commenced on the 10th of May, and completed on the 27th of November. The following is a statement of the lengths of the various sizes,

which vary somewhat from the lengths as proposed to be built, and as stated in last year's report:

283	ft. of	6 ft.	×	6 ft. 4	inches.	
482	"	4 ft. 8 in.	×	5 ft.		
1,820	"	4 ft.	×	4 ft. 4	"	
1,803	"	3 ft. 4 in.	×	3 ft. 8	"	
1,561	"	3 ft.	×	3 ft. 4	"	
1,200	"	2 ft. 6 in.	×	3 ft.		
605	"	2 ft. 6 in.	barrel			
154	"	2 ft.	"			
60	"	3 ft.	×	1 ft. 6	"	rectangular.
12	"	4 ft.	×	4 ft. 4	"	

Total, 7,980 feet.

This drain commences on the northerly side of the Lawrence meadow, and extends entirely around the westerly, southerly and easterly sides of the reservoir, and continues down Beacon Street, to a point a few hundred feet east of Rockland Street. It was a very important and costly portion of the work done during last year, requiring 1,367,500 brick, and about 4,300 barrels of cement in its construction. Being underground, and out of sight, it contributes nothing towards a visible show of progress. This drain intercepts the surface drainage, which would otherwise flow into the reservoir. A considerable portion of this drain is laid from 15 to 20 feet below the surface, and several hundred feet of it in solid rock. It passes under the Conduit which leads to Brookline Reservoir, where it crosses the new location of Beacon Street; and, as the excavation at this point was in solid ledge, upon which the Conduit itself rested, the utmost care was requisite to avoid injury by blasting. Workmen were employed night and day upon this particular spot, and every precaution was taken to avoid any casualty, which might seriously interrupt the supply of water to the Brookline Reservoir. The work was successfully accomplished, and the entire trench

around the drain and Conduit, for a length of about 50 feet, and as high as the top of the invert of the Conduit, was filled solid with concrete.

The new portion of Beacon Street has been graded, and, although not in complete order, will probably be open to public travel, and the old portion discontinued before the first of June. About 400 feet of the Conduit, in the vicinity of the intermediate gate-house, has been removed, and is to be rebuilt upon a masonry foundation carried down to solid rock about eight feet below the bottom of the reservoir. This section was originally built on a clay embankment, and has been badly cracked. It is located across the narrow gap which divides the upper and lower reservoirs, and hence the care and expense requisite at this point, in order that the dam may be tight and strong and no injury result to the Conduit, in case of one section of the reservoir being empty and the other full. While this work and that of building the intermediate gate-house is being prosecuted, the water is carried around the gap in a wooden flume, so constructed that it can be taken apart, and used again in a similar emergency. The foundations are already in for the intermediate gate-house, the cut granite is nearly all delivered, and a contract has been made for its erection, work upon which will soon commence.

The bank upon the upper section being nearly completed, there only remains, to complete this section ready to receive the water, the removal of about 40,000 cubic yards of muck and surplus material, the building of the influent and intermediate gate-houses, and the building of less than 400 feet of bank and slope-wall, all of which the Superintendent intends to do before winter.

The retaining wall, containing 2,380 cubic yards of stone, referred to in last year's report, has been finished, ready to receive the coping stone, and the filling in the rear for the drive-way nearly finished. Other parts of the drive-way have been graded and ballasted, and a portion graded and partially bal-

lasted, amounting in all to 5,450 feet graded, and about 4,700 feet ballasted. A considerable portion around the Lawrence meadow has been covered with broken stone and a temporary coating of gravel, so that people who desire can form a tolerable idea of the quality of roadway which we intend to have.

Contracts have been made for furnishing all the cut granite for the gate-houses, and for the erection of the same.

A contract has also been made with J. W. and J. F. Starr, of Camden, N. J., for the 48-inch pipe, about 7,400 feet in length, to connect the reservoir with the present mains in Brookline; said pipes and castings to be all delivered before December 1.

A contract has also been made with the Boston Machine Company for all the gates for our gate-houses and for regulating the connection with the present mains.

A route for the 48-inch main has been surveyed and staked out, and the amount of land to be taken from the several owners has been surveyed. Possession will be taken as soon as the papers can be prepared, and the work of grading commenced.

The following statement shows the amount expended from the appropriation for Chestnut Hill Reservoir for engineering, during the year ending April 30, 1868, viz:

Salary of Henry M. Wightman, Resident Engineer,		$1,938 00
" S. C. Horn, Assistant Engineer		891 00
" W. F. Learned, Rodman		52 00
" D. C. Sanger, "		336 00
" A. Chester, "		72 00
" J. Sullivan, Axeman		594 00
" E. R. Brown, Architect		1,818 00
		$5,701 00
Incidental expenses		132 83
Total		$5,833 83

Besides the tables already alluded to in this report, there will be found appended the usual tables relating to the amount of rainfall; and to the several gentlemen who have kindly furnished materials for these tables I desire to express my thankful acknowledgments.

Statement showing Amount of Rain-Fall on Water-shed of Lake Cochituate, Amount of Water consumed and wasted, available Amount received into Lake, available percentage of Rain-Fall, etc., from 1852 to 1867, inclusive.

YEAR.	Rain-Fall.	Amount of Rain-Fall on Water-shed of Lake Cochituate.	Amount of Water consumed.	Amount of Water wasted from Lake.	Total am't consumed and wasted.	Rise of Lake during the year.	Fall of Lake during the year.	Total available amount of Rain-Fall received into Lake.	Available daily average am't of Rain-Fall rec'd into Lake.	Available per-cent'e of Rain-Fall rec'd into Lake.
	Inches.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	
1852*	47.93	15,759,207,000	2,947,042,800	4,020,566,885	6,994,609,685	.....	261,360,000	6,733,249,685	18,396,857	43 per cent.
1853	55.86	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	41,957,562	74 per cent.
1858	48.66	15,999,232,000	4,689,155,000	1,934,500,000	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	17,714,065	35 per cent.
1861	46.44	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	20,271,233	45 per cent.
1863	69.30	22,785,586,000	5,927,052,500	2,165,696,470	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	.....	7,052,973,174	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	25 per cent.
1867	56.25	18,494,795,000	4,294,176,000	2,482,041,000	7,254,570,000	....	698,811,000	6,555,759,000	17,961,000	35 per cent.
Average, 50.93		Aver. daily waste for 14 years .....8,340,400 " " " for 6 years, '52–59...14,378,900 " " " last 8 years, '60–67... 3,806,630			Average daily capacity of Lake as a source of supply for 14 years, 21,716,700					46 p. ct. av.

* Observations of Rain-Fall at Lake Cochituate commenced 1852, and these observations are assumed as correct for the whole district.

† Lake raised two feet.

Consumption of Water. Daily Average Number of Wine Gallons drawn from the Brookline Reservoir.

MONTHS.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
January	1,700,000	5,181,700	7,233,700	8,280,900	8,050,500	10,695,200	9,702,700	12,669,000	15,089,000	12,160,000
February	.....	5,214,000	7,221,100	8,790,300	8,643,600	10,654,200	10,349,800	12,791,000	14,175,000	14,399,000
March	1,550,000	4,841,200	6,137,900	8,521,100	8,202,200	9,582,100	10,125,600	12,504,000	13,941,000	14,154,000
April	.....	4,961,000	5,365,200	8,048,700	7,903,600	8,738,500	8,540,000	10,800,000	12,454,000	13,465,000
May	3,600,000	5,346,100	6,238,400	8,350,000	8,123,400	9,685,300	9,103,800	10,378,000	12,414,000	11,423,000
June	4,300,000	6,906,500	7,925,000	8,033,100	8,945,900	11,745,200	9,984,400	11,223,000	12,504,000	10,867,000
July	4,800,000	8,514,200	7,180,200	9,608,000	8,809,200	10,613,800	11,056,600	13,167,000	13,551,000	13,621,000
August	4,100,000	8,004,600	7,235,000	9,709,300	8,461,900	10,028,100	11,120,800	12,664,000	13,077,000	13,141,000
September	4,800,000	6,585,500	7,230,600	7,920,000	8,640,700	9,712,400	11,710,800	11,522,000	12,030,000	12,745,000
October	4,550,600	4,504,300	6,716,600	6,930,000	8,871,100	8,769,800	10,771,200	11,891,000	10,864,000	12,969,000
November	3,800,000	4,960,500	6,473,500	6,637,900	8,624,700	8,030,200	10,383,200	11,691,000	11,372,000	12,143,030
December	3,600,000	5,037,000	7,663,400	7,195,800	9,228,400	10,597,600	11,307,200	13,284,000	11,241,000	13,075,000
Average for Year	3,680,000	5,837,900	6,883,800	8,125,800	8,542,300	9,902,000	10,346,300	12,048,600	12,726,000	12,847,000

MONTHS.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
January	14,512,000	17,862,000	21,106,769	17,000,000	16,112,000	18,954,000	13,412,000	14,850,000	13,511,000	.....
February	14,769,000	18,901,000	20,804,131	17,000,000	17,328,000	18,846,000	13,318,000	13,385,000	13,831,000	.....
March	14,480,000	15,409,000	19,453,344	17,300,000	16,681,000	16,841,000	12,027,000	12,284,000	13,100,000	.....
April	13,760,000	14,621,000	17,151,593	15,300,000	15,125,000	16,506,000	11,975,000	11,251,000	12,770,000	.....
May	11,302,000	14,790,000	16,687,832	14,300,000	15,407,000	16,094,000	13,660,000	11,076,000	12,301,000	.....
June	11,639,000	17,838,000	17,231,984	16,600,000	16,138,000	17,730,000	14,391,000	11,878,000	13,625,000	.....
July	13,219,000	17,239,000	18,897,809	16,400,000	15,954,000	18,112,000	13,207,000	12,668,000	14,250,000	.....
August	12,704,000	19,297,000	18,272,365	17,000,000	16,980,000	16,188,000	13,426,000	12,441,000	14,546,000	.....
September	12,389,000	17,957,000	18,098,259	17,000,000	17,035,000	16,798,000	12,624,000	11,842,000	13,186,000	.....
October	12,026,000	16,938,000	17,987,128	17,300,000	15,779,000	15,479,000	11,273,000	12,396,000	13,518,000	.....
November	12,715,000	16,862,000	16,604,076	17,100,000	16,028,000	14,079,000	11,750,000	11,262,000	12,707,000	.....
December	14,586,000	19,151,000	15,976,362	17,000,000	16,295,000	14,547,000	10,877,000	11,412,000	15,434,000	.....
Average for year	13,175,000	17,238,000	18,189,304	16,600,000	16,238,500	16,681,000	12,662,000	12,229,000	13,565,000	.....

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

MONTHS.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.*	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
January	9.50	10.63	9.51	10.54	10.16	8.06	9.53	10.75	10.80	10.83	11.93	6.09	11.33	13.88	7.41	8.37	12.14
February	10.21	10.20	10.78	10.95	10.65	7.59	10.28	10.05	12.17	11.36	12.77	6.57	12.85	13.71	8.24	8.73	13.14
March	10.43	10.49	10.44	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
April	11.17	11.23	10.68	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
May	11.02	10.94	10.98	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
June	10.40	10.28	10.62	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
July	9.76	9.44	9.45	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
August	9.01	8.40	8.64	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
September	8.00	5.68	7.78	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
October	7.55	6.55	7.34	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
November	8.07	7.74	9.58	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
December	9.67	8.49	10.57	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
Yearly averages	9.57	9.17	9.70	9.00	9.29	10.14	11.26	10.24	11.04	10.93	10.94	11.10	13.52	10.84	10.76	11.20	12.33

* High-water mark raised two feet.

Annual Amount of Rain-Fall, in Inches, at Lake Cochituate, Boston and vicinity, 1849 *to* 1867, *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 E. Hobbs and J. R. Scott, Ag't Boston Manufacturing Co.	Lowell, by Merrimac Manufacturing Co.	Lowell, by Locks and Canals Co., J. B. Francis.	Providence, by A. Caswell.
1849	.....	40.30	40.97	40.74	51.09	.....	34.69
1850	.....	53.98	54.07	62.13	45.68	.....	51.48
1851	.....	44.31	41.97	41.00	41.00	.....	43.30
1852	* 45.93	47.94	40.51	42.24	42.78	.....	38.58
1853	* 55.86	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	44.74
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	45.29
1860	55.44	51.46	46.95	.....	46.91	46.67	38.24
1861	46.44	50.07	50.14	.....	43.32	42.95	44.25
1862	49.69	61.06	57.21	.....	44.26	44.61	50.09
1863	69.30	67.72	56.42	53.66	52.37	57.81	54.17
1864	42.60	49.30	.....	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	46.04
1867	56.25	55.64	41.71	41.40	45.54	45.87	47.04

* By J. Vannevar.

Conduit.

The following table shows the different heights at which the water has been running, and the number of days in each month at the different heights:

The height of the Conduit is six feet four inches.

1867.	HEIGHTS IN FEET AND INCHES.																														
	0	4.6	4.7	4.8	4.9	4.10	4.11	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.8	5.9	5.10	5.11	6.0	6.1	6.2	6.4	6.6	6.8	6.10	7.0	7.2	7.4	7.6
	NUMBER OF DAYS IN EACH MONTH.																														
January,	.	1	.	2	.	12	.	3	1	4	.	1	.	1	3	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.
February,	.	.	.	.	.	.	.	5	1	4	.	1	.	8	4	1	.	.	2	.	.	.	.	1	.	1	.	.	.	.
March .	.	.	.	.	.	3	1	13	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
April . .	.	1	.	.	.	18	.	5	.	.	.	1	.	1	.	.	.	1	1	1	1	.	.	.	.	.	.	.	.	.
May . .	.	.	.	.	.	27	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
June . .	3	.	.	.	.	13	.	.	.	.	.	1	.	5	.	.	1	.	.	.	.	.	1	.	1	3	1	1	.
July . .	1	.	.	.	.	3	.	1	.	.	.	.	.	24	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.
August .	4	.	1	.	.	4	1	5	.	.	.	.	.	3	.	.	.	.	9	.	.	.	.	1	.	2	.	.	1
Septembr.	.	.	.	.	.	.	.	1	.	21	2	.	1	.	.	.	.	.	3	.	.	1	.	.	.	1	.	.	.
October .	2	1	.	.	.	1	.	7	.	7	3	1	1	2	1	.	.	.	5	.	.	.	.	.	.	.	.	.	.
Novembr.	1	.	.	1	2	19	.	3	.	1	.	.	.	.	.	1	.	.	1	.	.	1	.	.	.	.	.	.	.
Decembr.	.	.	.	.	.	9	.	.	.	.	8	.	.	1	5	.	1	1	5	.	.	1	.	.	.	.	.	.	.
Total,	11	3	1	3	2	109	3	46	2	51	13	5	2	45	13	2	2	2	29	1	1	3	1	2	1	9	1	1	1

Average monthly Heights of Water in Reservoirs at Brookline, Beacon Hill, South and East Boston, 1861–67 *inclusive.*

	BROOKLINE.							BEACON HILL.						
Month.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
January	122.81	122.46	123.64	122.37	123.31	122.28	122.00	116.61	117.48	118.36	117.72	119.18	119.20	119.11
Febru'ry	122.68	122.85	123.23	122.61	122.82	122.47	123.12	118.93	119.46	118.18	117.54	118.91	119.65	118.59
March .	123.32	123.52	123.23	123.62	123.26	123.19	123.05	119.05	119.18	118.03	116.38	120.58	120.72	119.45
April . .	124.01	124.18	123.85	123.82	123.38	123.45	123.00	118.91	117.91	117.27	117.21	121.28	120.70	119.86
May . . .	124.04	124.00	123.52	123.62	122.65	123.04	123.07	119.06	117.59	116.33	116.53	120.31	119.53	118.50
June . .	123.68	123.25	123.17	122.66	123.23	123.29	122.34	117.32	116.39	115.40	115.31	120.56	118.53	118.34
July . . .	122.68	123.73	122.76	122.87	123.33	122.97	122.98	116.48	116.46	116.34	115.32	121.23	119.51	119.00
August.	123.71	123.70	123.11	122.64	123.39	122.80	122.23	114.18	116.22	116.05	115.19	119.83	119.17	117.70
Sept. . .	123.76	123.64	123.36	122.03	123.29	122.81	122.52	113.14	116.22	116.12	115.91	119.03	119.39	120.46
October	123.79	123.85	122.26	123.19	123.29	123.03	122.65	115.91	. .	115.87	118.17	118.43	119.56	120.46
Nov. . .	123.80	124.07	123.63	122.78	123.38	122.75	122.89	116.74	117.20	116.85	118.55	120.14	119.78	120.84
Dec. . . .	124.00	123.46	122.53	122.29	123.24	122.64	122.37	117.45	115.23	118.30	117.35	120.50	119.37	120.02
Average	123.52	123.56	123.19	122.87	123.21	122.89	122.69	116.98	117.21	116.92	116.77	120.00	119.59	119.36

	SOUTH BOSTON.							EAST BOSTON.						
Month.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
January	115.03	113.66	115.73	110.63	114.21	114.38	112.46	95.37	96.26	95.64	90.22	96.12	93.61	91.89
Febru'ry	115.07	114.08	115.54	110.94	113.42	114.44	111.36	93.05	94.94	93.86	92.98	97.00	96.61	92.06
March .	115.12	114.12	115.36	111.13	113.64	113.51	111.74	94.60	95.75	94.29	93.50	94.83	94.22	91.69
April . .	115.32	114.93	114.73	112.07	114.82	114.99	111.88	98.07	96.71	95.65	96.16	96.52	96.47	90.91
May . . .	113.83	115.74	112.71	111.64	115.44	114.90	111.63	97.85	96.99	93.07	97.68	96.04	95,85	89.63
June . .	112.58	114.22	111.39	109.06	114.91	114.32	111.19	96.22	95.99	91.10	94.22	93.91	93.71	91.82
July . . .	110.91	114.23	109.75	108.57	114.36	113.96	111.53	95.00	96.13	90.43	92.34	96.82	95.35	94.60
August.	112.92	114.03	109.80	109.53	113.80	114.07	111.90	97.34	93.96	91.23	92.84	95.78	93.85	94.16
Sept. . .	112.96	114.04	109.64	110.21	113.69	113.41	111.70	95.76	95.57	91.96	95.00	94.52	*	99.40
October	114.68	114.24	109.90	112.49	112.89	112.74	111.29	95.56	91.80	95.02	97.55	93.38	*	96.85
Nov. . .	114.14	115.94	111.25	112.49	112.74	112.03	111.26	96.40	93.57	93.36	98.14	92.23	*	93.47
Dec. . . .	113.79	116.35	109.90	113.89	113.78	112.62	111.08	97.37	95.77	89.79	97.27	94.34	92.29	92.57
Average	113.86	114.63	112.14	111.05	113.97	113.78	111.59	96.05	95.29	92.95	94.83	95.12	94.66	93.25

Note. The above average heights are given in feet and parts above marsh level. Maximum high water in the Brookline Reservoir is 124.6 feet above marsh level. By deducting the heights in the City Reservoirs from the heights in the Brookline Reservoir, in each month, we find the loss of head in the different sections of the city at that time.

* East Boston Reservoir was shut off for repairs twenty-seven days in September, the month of October, and three days in November, 1866. Its average height is for nine months only.

Respectfully submitted.

N. HENRY CRAFTS,

City Engineer.

BOSTON, May 1, 1868.

N. J. BRADLEE, Esq., *President of the Cochituate Water Board:*

SIR:—My report for the year ending with the 30th of April, is herewith respectfully submitted. An account of the extensions of the main pipes, service pipes, stock in store, etc., may be found in the tables below, in the usual form.

The raising of the last section of the large mains on Tremont Street was completed during the year. The other sections were raised, one in 1860, and the other in 1865.

The raising last year was quite successful. With the exception of the breaking in of the sewer at the terminus of the line, no accident occurred. This sewer was a large one, but was only four inches in thickness. It was repaired and strengthened by an additional course of brick. In replacing the earth at this point, I thought it would be more economical to put it back as well as the circumstances would permit, and repave it when fairly settled. It will be repaved soon as the weather will admit.

Last fall, by an arrangement between the Water Boards of Charlestown and Boston, the box over the pipes by the side of Chelsea Bridge was removed; the line of pipes that supply the City of Chelsea was laid on the same capping with ours, and both lines *housed* over. The size of this covering being sufficiently large to admit two or more men removed a serious difficulty in the way of making repairs.

The work of repairing the East Boston Reservoir was commenced this spring. The bad weather has thus far been quite unfavorable to the progress of this work, but everything is now arranged so that nothing but the weather, that I know of, will interrupt its speedy completion.

The work of laying the mains in the newly annexed territory was commenced some three weeks since, and I hope soon to report to the Board of a more rapid progress.

From year to year this department performs a great deal of work of a nature that cannot be inserted in the tables below. As you are conversant with these labors, and as they would be of no interest to the City Government or the public, I will not describe them here.

Statement of Location, Size and Number of Feet of Pipe Laid in 1867.

In what Street.	Between what Streets.	Diameter of Pipes in Inches.	Feet of Pipe.
	BOSTON PROPER.		
Columbus Ave.	Dartmouth and Warren Ave.	12	434
" "	Rutland Sq. and Chester Park	12	329
" "	Canton and Rutland Sq.	12	784
Berkeley	Lawrence and Chandler	12	119
	Total 12 inches in Boston		1,666
East Canton	Harrison Ave. and Albany	6	148
" Brookline	" " " "	6	465
" Dedham	" " " "	6	207
Union Park	" " " "	6	380
Concord	" " " James	6	280
West Brookline	Tremont and Warren Ave.	6	121
Concord Sq.	" " Columbus Ave., N. Side.	6	95
" "	" " " " "	6	69
Chapman	" " Emerald	6	400
Rutland Sq.	" " Columbus Ave.	6	156
Kendall	" " Shawmut Ave.	6	61
West Canton	Warren Ave. and Columbus Ave.	6	471
Newbury	Berkeley and Clarendon	6	458
Chandler	" " "	6	173
Tremont	Kendall and Hammond Ave.	6	180
North Charles	Cambridge and Poplar	6	840
Appleton	Clarendon and Canton	6	1,060
Albany	Oak and Curve	6	65
	Total 6 inches in Boston		5,629
South	Opposite Harvard	4	100
Albany	At Upper Yard	4	221
Prescott Place	East of Washington	4	264
Concord Sq.	Tremont and Columbus Ave., N. Side.	4	30
Lawrence	Clarendon and Dartmouth	4	370
James	Newton and Concord	4	144
Park	On Boston Common	4	108
	Total 4 inches in Boston		1,237
	SOUTH BOSTON.		
I.	Broadway and Fourth	6	156
Sixth	N. and O.	6	267
Third	Dorchester and Emerson	6	231
O.	Sixth and Seventh	6	249
Sixth	N. and O.	6	363
Middle	Dorchester and Federal	6	250
	Total 6 inches in South Boston		1,516

Statement of Location, Size, etc. Continued.

In what Street.	Between what Streets.	Diameter of Pipes in Inches.	Feet of Pipe.
	SOUTH BOSTON. (*Continued.*)		
Dove.....	E. and F.....	4	715
	Total 4 inches in South Boston.....		715
	EAST BOSTON.		
Saratoga	Putnam and Prescott.....	6	273
	Total 6 inches in East Boston..	.....	273
	ROXBURY.		
East	Northampton and Foundry.....	12	1,200
	Total 12 inches in Roxbury	.....	1,200
Tremont	Kendall and Cabot.....	6	360
	Total 6 inches in Roxbury	.....	360

Raised.

1,900 feet 36-inch pipe on Tremont Street, between Newton and Northfield streets.

1,900 feet 30-inch pipe on Tremont Street, between Newton and Northfield streets.

Changed.

277 feet 6-inch pipe on Richmond Street, between Hanover and Salem streets.

158 feet 4-inch pipe on Adams, between Sudbury and Chardon streets.

Taken Out.

498	feet	$1\frac{1}{2}$-inch	Iron	Pipe.
40	"	$1\frac{1}{4}$-inch	Lead	"
297	"	1-inch	"	"
445	"	$\frac{3}{4}$-inch	"	"
538	"	$\frac{5}{8}$-inch	"	"

Extended.

180	feet	$1\frac{1}{2}$-inch	Lead	Pipe.
25	"	1-inch	"	"
44	"	$\frac{3}{4}$-inch	"	"
176	"	$\frac{5}{8}$-inch	"	"

Statement of Service Pipe laid in 1867.

Diam. in inches.	BOSTON PROPER.		SOUTH BOSTON.		EAST BOSTON.		TOTAL.	
	Number of Pipes.	Length in Feet.	Number of Pipes.	Length in Feet.	Number of Pipes.	Length in Feet.	Number of Pipes.	Length in Feet.
1	6	426	. .	. .	. .	. .	6	426
¾	3	110	. .	. .	. .	. .	3	110
⅝	352	11,414	208	6,902	41	1,488	601	19,804
½	47	931	43	1,530	23	1,018	113	3,479
	AGGREGATE						723	23,819
	Making the Total Number up to May 1st, 1868							26,924

Repairs of Pipes during the Year 1867.

WHERE.	DIAMETER OF PIPES IN INCHES.																
	40	36	30	24	20	16	12	8	6	4	2	1½	1	¾	⅝	½	Total.
Boston . . .	.	6	10	.	.	.	7	.	23	54	6	50	15	6	271	9	457
South Boston,	.	.	.	.	.	.	.	.	7	1	.	.	1	1	79	6	95
East Boston .	.	.	.	.	5	.	.	.	8	1	.	.	2	.	40	1	57
Totals . .	.	6	10	.	5	.	7	.	38	56	6	50	18	7	390	16	609

RECAPITULATION.

SECTION.	1867.	DIAMETER IN INCHES.				
		36	12	8	6	4
Boston Proper.	Total number of feet laid...	....	1666	....	5629	1237
	Stopcocks in same.....	....	1	....	15	3
South Boston..	Total number of feet laid...	....	.....	....	1516	715
	Stopcocks in same.....	....	.....	....	2	2
East Boston...	Total number of feet laid...	....	.....	....	273	....
	Stopcocks in same.....	....	.....	....	.....	....
Roxbury.....	Total number of feet laid...	....	1200	....	360	....
	Stopcocks in same.....	....	.....	....	1	....
	Sums of Pipes.....	....	2866	....	7778	1952
	" " Stopcocks.....	....	1	....	18	

Statement of the Length of different Sizes of Pipes laid and Number of Stopcocks put in, to May 1st, 1868.

	DIAMETER OF PIPES IN INCHES.										
	40	36	30	24	20	16	12	8	6	4	
Feet of Pipe laid in Br'kline, Roxb'y, and Boston Proper,	23,082	19,991	26,696	5,773	....	6,096	62,337	2,020	252,153	83,394	
Number of Stopcocks in same	4	6	8	10	1	19	120	5	521	285	
Feet of Pipe laid in South Boston	....	....	....	....	8,155	....	18,938	2,871	94,533	27,176	
Number of Stopcocks in same	....	....	....	....	4	....	31	2	133	64	
Feet of Pipe laid in East Boston	....	....	....	....	15,972	1,523	16,150	....	70,075	4,754	
Number of Stopcocks in same	....	....	....	....		3	23	....	92	29	
Feet of Pipe laid in Newton and Needham	....	1,074	2,140	....	....	....	1,359	....	360	....	
Number of Stopcocks in same	....	....	....	....	....	....	2	....	2	....	
TOTALS . . Length of Pipe laid	23,082	21,065	31,836	5,773	24,127	7,619	98,784	4,891	417,121	115,324	749,622 feet equal to 141 ms. 5,142 ft.
Number of Stopcocks put in	4	6	8	10	11	22	176	7	748	378	1,370

Of the leaks that have occurred in pipes of 4 inches and upwards, 65 were on the joints, 21 by settling of earth, 2 by defective pipe, 33 by frost, 1 stopped by rust. Total, 122.

Of 2 inches and in service pipes, 2 were on the joints, 127 by settling of earth, 1 by settling of boxing, 2 by settling of wall, 1 by settling of drain, 41 by defective pipe, 9 by defective coupling, 4 by defective faucet, 1 by defective packing, 77 by rust, 137 by frost, 15 stopped by fish, 49 stiff connections, 9 by faucet loose at main, 3 by faucet broken at main, 3 by faucet pulled out at main, 3 struck by pick, 2 by pipes not in use, 1 exposed and pulled out by some person unknown. Total, 487.

Year.	Diameter of		Total.
	Four Inches and Upwards.	Less than Four Inches.	
1850	32	72	104
1851	64	173	237
1852	82	241	323
1853	85	260	345
1854	74	280	354
1855	75	219	294
1856	75	232	307
1857	85	278	363
1858	77	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

Hydrants.

During the year, thirty (30) new Hydrants have been established as follows:

Twenty-one (21) in Boston proper, six (6) in South Boston, one (1) in East Boston, two (2) in Roxbury.

Total number of Hydrants established up to May 1, 1868.

In Boston proper	1,029
South Boston	338
East "	197
Brookline	3
Roxbury	18
Charlestown	11
Chelsea	8
	1,604

Thirty-five (35) Hydrants have been taken out and replaced by new or repaired ones, and one hundred and ten (110) boxes have been renewed. The Hydrants have had the attention of former years paid them.

Stopcocks.

Twenty-four (24) new Stopcocks have been established this year, and 24 Boxes have been renewed. All the Stopcocks have had the usual attention paid them.

Statement of Pipes and other Stock on hand, exclusive of Tools, May 1, 1868.

NUMBER.	DIAMETER IN INCHES.													
	40	36	30	24	20	18	16	12	8	6	4	3	2	1½
Pipes	17	16	80	5	30	3	27	294	3	520	288	50	.	.
Blow-off Branches	1	.	2	.	.	.	.	.	.	.	.	.	.	.
Y Branches	.	.	1	.	.	.	1	1	.	4	.	.	.	.
Three Way Branches	7	4	3	.	3	.	5	17	5	19	11	.	8	.
Four Way Branches	.	.	3	1	.	.	2	9	7	1	.	.	.	.
Flange Pipe	2	2	3	3	4	.	.	4	.	.	.	.	.	.
Sleeves	5	6	2	8	3	.	3	14	3	11	18	10	24	.
Clamp Sleeves	.	5	6½	2	.	.	3	3	.	14	17	2	.	.
Caps	2	2	5	1	1	.	2	12	4	6	9	.	.	.
Reducers	3	2	.	2	.	.	3	4	1	8	10	.	.	.
Bevel Hubs	.	.	.	.	.	.	.	.	.	8	3	.	.	100
Curved Pipes	.	3	17	1	2	.	3	10	.	.	.	.	.	.
Quarter Turns	.	2	2	.	2	.	.	13	2	10	6	5	5	.
Double Hubs	.	.	.	.	4	.	9	.	.	.	.	.	.	.
Offset Pipes	.	.	.	.	.	.	.	5	.	4	9	.	.	.
Yoke Pipes	.	.	.	.	.	.	.	8	.	8	.	.	.	.
Man-hole Pipes	2	.	2	.	.	.	.	.	.	.	.	.	.	.
One-eighth Turns	1	.	.	.	.	.	.	1	3	14	18	3	.	.
Pieces of Pipes	4	2	11	3	22	.	2	16	.	10	19	.	.	.
Stopcocks	1	1	1	2	2	.	2	4	2	17	24	4	.	.

Hydrants, 18 new Lowell, 4 new Wilmarth, 14 Lowell (old), 6 Wilmarth ditto.

For Hydrants, 18 Bends, 35 Lengtheners, 14 Frames, 52 Covers, 50 Plungers, 55 Screws, 37 Wastes, 43 Nipples, 32 Valve Seats, 65 Stuffing Boxes, 5 Hose Couplings, Male ends, 4 Wharf Hydrants, 50 Composition Couplings for ditto.

For Stopcocks. — Two 36-inch screws, one 30-inch ditto, two 24-inch ditto, one 16-inch ditto, four 6-inch ditto, six 4-inch ditto, nine 6-inch, unfinished; one 4-inch screw for waste weir, one ditto for Brookline Reservoir (old); four 12-inch plungers, four 6-inch ditto, six 4-inch ditto; thirty 6-inch rings, sixty 4-inch ditto; nine frames; twenty-three covers; 6,045 pounds iron castings, for 6-inch gates; 4,456 pounds ditto, for 4-inch gates; 613 pounds of composition castings for 6 and 4 inch gates, unfinished; nine 6-inch flanges, seven 4-inch ditto.

Meters. — In the shop: one 2-inch, thirty 1-inch, five $\frac{5}{8}$-inch (old).

Stock for Meters. — Twenty-eight 1-inch nipples, thirty-eight $\frac{5}{8}$-inch ditto, thirty rubber ditto; eight 2-inch connection-pieces, eleven 1-inch ditto, twenty-five $\frac{5}{8}$-inch ditto; thirty 1-inch meter cocks, thirteen $\frac{5}{8}$-inch ditto, seventy-five $\frac{5}{8}$-inch ditto, unfinished; twenty-two clocks, twenty-two glasses, twenty-one spindles, ten feet leather hose, twelve sheets straw board, seven metre frames; six 3-inch fish pots, one 2-inch ditto (old); four 2-inch flanges.

For Service Pipe. — Forty-nine 1-inch union cocks, fifty-five $\frac{3}{4}$-inch ditto, four hundred and twenty $\frac{5}{8}$-inch ditto, eighty $\frac{1}{2}$-inch ditto; fifteen 1-inch air cocks; twenty-six $\frac{5}{8}$-inch Y cocks, thirty-three 1-inch T ditto, eighteen $\frac{3}{4}$-inch ditto, twelve $\frac{5}{8}$-inch ditto, twelve $\frac{5}{8}$-inch straight ditto; nine 2-inch male couplings, twenty-five $1\frac{1}{4}$-inch ditto; thirty 1-inch female couplings, three hundred and sixteen $\frac{5}{8}$-inch ditto; nine $1\frac{1}{4}$-inch connection couplings; nine 1-inch male couplings, twenty-five $\frac{3}{4}$-inch ditto, eighty-four $\frac{5}{8}$-inch ditto, ten $\frac{1}{2}$-inch ditto; one hundred and fifty $\frac{1}{2}$-inch unfinished couplings, fifty $\frac{5}{8}$-inch ditto; seventy-five $\frac{5}{8}$-inch long boxes (iron); two hundred and seventy tubes, twenty-four T boxes, fifteen Y boxes, thirty extension tubes.

Lead Pipe. — 1,864 pounds 2-inch pipe, 555 pounds $1\frac{1}{4}$-inch ditto, 1,986 pounds 1-inch ditto, 63 pounds $\frac{3}{4}$-inch ditto, 7,600 pounds $\frac{5}{8}$-inch ditto, 3,920 pounds $\frac{1}{2}$-inch ditto; 1,195 pounds old pipe, 946 pounds 1-inch tin-lined lead pipe, 615 pounds $\frac{5}{8}$-inch ditto, 1,220 pounds $\frac{1}{2}$-inch ditto; 44 pounds solder, 47 pounds $\frac{5}{8}$-inch block tin pipe.

Blacksmith Shop. — 250 pounds square iron, 300 pounds flat ditto; 750 pounds Norway iron, 700 pounds round refined iron, 1,100 pounds working pieces, 297 pounds cast-steel, 2,500 pounds Cumberland coal.

Carpenter's Shop. — 300 feet spruce boards, 6,200 feet spruce plank, 110 feet oak plank, 100 feet pine sheathing, 8 hydrant boxes, 7 stopcock ditto; 204 top pieces, 18 hydrant boxes, unfinished, 300 pounds spikes and nails.

Wharf Hydrants. — Four, forty-five nipples, five 2-inch male couplings for hose.

Tools. — One steam engine, one large hoisting crane; two boom derricks, four hand-geared ditto; two sets of shears, and all the rigging for the same; tools for laying and repairing main and service pipes; two engine lathes, one Fox ditto, one hand ditto; one upright drilling machine, three grindstones; the necessary tools for carrying on the machine, blacksmith, carpenter's, and plumber's shops; one circular saw, three large tool houses; one 40-inch proving press, one 36-inch ditto, one small ditto; also office furniture, and a large lot of patterns stored at pipe yard, and at the foundries where we obtain castings.

Stable. — Four horses, three wagons, two buggies, two pungs, five sets harness, two sleighs, two hundred pounds English hay, twenty-four bushels grain.

Beacon Hill Reservoir. — One large composition cylinder, 16-inch jet, one 6-inch composition jet; three composition

plates, nine cast-iron plates; two 4-inch composition jets, five swivel pipe patterns, one 2-inch copper straight jet, six composition jets for small fountains, six large composition cylinders.

Miscellaneous. — 20 gallons linseed oil, 25 gallons tallow oil, 25 pounds white lead, 2,000 pounds furnace coal, 33 pounds leather, 1 freight gravel, 500 bricks, 1,010 pounds gasket, 5 kegs bolts, 375 feet damaged hose, one-half cord wood, 12 reservoir gate covers, 5 manholes, 6 plates; lot of old iron, lot of old lumber, also old machinery from Marlboro'.

Respectfully submitted.

E. R. JONES,

Superintendent East Division.

Chestnut Hill Reservoir.

May 13th, 1868.

Nathaniel J. Bradlee, Esq., *Pres. Cochituate Water Board:*

Sir, — In presenting you with the report of the condition of matters connected with the Western Division, I must say that many things that were proposed last spring to be done have been left undone, owing to more pressing wants at the Chestnut Hill Reservoir. Everything at the Lake has been kept in its usual good order. The culverts and waste-weirs are in a good condition. I would call your attention to the embankment near the Saxonville Branch Railroad. It is washing away rapidly, and steps should be taken at once to protect it. Stone were got out and hauled to the point opposite the grove, for the purpose of building a substantial wall; but the unfavorable weather the past winter has prevented the work being done. New stop-plank have been made for the dam and for the division of the Lake. They are painted, and stored in the boat-house, ready for use. The willows that were set out for the purpose of making a hedge have not done as well as was expected. Those on the east side of the road have done very well, and will be large enough by another year to have the fence in front of them removed. Slips have been set out on the west side of the road this spring, and it is hoped that they may yet be a success. The Filter Dam at Pegan Brook has been re-built in a thorough manner. Stone were taken from the Chestnut Hill Reservoir for that purpose, as it was impossible to get them at the time they were wanted in a more convenient locality. Owing to the rapid rise of the water at the Lake this spring, nothing was done towards building the second dam that was ordered to be

built. Should a favorable time occur this season, it will be attended to. The trees and bushes over the line of conduit have been cut down and disposed of. Above Newton Centre the embankment was made use of as a road to haul off the wood cut in that neighborhood. To prevent such use being made of it, posts have been set at different points so as to prevent the passage of teams. At the Brookline Reservoir, but little has been done, except to top-dress the banks. Muck and manure were hauled on to the ground last fall from the Chestnut Hill Reservoir, and this spring it has been spread over all the grass-land. The gate-house and embankment wall remain the same as last year, still needing repairs that cannot be made until the completion of the new reservoir. The annual examination of the conduit has been made between the Lake and Charles River. Several sections require cleaning, which will be attended to at an early day. As Mr. Crafts will make a full report of the same, I need say no more. With the exception of some fences that are to be built, and some that need repairing, I believe all connected with this division to be in good order. The following is a list of tools, etc., belonging to this division, stored at the Lake:

Respectfully submitted.

ALBERT STANWOOD,

Supt. Western Division B. W. W.

SCHEDULE OF PROPERTY ON WESTERN DIVISION.

One horse, one carriage, one express wagon, one single harness, one cart, one cart harness, one buffalo robe, one pung, two spades, six wheelbarrows, six shovels, twelve picks, one axe, one hand saw, one iron square, one grindstone, three water pails, two hammers, one pair hedge shears, two pair ice tongs, one gravel

screen, one sand sieve, one stone drag, one drain mould, two hoes, one iron rake, two bars, one stone hammer, two hay forks, one dung fork, three trowels, four rammers, four wrenches, two stop-plank hooks, one stone roller, one boat (needs repairing), one boat awning, one rain-gauge, one pair steel-yards, one cooking range, one extension table, six chairs, one wash-stand, marble top, one map of Boston and its environs.

A. STANWOOD,
Supt. Western Division B. W. W.

WATER REGISTRAR'S OFFICE,
BOSTON, May 1, 1868.

N. J. BRADLEE, Esq., *Pres. of the Cochituate Water Board:*

SIR, — The Water Registrar, in compliance with the provisions of the ordinance, respectfully presents to the Cochituate Water Board his Annual Report for the year 1867, together with the amount of income received to May 1, 1868.

The total number of water-takers now entered for the year 1868 is 28,104; being an increase, since January 1, 1867, of three hundred and fifty.

During the year 1867, there have been six hundred and ten cases where the water has been turned off for non-payment of water rates. Of this number, 494 have been turned on, leaving a balance of 116 still remaining off.

The total amount of water rates received from Dec. 31, 1866, to Jan. 1, 1868, is . .		$522,130 93
Of the above, there was received for water used in previous years the sum of	$43,390 98	
Leaving the receipts for water furnished during the year 1867 the sum of	$478,739 95	
In addition to the above, there has been received, for turning on water in cases where it had been turned off for non-payment of rates, the sum of		988 00
Total, ...		$523,118 93
The amount received for water rates from Jan. 1, 1868, to May 1, 1868, is		422,625 72
Carried forward,		$945,744 65

Brought forward,		$945,744 65
Of this amount, there was received for water used in previous years the sum of	$43,200 22	
Leaving the receipts for water (assessed for the year 1868) to May 1, 1868, the sum of .	$379,425 50	
The amount received from Jan. 1, 1868, to May 1, 1868, for turning on water in cases where it had been turned off for non-payment of rates, is		714 00
Total		$946,458 65

Total receipts from January 1, 1867, to May 1, 1868, is	$946,458 65
The increased amount of income in 1867 over the previous year is	35,592 68
The total amount of assessments now made for the present year is	392,157 18
The estimated amount of income from the sales of water during the year 1868 is	550,000 00
The expenditures of my office for the year 1867 have been	14,279 25

The items of this expenditure are as follows:

Paid Wm. F. Davis, Registrar,	2,200 00
" Chas. H. Little, Treasurer's Clerk,	1,600 00
" Chas. L. Bancroft, "	1,200 00
" Stephen Badlam, "	1,200 00
" Edwin Jennings, "	1,200 00
" Jacob F. Mayo, services on meters,	1,000 93
" R. D. Child, Inspector,	849 50
Carried forward,	$9,250 43

Brought forward,	$9,250 43
Paid C. M. Thompson, Inspector,	849 50
" F. W. Fay, "	849 50
" T. L. Kelley, "	849 50
" J. Hayward, Jr., "	849 50
" O. A. Ramsdell, "	849 50
" J. L. Fairbanks, stationery,	282 60
" A. Mudge & Son, printing,	498 72
	$14,279 25

Meters.

The total number of meters now applied to the premises of water-takers is 895. Of this number, 679 are $\frac{5}{8}$-inch, 189 1-inch, 23 2-inch, 3 3-inch, 1 4-inch size.

They are attached to a variety of establishments, embracing hotels, railroads, manufactories, stables, confectionery, oyster saloons, and buildings occupied by several tenants.

The following table exhibits the yearly revenue received from the sale of Cochituate water, since its introduction into the city, Oct. 25, 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,	to May 1,	1868,		422,625 72
					$6,161,782 80

Statement showing the number of houses, stores, steam engines, etc., in the City of Boston, supplied with Cochituate water to the first of January 1868, with the amount of water rates paid for 1867.

19,854	Dwelling-houses,	$252,776 41
7	Boarding "	253 25
78	Model "	2,061 25
4	Lodging "	83 00
8	Hotels	480 00
4,395	Stores and shops,	41,106 57
172	Buildings,	5,942 39
394	Offices,	3,079 88
35	Printing offices,	478 75
19	Banks,	248 50
18	Halls,	258 00
1	Theatre,	9 75
28	Private schools,	243 75
15	Asylums,	772 25
4	Green-houses,	38 00
63	Churches,	699 50
3	Markets,	697 50
119	Cellars,	773 75
286	Restaurants and saloons,	3,926 97
4	Club Houses,	102 00
1	Bath-house,	55 00
40	Photographers,	1,115 50
10	Packing-houses,	339 00
1,047	Stables,	7,898 23
12	Factories,	391 00
	Carried forward,	$323,830 20

	Brought forward,	$323,830 20
7	Bleacheries,	114 50
72	Bakeries,	560 50
5	Ship-yards,	70 00
3	Dry docks and engines,	64 00
59	Shops " "	3,639 89
20	Stores " "	1,378 22
5	Foundries " "	200 94
5	Factories " "	260 42
5	Printing " "	200 76
1	Bakery " "	33 00
1	Ship-yard " "	34 00
3	Buildings " "	528 31
1	Pottery " "	35 00
2	Mills " "	222 91
44	Stationary "	1,520 18
4	Armories,	53 50
2	Gymnasiums,	41 50
510	Hand hose,	2,865 00
13	Fountains,	103 00
	Gas Light Co's., (filling gasometers),	434 41
	Mill-dam Co.	266 75
	Custom House,	150 00
54	Steamboats,	10,300 09
	Office, (Harbor Master),	6 00
	" (City Scales),	9 00
	Court House,	262 50
	Probate Building,	47 50
	House of reception,	10 00
5	Fire-alarm motors,	50 00
23	Fire-engines, hose, hook and ladder houses,	553 50
280	Public Schools,	1,970 00
	Carried forward,	$349,815 58

Brought forward,	$349,815 58
City Stables,	200 75
Offal Station,	150 00
Steamer "Henry Morrison"	192 56
House of Correction,	462 00
Public Library,	50 00
Faneuil Hall,	40 00
Shop (paving department),	9 00
Common (sewer department, making mortar, etc.,)	56 00
Public urinals,	145 00
Street sprinkling,	400 00
J. F. Paul & Co., (contract pipe),	40 08
Building purposes,	2,263 94
Contractors for supplying shipping,	1,889 53
Metered water,	123,025 51
	$478,739 95

Statement showing the number and kind of Water Fixtures contained within the premises of Water-takers in the City of Boston, to January 1, 1868, *as compared with previous years.*

1865.	1866.	1867.	REMARKS.
4,797	4,774	5,074	Taps. These have no connection with any drain or sewer.
40,184	40,496	42,099	Sinks.
16,767	17,204	18,910	Wash-hand basins.
5,475	5,499	5,929	Bathing-tubs.
6,752	7,398	7,789	Pan water-closets.
7,317	7,563	8,394	Hopper "
181	312	246	" " pull.
315	239	297	" " self-acting.
213	226	357	" " waste.
498	536	571	" " door.
1,741	1,790	1,968	Urinals.
6,087	6,365	6,806	Wash-tubs. These are permanently attached to the building.
737	756	759	Shower-baths.
13	13	14	Hydraulic rams.
715	773	711	Private hydrants.
334	350	388	Slop-hoppers.
28	33	40	Foot-baths.
92,154	94,327	100,352	

Respectfully submitted.

WM. F. DAVIS,

Water Registrar.