Fifth Annual Report

OF THE

BOSTON WATER BOARD.

1881.

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BOSTON WATER BOARD.

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CITY OF BOSTON.

FIFTH ANNUAL REPORT

OF THE

BOSTON WATER BOARD,

FOR THE YEAR ENDING APRIL 30, 1881.

Office of Boston Water Board,
May 1, 1881.

To the City Council of the City of Boston: —

The Boston Water Board herewith respectfully submit their fifth annual report, together with reports from the City Engineer, Water Registrar, Clerk of the Board, the Clerk and Registrar of the Mystic Works, and the superintendents of the various divisions.

The present state of the different departments continues to be satisfactory. A number of improvements and extensions contemplated at the date of the last report have been carried out. A careful examination of the reports of the officers above referred to will show in detail the methods of construction and effects of these works.

In general, the lakes, basins, aqueducts, reservoirs, and distributing systems are in excellent repair, and doing good service.

With all the appliances at the command of the city it is still a work of difficulty to keep the resources of the works equal to the growing demands made upon them, and the Board often find themselves placed in the embarrassing position of being obliged to refuse applications for extensions and use of water, especially in the high-service districts, for fear of endangering the efficiency of the present distribution.

Consumption of Water.

The average daily consumption of water for the year 1880, including the Mystic Works, was 35,887,880 gallons, — an increase of 3.8 per cent. over the consumption of the preceding year. This increase, undoubtedly, would have been much larger if the Board had not taken steps, during the severe drought of the last season, to call the attention of citizens to the dangers of a diminished supply. In view of the constant increase in consumption, the Board can only reiterate their requests, made in the last report, for authority to enlarge the works in several important directions.

A new storage-basin on the Sudbury river is the largest extension now in view.

On Nov. 26, 1880, this Board sent a communication to the City Council asking for an appropriation for surveys and the purchase of land, and on Dec. 13, an order for the appropriation of $55,000 for these purposes was passed, and early in the present year the engineer was directed to make the necessary surveys and borings to determine the best site for another dam and storage-basin. The plans have since been completed, the land secured, and another appropriation requested for the purpose of construction. It is important that the work should be begun as soon as possible.

The high-service works, also, need large additions to their present capacity. During the summer months of the past year the consumption in this branch of the department was about 20 per cent. more than during the corresponding months of the preceding year. A general plan for these works was outlined by the late City Engineer, Mr. Jos. P. Davis, and detailed surveys are now in progress by his successor.

While these works of enlargement are proceeding, and before they can be completed, it is the opinion of the Board that some steps must be taken to check the wanton waste of water. On Oct. 4, 1880, this Board was requested to report to the City Council the best method, in their judgment, for arresting waste of water. On Nov. 18, a report, in answer to the above-mentioned order, was made, stating that, in the judgment of the Board, the most efficient permanent method of accomplishing this purpose would be by the application of meters. Previous to this report the engineer had been directed to import from England, for the purpose of experiment, three of the Deacon meters, which had proved efficient in detecting and checking waste in Liverpool and other cities in England. They have since been procured and are now in service in the Charlestown district.

Besides experiments with the Deacon meter tests of other meters are being made for the purpose of ascertaining the value of several meters of different manufacture, and no steps will be left untried to determine the best course to pursue should the general application of a meter system be decided on. The following Act bearing on this subject was passed by the last Legislature, and approved April 15, 1881.

AN ACT TO AUTHORIZE THE CITY OF BOSTON TO ATTACH METERS TO BUILDINGS WHICH IT SUPPLIES WITH WATER.

SECTION 1. The city of Boston is hereby authorized, at its own expense, to attach and maintain a sufficient water-meter to the main service-pipe in any building or buildings which may be supplied with water by said city under authority of law; and where any building situate within the city of Boston shall be supplied with water by said city through a meter, and there shall be more than one tenement contained in said building, or where different rooms in the same building are leased to or occupied by different persons taking water through separate fixtures, the owners or lessees of said building shall be liable to said city for the entire amount of water so supplied to said building: *provided*, that in the case of dwelling-houses containing more than one tenement and not more than three tenements, it shall be necessary to obtain the consent of the owner thereof before attaching such meter.

SECT. 2. This act shall take effect upon its passage.

SUDBURY RIVER.

Sudbury river has supplied to the city 6,230,200,000 gallons, equivalent to an average daily supply of over 17,000,000 gallons. Of this quantity more than 5,000,000,000 gallons were run directly to the city without passing through Lake Cochituate. All of the storage-basins were full at the beginning of the year, and were heavily drawn upon to reinforce the small flow of the river during the drought. Unfortunately a vegetable growth of algæ appeared in two of the basins and rendered the water somewhat objectionable. Researches by experts have not shown that these plants produce any injurious effect upon the public health. They appear without apparent cause in the water. Fortunately one branch of the river was free from their presence, and water was supplied to the city from this source during the greater part of the year.

The dams, gate-houses, and other structures on this portion of the works are in excellent condition.

Some work of construction in the way of sheeting and puddling the embankment at Dam 2 has been prosecuted for the purpose of arresting some percolation. After this was accomplished the work of construction was considered completed, and on Oct. 15, 1880, the works were transferred

from the Engineering Department to the Superintendent of the Western Division.

As much opposition was engendered at the time of the conception of these works, it may not be out of place to review, briefly, the service they have accomplished and the decided way in which they have realized the expectations of the friends of the project.

On Jan. 21, 1875, the waters of the river were taken by the city under legislative sanction. At that date the daily rate of consumption was something over 18,000,000 gallons per day, which was more than Lake Cochituate, unaided, was capable of furnishing. During 1875 an amount equivalent to a daily supply of 7,000,000 gallons was furnished from the Sudbury river by means of a temporary connection. During the following year the consumption was more than 20,000,000 gallons. In 1877 the river furnished 5,000,000 gallons daily, while the whole consumption did not vary greatly from the preceding year. In 1878 the consumption rose to 23,000,000 gallons, of which the river furnished more than 9,000,000. In the next year more than 10,000,000 gallons were furnished out of the 25,000,000 total consumption. In 1880 the consumption was 26,500,000 gallons, of which the river furnished more than 17,000,000. During the six years referred to the total amount received and used in the city from the Sudbury river source was more than 20,000,000,000 gallons. It will be readily seen from an inspection of these figures that, if these or other works had not been meditated and pushed to completion when they were, the city would now be seriously affected by its lack of water supply.

A most gratifying fact in connection with the building of the Sudbury river works is, that they have been completed within the original estimate, and in a rather better manner than at first proposed.

Lake Cochituate.

The water from this source has caused a great deal of trouble during the past year; the cucumber taste having again made its appearance, notwithstanding the steps taken last year to improve the meadows around the lake. On February 26 the supply from this source was cut off, since which time it has been maintained wholly by the Sudbury river. The surface of the lake was drawn down during the year 1880 about eight feet, to a point too low to keep up the full flow in the aqueduct. In order to guard against a threatened scarcity of water, the Board purchased pumps and boilers to erect at the gate-house to keep up the supply, but fortunately

they were not needed. The machinery is stored at Chestnut-Hill reservoir, ready for a similar emergency, should one occur in the future.

Every means known to the Board have been taken to investigate the cause of the peculiar taste which occasionally visits the waters of the lake. On January 26, an order was approved by the Mayor, requesting a report from this Board on the cause and prevention of the impurity of the water supplied to the city, and on February 10 the following report was made, and is here reprinted, as forming a portion of the history of this matter: —

CITY OF BOSTON, CITY HALL,
BOSTON WATER BOARD OFFICE, Feb. 10, 1881.

To the City Council: —

The Boston Water Board, having been requested, by an order approved Jan. 26, 1881, to report "on the cause and prevention of the impurity in the water supplied to the city," would respectfully report that, at the time of the passage of the order by the City Council the city was supplied with water from both the Sudbury and Cochituate sources, in the proportion of about one-third Cochituate to two-thirds Sudbury. The Board having become satisfied that the peculiar taste to the water, known commonly as the "cucumber" taste, was due to the Cochituate water, caused this source to be shut off from the supply, and since then the water has much improved in taste if not in color.

Although the Board have taken every means in their power to ascertain the cause of the "cucumber" taste, they have arrived at no result. Chemical analysis throws no more light on the subject now than it did in 1876, when the same trouble visited the water. At that time extended examinations and experiments were made, and a detailed report made to the Council. The recent analyses and examinations made by experts throw no more light on the subject than they did then.

While the water seems to be perfectly clear, and, so far as the Board can say, perfectly wholesome, the disagreeable taste permeates a large body of water in a short time and in a mysterious manner.

The report of Professor Nichols, of Feb. 3, 1881, containing the analyses, is submitted herewith.

Respectfully submitted,

BOSTON WATER BOARD,
By LEONARD R. CUTTER,
Chairman.

MASS. INSTITUTE OF TECHNOLOGY,
BOSTON, Feb. 3, 1881.

To the Water Board of the City of Boston: —

GENTLEMEN, — The accompanying table contains the results of the examination of three samples of water, two of which were furnished me by Mr. Fitzgerald, and one of which was drawn in my laboratory on February 1.

The water received in the city at the present time is entirely from the Sudbury river. It has a marked yellowish brown color and a decidedly "pondy" taste. The water is more strongly colored and contains a

larger amount of dissolved matter than usual, and is about the same in character as that received in the city about a year ago when, for a short time, the water came directly from the Sudbury sources. The water is somewhat objectionable in appearance, owing to its marked color; it is also not altogether palatable, but I do not think it can be called unwholesome. It is a soft surface water, rather highly charged with vegetable matter, and I have no doubt that many persons who are accustomed to hard surface waters or to well water would suffer some derangement of the digestive organs if they should begin to drink freely of this water. Probably also some sick persons might be affected by it; but I believe that, as far as a person in average health is concerned, the water is wholesome.

As to the so-called "cucumber" taste which, until within a few days has been noticed over the greater part of the city, there is little that I can say in addition to what has already been said in a report by Dr. Farlow, Mr. Edward Burgess, and myself, presented in April, 1876. Although since that date I have visited other water supplies and made a number of experimental and other observations, I have been unable to satisfy myself as to the cause of the trouble. Whether it is due to a peculiar decomposition of the dead organic matter in the water, or whether some living organism is concerned in its formation, is not known. As far as my information goes, there is no evidence to show that a water possessing this peculiar taste is less wholesome than the same water when free from the taste.

Yours respectfully,

WM. RIPLEY NICHOLS.

EXAMINATION OF BOSTON WATER.

[Result expressed in parts in 100,000.]

Locality.	Unfiltered Water.		Solid Residue.		Total at 212 F.
	Ammonia.	"Albuminoid Ammonia."	Inorganic.	"Organic and Volatile."	
Feb. 1, 1881.					
Terminal chamber	0.013	0.024	3.82	2.64	6.46
Brookline Reservoir	0.013	0.021	4.18	2.18	6.36
Institute of Technology, Boston . .	0.009	0.021	3.98	2.38	6.36

Analytical Note.—The so-called "organic and volatile matter" (which is really the loss which the residue of evaporation suffers when heated to a low red-heat) is not a very exact determination, and the differences in the case of these three waters are no greater than might be obtained with different samples of the same water. The three samples are practically alike.

The pollution of the lake from the sewage of Pegan brook, in Natick, still continues. The test cases, referred to in the last report, were finally carried to the Supreme Court, after having been heard before a sheriff's jury, as provided for in the act, and were finally decided in favor of the city, on

points of law. The five parties complained of will be obliged to provide some other means for disposing of their drainage. Other cases will be brought before the courts, until the rights of the city are established in this important matter.

Aqueducts and Reservoirs.

The Sudbury-river aqueduct is in good condition. Few repairs of importance have been made to this structure during the year. A portion of the grounds has been fenced, particularly on embankments.

Owing to the shutting off of the lake water, more extended repairs have been made on the Cochituate aqueduct than has ever been possible before. This work will be carried on until the water in the lake has regained its purity and can be run to the city.

Chestnut-Hill reservoir is in excellent condition. Brookline reservoir has lately been cleaned out and thorough repairs made to the gate-houses and other portions of the work. From the character and small quantity of the deposit found on the bottom, it is the opinion of those in charge that it will hardly be necessary to draw off the water again, for this purpose, for many years.

On Nov. 27, 1880, the Board of Aldermen, acting in their capacity as county commissioners, seized the Beacon-Hill reservoir for the purpose of erecting a new court-house on its site, and this structure has now passed out of the control of the water department. No provision has yet been made by the City Council to reimburse the water works for this valuable property. This Board can only petition for an equitable adjustment of this matter, and they take this means of calling the early attention of the City Council to the facts in the case.

The right to lay a new 48-inch main was obtained from the Legislature previous to the date of the last report. Since that time the work has been successfully completed, and on November 29 water was run to the city through the pipe. The pressure in the city was raised about ten feet.

This new main runs from Chestnut-Hill reservoir directly to the city, through Beacon street as far as the junction with Brookline avenue, where it connects with the old 40-inch main. By authority of an order of the City Council, passed July 8, 1880, the work was done by day labor. It is one of the most important additions that have been made of late years to the capacity of the works.

The distributing system has been still further enlarged

during the year by the laying of about nine miles of main pipe.

The City Council having authorized the sale of water to the City of Cambridge to supplement their short supply during the drought, a connection for that purpose was made at Cottage Farm between the pipes of the two cities, but, as yet, it has not been used, the City of Boston being itself dangerously threatened with a short supply of water at the very time it was most needed in Cambridge.

High-Service Works.

The total quantity of water pumped during the year 1880, at the Highland pumping-station, was 856,840,000 gallons against 820,827,210 gallons for the preceding year, an increase of about 4 per cent. The cost per million gallons raised one foot was 8.3 cents.

The capacity of these works was reached long ago. The importance of a rearrangement and enlargement has been fully discussed in previous reports, and the work of rebuilding should be begun at once. On Nov. 20, 1880, a communication was sent from this Board to the City Council, recommending application to the Legislature for an act to take land and construct works. On Dec. 9 the request was granted, and on March 24, 1881, the following act was signed by the Governor: —

AN ACT in addition to the Acts for the purpose of supplying the City of Boston with Pure Water.

Be it enacted, etc., as follows: —

Section 1. For the purpose of supplying water to its inhabitants, and especially for the purpose of increasing the supply of water which can be used for its high-service, the city of Boston is hereby authorized by and through the agency of the Boston Water Board to construct and maintain new reservoirs, and connect the same by aqueducts and pipes with its present sources of water supply, and with its present reservoirs, aqueducts and pipes, and to construct and maintain new works and pumping-stations in connection with said new reservoirs; and for this purpose may take and hold by purchase or otherwise any lands or real estate necessary therefor, situate in the cities of Boston or Newton, or in the town of Brookline, and lay said aqueducts and pipes over or under any water-course or any streets, turnpike roads, railroads, highways or other ways, in such manner as not to unnecessarily obstruct or impede the travel thereon; and may enter upon and dig up any such roads, streets or ways, for the purpose of laying down said pipes beneath the surface thereof, and for maintaining and repairing the same; but always in such manner and with such care as not to render the roads, streets and ways unnecessarily unsafe or inconvenient to the public travel thereon. And said city of Boston in performing said work shall not unnecessarily interfere with any existing sewers, water or gas pipes, and shall be subject to such reasonable regulations as to time, place and

manner of digging up any streets or ways of public travel for the purposes aforesaid, and the laying of said pipes, as shall be made by the City Council of the city of Newton or the selectmen of the town of Brookline, within the limits of said city or town, for the protection of their rights of drainage and sewerage therein and the public rights of passage thereon.

SECT. 2. Whenever the city of Boston shall dig up any street or way as aforesaid, it shall restore the same to as good order and condition as the same shall be in when such digging commenced; and the city of Boston shall at all times indemnify and save harmless the city of Newton and the town of Brookline against all damage which may be recovered against them respectively, and shall reimburse to them respectively all expenses which they shall incur by reason of any defect or want of repair in any street or way, caused by the construction of said aqueduct or the laying of said pipes, or by the maintaining or repairing the same: *provided*, that the city of Boston shall have due and reasonable notice of all claims for such damages or injury, and opportunity to make a legal defence thereto.

SECT. 3. The city of Boston shall be liable to pay all damages that shall be sustained by any persons in their property by the taking of any land or real estate or the laying of said pipes as aforesaid; and any person sustaining damage as aforesaid may have the same ascertained, determined, collected and paid in the manner which is provided in sections six, seven and eight of chapter one hundred and sixty-seven of the acts of the year eighteen hundred and forty-six.

SECT. 4. Upon requisition by the City Council of the city of Newton, or the board of selectmen of the town of Brookline, prior to the laying of the said aqueduct and pipes through their respective limits, the city of Boston shall insert a number of hydrants in said pipes at points not less than one thousand feet apart, to be used for extinguishing fires, free of charge, and for no other purpose; and said city or town shall pay to the city of Boston the expense of inserting and keeping in repair such hydrants as shall have been so inserted upon their requisitions aforesaid within their respective limits.

SECT. 5. This act shall take effect upon its acceptance by the City Council of the city of Boston.

[*Approved March 24, 1881.*]

An appropriation for the purpose of constructing new high-service works will be asked for at an early date.

On May 13, 1880, the City Council authorized an expenditure of $33,500 for the purpose of supplying a high-service system to East Boston. On May 18 a contract was made with Henry R. Worthington for the necessary machinery; and in October following the pumps were completed and put in operation. The pumps are capable of delivering one and one-half million gallons per day. The total cost of this work was about $23,000. A full description will be found in the City Engineer's report. The effect of this independent system of high-service supply is to furnish the high lands of East Boston with water under a greater pressure than was possible from the Cochituate works.

The Brighton high-service pumps are in good working order. They deliver during certain days in the hot weather 270,000 gallons in 24 hours.

Mystic Department.

The works of this department are believed to be in fair condition.

The pumps have raised 3,434,195,710 gallons during the year 1880, at a cost of 5.4 cents per million gallons raised one foot.

During the latter part of the summer the lake was drawn so low that it became necessary to erect temporary pumps to keep up the supply to the conduit. In September the machinery, formerly used at Lake Cochituate for the same purpose, was transferred to the Mystic lake and set up; and on Oct. 4 the pumps were started. They were run until Jan. 17, 1881.

The severe drought told heavily on the Mystic supply. The water was drawn down to the lowest point ever reached, viz., one foot above the bottom of the conduit.

A full statement of the capacity of the Mystic Works and of the purity of the water would hardly seem to be necessary when so many able reports have been made on the subject, and the actual condition of the water-shed been made a point of such diligent research; but a few facts, showing something of the past history and present condition of this source of water supply, may, however, enable the City Council to appreciate the position in which the Board now find themselves. When it was first proposed to annex Charlestown to Boston, one of the most important, if not the leading argument used in favor of the same was the extent and purity of the Mystic water, and the great benefit it would prove to the larger municipality.

In 1874, after annexation, the Mystic Water Board thus expressed itself, in giving up control of the works: "We are firm in the faith that you have a property of great value in the Mystic Water Works and the grants to the City of Charlestown for a supply of pure water."

The area of the water-shed of these works had always been taken at 31 square miles, upon the authority of Messrs. Baldwin and Stevenson, the original engineers of the works. On Oct. 27, 1873, the Cochituate Water Board were directed to report to the City Council the facts in regard to the Mystic supply. The information desired was communicated by Messrs. Kirkwood and Francis, whose engineering abilities were undoubted. Their report, which was very elaborate and the result of minute investigation, was made in Dec., 1873. The area of the water-shed, as taken by them, was $24\frac{1}{2}$ square miles, after deducting water surfaces, and they placed the capacity, with storage basins, at 17,000,000 gallons.

In regard to the impurities in the water, they say: "Its passage, however, through the large body of water in the upper Mystic pond admits of such a diffusion as to render such impurities entirely imperceptible to our senses at the lower end of the pond, where the Charlestown works have their conduit connection."

An extensive investigation into the purity of the water was made at the same time by Prof. E. N. Hosford, in his report of which (City Doc. No. 134, 1873) he summarizes as follows: "Of its salubrity as a drinking-water it will compare well with the best waters in use for city supply. It has experienced no appreciable deterioration since its introduction."

In 1874, Mr. J. P. Davis reported the true area of the water-shed to be 26.2 square miles, excluding water surfaces. This result was determined accurately by triangulation, and set at rest finally this much-disputed question.

The actual collection on this area during the year 1880, as determined by the City Engineer, was something over 15,000,000 gallons per day; but this amount of water could only be utilized by building extensive storage-basins. The capacity of supply of the present arrangement of works, in a dry year, is probably less than 7,000,000 gallons per day. The question that naturally arises is, Can the purity of the Mystic water be preserved so as to warrant further expenditures for continuing it as a water supply?

In 1873 Messrs. Kirkwood and Francis found 27 large establishments, 20 of which were tanneries, pouring their filth into the water. If, with this large amount of sewage, the water appeared reasonably pure and good, the Board believed that, if these objectionable elements could be removed, the water would not only be preserved in its original condition, but would also be much improved; and that, by preventing further pollution, it would be fitted for domestic use for many years to come. Accordingly a sewer was built, and much time and money devoted to the diversion of this drainage into tide water. This was successfully accomplished, mostly during the year 1879, and the Board were congratulating themselves on a favorable condition of affairs, when a trouble arose wholly unexpected. The towns of Medford and Arlington, early in December last, complained of a nuisance, caused, as they alleged, by the discharge of sewage into the lower Mystic pond.

On Dec. 18 notices were served by the Board of Health of Medford on the City of Boston, requesting an abatement of the nuisance within 24 hours. Private petitions had previously been received in the City Council in regard to the same matter.

On Jan. 10 the Board invited all the towns interested to meet the representatives of the city in regard to the matter, and a number of conferences were subsequently held, but no agreement could be settled upon. The towns, in the mean time, had petitioned the Legislature, and, although the city did all in its power to arrest such legislation, the following act was passed: —

AN ACT TO REQUIRE THE CITY OF BOSTON TO ABATE A NUISANCE IN MYSTIC LOWER POND, FOR PROTECTING THE PURITY OF THE WATERS OF SAID POND, AND FOR THE PRESERVATION OF THE PUBLIC HEALTH, ESPECIALLY IN THE TOWNS OF MEDFORD AND ARLINGTON.

SECTION 1. The city of Boston is hereby directed to cease emptying sewage, or waters, or substances containing polluting matter or properties, into Mystic Lower Pond, through its sewer constructed under chapter two hundred and two of the Acts of eighteen hundred and seventy-five or otherwise, and is hereby also directed to take up and remove so much of said sewer as extends into said pond, and also that part thereof between said pond and a point on the line of said sewer at least two hundred feet from said pond, within three months from the passage of this act, and thereafter no person or persons, no municipal nor other corporation or corporations, shall discharge or divert into said pond, any sewage or offensive matter, waters or substances containing such properties or of such quality as shall of themselves or in connection with other matter create a nuisance in said Mystic Lower Pond, or endanger the public health; but nothing herein shall be construed to prohibit the city of Boston from discharging such water as shall be collected into its said sewer into said Mystic Lower Pond after said city shall have purified, cleansed, and freed the said waters from all offensive, contaminating, noxious, and polluting properties and substances, so that said waters shall not of themselves, or in connection with other matter, create a nuisance therein or endanger the public health: *provided*, that said waters so purified shall flow for a distance of at least two hundred feet immediately before their entrance into said pond in an open drain over a gravelly or sandy bottom.

SECT. 2. The city of Boston is hereby directed to cause said Mystic Lower Pond to be cleansed of such impurities prejudicial to the public health as, in the judgment of the state board of health, lunacy, and charity, it shall have caused, and at such time, and in such manner and extent, as shall be approved by the state board of health, lunacy, and charity, and said city shall pay the expense incurred thereby; and should the said board deem the same to be necessary, and so decide, the city of Boston may erect a dam at the outlet of the lower Mystic Pond, and may exclude tide-water from said pond, and may raise the height of the water in said pond, and may take land therefor; and any person suffering any damage shall have the right to have damages assessed therefor, as provided in section three of this act.

SECT. 3. The city of Boston is hereby authorized to take and hold, for the time necessary to carry out the provisions of this act, such lands in the towns of Woburn or Winchester, on or near the line of said sewer, as it shall deem necessary, and may construct such canals, basins, tanks, passage-ways, and works as may be necessary to enable said city to treat said sewage and waters in order to free the said waters of all noxious, dangerous, and offensive matter and properties. Said city shall make compensation to the owners for such lands as it shall take under this act, and if said city and said owners do not agree, any person aggrieved

shall be entitled to have his damages ascertained by a jury upon petition to the county commissioners of Middlesex county, the proceedings upon which shall be like those provided for the recovery of damages in the taking of lands for highways.

SECT. 4. Said city of Boston is hereby authorized to raise and appropriate, in such manner as its city government shall determine, such sums of money as shall be incurred by said city in carrying out the provisions of this act.

SECT. 5. This act shall be subject to the same limitations expressed in section twelve of chapter two hundred and two of the Acts of the year eighteen hundred and seventy-five.

SECT. 6. The supreme judicial court, or any justice thereof, in term time or vacation, sitting in equity for either of the counties of Suffolk or Middlesex, shall have jurisdiction in equity to enforce the provisions of this act by injunction or by any other appropriate equitable remedy, on complaint of the selectmen of either of the towns of Medford or Arlington.

SECT. 7. This act shall take effect upon its passage.

Approved May 13, 1881.

As it is held to be impracticable by the city to carry out the provisions of this act, a probable result may be to restore the sewage again to the drinking-water.

In view of all the difficulties that beset the maintenance of the purity of the Mystic water, it would seem to be the wisest course not to engage in any more expenditures for the purpose of enlarging the supply from the present source, but to look to the Shawshine river for a reinforcement of the Mystic. Acting in this belief the Board, on February 7, sent a communication to the City Council, recommending that application be made to the Legislature for authority to take water from the Shawshine. This was accordingly done under an order of the City Council, but the petition was refused by the Legislature for reasons not necessary to discuss here.

The only course left for the city is either to continue its application or to connect the Mystic supply with the Sudbury and Cochituate. This latter scheme would entail an enormous expenditure, not only for mains, but for the development of the whole storage capacity of the Sudbury valleys. It is to be hoped that the city will not be driven to this alternative.

LEONARD R. CUTTER, *Chairman*,
FRANCIS THOMPSON,
ALBERT STANWOOD.

EARNINGS OF THE WORKS.

The total receipts of the Cochituate Water Works from all sources for the year ending April 30, 1881, are as follows, viz.: —

Stock on hand May 1, 1880		$61,159 24
Income from sales of water		1,063,852 79
Income from shutting off and letting on water and fees		3,273 00
Sundry receipts by Water Board		64,423 69
Profits in manufacturing hydrants, etc., etc., for the year ending March 15, 1880	$3,958 60	
Stock returned to proving yard from alterations of pipes in streets	1,351 10	
Increased valuation of stock, March 15, 1880	27,381 52	
		32,691 22
Amount overdrawn by Auditor for payment of annuity to Sarah Munroe and returned to the City Collector		52 50
		$1,225,452 44

The total amount charged to Cochituate Water Works for the year ending April 30, 1881, is as follows, viz.: —

Current expenses	$211,091 84	
Extension of works paid for out of income	103,451 32	
Interest on funded debt	619,476 52	
		934,019 68
Balance April 30, 1881		$291,432 76
Stock on hand April 30, 1881,	$95,763 86	
Paid to Cochituate Water Sinking Fund, April 30, 1881	195,668 90	
		$291,432 76
Excess of income over expenditures for 1880–81	$195,668 90	
Amount required for Sinking Fund	182,798 31	
Excess of income over all requirements		$12,870 59

The outstanding Cochituate Water Loans at this date, exclusive of the Additional Supply, are as follows: —

5 per cent. Sterling Loan (£399,500)	$1,947,273 98		Due Oct.	1, 1902
5 per cent. Loans	100,000 00	100,000	Due April	1, 1906
5 per cent. Loan	1,000 00	1,000	Due Oct.	1, 1907
6 per cent. Loans	$4,253,000 00	300,000	Due Dec.	1, 1897
		200,000	Due Dec.	12, 1897
		450,000	Due June	16, 1898
		540,000	Due Oct.	1, 1898
		250,000	Due April	1, 1899
		625,000	Due Jan.	1, 1901
		688,000	Due April	1, 1901
		330,000	Due July	1, 1901
		413,000	Due April	1, 1903
		38,000	Due April	1, 1904
		161,000	Due Jan.	1, 1905
		142,700	Due April	1, 1905
		6,000	Due Oct.	1, 1905
		82,550	Due Jan.	1, 1906
		8,750	Due April	1, 1906
		4,000	Due Oct.	1, 1906
		8,000	Due Jan.	1, 1907
		5,000	Due April	1, 1907
		1,000	Due July	1, 1907
4 per cent. Loan	280,000 00	280,000	Due April	1, 1910
	$6,581,273 98			

The total receipts of the Mystic Water Works from all sources for the year ending April 30, 1881, are as follows, viz.: —

Stock on hand May 1, 1880		$14,547 05
Income from sales of water		225,992 47
Income from shutting off and letting on water and fees		751 75
Sundry receipts by Water Board		4,843 78
Receipts by Mystic Water Registrar for service-pipes, etc.		769 77
		$246,904 82

The total amount charged to Mystic Water Works for the year ending April 30, 1881, is as follows, viz.: —

Current expenses	$101,906 64	
Extension of works paid for out of income	4,729 16	
Amounts carried forward,	$106,635 80	$246,904 82

Amounts brought forward,	$106,635 80	$246,904 82
Interest on funded debt . .	65,145 00	
Amount paid Chelsea, Somerville, and Everett, under contracts	26,695 28	
		198,476 08
Balance, April 30, 1881		$48,428 74
Stock on hand, April 30, 1881 .	$16,657 44	
Paid to Mystic Water Sinking Fund, April 30, 1881 . .	31,771 30	
		$48,428 74
Amount required for Sinking Fund for year 1880–81 . .	$83,559 39	
Excess of income over expenditures for year 1880–81 . .	31,771 30	
Excess of requirements over income . .		$51,788 09

The outstanding Mystic Water loans at this date are as follows: —

6 per cent. currency Mystic Water Loans .	$613,000 00	$26,000	Due Oct. 1, 1881
		1,000	Due April 1, 1885
		35,000	Due April 1, 1886
		60,000	Due Oct. 1, 1886
		50,000	Due Oct. 1, 1887
		3,000	Due April 1, 1888
		100,000	Due July 1, 1890
		51,000	Due Jan. 1, 1891
		139,000	Due July 1, 1891
		67,000	Due Jan. 1, 1892
		42,000	Due July 1, 1892
		39,000	Due July 1, 1893
5 per cent. currency Mystic Water Loans .	410,000 00	100,000	Due Oct. 1, 1882
		202,000	Due Oct. 1, 1883
		6,000	Due Oct. 1, 1893
		102,000	Due April 1, 1894
6 per cent. currency Mystic Sewer Loans .	130,000 00	130,000	Due April 1, 1886
	$1,153,000 00		

MYSTIC SEWER.

Balance of loan, April 30, 1880 . . .	$21,754 36
Payments during year 1880–81 . . .	4,871 63
Balance unexpended April 30, 1881 . .	$16,882 73

The following statement shows the appropriations by the City Council for an additional supply of water, with the loans issued to meet them, and the amount of expenditures to this date :—

ADDITIONAL SUPPLY OF WATER.

APPROPRIATIONS.

Oct. 21, 1871.	Transfer from Reserved Fund	$10,000 00
Apr. 12, 1872.	Order for Treasurer to borrow	100,000 00
Apr. 11, 1873.	" " "	500,000 00
Feb. 26, 1875.	" " "	1,500,000 00
July 1, 1876.	" " "	2,000,000 00
Apr. 20, 1878.	" " "	600,000 00
Apr. 11, 1879.	" " "	350,000 00
	Total appropriations to April 30, 1879	$5,060,000 00

Oct. 1, 1875.	Premium on $1,000,000 bonds, under order of Feb. 26, 1875	$83,700 00	
April 1, 1876.	Premium on $452,000 bonds, under order of Feb. 26, 1875	47,786 80	
Oct. 1, 1876.	Premium on $2,000,000 bonds, under order of July 1, 1876	221,400 00	
			352,886 80
			$5,412,886 80

EXPENDED.

1871–72	$2,302 81	
1872–73	61,278 83	
1873–74 including $20,897.50 discount on bonds sold, January, 1874	114,102 77	
1874–75	224,956 68	
1875–76	783,613 49	
1876–77	1,924,060 24	
1877–78	1,257,715 26	
1878–79	635,658 08	
1879–80	213,350 97	
1880–81	35,677 98	
		5,252,717 11
Balance of appropriations unexpended, April 30, 1881		$160,169 69

Balance of loans, April 30, 1880 . . . $195,847 67

Receipts.

Rents, etc. 1,240 94

Amount carried forward, $197,088 61

Amount brought forward,		$197,088 61
	Payments.	
To sinking fund	$1,240 94	
Sundry payments for construction, land-damages, etc. .	35,677 98	
		36,918 92
Balance unexpended, April 30, 1881 . .		$160,169 69

The outstanding loans which were made on account of Additional Supply of Water are as follows:—

4 per cent. Loans, . .	$670,000	$82,000	Due July 1, 1908
		588,000	Due April 1, 1908
5 per cent. Loans, . .	3,452,000	1,000,000	Due Oct. 1, 1905
		452,000	Due April 1, 1906
		2,000,000	Due Oct. 1, 1906
5 per cent. Loan, . .	12,000		Due April 1, 1908
6 per cent. Loans, . .	648,000	100,000	Due July 1, 1902
		492,000	Due April 1, 1903
		8,000	Due Jan'y 1, 1904
		48,000	Due July 1, 1905
4½ per cent. Loan, . .	268,000		Due Oct. 1, 1908
	$5,050,000		

REPORT OF THE CLERK.

OFFICE OF THE BOSTON WATER BOARD,
BOSTON, May 1, 1881.

LEONARD R. CUTTER, Esq.,
Chairman of the Boston Water Board: —

SIR, — The following is a statement of the receipts and expenditures of the Boston Water Board for the financial year ending April 30, 1881: —

RECEIPTS.

On account of Cochituate Water Works . .		$1,131,601 98
" " Additional Supply of Water .		1,240 94
" " Mystic Water Works . .		232,357 77
		$1,365,200 69
Balance of loans unexpended April 30, 1880, Additional Supply of Water . .	$195,847 67	
Mystic Sewer . . .	21,754 36	
Appropriation, New Main, Cochituate Water Works .	280,000 00	
Appropriation, Chestnut Hill driveway, 1880–81 . .	3,000 00	
Stock purchased in previous years, Cochituate Water Works	93,850 46	
Mystic Water Works . .	14,547 05	
		608,999 54
		$1,974,200 23

EXPENDITURES.

Current expenses, Cochituate Water Works . . .	$211,091 84	
Current expenses, Mystic Water Works . . .	101,906 64	
Amounts carried forward,	$312,998 48	$1,974,200 23

Amounts brought forward,	$312,998 48	$1,974,200 23
Extension of Cochituate Water Works	103,451 32	
Extension of Mystic Water Works	4,729 16	
Interest on Cochituate Water Loans	619,476 52	
Interest on Mystic Water Loans	65,145 00	
Chelsea, Somerville, and Everett contracts, account Mystic Water Works	26,695 28	
Construction, New Main, Cochituate Water Works	267,778 80	
Construction, Additional Supply of Water	35,677 98	
Construction, Mystic Sewer	4,871 63	
Surplus Income of Cochituate Water Works to Cochituate Water Sinking Fund	195,668 90	
Income of Additional Supply of Water to Cochituate Water Sinking Fund	1,240 94	
Surplus Income of Mystic Water Works to Mystic Water Sinking Fund	31,771 30	
Chestnut-Hill Driveway	2,999 58	
Balance of Appropriation Chestnut-Hill Driveway carried into the Treasury, April 30, 1881	42	
		1,672,505 31
		$301,694 92

April 30, 1881, Balance of loans unexpended, Additional Supply of Water	$160,169 69	
Mystic Sewer	16,882 73	
New Main, Cochituate Water Works	12,221 20	
Stock on hand April 30, 1881, Cochituate Water Works	95,763 86	
Mystic Water Works	16,657 44	
		$301,694 92

Total Water Debt of the City of Boston.

Cochituate, outstanding, April 30, 1881 . .	$11,631,273 98	
Mystic, outstanding, April 30, 1881 . . .	1,153,000 00	
		$12,784,273 98

Cochituate Water Debt.

Outstanding, April 30, 1880	$11,697,273 98	
Paid in 1880–81 . .	66,000 00	
		$11,631,273 98

Mystic Water Debt.

Outstanding, April 30, 1880	$1,153,000 00	
Paid in 1880–81 . .	0,000,000 00	
		$1,153,000 00

Total Water Sinking Funds, April 30, 1881.

Cochituate Water Sinking Fund	$1,989,300 88	
Mystic Water Sinking Fund	366,898 39	
		$2,356,199 27

Trial Balance, Cochituate Water Works, April 30, 1881.

	Dr.	*Cr.*
Construction Account .	$16,750,518 05	
Cochituate Water Works .		$16,750,518 05
City Treasurer, Loan Account	475,847 67	
Income of Additional Supply of Water		1,240 94
Appropriation, Additional Supply of Water . .		160,169 69
Appropriation, New Main, Cochituate Water Works .		12,221 20
Income of Cochituate Water Works		1,225,452 44
Amounts carried forward,	$17,226,365 72	$18,149,602 32

Amounts brought forward,	$17,226,365 72	$18,149,602 32
Maintenance of Cochituate Water Works	211,091 84	
Extension of Cochituate Water Works	103,451 32	
Interest on Cochituate Water Loans	619,476 52	
Stock Account	95,763 86	
City Treasurer, Revenue Account	1,132,842 92	
Appropriation, Chestnut-Hill Driveway		42
City Treasurer, Appropriation Account	3,000 00	
City Treasurer		1,242,389 44
Funded Debt	11,631,273 98	
Cochituate Water 6% Currency Loan		4,901,000 00
Cochituate Water 5% Currency Loan		13,000 00
Cochituate Water 5% Gold Loan		3,552,000 00
Cochituate Water 5% Sterling Loan		1,947,273 98
Cochituate Water 4% Currency Loan		588,000 00
Cochituate Water 4% Loan		362,000 00
Cochituate Water 4½% Loan		268,000 00
Commissioners on the Sinking Funds	1,989,300 88	
Cochituate Water Sinking Fund		$1,989,300 88
	$33,012,567 04	$33,012,567 04

Trial Balance, Mystic Water Works, April 30, 1881.

	Dr.	*Cr.*
Construction	$1,624,248 89	
Mystic Water Works		$1,624,248 89
City Treasurer, Revenue Account	232,357 77	
Income of Mystic Water Works		246,904 82
Amounts carried forward,	$1,856,606 66	$1,871,153 71

Amounts brought forward,	$1,856,606 66	$1,871,153 71
Maintenance of Mystic Water Works	101,906 64	
Extension of Mystic Water Works	4,729 16	
Interest on Mystic Water Loans	65,145 00	
Chelsea, Somerville, and Everett contracts	26,695 28	
Stock account	16,657 44	
City Treasurer, Loan Account	21,754 36	
Appropriation, Mystic Sewer		16,882 73
City Treasurer		205,458 10
Funded Mystic Water Debt	1,153,000 00	
Mystic Water 6% Currency Loan		613,000 00
Mystic Water 5% Currency Loan		410,000 00
Mystic Sewer 6% Currency Loan		130,000 00
Commissioners on the Sinking Funds	366,898 39	
Mystic Water Sinking Fund		366,898 39
	$3,613,392 93	$3,613,392 93

Cost of Construction of the Cochituate Water Works to May 1, 1881.

Cost of Water Works to January 1, 1850, as per final report of Water Commissioners	$3,998,051 83
Extension to East Boston	281,065 44
Jamaica-pond aqueduct	13,237 50
New dam at Lake Cochituate	10,940 08
Raising lake two feet, including damages	28,002 18
Dudley pond, lower dam, and making connections with lake	18,982 23
New main from Brookline reservoir	304,991 83
Land and water rights and land-damages since January 1, 1850	49,486 17
New pipe-yard and repair-shop	25,666 51
Upper yard, buildings, etc.	9,165 63
New water-pipes, East Boston	20,999 43
Amount carried forward,	$4,760,588 83

Amount brought forward,	$4,760,588 83
New main, East Boston	24,878 08
Pumping-works at Lake Cochituate	23,446 60
High-service, stand-pipe, engine-house and engines	103,829 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
Keeper's house, Parker Hill	2,764 90
Temporary high-service, Brighton	7,865 86
New stable at Chestnut-Hill reservoir	8,103 55
Pegan dam, Natick	1,394 06
Willow dam, Natick	1,567 29
High-service, East Boston	22,960 07
New main from Chestnut-Hill reservoir	267,778 80
Cost of laying main pipe for extension in Roxbury, Dorchester, Brighton, and West Roxbury Districts	1,758,512 22
Additional supply of water, including land damages and all expenses	5,252,717 11
Cost of laying main pipe since January 1, 1850	1,781,490 27
	$16,750,518 05

Cost of Construction of the Mystic Water Works to May 1, 1881.

Salaries	$17,644 61
Engineering	33,746 87
Land-damages	91,855 38
Reservoir	141,856 26
Dam	17,167 26
Conduit	129,714 30
Engine-house, coal-shed, and chimney	36,112 99
Engines	150,096 70
Grubbing pond	9,393 26
Iron pipes	108,437 10
Iron pipes, trenching	61,029 59
City distribution	162,335 23
Hydrants	19,976 21
Stopcocks	19,262 52
Miscellaneous items	14,012 51
Amount carried forward,	$1,012,640 79

Amount brought forward,	$1,012,640 79
Roadway and bridge	3,529 22
Lowering Mystic river	3,012 06
Inspections	1,824 79
Service-pipes and meters	133,858 70
Hydrants for Somerville and Medford	2,653 08
Somerville distribution	2,492 10
Dwelling-house for engineer and fireman (pumping-station)	4,871 02
Chelsea extension	37,347 86
Medford extension	3,997 41
Drinking fountains	1,415 05
New line of supply main	203,050 09
Stable and pipe-yard	8,964 64
Extension of engine-house and boiler	33,727 43
New force main	9,875 17
Mystic sewer	113,117 27
New stable, engine-house	1,767 39
Additional force main	24,882 96
Temporary pumping-works	3,380 30
Cost of laying main pipe since 1873	17,841 56
	$1,624,248 89

Respectfully submitted,

W. E. SWAN,
Clerk of the Boston Water Board.

REPORT OF THE CITY ENGINEER.

OFFICE OF THE CITY ENGINEER,
CITY HALL, BOSTON, June 1, 1881.

L. R. CUTTER, ESQ., *Chairman Boston Water Board:* —

SIR, — In accordance with the requirements of the ordinance establishing the Boston Water Board, I respectfully submit the following report on the condition of the Water Works: —

SUDBURY AND COCHITUATE WORKS.

SUDBURY RIVER RESERVOIRS AND LAKE COCHITUATE.

The reservoirs upon the Sudbury river were all full at the beginning of the year 1880, and they remained at or near high-water mark until the middle of May. Reservoir No. 3 was not drawn upon for the supply of the city until August 18th, and, consequently, remained full until that time. Sept. 1st its surface was 171.80 above tide marsh level; Oct. 1st, 167.22, and Oct. 30, 159.62, or 15.62 feet below the crest of the dam.

During November and December, 1880, and January, 1881, this reservoir was allowed to fill, and on Feb. 1st its surface was 168.38. On March 6th the reservoir was full and wasting over the dam.

Reservoir No. 2 was drawn upon during June, July, and August, lowering its surface from 166.93 on June 1st to 156.95 on Aug. 18th. Nov. 1st it had risen to 163.48, and was then again drawn upon until on Jan. 8th, 1881, it was 155.32 or 11.8 feet below the top of the flash boards. From Feb. 1st to 13th the reservoir was filling, and on the latter date commenced to waste over the dam into the Reservoir No. 1.

Reservoir No. 1 has been kept at or near the crest of the dam during the entire year. Until June 1st water was taken from this reservoir for the city supply, but the presence of large quantities *algæ* during the summer rendered it unfit for use.

At the present time the reservoirs are all full.

In addition to the amount of 1½ million gallons per day which is allowed constantly to flow into the river, water was wasted at Dam 1, from Jan. 3d to 9th, 1880, inclusive; Jan. 11th to 19th; Jan. 21st to April 17th; April 19th to May 15th, and from Feb. 13th to May 1st, 1881.

The total amount wasted during the year 1880 was 11,290,000,000 gallons, equal to a daily supply of 30,847,000 gallons.

During the year 6,230,200,000 gallons, equal to a daily supply of 17,022,400 gallons, have been supplied from the Sudbury river. Of the above amount 826,700,000 gallons were run into Lake Cochituate, and 5,403,500,000 gallons into Chestnut-Hill reservoir. The table on page 41 gives the monthly quantities diverted from the river since 1872.

Lake Cochituate, on Jan. 1, 1880, was 126.50 above tide marsh level, or 0.86 ft. below the top of the conduit.

During the early part of this year the lake was rising, and on May 4th water was allowed to waste over the outlet dam. This waste continued until May 6th, its total amount being 65,577,700 gallons.

By means of the Sudbury the lake was kept near high-water mark until June 12th, when the supply from that source having been stopped, the water surface commenced falling immediately and continued to fall until Jan. 10th, 1881, when it was 9.06 feet below high-water mark, or 2.06 feet below the top of the aqueduct. March 11th, 1881, it had again filled, and waste was commenced at the outlet dam, and still continues.

When the lake was at its lowest stage, and the supply from the Sudbury was being rapidly exhausted, there was a possibility that pumping from the lake would have to be resorted to. The pumping machinery which had been relied upon in similar emergencies was in use on the Mystic, and it was therefore deemed advisable to procure two new sets of pumping engines and boilers. This machinery should be kept in readiness in case a similar condition of the supply should occur before the completion of the new reservoir on the Sudbury.

From Jan. 20th to Feb. 5th, 1881, no water was drawn from the lake for supplying the city, and Feb. 26th the "cucumber" taste having been traced to this source, the gates were again closed and have remained so since.

Dug pond contributed about 150,000,000 gallons to the Lake supply between March 9 and April 12, 1880, and Dudley pond was drawn upon Oct. 13th, when its surface was four feet below high-water. This pond had been lowered

about ten feet when the stop-planks were replaced Dec. 7, 1880.

Aqueducts and Distributing Reservoirs.

With the completion of the Sudbury system, the necessity for straining the Cochituate aqueduct practically ceases. From May 1st until Aug. 15th, five feet of water were run. On the latter date this height was increased six inches, falling afterwards with the surface of the lake until Jan. 20th when the head-gates were shut down permanently on account of the continued bad taste of the water.

The Sudbury-river aqueduct has been in almost continuous use for the past year. It has required but trifling repairs.

Chestnut-Hill reservoir, with its grounds, gate-houses, etc., are in good condition.

The laying of the new 48-inch main having rendered practicable the cleansing of the Brookline reservoir, the gates at the effluent gate-house were closed March 28th, and the reservoir emptied by means of the blow-off into the brook leading to Muddy river.

The work of cleansing the reservoir, and repairing the structures connected with it, was done under the immediate direction of the superintendent of the Western Division, and a full description of the methods employed and amount done will be found in his report.

The Beacon-Hill reservoir has been taken as a site for a new Court House, by a vote of the Board of Aldermen, passed Nov. 27th, 1880, and is now in charge of the Joint Standing Committee on Public Buildings.

The structure is to be taken down, but the pipes have not as yet been disconnected from it, as it was not desirable to find a new place for the apparatus for measuring the pressure and approximate supply until the committee made some arrangements for the disposal of the reservoir.

The East Boston reservoir, which has been out of active use for a number of years, has, by the construction of the high-service works in this District, been again placed in service.

The South Boston reservoir is kept full for use in case of accident to the supply mains of this section of the city.

The East and South Boston reservoirs are in good order.

Highland High-Service Works.

The table on page 46 shows the average monthly heights of the water in Parker-Hill reservoir for the year 1880.

The grounds about the reservoir and at the stand-pipe are in good condition. New fences have been built on two sides of the stand-pipe lot and on the west side of the reservoir grounds.

At the pumping station the machinery and buildings are in good order. The upper portion of the chimney, which had become disintegrated from the action of the weather, has been rebuilt and covered with lead.

The Worthington engine has pumped all of the water during the past year.

Total quantity of water pumped, 856,840,000 gallons.

Total coal consumed, 1,628,800 lbs., of which 13.7 per cent. were ashes and clinkers.

Average lift, 116.39 feet.

Quantity pumped per lb. of coal, 526.1 gallons.

Average daily quantity pumped, 2,341,093 gallons, an increase of 4.1 per cent. over that of 1879.

Average duty 51,063,900 ft.-lbs. per 100 lbs. of coal, without deductions for ashes and clinkers.

The duty is somewhat less than that of last year, due to the poor quality of the coal supplied, especially during the latter part of the year.

The table on page 48 shows the monthly quantities pumped, work done, etc.

Cost of Pumping.

Salaries	$3,716 94
Fuel	4,129 20
Repairs	6 25
Oil, waste, and packing	71 63
Small supplies	331 72
Total	$8,255 74

Cost per million gallons raised one foot high $0.083.

Brighton High-Service.

These works have been in constant operation, and are in good condition.

The quantity of water required is rapidly increasing, and during warm weather, when there is a large amount used for street watering, the consumption is 250,000 to 270,000 gallons per day.

EAST BOSTON HIGH-SERVICE WORKS.

These works, which were placed in operation Oct. 12th, supply the territory comprised in two high districts, the "Eagle Hill" and "Belmont Square," and enable East Boston to be supplied from the Sudbury and Cochituate instead of the Mystic.

The works consist of two Worthington compound high-pressure pumps, together capable of raising 1,500,000 gallons in twenty-four hours; two upright tubular boilers to furnish steam for the pumps, a check-valve with a by-pass and safety-valve for regulating, in connection with the reservoir, the pressure upon the pipes, and about 7,500 feet of main pipe connecting with the former supply mains. The manner in which the reservoir is utilized in conjunction with the high-service works will be understood from the following description.

In the 16-inch pipe entering the reservoir is placed a check-valve which prevents the entrance of any water. Passing around the check-valve is a 10-inch pipe provided with a valve which is kept closed by means of a weighted lever in the same manner as a safety-valve. This valve is so set as to be opened by a pressure of 10 lbs. During the day, while the pumps are in operation, the check-valve remains closed, and an increased pressure of 10 lbs. over that due to the reservoir is maintained on the distribution, the surplus amount pumped passing into the reservoir through the safety-valve and 10-inch by-pass. When the pumps are stopped the pressure falls, the check-valve opens, and the supply is drawn from the reservoir.

The supply for the pumps is taken from the 20-inch low-service main which connects East Boston with the city proper mains.

The pumping machinery is located in a neat wooden building on Brooks street, upon the reservoir lot. The entire work has been completed at a cost of about $23,000, the amount appropriated for the work being $33,000.

During the extreme cold weather the head in the supply main was so reduced by waste, to prevent freezing of service pipes, that no water could be obtained for the pumps and the reservoir was almost exhausted. It is proposed to provide a remedy for this difficulty the coming season by connections which will enable a supply for the high-service to be drawn from the Mystic in cases of necessity.

The daily consumption from these works is about 350,000 gallons.

Forty-eight-Inch Main.

The Legislature of 1880 passed an act granting the right to lay this new main from Chestnut-Hill reservoir through the town of Brookline to the city. The 20th of March an appropriation of $280,000 was made by the City Council for the pipes and special castings required. Such favorable contracts were made for these pipes that the appropriation will be sufficient to complete the entire work, although it was anticipated that a further appropriation would be needed to lay the pipes.

The work of laying the pipes was commenced on June 23d, and at 12 M. of Nov. 29th water was supplied to the city through the new main, direct from Chestnut-Hill reservoir. The pressure throughout the city was immediately increased about 10 feet.

A 30-inch main, to be charged to this appropriation, still remains to be laid in Francis street, to connect the 40-inch with the 30-inch and 36-inch mains, originally laid to supply the city, and it is expected that this connection will still further increase the head.

The new main starts from the effluent gate-house, at Chestnut-Hill reservoir, and after connecting with a 48-inch pipe, which is laid around the reservoir from the terminal chamber of the Sudbury-river conduit, it passes through Beacon street to the junction of Brookline avenue, — a distance of 16,300 feet, — where it connects with the 40-inch main from Brookline reservoir. At the junction of Harvard street, in Brookline, a branch has been put in for a contemplated connection with the Mystic works, and a gate is located in the main at this point. Gates to control the flow of the water have also been placed on the connection at Chestnut-Hill reservoir and at Brookline avenue. Near St. Paul street, in Brookline, a section of the pipe line, 780 feet in length, is supported by a pile foundation, consisting of spruce piles driven in pairs, at distances apart of 5 feet crosswise, and 6 feet lengthwise of the trench, and capped crosswise with 10-inch by 10-inch spruce caps 8 feet long.

The cost of the main was largely increased by the necessity of removing and relaying many of the water and gas pipes in the town of Brookline.

Mystic Works.

Mystic Lake. — At the beginning of the year 1880 the water in Mystic Lake was 1.71 ft. above tide-marsh level,

or 5.88 ft. above the conduit invert. Jan. 25th it had risen to 6.65 ft., and was allowed to waste at the outlet dam. The waste continued until April 28th, and from May 1st to 12th, after that time the surface fell, standing July 1st, 3.26; Aug. 27th, 1.50, or at the top of the conduit; Sept. 1st, 1.27, and Oct. 1st, — 0.92.

During September temporary pumping machinery was placed at the lake, to raise the water into the conduit.

The engines and pumps which were used at Lake Cochituate in 1871 and 1874, for a similar purpose, were placed in position upon temporary platforms which had been built to receive them. October 2d, as the conduit by gravitation would no longer furnish the supply, the pumps were started, and were continued in operation until the 17th of January, 1881.

On the 25th of October the lake surface was 3.18 feet below tide-marsh level, or only one foot above the conduit invert; the lowest point ever reached. January 1st, 1881, it was 1.63 feet below tide-marsh level, February 1st, 0.40 above the same base, and Feb. 14th water was wasted over the outlet dam.

During the year 2,158,761,200 gallons have been wasted at the outlet dam, equal to an average daily supply of 5,914,000 gallons for the year.

During the season advantage was taken of the low stage of the water to remove from the upper end of Mystic Lake, near Mystic Station, a large quantity of mud and muck and to repoint the joints of the Mystic dam and wing-walls; a considerable amount of vegetable matter was also removed from Wedge and Whitney's ponds.

Mystic Valley Sewer.

The Mystic Valley Sewer is in good working condition. During last year the towns of Medford and Arlington complained of unpleasant smells, which, it was claimed, were due to the accumulation of sewage in the Lower Mystic pond, and the Legislature was appealed to for an abatement of the alleged nuisance.

The result of this action was the enactment of a law ordering the discontinuance of the sewer unless the sewage is so treated as to render its contents free from polluting substances. The location of the sewer and the peculiar composition of the sewage which, as it is well known, contains mainly the refuse of tanneries, renders it a very difficult, if not insolvable problem to comply with the requirements of

the act. This opinion is corroborated by the conclusions of a report made by Prof. Nichols in reference to the treatment of this sewage by various chemical substances. His report will be found in the Appendix.

It is not possible for the present to foresee what effect this action of the Legislature may have on the welfare of the Mystic supply. The matter is now in the hands of a special committee of the City Government.

Mystic Pumping Station and Reservoir.

The work done by the engines at this station, during each month, is shown on page 47.

Engine No. 1 was in use 1,190 hours 15 minutes.
" 2 " 4,324 " 50 "
" 3 " 7,999 "

Total amount pumped, 3,434,195,710 gallons.

Total amount of coal consumed 8,174,700 lbs., of which 7.4 per cent. were ashes and clinkers.

Average lift, 150.83 feet.

Quantity pumped, per lb. of coal, 420.1 gallons.

Average duty of the three engines (no deductions), 52,845,400 feet per 100 lbs. of coal.

Cost of Pumping.

Salaries	$6,969 38
Fuel	19,695 64
Repairs	310 30
Oil, waste, and packing	989 99
Small supplies	88 22
Total	$28,053 53

Cost per million gallons raised one foot high, $0.054.

The pumps have received only ordinary repairs, and are in fair condition. The boilers are now being examined and repaired. Some grading has been done on the roadway leading to the reservoir. The reservoir is in good condition.

Pipes, Pipe Plans, and Miscellaneous.

Exclusive of the 48-inch main, the Cochituate distribution has been extended about nine miles during the year.

The Mystic pipe system has been improved by the substi

tution of about two miles of cast-iron pipe for the same length of wrought-iron and cement pipe.

At the request of the City of Cambridge a connection has been made at Cottage Farm between the 16-inch main supplying the Brighton district and the distribution system of the Cambridge works, to be used in case of a failure of their supply.

The 20-inch and 16-inch pipes on Chelsea bridge, for a distance of about 300 feet, have been removed from their pile foundations and relaid in earth filling; a portion of the channel previously spanned by a pile structure having been filled by the City of Chelsea, enabling this change for the better to be made.

Quality.

The quality of the water during the past year has been, at times, objectionable; the disagreeable taste complained of several times in previous years has again appeared, and has been located in Lake Cochituate at a time when the conditions for a good supply were never better. The meadows on the south side of Central Turnpike have been kept covered with a good depth of water, by means of the dam built last year, as have also the Hanchett meadows, while as the lake lowered, all the water from Pegan brook was filtered through the new gravel dam.

The water in the lake was free from *algæ* and appeared clear and pure, but the fishy or cucumber taste was very strongly marked. The cause for this bad taste is still unknown, notwithstanding all the investigations that have been made by scientists in this and other localities where it has been noticed.

The vegetable growths observed in 1879 have been found again in the Mystic supply, and in two of the Sudbury river reservoirs. In the latter, owing to the double system of reservoirs which allows a complete separation of the two branches of the river and the isolation of either from the rest of the supply, the trouble from this source has been very much lessened. In the Mystic, although it gave promise of being very bad at one time, it was dissipated by some unknown cause, and did not appear to an objectionable extent either in the lake or distribution.

Notwithstanding the objectionable quality of the water caused by the presence of *algæ* and the cucumber or fishy taste, two evils which are entirely distinct from one another, it should be stated that, in the opinion of some of the best

authorities, this abnormal condition of the water has no injurious effect upon the public health.

ADDITIONAL SUPPLY. — SUDBURY RIVER.

At the beginning of the year very little was left to be done to complete the work, as contemplated in the original estimates.

At Dam No. 2 the impervious hearting of the embankment was extended several hundred feet, by means of sheet piling and puddling, on the high grounds at the easterly end; the rest of the work during the summer consisted in completing the reservoirs and improving their borders. On the 15th of October, 1880, the care of the portion of the work left until then, under the immediate direction of this department, was transferred to the Superintendent of the Western Division of the Water Works; on that date may be said to have ended the period of construction.

A description of the work on "Additional Supply," and of the progress of construction, has been given every year in the annual reports of the City Engineer; but, as no comprehensive statement of the operations in connection with it has been furnished, I transmit with this report a more complete account, prepared by Mr. A. Fteley, formerly Resident Engineer in charge of the works.

It was the intention of the former City Engineer, Mr. Joseph P. Davis, to have prefaced this report of Mr. Fteley's with a brief history of the inception and progress to completion of this important work in which he took so much interest, and which owes its success so largely to his ability, but the pressure upon his time since he resigned the office of City Engineer has been so great that he has not been able to give it the requisite attention. It is needless for me to say that no one was better qualified to write the report which I now transmit than the one who wrote it, identified as he has been with the scheme from the beginning of the work. It should be printed for preservation, as forming a portion of the history of the Boston Water Works.

New Storage Reservoirs.

According to the instructions received from your Board at the beginning of the year, an investigation has been made to ascertain the most favorable location for an additional reservoir, and Basin No. 4 of the preliminary surveys, on Cold Spring brook in Ashland, has been selected as the most desirable in the present condition of the water supply.

As my report of May 14th to your Board upon this subject gives the reasons of this choice and a description of the proposed works, the approximate contents of the reservoir and the estimates of cost, it is appended.

Consumption.

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

From Lake Cochituate and Sudbury river,	26,500,000 galls.
" Mystic Lake	9,387,880 "
Total	35,887,880 galls.

an increase of 3.8 per cent. over the consumption of 1879.

The consumption from the Sudbury and Cochituate works from May 1st, 1880, to May 1st, 1881, was 9.7 per cent. more than for the previous year. The average daily consumption for each month is shown by the table on page 40.

East Boston was supplied from the Mystic works until Oct. 12th; since that time from the Sudbury and Cochituate works.

The figures given in the tables, showing the consumption of water, refer only to average quantities. During the last severe winter the daily consumption increased at times enormously, and attained a maximum of 56,000,000 gallons from all the works. The effect of this large consumption was to reduce the pressure in the city proper distribution about 33 feet, notwithstanding the increased capacity furnished by the new 48-inch main.

In Charlestown, Chelsea, Somerville, and Everett, supplied by the Mystic, the high grounds were at times without any supply, and in case of an extensive fire the effects would have been disastrous.

The variation in the daily consumption from the Highland high-service works is very marked, and its general increase must also be noted. The highest average weekly consumption during last winter was at the rate of 3,056,500 gallons, while it was but 2,419,000 gallons in the winter of 1879–80, an increase of about 27 per cent. For the summer months the corresponding quantities were 3,201,900 and 2,655,000, an increase of about 20 per cent. Although the total increase of consumption from these works was but 4.1 per cent. more than in 1879, owing to the refusal to extend the system more than was imperatively demanded, the above figures confirm

the statement made in my last annual report in reference to the necessity of constructing new high-service works.

There are many districts which are now inadequately supplied from the low-service distribution, and which should be connected with the high-service, but the present condition of works as to capacity is not such as to warrant any extension of the system.

This question was very fully considered in last year's report, and the recommendations there made were indorsed by your Board, and the City Council petitioned the Legislature for an act authorizing the construction of the works. This act has been obtained, and, although I have received no special request from your Board in regard to the matter, I have been engaged in making such surveys and investigations as will enable me to present for your consideration when you should desire it such estimates and plans as may be required. The work of construction should be commenced during the present season.

Condition of the Water Works.

The condition of the works is, on the whole, satisfactory. Reference has been elsewhere made to the repairs upon the Cochituate aqueduct, but in this connection it must be remembered that more extensive repairs are needed in some parts of this conduit where the abundance of ground-water will render the work difficult and costly, and that some action ought to be taken in reference to the improvement of the outlet of Lake Cochituate. My reasons for recommending this work are given at some length in my last annual report to your Board.

The year 1880 was an exceptionably dry one. The drought, due to the unusually small amount of snow-fall during the winter, and to the small rain-fall throughout the year, was severe, and the various storage reservoirs were drawn from to an unusual extent.

Upon the Sudbury river water-shed, from a rain-fall of 38.177 in., 32.7 per cent. only, equal to 12.487 in. were collected. On the Cochituate water-shed the rain-fall was 35.88 ins., of which 29 per cent., equal to 10.3 ins., were collected. On the Mystic water-shed the yield was 12.28 in., or 35.7 per cent. of the rain-fall, which was 33.42 in. Average yield 12.10 in.

The minimum amount of water collected in a year from the Cochituate water-shed since 1852 was 14.98 in. in 1871. The capacity of the Mystic water-shed for the same year, as

calculated from experiments at the Mystic dam in 1874, was 17,250,000 gallons (daily average), while 15,300,000 gallons only have been collected during the year 1880.

These results show that 12 in. of water from a drainage area in this vicinity cannot be safely calculated upon as its minimum yield.

The drawing down of Mystic lake to the lowest point it had ever reached since it has been used as a source of water supply, has demonstrated the necessity alluded to in my last annual report to your Board of increasing the resources of these works. The best method of accomplishing this result is a problem difficult to solve, owing to the uncertainty of being able in the future to preserve this source from dangerous contamination from the drainage of the towns in the valley through which its tributaries run.

I am of the opinion that the future cost of preserving the purity of this supply would not warrant the building of any storage basins such as have been proposed upon it.

The cost of the basins themselves would be large and the same amount spent upon some other source such as the Shawshine river would be a permanent investment, while on the Mystic it would probably be but a temporary, and therefore a useless one.

The connection of the Mystic pumping station with the Sudbury and Cochituate works, by means of a main pipe from the new 48-inch main, would be an expensive scheme, as it would require the development of nearly the full capacity of the Sudbury by building immediately the storage basins upon it, in addition to the cost of the main pipe.

In view of all the circumstances connected with this subject I would renew my recommendation, made verbally to your Board, that efforts should again be made to procure the right to take the Shawshine river as a supplement to the Mystic supply for the present, and to supplant it in the future. Although the previous efforts in this direction failed of success, owing to the complication of the matter with other questions, it should not, I think, prevent a renewed presentation of the matter to the next Legislature.

The Sudbury river reservoirs were heavily drawn from during the past season, and although they contained, at the end of the drought several hundred million gallons of water, they were as low as they can safely be allowed to be drawn.

During the year 6,230,200,000 gallons have been supplied by Sudbury river, an average of 17,022,400 gallons per day. Adding to that quantity one and a-half million gallons per day which the city must let run in the river from the lowest dam, it will be seen that this source of supply has been very

nearly drawn from to the amount which it was calculated to furnish with the present works.

The experience of the last year has given the measure of the resources of our water-supply with the present works; the drought was exceptional, but a similar one may occur again. When the increase of population in our city is taken into consideration, it becomes a pertinent question how the water-supply can be made to keep pace with the wants of the people.

An additional storage reservoir on the Sudbury is now necessary, but at the present rate of increase another will soon be wanted; a larger consumption will cause a reduction of pressure in the city, creating a demand for new and larger mains, or else an increase of the high-service limits. It is evident that the expense of providing for these wants will be excessive, and become a great burden upon the water-takers or the tax-payers.

The consumption should therefore be confined as closely as possible to the legitimate needs of the people, and measures should be adopted to prevent all unnecessary use or waste of water.

A useful step in this direction has been taken in applying several Deacon waste-water meters in the Charlestown district, from which it is expected valuable information will be obtained as to the amount and cause of waste. I expect, before the end of the year, to be able to report upon the working of this apparatus, and, if the results should warrant it, some similar system should be applied to the whole city.

The usual tables, showing the rain-fall, consumption of water, amount of water collected from the various water-sheds and all the statistics illustrating the capacity and the working of the various sources of supply, are appended.

Respectfully submitted,

HENRY M. WIGHTMAN,
City Engineer.

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

	COCHITUATE WORKS.							MYSTIC WORKS.						
Month.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
January	16,651,300	18,978,300	21,550,200	25,129,300	24,210,600	28,190,200	25,817,600	8,291,307	11,137,400	9,896,737	11,859,854	10,325,705	11,111,972	10,511,279
February . . .	19,103,850	20,991,700	22,675,200	22,071,800	23,848,700	27,446,300	27,625,800	9,705,467	11,150,000	10,601,013	9,982,621	9,944,140	12,253,090	11,616,248
March	17,657,300	17,878,100	20,931,500	19,446,600	21,019,500	24,163,800	23,095,700	8,110,458	10,058,700	9,396,910	8,578,935	8,192,825	9,851,219	10,324,323
April	15,929,600	15,852,000	17,300,500	18,988,800	20,628,300	20,421,800	22,670,700	6,849,252	7,671,800	7,568,052	7,200,533	7,365,951	8,311,620	9,400,931
May	16,731,900	17,164,500	18,837,800	19,520,300	22,023,800	22,953,800	25,238,200	6,735,285	5,663,224	7,610,317	7,250,492	7,717,476	8,523,744	9,962,213
June	19,239,750	19,923,400	19,872,300	20,192,400	23,360,600	24,101,200	27,795,400	7,202,680	6,505,015	8,560,937	8,190,530	8,383,667	9,054,267	10,891,057
July	21,386,200	20,396,400	20,820,600	20,799,400	25,620,000	26,156,900	26,951,800	7,861,818	6,494,046	9,152,492	8,371,295	9,087,658	9,150,925	10,051,544
August	20,127,800	19,085,200	21,333,900	20,778,400	24,679,600	27,075,100	28,175,100	7,589,671	6,124,240	8,600,788	8,121,402	8,751,038	8,027,325	9,754,149
September . .	20,022,600	20,497,400	19,430,800	21,499,500	24,469,700	28,017,800	28,734,400	7,424,292	6,224,227	8,619,557	8,242,180	8,767,490	7,614,951	9,591,891
October	19,320,900	19,470,700	19,214,000	19,593,700	24,100,700	27,702,600	27,487,900	7,118,184	5,931,448	8,081,052	8,780,799	7,900,000	7,771,578	7,634,888
November . . .	14,319,500	19,076,400	17,023,700	19,577,500	22,200,600	25,299,200	26,458,400	6,972,835	5,971,798	7,153,629	7,396,879	7,525,957	7,372,892	6,245,891
December . . .	16,407,950	21,898,500	23,783,000	20,535,900	22,298,500	26,831,900	28,010,500	7,854,951	10,087,886	10,673,036	7,732,921	8,227,314	8,585,799	6,778,046
Yearly average,	18,074,900	19,267,700	20,237,700	20,673,500	23,205,700	25,695,900	26,500,000	7,643,017	7,751,649	8,825,808	8,386,257	8,515,768	8,883,470	9,387,879

Diversion of Sudbury-River Water, 1872 and 1875–80.

Month.	1872.	1875.	1876.	1877.	1878.		1879.		1880.	
	To Lake Cochituate.	To Lake Cochituate.	To Lake Cochituate.	To Lake Cochituate.	To Lake Cochituate.	To Chestnut-Hill Res'r.	To Lake Cochituate.	To Chestnut-Hill Res'r.	To Lake Cochituate.	To Chestnut-Hill Res'r.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
January	Total January 19th to September 17th, 1,676,600,000 gallons.	140,400,000	410,300,000	427,200,000	.....	.....	.....	204,600,000	228,400,000	673,600,000
February		517,200,000	491,400,000	353,700,000	4,700,000	148,400,000	.....	272,300,000	11,300,000	604,100,000
March		380,300,000	22,000,000	8,200,000	12,000,000	.....	.....	295,100,000	8,200,000	268,400,000
April		265,700,000	.....	.....	.....	.....	.....	117,700,000	161,300,000	348,000,000
May		203,100,000	61,100,000	6,400,000	98,000,000	.....	.....	245,900,000	280,800,000	460,000,000
June		144,300,000	.....	87,500,000	504,100,000	.....	.....	180,800,000	136,700,000	398,600,000
July		343,100,000	149,300,000	2,660,000	177,300,000	118,200,000	333,100,000	322,500,000	.....	378,400,000
August		402,900,000	507,500,000	47,990,000	747,200,000	96,400,000	45,500,000	322,100,000	.....	592,000,000
September		.....	111,800,000	78,400,000	287,300,000	34,900,000	9,300,000	294,600,000	.....	445,500,000
October		158,800,000	380,800,000	882,300,000	661,600,000	168,400,000	.....	234,800,000	.....	434,600,000
November		.....	215,800,000	.....	176,100,000	109,500,000	21,400,000	339,300,000	.....	398,200,000
December		.....	178,300,000	.....	.....	78,000,000	2,000,000	508,200,000	.....	402,100,000
Totals	1,676,600,000	2,555,800,000	2,528,300,000	1,894,350,000	2,668,300,000	753,800,000	411,300,000	3,337,900,000	826,700,000	5,403,500,000
Total diversion from Sudbury River	1,676,600,000	2,558,800,000	2,528,300,000	1,894,350,000	3,422,100,000		3,749,200,000		6,230,200,000	
Av. daily diversion for whole year	4,581,000	7,002,000	6,908,000	5,190,000	9,376,000		10,272,000		17,022,400	

Statement showing Amount of Water drawn from Lake Cochituate; Amount wasted; Amount of Rainfall collected in Lake; Amount received into Lake from Sudbury River; Percentage of Rainfall collected, etc., 1852 to 1880. Water-shed of Lake = 12,077 acres.

Year.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	Amount received into Lake from Sudbury River.	Storage.		Total amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
				Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1852[1]	2,974,042,800	4,020,566,900	.....	261,300,000	261,300,000	6,733,249,700	18,396,900	47.93	20.61	43.
1853	3,117,939,500	3,166,417,500	.....	239,580,000	.....	6,523,937,000	17,873,800	55.73	19.51	35.
1854	3,614,230,000	4,187,733,000	.....	.....	217,800,000	7,584,163,000	20,778,500	43.15	22.87	53.
1855	3,776,399,500	No account kept	.....	.....	326,700,000	.....	.....	54.96	.....	.....
1856	4,409,787,600	"	.....	598,950,000	.....	.....	.....	40.80	.....	.....
1857	4,644,990,000	10,625,900,000	.....	32,670,000	.....	15,303,560,000	41,927,600	63.10	46.69	74.
1858	4,689,155,000	1,934,500,000	.....	.....	141,570,000	6,482,085,000	17,759,000	48.66	19.46	40.
1859[2]	4,808,875,000	7,569,000,000	.....	283,140,000	.....	12,661,015,000	34,687,700	49.02	38.24	78.
1860	6,309,108,000	None.	.....	174,240,000	.....	6,483,348,000	17,714,100	55.44	19.40	35.
1861	6,639,095,900	3,377,559,000	.....	.....	1,459,260,000	8,557,394,900	23,444,900	45.44	25.45	56.
1862	6,059,000,000	33,200,000	.....	1,306,800,000	.....	7,399,000,000	20,271,200	49.69	22.36	45.
1863	5,927,052,500	2,165,696,500	.....	762,300,000	.....	8,855,049,000	24,260,400	69.30	27.03	39.
1864	6,105,306,700	1,368,746,000	.....	.....	1,848,577,000	5,625,475,700	15,370,200	42.60	17.04	40.
1865	4,621,630,000	1,688,120,700	.....	743,242,500	.....	7,052,993,200	19,323,300	49.46	21.27	43.
1866	4,463,585,000	None.	.....	742,242,500	.....	5,206,827,500	14,265,300	62.32	15.58	25.

1867	4,951,225,000	2,482,041,000	.....	.....	698,811,000	6,734,455,000	18,450,600	56.25	20.25	36.
1868	5,405,515,000	2,507,684,000	.....	346,371,000	.....	8,259,570,000	22,567,200	49.71	24.86	50.
1869	5,500,696,000	1,635,570,000	.....	480,882,000	.....	7,620,203,000	20,877,300	64.34	23.16	36.
1870	5,477,810,000	4,818,971,000	.....	.....	1,736,085,000	8,560,696,000	23,453,900	55.89	26.27	47.
1871	5,223,500,000	None.	.....	.....	250,933,000	4,972,567,000	13,623,500	45.39	14.98	33.
1872	5,775,151,200	None.	1,676,666,400	1,543,995,500	.....	5,642,480,300	15,416,600	48.47	16.96	35.
1873	6,511,826,900	2,917,977,000	.....	.....	515,132,000	8,914,671,900	24,423,800	45.43	27.26	60.
1874	6,623,972,900	1,145,851,700	.....	.....	1,367,715,000	6,402,109,600	17,540,000	35.93	19.40	54.
1875	7,092,955,500	None.	2,555,800,000	1,222,885,000	.....	5,760,040,500	15,780,900	45.49	17.74	39.
1876	7,277,175,200	1,619,243,800	2,528,300,000	43,438,000	.....	6,411,557,000	17,517,900	48.49	19.40	40.
1877	7,626,889,200	1,484,978,600	1,894,350,000	378,727,000	.....	7,596,244,800	20,811,600	43.80	23.21	53.
1878	7,743,904,700	3,341,875,000	2,668,300,000	219,788,000	.....	8,637,267,700	23,663,700	53.58	26.25	49.
1879	6,051,838,900	1,523,361,400	411,300,000	.....	1,322,697,300	5,841,203,000	16,003,300	38.01	17.86	47.
1880	4,284,147,100	65,577,700	826,700,000	.....	146,265,000	3,376,759,800	9,226,100	35.83	10.30	29.
Averages	5,438,165,500	2,358,539,600	.....	.....	.....	7,377,700,800	20,201,100	49.11	22.08	45.

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

[2] Lake raised two feet.

Statement showing Amount of Water diverted from Sudbury River to Lake Cochituate and Chestnut-Hill Reservoir; Amount wasted; Amount of flow in river; Percentage of Rainfall collected, etc., 1875 to 1880.

(Water-shed from 1875 to 1878, inclusive, = 77,764 sq. miles; in 1879, =78,238 sq. miles, and in 1880, =76,305 sq. miles.)

Year.	Amount of Water diverted to Lake Cochituate and Chestnut-Hill Reservoir.	Amount of Water wasted from River.	Storage.		Total amount of flow in River.	Daily average amount of flow in River.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
			Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1875	2,555,800,000	24,971,600,000	66,300,000	. . . . .	27,593,700,000	75,599,200	45.490	20.418	44.88
1876	2,528,300,000	29,942,300,000	. . . . .	160,700,000	32,309,900,000	88,278,400	49.563	23.908	48.24
1877	1,894,350,000	29,438,300,000	112,100,000	. . . . .	34,444,750,000	94,369,200	44.018	25.487	57.90
1878	3,422,100,000	37,125,200,000	654,700,000	. . . . .	41,202,000,000	112,882,200	57.931	30.487	52.63
1879	3,749,200,000	20,817,500,000	962,200,000	. . . . .	25,528,900,000	69,942,200	41.419	18.775	45.33
1880	6,230,200,000	11,290,000,000	. . . . .	958,600,000	16,561,600,000	45,250,300	38.177	12.487	32.71
Average	3,396,660,000	25,597,500,000	. . . . .	. . . . .	29,606,810,000	81,040,500	46.100	21,927	47.56

Statement showing Amount of Water drawn from Mystic Lake; Amount wasted; Amount of Rainfall collected in Lake; Percentage of Rainfall collected, etc., 1876 to 1880; Water-shed of Lake, 17,200 acres.

YEAR.	Amount of Water drawn from Lake.	Amount of Water wasted from Lake.	STORAGE.		Total amount of Rainfall collected in Lake.	Daily average amount of Rainfall collected in Lake.	Rainfall.	Rainfall collected.	Percentage of Rainfall collected.
			Gain.	Loss.					
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Inches.*	*Inches.*	*Per cent.*
1876	3,230,101,300	6,369,774,700	. . . . .	32,583,000	9,567,293,000	26,140,100	47.00	20.49	43.6
1877	3,069,554,800	7,250,223,500	. . . . .	16,291,400	10,303,486,900	28,228,700	43.095	22.06	51.2
1878	3,354,371,200	8,714,479,600	. . . . .	28,672,900	12,040,177,900	32,986,800	54.065	25.79	47.7
1879	3,736,107,800	4,625,691,800	. . . . .	233,944,900	8,127,854,700	22,268,000	35.30	17.61	49.9
1880	3,692,195,700	2,158,761,200	. . . . .	113,500,000	5,737,456,900	15,676,100	34.42	12.28	35.7
Averages	3,416,466,200	5,823,786,200	. . . . .	. . . . .	9,155,253,900	25,059,900	42.78	19.65	45.6

Table showing the average monthly and yearly Heights above tide marsh level of the Water in the Lakes and Reservoirs of the Boston Water Works.

Month.	Reservoir No. 1. Flash-boards 159.29.		Reservoir No. 2. Flash-boards 167.12.		Reservoir No. 3. Stone-crest 175.24.		Farm Pond High water 149.25.		Lake Cochituate High water 134.36.		Chestnut-Hill Reservoir High water 124.00.		Brookline Reservoir High water 124.00.		Parker Hill Reservoir High water 219.00.		Mystic Lake High water 7.00.		Mystic Reservoir High water 147.00.	
	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880	1879	1880
Jan. .	149.76	158.49	151.21	164.23	171.22	175.54	148.36	149.40	132.64	127.55	122.25	122.72	121.34	122.14	217.09	218.43	5.93	4.16	146.69	147.00
Feb. .	157.75	158.90	157.75	165.27	172.27	175.29	149.18	149.56	132.54	130.74	122.76	123.43	122.12	122.89	217.43	218.43	5.99	6.28	146.58	147.04
Mar. .	158.27	158.66	158.27	166.42	170.74	175.48	149.06	149.21	133.32	132.55	123.38	122.90	122.90	122.29	217.62	217.90	5.77	6.01	146.61	146.99
April .	155.44	159.13	155.68	167.07	172.53	175.47	148.81	149.16	133.69	133.49	123.11	123.21	122.63	122.59	218.15	217.84	5.89	6.22	146.58	146.87
May .		159.15	Reservoir empty from May 1 to Aug. 19.	167.20	174.39	175.36	147.47	149.31	133.72	134.17	123.31	123.52	122.89	122.97	217.69	218.14	6.20	6.26	146.34	146.70
June .		158.61		165.72	175.59	175.20	147.03	149.18	132.91	133.81	122.90	123.12	122.38	122.47	217.98	217.84	6.22	4.72	146.47	146.85
July .		158.65		160.82	174.06	175.06	147.04	148.78	131.96	132.57	123.01	123.07	122.47	122.30	218.49	218.60	4.79	2.55	146.56	147.23
Aug. .		158.61		159.49	171.46	174.09	147.81	148.16	131.41	131.14	122.54	123.58	121.81	122.29	218.04	217.65	3.45	2.25	146.50	147.38
Sept. .		158.17		158.71	172.32	170.19	148.66	148.99	130.46	129.64	123.21	123.72	122.67	123.08	217.60	218.21	3.86	0.16	146.54	147.24
Oct. .	Reservoir empty.	157.84		161.44	171.89	162.89	149.01	149.12	128.51	128.01	122.78	123.81	122.46	123.21	217.79	218.77	2.41	-2.35	146.50	146.97
Nov. .		157.53		162.14	172.32	161.63	149.33	149.22	126.84	127.16	123.06	123.66	121.91	123.13	217.89	218.21	1.13	-2.77	146.68	147.01
Dec. .	151.50	157.15	162.10	159.87	174.11	164.01	149.18	148.78	126.56	126.22	122.51	123.29	121.00	123.01	218.39	217.84	1.26	-2.30	146.63	146.80
Yearly average	. . .	158.41	. . . .	163.20	172.74	171.68	148.41	149.07	131.21	130.59	122.90	123.34	122.21	122.70	217.85	218.15	4.41	2.60	146.56	147.01

Statement of Operations at the Mystic Pumping-Station for the Year 1880.

1880.	Engine No. 1.			Engine No. 2.			Engine No. 3.			Total amount pumped.	Daily average amount pumped.	Daily average amount coal consumed.	Per cent. ashes and clinkers.	Quantity pumped per lb. coal.	Average lift in feet.	Duty in ft. lbs. per 100 lbs. of total coal.
	Total pumping time.		Total amount pumped.	Total pumping time.		Total amount pumped.	Total pumping time.		Total amount pumped.							
	Hrs.	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Hrs.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	%	*Gals.*	*Ft.*	*Ft.-lbs.*
January	14	30	2,744,878	639	15	111,277,034	729	30	212,045,312	326,067,224	10,518,298	25,287	7.2	415.9	150.54	52,223,300
February	96	15	16,120,458	650	. . .	117,743,760	678	15	203,224,576	337,088,794	11,623,751	28,328	7.3	410.3	150.87	51,630,400
March	348	15	57,124,508	297	30	50,959,480	743	30	211,795,968	319,879,956	10,318,708	25,800	7.1	399.5	150.37	50,157,100
April	535	45	92,097,316	275	30	53,060,192	452	15	137,088,000	282,245,508	9,408,184	23,073	7.1	408	150.15	51,060,700
May	195	30	35,640,228	553	45	105,571,348	546	15	167,399,424	308,611,000	9,955,194	23,787	7.5	418.5	150.28	52,453,600
June	. . .	. . .	. . . . .	527	45	97,916,856	720	. . .	229,032,448	326,949,304	10,898,310	24,666	7.	441.8	150.80	55,566,886
July	. . .	. . .	. . . . .	367	40	69,430,404	739	30	242,196,480	311,626,884	10,052,480	22,597	7.	444.8	150.67	55,901,000
August	. . .	. . .	. . . . .	277	30	51,931,618	744	. . .	250,476,032	302,407,650	9,755,085	21,984	7.2	443.7	150.81	55,814,400
September	. . .	. . .	. . . . .	355	10	59,403,400	720	. . .	227,222,016	286,625,416	9,554,180	22,300	8.5	428.4	152.32	54,426,600
October	. . .	. . .	. . . . .	299	15	49,447,366	656	. . .	188,263,936	237,711,302	7,668,107	18,548	8.1	413.4	152.51	52,583,100
November	. . .	. . .	. . . . .	53	30	10,173,172	612	15	177,348,608	187,521,780	6,250,726	15,583	7.4	401.1	150.19	50,253,200
December	. . .	. . .	. . . . .	28	. . .	5,576,732	657	30	201,884,160	207,460,892	6,692,287	16,335	7.4	409.6	150.43	51,397,600
Averages and Totals	1,190	15	203,727,388	4,324	50	782,491,362	7,999	. . .	2,447,976,960	3,434,195,710	9,383,048	22,335	7.4	420.1	150.83	52,845,400

Statement of Operations at the Highland Pumping-Station for the Year 1880.

	WORTHINGTON ENGINE.			Daily average amount pumped.	Total amount coal consumed.	Daily average amount coal consumed.	Per cent. ashes and clinkers.	Quantity pumped per lb. of coal.	Average lift in feet.	Duty in ft.-lbs. per 100 lbs. of total coal.
	Total pumping time.		Total amount pumped.							
	Hrs.	*Min.*	*Gallons.*	*Gallons.*	*Lbs.*	*Lbs.*	%	*Gallons.*	*Feet.*	*Ft.-lbs.*
January	651	....	69,719,000	2,249,000	135,200	4,361	13.8	515.7	115.96	49,871,900
February	610	....	67,874,500	2,340,500	130,700	4,507	13.9	519.3	117.35	50,824,500
March	651	....	67,161,500	2,166,500	126,900	4,093	12.	529.2	115.27	50,878,900
April	630	....	65,224,000	2,174,133	118,300	3,943	12.	551.3	113.88	52,365,800
May	651	....	76,508,000	2,468,000	140,900	4,545	13.4	543.	115.50	52,305,100
June	627	15	83,979,000	2,799,300	160,000	5,333	14.4	524.9	119.20	52,176,927
July	644	....	75,779,500	2,444,500	149,300	4,816	16.1	507.6	118.97	50,359,000
August	616	....	75,407,500	2,432,500	141,300	4,710	14.6	533.7	118.27	52,640,600
September	629	45	74,431,000	2,481,033	139,100	4,637	13.5	535.1	119.20	53,193,000
October	650	15	72,617,500	2,342,500	138,500	4,468	13.1	524.2	116.89	51,111,700
November	604	15	59,969,500	1,998,983	117,900	3,930	13.4	508.6	114.58	48,604,500
December	651	....	68,169,000	2,199,000	130,700	4,216	13.6	521.6	111.57	48,532,900
	7,615	30	856,840,000	2,341,093	1,628,800	4,450	13.7	526.1	116.39	51,063,900

BOSTON WATER WORKS.

Diagram showing the rainfall and daily average consumption for each month.

Yearly Averages shown thus -------

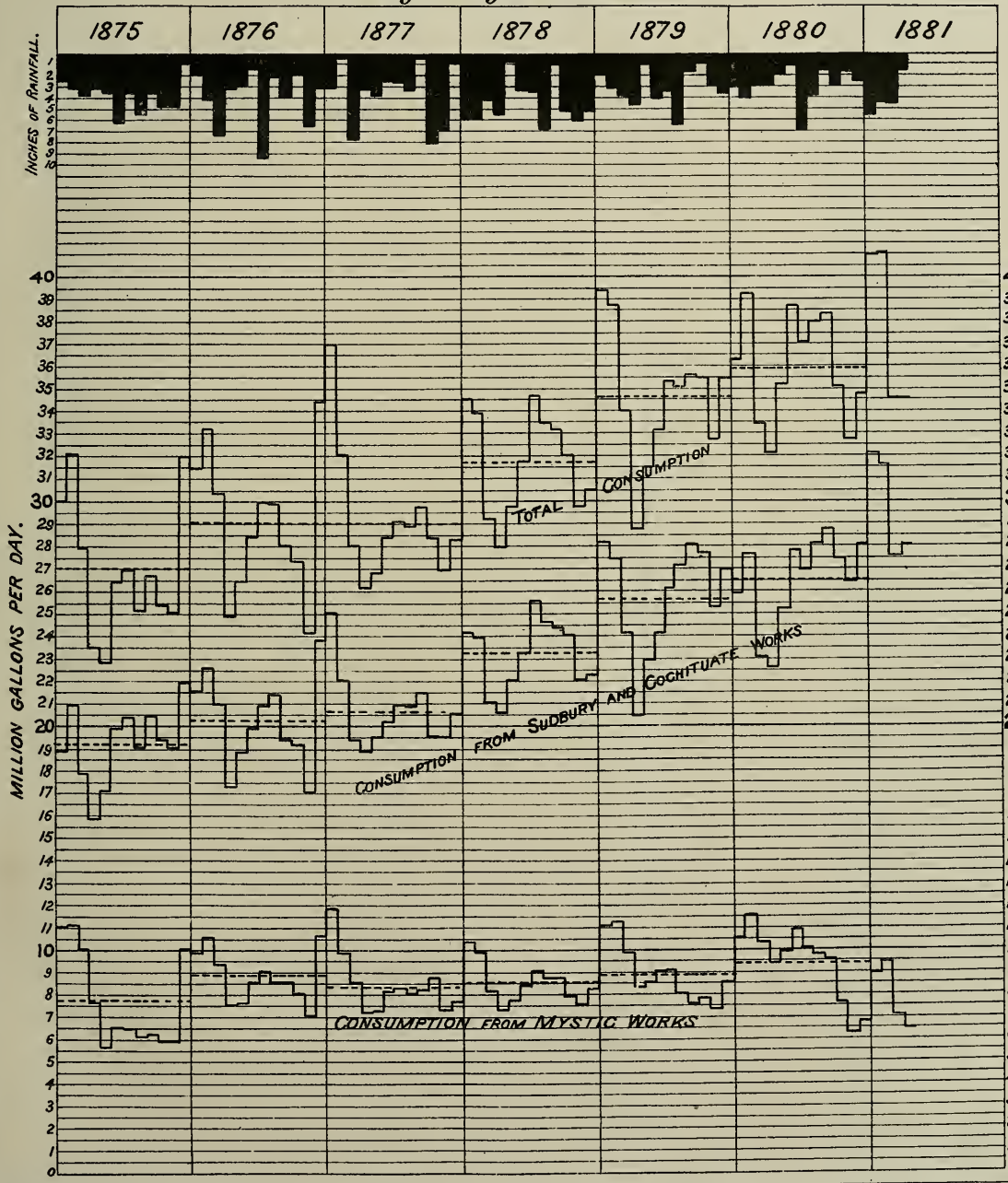

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Table showing the Rainfall on Sudbury-River Water-shed for the Year 1880.

1880	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2	. . .	1.558	. . .	. . .	0.597	0.932	0.34	. . .	. . .	. . .	. . .	1.147
3	. . .	. . .	. . .	. . .	0.039	0.005	0.74	. . .	. . .	. . .	. . .	. . .
4	. . .	. . .	0.252	0.861	. . .	. . .	. . .	1.658	. . .	. . .	. . .	. . .
5	. . .	. . .	0.296	. . .	. . .	. . .	. . .	. . .	. . .	0.168	. . .	0.614
6	. . .	. . .	. . .	0.054	0.002	0.033	0.082	. . .	. . .	. . .	0.286	. . .
7	0.414	. . .	0.21	. . .	. . .	. . .	. . .	. . .	0.078	. . .	0.192	. . .
8	. . .	. . .	. . .	. . .	0.001	. . .	. . .	. . .	. . .	. . .	. . .	. . .
9	0.053	. . .	0.126	. . .	. . .	0.498	0.198	. . .	. . .	. . .	. . .	. . .
10	. . .	0.024	. . .	. . .	. . .	. . .	. . .	. . .	0.71	. . .	. . .	. . .
11	. . .	. . .	0.186	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.465	. . .
12	. . .	. . .	. . .	. . .	. . .	0.12	. . .	0.132	. . .	0.22	. . .	. . .
13	0.668	1.338	. . .	. . .	0.092	0.213	1.334	. . .	. . .	. . .	. . .	0.006
14	. . .	. . .	0.072	. . .	0.089	. . .	. . .	. . .	0.783	. . .	. . .	. . .
15	0.032	0.051	. . .	. . .	. . .	. . .	0.542	0.01	. . .	. . .	0.031	0.384
16	. . .	. . .	0.692	0.852	. . .	0.103	0.264	. . .	. . .	. . .	. . .	. . .
17	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.122	. . .	. . .
18	. . .	0.126	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.006	. . .
19	. . .	. . .	0.452	. . .	0.27	. . .	. . .	. . .	. . .	. . .	. . .	. . .
20	0.569	. . .	. . .	0.098	. . .	0.079	1.81	. . .	. . .	. . .	0.763	. . .
21	. . .	. . .	0.019	. . .	. . .	0.032	. . .	0.258	. . .	. . .	. . .	. . .
22	. . .	. . .	. . .	. . .	. . .	. . .	0.803	. . .	. . .	1.77	. . .	. . .
23	0.92	0.32	. . .	. . .	0.018	. . .	. . .	. . .	. . .	. . .	. . .	. . .
24	. . .	. . .	. . .	0.233	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
25	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.058	. . .	. . .	0.029	0.006
26	. . .	0.085	. . .	0.057	. . .	0.05	. . .	. . .	. . .	0.05	. . .	. . .
27	. . .	. . .	. . .	. . .	. . .	. . .	0.136	. . .	. . .	. . .	. . .	0.25
28	0.77	. . .	1.01	. . .	0.224	0.073	. . .	. . .	0.032	. . .	0.013	. . .
29	. . .	0.478	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
30	. . .	. . .	. . .	0.950	. . .	. . .	0.024	. . .	. . .	. . .	. . .	0.421
31	0.14	. . .	. . .	. . .	0.504	. . .	. . .	1.892	. . .	1.41	. . .	. . .
	3.566	3.98	3.315	3.105	1.836	2.138	6.273	4.008	1.603	3.74	1.785	2.828

Total for the year . . . . . 38,177 inches.

Being an average of five gauges, located at Framingham Centre, Southboro', Marlboro', Westboro', and Hopkinton.

Table showing the Rainfall at Lake Cochituate for the Year 1880.

1880	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	1.54	...	...	0.56	0.63	0.48	...	...	...	...	1.10
3	...	...	...	0.36	...	...	0.16	...	...	...	...	...
4	...	...	0.25	0.28	...	...	0.40	1.80	...	...	...	...
5	...	...	0.35	...	...	...	...	...	...	0.12	...	0.60
6	...	...	...	0.08	0.03	0.03	0.04	...	...	...	0.15	...
7	0.40	...	0.23	...	...	...	...	...	0.09	...	0.12	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	0.03	...	0.05	...	...	0.17	0.26	...	...	...	...	...
10	...	0.02	...	...	...	...	...	...	0.82	...	...	...
11	...	...	0.13	...	...	...	...	...	...	...	0.50	...
12	...	...	...	...	...	0.06	...	0.03	...	0.04	...	...
13	0.47	1.31	...	...	0.22	0.11	1.60	...	...	...	...	...
14	...	...	0.09	...	0.18	...	...	...	0.74	...	...	...
15	0.02	0.03	...	...	...	...	0.30	...	...	...	0.04	0.31
16	...	...	0.60	0.86	...	...	1.10	...	...	...	...	...
17	...	...	...	0.04	...	...	...	...	...	0.05	...	...
18	...	0.16	...	...	...	...	...	...	...	...	...	...
19	...	...	0.35	...	0.29	...	...	...	...	...	...	...
20	0.55	...	...	0.08	...	0.03	1.74	...	...	...	0.80	...
21	...	...	0.03	...	...	...	...	0.22	...	...	...	...
22	...	...	...	...	...	...	0.80	...	...	1.50	...	...
23	0.78	0.35	...	...	...	...	...	...	...	...	...	...
24	...	...	...	0.26	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	0.04	...
26	...	0.09	...	0.05	...	0.20	...	...	...	...	...	...
27	...	...	...	...	...	...	0.12	...	...	...	...	0.20
28	0.68	...	0.75	...	0.20	0.02	...	...	0.04	...	0.05	...
29	...	0.55	...	...	...	...	...	...	...	...	...	...
30	...	...	...	0.93	...	...	...	1.76	...	...	...	0.35
31	0.14	...	...	...	0.50	...	...	...	...	1.24	...	...
Totals.	3.07	4.05	2.83	2.94	1.98	1.25	7.00	3.81	1.69	2.95	1.70	2.56

Total for the year . . . . . 35.83 inches.

Table showing the Rainfall on Mystic Water-shed for the Year 1880.

1880	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2	. . .	1.545	. . .	. . .	0.315	0.75	0.525	. . .	. . .	. . .	. . .	1.14
3	. . .	. . .	. . .	0.56	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
4	0.01	. . .	0.30	0.02	. . .	. . .	0.25	1.77	. . .	. . .	. . .	. . .
5	. . .	. . .	0.295	. . .	0.51	. . .	. . .	. . .	. . .	0.095	. . .	0.48
6	. . .	. . .	. . .	0.075	. . .	0.05	0.05	. . .	. . .	. . .	0.225	. . .
7	0.39	. . .	0.22	. . .	. . .	0.015	. . .	. . .	0.04	. . .	0.285	. . .
8	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
9	0.08	. . .	0.05	. . .	. . .	0.06	0.09	. . .	. . .	. . .	. . .	. . .
10	. . .	0.06	. . .	. . .	. . .	. . .	. . .	. . .	0.50	. . .	. . .	0.02
11	. . .	. . .	0.10	. . .	. . .	. . .	. . .	. . .	0.265	. . .	0.38	. . .
12	. . .	. . .	. . .	. . .	. . .	0.04	. . .	. . .	. . .	0.065	. . .	. . .
13	0.50	1.33	. . .	. . .	. . .	0.06	2.165	. . .	0.50	. . .	. . .	. . .
14	. . .	. . .	0.08	. . .	0.285	. . .	. . .	. . .	0.105	. . .	. . .	. . .
15	0.02	0.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.37
16	. . .	. . .	0.52	0.59	. . .	. . .	0.45	. . .	. . .	. . .	0.02	. . .
17	. . .	. . .	. . .	0.04	. . .	0.16	. . .	. . .	. . .	0.155	. . .	. . .
18	. . .	0.115	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.01	. . .
19	. . .	. . .	0.265	. . .	0.275	. . .	. . .	. . .	. . .	. . .	. . .	. . .
20	0.515	. . .	. . .	0.02	0.035	0.355	2.995	. . .	. . .	. . .	0.93	. . .
21	. . .	. . .	0.075	. . .	. . .	. . .	. . .	0.02	. . .	. . .	. . .	. . .
22	. . .	. . .	. . .	. . .	. . .	. . .	0.655	. . .	. . .	1.36	. . .	. . .
23	0.49	0.365	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
24	. . .	. . .	. . .	0.15	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
25	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.05	. . .	. . .	0.02	. . .
26	. . .	0.095	. . .	0.065	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
27	. . .	. . .	. . .	. . .	. . .	. . .	0.055	. . .	. . .	. . .	. . .	. . .
28	0.55	. . .	0.585	. . .	0.24	. . .	. . .	. . .	0.015	0.06	0.035	. . .
29	. . .	0.68	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
30	. . .	. . .	. . .	0.66	. . .	. . .	. . .	1.795	. . .	. . .	. . .	0.49
31	0.06	. . .	. . .	. . .	0.36	. . .	. . .	. . .	. . .	0.96	. . .	. . .
Totals.	2.615	4.23	2.49	2.18	2.02	1.49	7.235	3.635	1.425	2.695	1.905	2.50

Total for year . . . . . 34.42 inches.

Being an average of two gauges, located at Mystic Lake and Mystic Station.

Table showing the Rainfall (in inches and hundredths) at various places in Eastern Massachusetts for the Year 1880.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Lake Cochituate	3.07	4.05	2.83	2.94	1.98	1.25	7.00	3.81	1.69	2.95	1.70	2.56	35.83
Framingham	3.06	4.11	3.57	3.01	1.92	1.82	5.89	4.50	1.52	3.50	2.00	2.97	37.87
Southboro'	3.265	3.86	3.37	3.145	1.935	2.235	6.515	4.56	1.525	3.745	1.775	2.88	38.81
Marlboro'	3.975	4.06	2.945	3.23	1.935	2.625	6.91	3.54	1.69	3.875	1.90	2.75	39.435
Westboro'	4.06	3.52	3.17	3.14	1.58	2.06	6.80	3.44	1.72	3.68	1.57	2.85	37.59
Hopkinton	3.47	4.35	3.52	3.00	1.81	1.95	5.25	4.00	1.56	3.90	1.68	2.69	37.18
Chestnut-Hill Reservoir	2.95	4.36	2.82	2.41	1.71	0.72	6.14	2.52	1.75	3.08	2.23	2.18	32.87
Waltham (Boston Manufacturing Co.)	3.31	2.56	3.16	2.20	1.48	0.96	6.84	3.80	1.40	3.00	1.24	1.78	31.73
Cambridge (Observatory)	3.79	4.20	3.28	2.00	1.51	0.80	6.75	3.49	1.71	2.78	2.10	2.81	35.22
Lowell (Locks and Canals Co.)	4.36	3.94	3.00	2.38	2.68	1.70	6.52	3.16	1.54	2.82	1.84	2.58	36.52
Lowell (Merrimack Co.)	4.12	3.18	3.08	2.28	2.54	1.82	6.52	3.00	1.60	2.62	1.88	2.64	35.28
Mystic Lake	2.40	4.18	2.53	2.02	2.04	1.44	7.36	3.89	1.43	2.79	1.87	2.50	34.45
Mystic Station	2.83	4.28	2.45	2.34	2.00	1.54	7.11	3.38	1.42	2.60	1.94	2.50	34.39
Mystic Engine-house	2.59	4.38	2.57	1.96	1.90	0.89	7.21	3.60	1.50	2.65	1.965	2.31	33.525
Beacon-Hill Reservoir	2.51	4.08	2.85	2.59	1.58	0.50	6.03	2.96	1.68	2.96	2.30	2.55	32.59
Boston (Superintendent of Sewers)	3.23	4.73	3.85	3.28	1.86	0.63	7.52	2.87	2.30	3.41	2.07	3.14	38.89
Boston (U.S. Signal Service)	3.72	4.11	3.25	2.85	1.63	0.75	6.86	2.90	2.36	3.15	2.30	3.42	37.30
Averages	3.34	4.00	3.07	2.63	1.89	1.39	6.66	3.50	1.67	3.15	1.90	2.66	35.86

Table showing the Amount of Evaporation at Chestnut-Hill Reservoir, and the Temperature of Air and Water at different Stations on the Water Works.

1880.	Evaporation in Inches.		Temperature of Air.						Temperature of Water.	
	Chestnut-Hill Reservoir.		Chestnut-Hill Reservoir.			Parker-Hill Reservoir.			B'kline Res'r.	Mystic E. H.
	Wooden Tank.	Tin Tank.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Mean.	Mean.
January	....	....	53	0	32	57	8	33	37	36
February	....	....	58	−5	29	58	4	30	36	36
March	....	....	64	16	34	64	14	32	36	37
April	....	....	74	23	47	70	20	45	46	44
May	5.22	5.31	95	34	64	91	33	62	60	62
June	6.45	7.04	96	44	68	90	44	67	70	72
July	5.83	7.24	95	52	72	92	54	70	75	76
August	5.34	6.47	91	40	69	88	45	68	74	74
September	4.04	5.64	88	36	63	86	43	63	68	68
October	2.71	4.04	75	22	50	74	27	50	58	58
November	....	....	67	8	36	61	10	35	44	46
December	....	....	40	−4	25	40	−8	24	38	35

APPENDIX I.

REPORT OF PROF. W. R. NICHOLS TO THE CITY ENGINEER.

Henry M. Wightman, Esq., *City Engineer:* —

Dear Sir, — Permit me to present the following report of the examination of a sample of sewage from the sewer which conveys the refuse of the tanneries into Lower Mystic Lake.

The sewage was received by me late in the afternoon of January 28th, having been taken from the sewer that afternoon. It was alkaline, reddish brown in color and contained a quantity of suspended matter, the coarser part of which settled somewhat readily. The odor, when the sample was fresh, was not very considerable, but was sufficiently marked to betray its origin. On standing in the laboratory, the organic matter, as might be expected, began to decompose and became more offensive.

The specific gravity was about 1007., water being 1000. Analysis showed that every 100,000 parts contained about 330 parts by weight of suspended matter and 1,170 parts of matter in solution, or expressed in grains to the United States gallon, one gallon contained —

In suspension	192 grains.
In solution	683 "
(Of which 432 grains were common salt.)	
Altogether	875 "

I have made a number of calculations and experiments with reference to the chemical treatment of the sewage, but I do not know that this was a fair sample of the entire daily discharge which I have assumed to be 200,000 gallons, or say in round numbers, 1,700,000 pounds.

Subsidence. — When the sewage stands quietly, the greater portion of the suspended matter settles, but the liquid still remains turbid and highly colored and liable to decompose. If the sewage were allowed simply to settle in tanks and the somewhat clarified liquid then run off directly or through coarse filters, the sediment could be removed as a thin mud.

The weight of *dry* sediment for the day's discharge would be some 5,600 pounds, and when wet (that is, in the form of sludge, which would run slowly or could be pumped), it would occupy about 12,000 gallons.

I am, of course, aware that at the present time settling tanks are in use in the tanneries, and that thus a large amount of solid matter is prevented from entering the sewer.

Treatment with lime. — The sewage, as I received it, was alkaline, no doubt from the excess of lime used in the tanneries, and the addition of a small quantity of lime had no effect on the clarification of the liquid. Even when added to the amount of two per cent. by weight (which would be 35,000 pounds of quicklime for the day's run), it failed to produce any very considerable effect. With the enormous proportion of $\frac{1}{6}$ by weight (290,000 lbs. of quicklime for the day's run), quite an efficient clarification was accomplished by the subsiding of the lime; but any such proposition as this would be out of the question from a practical point of view. Even in this case, however, the liquid still contained organic matter in too large a quantity to be discharged into a salt-water basin without being liable to cause offence.

Treatment with alum. — On the addition of alum (or sulphate of alumina) in sufficient amount, there separates readily from the sewage a rather bulky precipitate containing almost all the coloring matter, even in solution, and leaving the liquid clear and nearly colorless. As the experiment is performed in the laboratory, better results are obtained by this method than by any other, but to produce the best effect it is necessary to add as much alum as from $\frac{1}{4}$ to $\frac{1}{3}$ of one per cent. of the sewage. To treat, in this way, the daily discharge of sewage would require from 4,000 to 6,000 pounds of alum, or an equivalent amount of sulphate of alumina. The expense of the chemical puts this out of the question; and, if it did not, we should have to face the fact that the sediment formed would, after twenty-four hours' standing, occupy when wet, the space of 60,000 gallons; moreover, with the best clarification that I have been able to effect, the clear liquid still contained, in solution, a large amount of organic matter ready to decompose.

Treatment with clay. — I was not able to obtain satisfactory results by using clay, although when a considerable quantity was added to the sewage and thoroughly mixed with it, a certain amount of organic matter was dragged down as the clay settled. Such treatment, if applied practically, would increase very much the weight of sludge to be handled; but I have made no calculations of the amount of clay required.

Treatment with sulphuric acid. — When acid is added to the sewage in just sufficient quantity to neutralize its alkaline character, the liquid cleans itself quite well, most of the coloring matter subsiding as a flocculent sediment. The liquid still contains a large quantity of organic matter; but if, after treatment with acid, it were filtered and then allowed to flow over fragments of limestone or marble chips, to neutralize any excess of acid, it would no doubt give less offence than at present. The amount of acid required for this particular sample would be equivalent to about 2,000 pounds of oil of vitrol for the day's discharge, and the wet sludge would occupy about 20,000 gallons.

You will bear in mind that my experiments have been performed,

and my conclusions are based, on a single sample of sewage; I have no means of knowing how fairly it represents the average character of the entire day's run. More extended acquaintance with the stuff might lead me to modify somewhat the statements made. With this caution I state the following

Conclusions.

No practicable chemical treatment will purify the sewage to such an extent that it may be discharged into the Lower Mystic Lake with a reasonable expectation of freedom from offence.

It is *possible* to treat the sewage so that if it were discharged into a running stream, or into a tidal basin with considerable circulation, the risk of offence would be *very much lessened.*

The most practical way of treating the sewage would be to collect in tanks, mix with sulphuric acid (perhaps with addition of a small amount of sulphate of alumina,) allow to settle, filter through coke or other material, and then pass the liquid over marble chips or broken limestone to the point of discharge.

Respectfully submitted,

WM. RIPLEY NICHOLS,

Massachusetts Institute of Technology, February, 1881.

APPENDIX II.

Office of City Engineer,

City Hall, Boston, May 14, 1881.

Leonard R. Cutter, Esq., *Chairman of Boston Water Board.*

Dear Sir, — In accordance with the vote of your Board passed Jan. 1, 1881, instructing the City Engineer to make the necessary borings, examinations, and surveys to establish the location of an additional dam on Sudbury river or any of its tributaries, a general examination of the water-shed was made as early as practicable. Several locations (some of them indicated by the results of the preliminary surveys made in 1872) have been considered, and examinations such as their relative importance demanded, have been made.

On the southern branch of the river there are four locations for large storage basins.

First. Whitehall pond (a compensating reservoir built by the city at the time the Cochituate works were constructed, and afterwards sold), situated near the head waters of the river, with a water-shed of about five square miles. This pond will store about 900,000,000 gallons, and is a valuable storage basin, but the city, under ordinary circumstances, obtains now as much advantage

from it as it would if it owned it, as all the water that is run from it is intercepted by the city's dams on the river below. Its use by the mills is at a time, usually, when the city needs the water, that is, in the dryer months.

Second. A basin on the lower part of Indian brook could be obtained, but it is not a very favorable site, and its capacity would be small as compared with the others on this branch of the river.

Third. On the main stream above Ashland, a large basin could be built, but it would interfere with manufacturing establishments, and would require the raising of the roadbed of the Boston & Albany Railroad for a long distance. It is doubtful whether the city could obtain the necessary rights to interfere with the railroad, but, even if it could, the delay in obtaining them would amount to one season at least, and the cost of these rights, and of mill damages, independent of the cost of construction, would, obviously, be very high.

Fourth. Basin No. 4, of the preliminary surveys of 1872, an excellent location on Cold Spring brook, a short distance above its confluence with the Sudbury river in Ashland.

On the northern branch of the river there is but one site of sufficient importance to be considered at this time, and that is Basin No. 7, of the preliminary surveys of 1872, situated on Angle Brook. Basins 5 and 6, of the preliminary surveys, are on this branch of the river, but are too small for the present wants of the city. The upper portion of Stony brook will, doubtless, furnish sites of importance, although not large enough for present purposes.

From the results of the general investigations made, it was evident that the selection of a new storage reservoir, for the present needs of the city, should be confined to Basin No. 4, on Cold Spring brook, and Basin No. 7, on Angle brook, and a thorough examination was made of these two sites.

At both places rock can be reached at a reasonable depth for the foundation of the dams.

Basin No. 4, on Cold Spring brook, will contain about 1,100,000,000 gallons, and will add about 5,000,000 gallons per day to the supply, in a dry year. Its water-shed is 6.066 square miles (an additional water-shed of one square mile or more can probably be obtained by diverting a neighboring brook), and using the records kept at Lake Cochituate, as a basis of calculation, there are but four years in the past eighteen that the basin would not have been entirely filled before June 1st. The dam will be about 2,000 feet long, the water 45 feet deep at the dam, and the flowage area, with marginal land, will be 250 acres.

Its estimated cost, exclusive of land, is . . .	$354,000
" " of land damages	26,000
Total	$380,000

Basin No. 7, on Angle brook, will contain about 1,500,000,000 gallons, and will add about 5,000,000 gallons per day to the water-supply, in a dry year. Its water-shed is 7.765 square miles.

It would not fill in a dry year, but its flow-line has been determined so as to secure the least area of shallow flowage in proportion to size of basin. The dam will be about 1,200 feet long, the maximum depth of water at the dam 20 feet, and the flowage area, with marginal lands and islands, will be 873 acres.

Estimated cost, exclusive of land and other damages, is	$179,042
" " of land and other damages . . .	114,000
Total	$293,042

The results, then, of my investigations in regard to these two basins, are as follows: —

Basin No. 4 will cost	$380,000
" No. 7 "	293,000
A difference of	$87,000

in favor of Basin No. 7.

Basin No. 7 requires a land area of	873 acres.
" No. 4 " " "	250 "
	"
A difference of	623 "

Showing Basin No. 7 to have a very much larger area of shallow flowage and water surface for evaporation.

Basin No. 4 has a depth, at the dam, of . . .	45 feet.
" No. 7 " " " " " . . .	20 "
A difference of	25 "

Showing the much greater depth of Basin No. 4.

The advantages of Basin No. 4 over Basin No. 7 are, therefore, so far as the figures show, its much greater depth and much smaller area of flowage. The advantage of Basin No. 7 is its less cost. Basin No. 4 has, however, other advantages as compared with Basin No. 7. Its location on the southern branch of the river, where there is at present but one basin of moderate capacity, thus equalizing the storage on both branches, is an advantage of great importance in view of the trouble already experienced from the growth of *algæ* in the present basin on the northern branch. The superior purity of the water of the brook, the damming of which forms the basin, and the better character of the water-shed which supplies it, should also be considered.

In view of the advantages of Basin No. 4 in comparison with Basin No. 7, as above stated, I shall recommend the construction of the former in preference to the latter, as I think the increased cost of Basin No. 4 should not have sufficient weight to counterbalance its superiority in other respects, and as three seasons, counting the present as one, will be required to complete it, the

construction of the dam should be commenced without delay. Although numerous borings have been made at the site for the dam, there is still sufficient uncertainty existing about the nature of the foundation and the depth to which it must go, as in my opinion to render it advisable to build the portion of this dam from the ledge rock to the surface of ground by days' labor.

In conclusion, I would suggest to your Board that there is an unexpended balance of the appropriations made for the "Additional Supply," which will be sufficient to cover the cost of the present season's work; a statement of the appropriations made and probable balance which could be used for this work is as follows: —

Total appropriations to April 30, 1881 . .		$5,412,886 80
Total expenditures to same date .	$5,252,717 11	
Add for unsettled land damages, say	35,000 00	
		5,287,717 11
Balance		$125,169 69

Of which amount your Board has been authorized to expend $55,000 for the present investigations and for the purchase of land, leaving $70,169.69 which can be applied to the construction of the dam.

Respectfully submitted,

HENRY M. WIGHTMAN,
City Engineer.

WATER REGISTRAR'S REPORT.

OFFICE OF THE WATER REGISTRAR,
CITY HALL, BOSTON, May 5, 1881.

L. R. CUTTER, Esq.,
Chairman of the Boston Water Board: —

SIR, — In conformity with Section 15 of the water ordinance, I have the honor of submitting to the Boston Water Board my annual report for the year ending with April 30, 1881: —

The total number of water-takers now entered for the year 1881 is 53,284, being an increase of 986 over the previous year.

The total number of cases where the water has been turned off for non-payment of rates during the year is 854; of this number 687 have been turned on, leaving a balance of 167 still remaining off.

The total revenue received from the sale of water on account of the year ending April 30, 1881, is	$995,916 51
From the sale of water furnished in previous years	67,936 28
	$1,063,852 79
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	878 00
Received for summons	1,599 25
Total	$1,066,330 04
The estimated amount of income from the sale of water during the year ending April 30, 1882	$1,012,500 00
The expenditures of my office during the year 1880 have been	$26,167 29

METERS.

The total number of meters now attached to the premises of water-takers is 1,219.

Of this number 754 are $\frac{5}{8}$-inch; 381 1-inch; 4 $1\frac{1}{2}$-inch; 58 2-inch; 16 3-inch; 6 4-inch sizes.

In addition there are 175 elevators and 56 motors, with indicators attached, to determine the quantity of water consumed.

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

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Revere House	Hotel	..	3	..	..	..	1	4	1,045,595	$1,568 37
American House	"	2	1	1	..	..	..	4	816,379	1,224 55
Parker House	"	1	4	..	..	..	..	5	1,458,099	2,187 13
U.S. Hotel	"	..	3	..	..	..	2	5	1,504,125	2,256 19
Tremont House	"	2	3	..	..	..	..	5	1,464,780	2,197 16
Young's Hotel	"	1	2	..	..	..	1	4	2,143,182	3,214 75
Adams House	"	2	1	..	..	..	1	4	1,379,076	2,068 60
Hotel Berkeley	"	..	1	1	..	..	..	2	432,675	648 99
Albion Building	"	..	1	..	..	..	..	1	247,618	371 41
Hotel Pelham	"	1	3	..	..	..	..	4	311,082	466 61
Hotel Boylston	"	..	1	..	..	..	1	2	489,614	734 40
La Grange House	"	1	1	..	..	..	..	2	71,501	107 23
St. Cloud	"	2	..	..	..	..	2	4	255,803	383 69
Hotel Clarendon	"	..	1	..	..	..	1	2	207,894	311 81
Seaver House	"	1	..	..	..	..	..	1	40,615	60 90
Evans House	"	..	2	..	..	..	..	2	166,756	250 11
Park-square Hotel	"	1	..	..	..	..	..	1	39,426	59 11
Hotel Kempton	"	1	1	..	..	..	1	3	222,681	334 00
Hotel Hamilton	"	1	1	..	..	..	1	3	204,890	307 32
Hotel Vendome	"	..	..	..	..	1	2	3	961,891	1,442 81
Coolidge House	"	..	5	..	..	..	2	7	298,120	447 18
Hancock House	"	1	..	..	..	..	..	1	7,904	11 84
Merrimac House	"	1	..	..	..	..	..	1	26,617	39 91
Stanley House	"	2	..	..	..	..	..	2	60,660	90 98
Amount car'd forw'd.		..	..	..	..	..	..	..	13,856,983	$20,785 05

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	13,856,983	$20,785 05
International Hotel ..	Hotel ..	..	1	..	..	..	1	2	354,902	532 33
Hotel Alexander.....	" ..	..	1	..	..	..	1	2	163,867	245 80
Hotel Brunswick.....	" ..	..	3	..	..	..	..	3	1,419,020	2,128 51
Park's Hotel	" ..	2	..	..	..	..	..	2	73,968	110 94
Derby House.....	" ..	3	..	..	..	..	..	3	70,666	105 98
City Hotel	" ..	1	..	..	..	..	..	1	37,631	56 42
Hotel Albemarle.....	" ..	..	1	..	..	..	..	1	141,078	211 59
Ashland House.....	" ..	..	1	..	..	..	..	1	62,672	93 99
Hotel Columbus	" ..	..	1	..	..	..	1	2	286,516	429 75
Hotel Glover.....	" ..	..	1	..	..	..	2	3	104,663	156 97
Merchants Hotel.....	" ..	1	..	..	..	..	..	1	17,411	26 10
M. J. Flatley	" ..	1	..	..	..	..	..	1	24,242	36 35
New England House,	" ..	..	1	..	..	..	..	1	115,628	173 42
Winthrop House.....	" ..	1	..	..	..	..	..	1	104,779	157 15
Dooley's Hotel	" ..	1	..	..	..	..	..	1	31,059	46 56
Falmouth House.....	" ..	2	..	..	..	..	..	2	61,271	91 90
Job A. Turner	" ..	..	1	..	..	..	..	1	46,494	69 72
Milliken House.....	" ..	3	..	..	..	..	..	3	69,618	104 41
Sherman House	" ..	1	2	..	..	..	..	3	259,301	388 94
Everett House.....	" ..	..	1	..	..	..	..	1	28,059	42 07
Metropolitan House..	" ..	..	2	..	..	..	..	2	306,673	460 00
Commonwealth Hotel	" ..	..	1	..	..	..	1	2	495,584	743 35
St. James Hotel	" ..	..	3	..	..	..	..	3	737,602	1,106 39
Massachusetts House,	" ..	1	..	..	..	..	..	1	14,220	21 32
Bay State House	" ..	1	1	..	..	..	..	2	88,176	132 24
Mariner's House.....	" ..	1	..	..	..	..	..	1	33,268	49 88
Amount car'd forw'd.		..	..	..	..	..	..	..	19,005,351	$28,507 13

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd									19,005,351	$28,507 13
St. Leonard's Hotel	Hotel			1				1	27,820	40 92
Arlington House	"	2						2	63,673	95 51
Robertson House	"	2						2	43,054	64 56
Boston Hotel	"	1						1	36,198	54 28
Creighton House	"	2	1				2	5	603,416	905 10
Van Rensselaer	"		2					2	58,726	88 07
Quincy House	"	4	1					5	414,033	621 02
Marston House	"	1						1	118,272	177 39
Crawford House	"	4	1					5	437,875	656 79
Pavilion House	"		1					1	151,774	227 64
Norfolk House	"	1						1	124,323	186 46
Hampton House	"		1					1	86,031	129 03
Hotel Agassiz	"		1				2	3	318,740	478 09
Mason House	"	1						1	15,283	22 90
Albany House	"		1					1	52,751	79 11
Cattle Fair Hotel	"		1					1	79,307	118 94
Phœnix House	"	1						1	26,923	40 36
Hotel Huntington	"		1					1	167,397	251 06
Hotel Cluny	"		1				3	4	426,835	640 24
Stinson House	"	1						1	48,619	72 91
John D. Miller	"	2						2	25,969	38 93
Moody Merrill	"	1	1					2	259,595	389 38
New Marlboro' Hotel	"	3						3	73,390	110 06
Hotel Hoffman	"			2				2	202,962	304 43
Geo. W. Marks & Co.	"	1						1	6,238	9 33
Hotel Bristol	"		2				4	6	476,803	715 20
Amount car'd forw'd									23,351,358	$35,024 84

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	23,351,358	$35,024 84
Old Colony and Newport Railroad Co.	.....	5	4	2	..	..	..	11	3,407,647	5,111 45
Boston and Albany Railroad Co.	.....	17	8	3	..	..	..	28	5,579,799	8,369 56
Boston and Maine Railroad Co.	.....	1	3	..	..	..	..	4	610,240	915 35
Boston and Lowell Railroad Co.	.....	..	3	1	..	..	1	5	868,320	1,302 46
Fitchburg Railroad Co.	.....	..	3	..	..	..	..	3	983,079	1,474 58
Eastern Railroad Co.	.....	1	3	1	..	..	..	5	972,040	1,458 03
New York and New England R.R. Co.	.....	..	1	1	1	..	..	3	2,365,676	3,548 50
Boston and Providence Railroad Co.	.....	3	2	3	..	..	..	8	2,541,179	3,811 73
Boston, Revere Beach, and Lynn R.R. Co.	.....	..	..	1	1	..	..	2	759,860	1,139 77
Boston, Winthrop and Pt. Shirley R.R. Co.	.....	..	1	..	..	..	..	1	17,369	26 04
Boston Gas Light Co.	.....	1	3	2	..	1	..	7	4,403,367	6,605 01
So. Boston Gas L't Co.	.....	1	1	..	..	..	..	2	121,912	182 86
E. Boston Gas L't Co.	.....	..	1	..	..	..	..	1	182,494	273 71
Roxbury Gas L't Co.	.....	2	1	..	..	..	..	3	373,710	560 53
Dorchester Gas L't Co.	.....	..	1	..	..	..	..	1	127,934	191 88
Standard Sugar Refinery	.....	1	..	..	1	1	..	3	8,015,177	12,022 75
Jasper Sugar Refinery	.....	..	1	1	..	..	..	2	3,773	5 65
G. A. Jasper & Co.	Refinery	..	1	..	..	..	..	1	2,189	3 28
Continental Sugar Refinery	.....	..	..	2	..	..	..	2	2,779,740	4,169 59
Bay State Sugar Refinery	.....	..	..	2	..	..	..	2	1,742,570	2,613 85
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	59,209,433	$88,811 42

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	59,209,433	$88,811 42
Oxnard Sugar Refinery.....	.....	..	3	..	..	..	..	3	392,497	588 73
Boston Sugar Refinery	.....	..	..	..	..	1	..	1	86,980	130 46
Bay State Rolling Mill	.....	..	3	2	1	..	..	6	4,469,492	6,704 22
Norway Iron Works .	.....	1	6	2	..	..	..	9	4,727,564	7,091 33
Highland Spring Brewery	Brewery	..	1	2	..	..	..	3	1,038,340	1,557 51
Edward Habich	"	..	1	..	..	..	..	1	378,456	567 67
J. W. Kenney	"	..	1	..	..	..	..	1	229,313	343 95
King & Lang.....	"	..	1	..	..	..	..	1	Not using	
H. & J. Pfaff.....	"	..	..	1	..	..	..	1	898,830	1,348 24
Standard Brewery...	"	..	..	1	..	..	..	1	146,822	220 22
A. J. Houghton & Co., Hallock st.....	"	..	1	..	..	..	..	1	12,740	19 10
A. J. Houghton & Co., Station st.	"	..	1	..	..	..	..	1	360,773	541 14
Boylston Brewery ...	"	1	1	..	..	..	..	2	545,335	817 99
Gottleib Burkhardt ..	"	..	1	..	..	..	..	1	126,426	189 62
John Roessle.....	"	..	..	1	..	..	..	1	1,456,300	2,184 44
Jones, Cook, & Co. .	"	1	..	1	..	..	..	2	1,222,541	1,833 79
Boston Beer Co.....	"	..	2	..	..	..	..	2	896,983	1,345 45
Conrad Decker.....	"	..	1	..	..	..	..	1	228,792	343 18
Suffolk Brewing Co..	"	..	..	1	..	..	..	1	871,100	1,306 64
J. K. Souther	"	..	1	..	..	..	..	1	120,690	181 03
Elmwood Spring Brewery.....	"	..	1	..	..	..	..	1	113,231	169 83
Vincent & Hathaway.	Beer Factory.	..	1	..	..	..	..	1	83,622	125 39
Moses Fairbanks & Co.	"	..	1	..	..	..	..	1	115,375	173 04
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	77,731,635	$116,594 39

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	77,731,635	$116,594 39
Coburn, Lang, & Co.	Beer Factory	1	..	..	..	..	..	1	36,008	53 98
Comstock, Gove, & Co.	"	1	..	..	..	..	..	1	43,747	65 61
Isaac Pratt, Jr.....	Building	1	1	..	..	..	..	2	171,803	257 68
Wesleyan Association	"	3	..	..	..	..	..	3	93,271	139 90
Tremont Temple	"	1	1	..	..	..	1	3	191,559	287 31
S. S. Houghton & Dutton	"	3	..	..	..	..	..	3	109,555	164 31
P. McAleer	"	2	..	..	..	..	..	2	31,927	47 87
Smith & Porter.....	"	2	..	..	..	..	..	2	73,090	109 63
F. A. Dewson.....	"	2	..	..	..	..	..	2	167,863	251 78
Boston Journal.....	"	..	2	..	..	..	..	2	156,501	234 73
Joseph Byers.....	"	2	..	..	..	..	..	2	107,128	160 68
N.E. Mut. Life Ins. Co., 70 State st....	"	2	..	..	..	..	..	2	20,085	30 11
N.E. Mut. Life Ins. Co., Milk st.	"	1	1	..	..	..	..	2	118,827	178 23
Horticultural Hall ...	"	..	1	..	..	..	..	1	46,428	69 62
Suffolk National B'k.	"	2	1	..	..	..	..	3	28,515	42 76
Benjamin Leeds	"	2	..	..	..	..	..	2	46,292	69 42
Blackstone Market...	"	2	..	..	..	..	..	2	28,157	42 22
John Rayner heirs....	"	2	..	..	..	..	..	2	33,286	49 91
Hill & Towne	"	2	..	..	..	..	..	2	24,173	36 23
Turn Hall	"	..	1	..	..	..	..	1	72,005	107 98
B. B. Appleton heirs	"	1	..	..	..	..	..	1	53,125	79 68
J. W. Merriam.....	"	2	..	..	..	..	..	2	26,472	39 69
Peter B. Brigham est.	"	2	..	..	..	..	..	2	65,605	98 38
Mrs. Ellen Brooks...	"	1	..	..	..	..	..	1	29,477	44 20
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	79,506,534	$119,256 3

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	79,506,534	$119,256 30
Oriental Tea Company	Building	1	..	..	..	..	..	1	42,118	63 16
S. D. Hicks	"	1	1	..	..	..	..	2	321,850	482 75
John Stetson	"	..	1	..	..	..	..	1	109,661	164 47
Macullar, Parker, & Co.	"	..	1	..	..	..	..	1	68,658	102 97
John F. Mills	"	1	..	..	..	..	..	1	117,981	176 94
J. W. Damrell	"	..	1	..	..	..	..	1	215,765	323 62
J. I. Brown & Son	"	..	1	..	..	..	..	1	24,640	36 94
Hogg, Brown, & Taylor	"	1	1	..	..	..	1	3	398,990	598 46
A. Wentworth	"	2	..	..	..	..	..	2	23,996	35 98
William Ropes estate	"	4	1	..	..	..	..	5	400,689	601 01
A. D. Puffer	"	2	..	..	..	..	..	2	77,334	115 99
J. R. Hall	"	..	1	..	..	..	..	1	96,614	144 90
Grand Lodge of Masons	"	1	1	..	..	..	..	2	46,464	69 68
James W. Rollins	"	1	..	..	..	..	..	1	117,985	176 95
Henry C. Morse & Co.	"	2	..	..	..	..	..	2	12,621	18 91
Mass. Inst. of Technology	"	..	2	..	..	..	..	2	170,627	255 93
S. N. Brown, jr., 147 Tremont st.	"	1	..	..	..	..	..	1	58,288	87 41
A. H. Vinton	"	1	..	..	..	..	..	1	15,507	23 24
A. Stowell	"	1	..	..	..	..	..	1	53,720	80 57
B. F. Bradbury	"	1	..	..	..	..	..	1	24,885	37 30
Shepard, Norwell, & Co.	"	4	..	..	..	..	..	4	62,378	93 55
D. J. Hastings	"	..	1	..	..	..	..	1	22,335	33 48
C. U. Cotting, 628 Washington st.	"	5	..	..	..	..	..	5	113,354	170 02
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	82,102,994	$123,150 53

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	82,102,994	$123,150 53
C. U. Cotting, 7 Court sq.	Building	1	1	..	..	..	..	2	1,224	1 83
W. H. Mann	"	2	..	..	..	..	..	2	Vacant.	
Moulton & Bradley	"	1	..	..	..	..	..	1	385,625	578 42
Jordan, Marsh, & Co., Washington street	"	2	3	..	..	..	..	5	353,407	530 10
Charles A. Millen	"	..	1	..	..	..	..	1	92,312	138 41
Stephen H. Bennett heirs	"	2	..	..	..	..	..	2	115,911	173 85
W. H. Foster	"	1	..	..	..	..	..	1	41,350	62 00
Brown & Seavey	"	1	..	..	..	..	..	1	15,875	23 79
Franklin Evans	"	1	..	..	..	..	..	1	40,034	60 03
J. Zane & Co	"	2	..	..	..	..	..	2	43,129	64 67
Allen & Woodworth	"	1	..	..	..	..	..	1	30,725	46 07
Merchants' Exchange	"	1	1	..	..	..	1	3	706,513	1,059 75
H. M. Burr & Co	"	2	..	..	..	..	..	2	13,965	20 92
J. T. Brown & Co	"	1	..	..	..	..	..	1	35,516	53 25
J. C. Gray	"	3	1	..	..	..	..	4	45,876	68 80
C. F. Hovey & Co	"	3	1	..	..	..	..	4	220,989	331 46
Globe Publishing House	"	2	..	..	..	..	..	2	111,918	167 86
Charles Rollins	"	..	1	..	..	..	..	1	190,981	286 47
Adams Express Co	"	2	1	..	..	..	..	3	49,388	74 06
S. N. Brown, Jr., 79 Milk street	"	..	1	..	..	..	..	1	131,783	197 66
W. Blenkinsop	"	2	..	..	..	..	..	2	38,705	58 03
Boston Gas Light Co.	"	2	..	..	..	..	..	2	18,897	28 33
John F. Wilson	"	1	..	..	..	..	..	1	36,268	54 38
L. P. Ober	"	1	..	..	..	..	..	1	77,235	115 84
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	84,900,620	$127,346 51

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	84,900,620	$127,346 51
Young Men's Christian Association ...	Building	1	..	..	..	..	..	1	28,735	43 08
A. A. Miner	"	1	..	..	..	..	..	1	18,700	28 03
Henry F. Miller	"	..	1	..	..	..	..	1	52,339	78 50
Art Building	"	..	1	..	..	..	..	1	27,799	41 68
Equitable Life Ins. Co.	"	2	1	..	..	..	..	3	175,140	262 69
Potter & Watson....	"	..	1	..	..	..	..	1	18,111	27 16
W. Warren.....	"	..	1	..	..	..	..	1	13,069	19 57
John Simmons estate	"	..	2	..	..	..	..	2	165,254	247 86
Tremont National B'k	"	..	1	..	..	..	..	1	73,669	110 49
M. Englehardt	"	..	1	..	..	..	..	1	138,087	207 11
I. L. Pratt.....	"	1	..	..	..	..	..	1	15,636	23 43
Osgood & Greenough	"	1	..	..	..	..	1	2	96,414	144 60
R. H. White & Co. ..	"	1	1	..	..	..	..	2	263,510	395 24
Young Men's Christian Union.....	"	1	2	..	..	..	..	3	211,040	316 54
W. R. Clark	"	1	..	..	..	..	..	1	79,033	118 53
Deacon House	"	1	..	..	..	..	..	1	22,226	33 32
Boston Herald Building.....	"	3	..	..	..	..	..	3	458,591	687 86
Loring & Dexter, Trust.....	"	2	..	..	..	..	..	2	103,088	154 61
Commonwealth Building.....	"	..	1	..	..	..	..	1	66,506	99 74
Mutual Life Ins. Co. of N.Y.....	"	..	..	1	..	..	..	1	137,070	205 57
F. Tudor	"	3	..	..	..	..	..	3	146,839	220 24
E. Bangs	"	1	..	..	..	..	..	1	6,441	9 65
Jacob Sleeper.....	"	1	1	..	..	..	..	2	51,981	77 96
Amount car'd forw'd.		..	..	..	..	..	..	..	87,269,898	$130,899 97

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	87,269,898	$130,899 97
First National Bank .	Building	1	..	..	..	..	..	1	55,911	83 84
Studio Building	.....	..	1	..	..	..	..	1	102,208	153 29
Boston Post Building	.....	..	1	..	..	..	..	1	162,019	243 00
Traveller Building...	.....	2	1	..	..	..	..	3	84,241	126 35
Union Building.....	.....	5	..	..	..	..	..	5	187,997	281 98
Wentworth Building.	.....	1	..	..	..	..	..	1	29,231	43 83
Rice Building	.....	..	1	..	..	..	..	1	118,420	177 61
Carter Building	.....	2	..	..	..	..	..	2	26,642	39 95
Edmands Building...	.....	1	..	..	..	..	..	1	61,040	91 53
Washington Building	.....	..	1	..	..	..	..	1	128,204	192 28
Niles Building.....	.....	..	2	..	..	..	..	2	137,666	206 48
Palmer's Building ...	.....	1	..	..	..	..	..	1	59,118	88 67
Joy's Building	.....	3	..	..	..	..	..	3	44,447	66 65
J. Montgomery Sears, 199 Washington st.	.....	2	1	..	..	..	..	3	146,064	219 07
Advertiser Building..	.....	..	1	..	..	..	..	1	93,467	140 18
Lawrence Building ..	.....	2	1	..	..	..	..	3	69,095	103 62
Codman Building....	.....	7	..	..	..	..	..	7	97,932	146 87
Transcript Building..	.....	1	1	..	..	..	..	2	74,902	112 34
Merchants Bank Building	.....	1	1	..	..	..	..	2	80,509	120 74
Paine Memorial Hall.	.....	..	1	..	..	..	..	1	63,823	95 72
Chauncy Hall School	.....	1	..	..	..	..	..	1	13,981	20 95
Mass. General Hospital	.....	3	4	1	..	..	..	8	1,049,494	1,574 22
Adams Nervine Hospital	.....	1	1	..	..	..	1	3	13,765	20 64
New England Hospital	.....	1	..	..	..	..	..	1	132,359	198 52
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	90,302,433	$135,448 30

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount car'd forw d.	.....	..	..	..	..	..	..	..	90,302,433	$135,448 30
Mass. Homœopathic Hospital	.....	1	..	..	..	..	..	1	83,148	124 71
Notre Dame Academy	.....	1	..	..	..	..	..	1	35,284	52 91
House of the Good Shepherd	.....	1	..	..	..	..	..	1	54,284	81 41
Church Home	.....	..	1	..	..	..	..	1	133,342	200 00
Industrial Home	.....	..	1	..	..	..	..	1	44,301	66 44
Somerset Club	.....	2	..	..	..	..	..	2	134,366	201 58
Union Club	.....	1	..	..	..	..	..	1	153,054	229 56
Temple Club	.....	..	1	..	..	..	..	1	25,622	38 42
Central Club	.....	1	..	..	..	..	..	1	18,041	27 04
Boston Music Hall	.....	3	..	..	..	..	..	3	58,534	87 79
N.E. Conservatory of Music	.....	1	..	..	..	..	..	1	49,796	74 67
Park Theatre	.....	1	..	..	..	..	..	1	19,249	28 84
State of Massachusetts	State Ho.	2	1	..	..	..	..	3	353,784	530 66
The United States.	Post Office	..	..	1	..	..	..	1	131,370	197 04
Howard Athenæum	.....	1	..	..	..	..	..	1	14,655	21 96
Boston Theatre	.....	..	2	..	..	..	..	2	77,335	115 97
Globe Theatre	.....	4	..	..	..	..	..	4	80,693	121 02
Boylston Market	.....	5	..	..	..	..	..	5	84,033	126 03
Washington Market	.....	2	1	..	..	..	..	3	55,313	82 96
Suffolk Market	.....	4	..	..	..	..	..	4	53,529	80 26
Williams Market	.....	3	..	..	..	..	..	3	30,538	45 79
Medical College	.....	..	1	..	..	..	..	1	57,134	85 68
Boston College	.....	1	1	..	..	..	..	2	73,829	110 73
Mrs. C. C. Annable	Board'g.	3	..	..	..	..	1	4	244,183	366 27
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	92,367,850	$138,546 04

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	92,367,850	$138,546 04
Mrs. W. A. Colson ..	Board'g.	2	..	..	..	..	..	2	34,592	51 87
A. J. Stone	"	2	..	..	..	..	..	2	52,223	78 31
Weeks & Smith	"	1	..	..	..	..	..	1	27,401	41 08
J. H. Grout.....	"	1	..	..	..	..	..	1	40,328	60 48
George Odin heirs ...	"	1	..	..	..	..	..	1	22,285	33 41
Mrs. H. L. McClellan	"	2	..	..	..	..	..	2	60,147	90 20
Mrs. D. L. Morse ...	"	1	..	..	..	..	..	1	43,319	64 97
Mrs. C. Cummings...	"	1	..	..	..	..	..	1	20,527	30 76
James Knowlton.....	"	1	1	..	..	..	..	2	102,299	153 43
Ruel Philbrook.....	"	2	..	..	..	..	..	2	30,918	46 34
J. A. Merrill.....	"	..	1	..	..	..	..	1	64,753	97 11
Simon Oakes.....	"	1	..	..	..	..	..	1	10,381	15 55
Mrs. N. F. Chapin...	"	1	..	..	..	..	..	1	17,504	26 24
William Evans	Model..	3	..	..	..	..	..	3	93,060	139 58
B. S. Evans.....	"	2	..	..	..	..	..	2	21,958	32 92
E. Cutler	"	2	..	..	..	..	..	2	17,495	26 22
Michael Doherty.....	"	4	..	..	..	..	..	4	46,566	69 83
Job A. Turner.....	"	1	..	..	..	..	..	1	5,999	8 99
James Chisholm	"	1	..	..	..	..	..	1	22,693	34 01
J. Collins.....	"	2	..	..	..	..	..	2	52,614	78 90
D. L. Webster	"	1	..	..	..	..	1	2	185,557	278 31
Thomas Cantlon.....	"	1	..	..	..	..	..	1	12,305	18 44
Lowell Five-Cent Savings-Bank	"	..	1	..	..	..	..	1	156,509	234 75
N. Whiting	"	..	1	..	..	..	..	1	70,330	105 47
O. S. Sanders.....	"	2	..	..	..	..	..	2	120,521	180 77
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	93,700,134	$140,543 98

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	93,700,134	$140,543 98
H. H. Fay	Model..	1	..	..	..	..	..	1	14,133	21 18
D. Goodnow	"	..	1	..	..	..	..	1	40,647	60 96
David Wilcox & Co., 8 Boylston square..	Factory.	3	..	..	..	..	..	3	147,261	220 87
J. Morrill, Jr., & Co.	"	1	..	..	..	..	..	1	14,240	21 36
Pearson Cordage Co.	"	..	1	..	..	..	..	1	97,222	145 81
J. Morse.....	"	1	..	..	..	..	..	1	29,691	44 51
L. Whittaker.....	"	1	..	..	..	..	..	1	17,014	25 49
C. Wright & Co.....	"	1	..	..	..	..	..	1	39,372	59 03
Howard Watch & Clock Co.....	"	..	2	..	..	..	..	2	59,123	88 67
Haley, Morse & Co...	"	1	..	..	..	..	..	1	Not using.	
Roxbury Carpet Co...	"	..	1	..	..	..	..	1	423,799	635 68
George C. Pearson...	"	1	..	..	..	..	..	1	44,872	67 29
Putnam Nail Co.	"	..	3	..	..	..	..	3	564,764	847 13
William Carleton....	"	1	2	..	..	..	..	3	223,262	334 88
Murphy, Leavens, & Co.....	"	1	..	..	..	..	..	1	56,060	84 08
H. M. Richards	"	..	1	..	..	..	..	1	50,182	75 26
Charles E. Kershaw..	"	1	..	..	..	..	..	1	Vacant.	
J. H. Bailey & Co....	"	1	..	..	..	..	..	1	3,304	4 94
Peet Valve Co.....	"	..	1	..	..	..	..	1	153,173	229 74
A. W. Bailey.....	"	2	..	..	..	..	..	2	39,308	58 95
C. M. Clapp & Co....	"	..	1	..	..	..	..	1	36,428	54 62
W. S. Pratt	"	1	..	..	..	..	..	1	79,252	118 86
Byam, Carleton & Co.	"	1	..	..	..	..	..	1	18,331	27 48
Stephen Smith & Co.	"	1	..	..	..	..	..	1	60,110	90 15
Chickering & Sons ...	"	..	3	..	..	..	..	3	267,322	400 96
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	96,179,004	$144,261 88

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd..	.....	..	..	..	..	..	..	..	96,179 004	$144,261 88
Mace & Keys.....	Factory.	1	..	..	..	..	..	1	26,114	39 15
Bagnall & Loud	"	1	..	..	..	..	..	1	26,175	39 24
Boston Car Spring Co.	"	..	1	..	..	..	..	1	103,152	154 71
A. Folsom & Sons ...	"	..	1	..	..	..	..	1	56,915	85 36
Dwinell, Hayward, & Co.	"	1	..	..	..	..	..	1	105,468	158 19
J. M. Cook estate ...	"	..	1	..	..	..	..	1	247,121	370 66
Hallet & Davis	"	..	1	..	..	..	..	1	35,422	53 12
S. D. & H. W. Smith, Montgomery st.....	"	..	1	..	..	..	..	1	141,543	212 29
S. D. & H. W. Smith, Albany st.	"	..	1	..	..	..	..	1	116,289	174 41
Emerson Piano Co. ..	"	1	..	..	..	..	..	1	49,869	74 79
William Underwood & Co.	"	2	..	..	..	..	..	2	134,880	202 30
G. D. Dowes & Co. ..	"	..	1	..	..	..	..	1	70,153	105 21
D. Wilcox & Co., Avery st.	"	..	1	..	..	..	..	1	14,837	22 23
Newton, Morton, & Co.	"	2	..	..	..	..	..	2	98,016	147 01
Boston Belting Co....	"	..	1	2	..	..	..	3	366,767	550 13
Richardson, McKee, & Co.	"	1	..	..	..	..	..	1	88,495	132 72
H. Barker	"	..	1	..	..	..	..	1	30,154	45 21
Conrad Zeigler	"	1	..	..	..	..	..	1	20,732	31 08
C. H. Bacon	"	2	..	..	..	..	..	2	177,964	266 93
Morton & Chesley....	"	..	1	..	..	..	..	1	201,970	302 94
A. Zeigler	"	1	..	..	..	..	..	1	1,540	2 30
Cummings & Carlisle.	"	..	1	..	..	..	..	1	216,856	325 27
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	98,509,436	$147,757 13

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	98,509,436	$147,757 13
Walworth Manufact. Co.	Factory.	1	..	..	..	..	..	1	63,517	95 26
R. Rhodes	"	..	1	..	..	..	..	1	30,149	45 21
A. J. Morse & Co. ...	"	2	..	..	..	..	..	2	64,952	97 42
Seth W. Fowle & Son	"	1	..	..	..	..	..	1	4,428	6 62
H. B. Arnold & Co...	"	1	..	..	..	..	..	1	52,535	78 79
Dennison Manufact. Co., 25 Vale st.....	"	..	1	..	..	..	..	1	116,660	174 98
Chadwick Lead Works	"	2	..	..	..	..	..	2	118,033	177 05
Henry Mayo & Co....	"	..	2	..	..	..	..	2	183,165	274 73
B. F. Sturtevant.....	"	1	..	..	..	..	..	1	108,672	162 98
Charles W. Spurr ...	"	1	..	..	..	..	..	1	16,161	24 22
Hallett & Cumston...	"	1	..	..	..	..	..	1	79,728	119 56
P. Lally	"	..	1	..	..	..	..	1	113,211	169 79
S. G. Underhill.....	"	1	..	..	..	..	..	1	62,203	93 28
Amer. Molded Collar Co.....	"	1	..	..	..	..	..	1	86,914	130 36
Bardwell, Anderson, & Co.....	"	..	1	..	..	..	..	1	61,548	92 31
N.E. Water Meter Co.	"	..	1	..	..	..	..	1	16,674	24 99
Billings, Clapp, & Co.	"	1	..	..	..	..	..	1	35,201	52 78
Lewis & Wood (6 mos.)	"	1	..	..	..	..	..	1	24,328	36 48
Standard Rubber Co. (6 mos.).....	"	1	..	..	..	..	..	1	24,519	36 76
Lensford & Shultz (6 mos.)	"	1	..	..	..	..	..	1	8,578	12 86
John Broderick.....	"	1	..	..	..	..	..	1	6,979	10 45
A. H. Miller	"	1	..	..	..	..	..	1	48,552	72 82
Amount car'd forw'd.		..	..	..	..	..	..	..	99,836,143	$149,746 83

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	99,836,143	$149,746 83
Boston Cordage Co. (6 mos.)	Factory.	..	1	..	..	..	..	1	40,742	61 10
Rice & Hutchings	"	..	1	..	..	..	..	1	42,235	63 35
Fiedler, Moeldner, & Co. (3 mos.)	"	1	..	..	..	..	..	1	12,155	18 23
Woodbury & Pritchard (2 mos.)	"	..	1	..	..	..	..	1	7,992	11 98
National Sewing Machine Co. (1 mo.) ..	"	1	..	..	..	..	..	1	941	1 41
Kittredge & Co.	"	1	..	..	..	..	..	1	Vacant.	
D. Shales & Co.....	"	1	..	..	..	..	..	1	49,867	74 78
Christopher Blake ...	"	1	..	..	..	..	..	1	55,195	82 77
G. H. Dickerman....	"	1	..	..	..	..	..	1	45,063	67 63
J. L. Ross	"	2	..	..	..	..	..	2	Vacant.	
R. Estabrook & Son..	"	1	..	..	..	..	..	1	71,035	106 53
George Gill	"	1	..	..	..	..	..	1	22,973	34 45
F. King & Co.....	"	1	..	..	..	..	..	1	72,644	108 94
Grover & Baker Sewing Machine Co., Wash. st.	"	..	3	..	..	..	..	3	Vacant.	
Downes & Adams....	"	1	..	..	..	..	..	1	23,762	35 62
Jona. Cottle.....	"	..	..	1	..	..	..	1	942,470	1,413 69
J. A. Frampton.....	"	1	..	..	..	..	..	1	40,760	61 12
H. N. Glover.....	"	..	1	..	..	..	..	1	74,284	111 41
G. F. Waldron	Mach'ist	1	..	..	..	..	..	1	Vacant.	
A. K. Young	"	2	..	..	..	..	..	2	58,375	87 55
Harrison Loring.....	"	2	1	..	..	..	..	3	34,195	51 29
S. A. Woods & Co. ..	"	1	..	..	..	..	..	1	102,226	153 32
George F. Blake.....	"	..	1	..	..	..	..	1	108,916	163 35
Amount car'd forw'd .	.....	..	..	..	..	..	..	..	101,641,973	$152,455 35

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	101,641,973	$152,455 35
AshcroftManufact.Co.	Mach'ist	1	1	..	..	..	..	2	86,785	130 16
L. M. Ham.....	"	2	..	..	..	..	..	2	64,588	96 86
Dennis Crowley	"	1	..	..	..	..	..	1	43,805	65 69
L. A. Bigelow.....	"	..	1	..	..	..	..	1	119,628	179 42
William Evans	"	3	1	..	..	..	..	4	121,668	182 48
Smith & Lovett.....	"	1	..	..	..	..	..	1	27,052	40 56
Am. Tool and Machine Co.....	"	..	1	..	..	..	..	1	124,667	186 98
J. Souther & Co.	"	1	..	..	..	..	..	1	86,965	130 43
Boston Machine Co. .	"	1	1	..	..	..	..	2	202,100	303 14
Hersey Brothers.....	"	1	..	..	..	..	..	1	31,029	46 52
Hinckley Locomotive Works	"	1	3	..	..	..	..	4	410,525	615 76
Atlantic Works, Chelsea st.	"	..	1	..	..	..	..	1	180,928	271 38
Atlantic Works, Border st.	"	..	..	1	..	..	..	1	262,800	394 18
Holmes & Blanchard, Charlestown st.....	"	..	1	..	..	..	..	1	99,992	149 97
H. S. Robinson.....	"	1	..	..	..	..	..	1	31,939	47 89
Geo. T. McLaughlin.	"	2	..	..	..	..	..	2	93,542	140 29
South Boston Iron Co.	Foundry	3	2	1	..	..	..	6	279,865	419 79
Holmes & Blanchard, Taylor st.....	"	1	..	..	..	..	..	1	28,386	42 56
James Gurney & Co..	"	1	..	..	..	..	..	1	38,068	57 08
William Blake & Co..	"	..	1	..	..	..	..	1	111,299	166 92
Whiting Foundry Co.	"	1	..	..	..	..	..	1	78,940	118 38
Tremont Foundry Co.	"	1	..	..	..	..	..	1	6,319	9 46
Fulton Iron Foundry Co.	"	..	1	..	..	..	..	1	26,041	39 05
Amount car'd forw'd.		..	..	..	..	..	..	..	104,198,904	$156,290 30

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	104,198,904	$116,290 30
Charles Roberts	Foundry	..	1	..	..	..	..	1	115,821	173 71
Highland Foundry Co.	"	1	..	..	..	..	..	1	45,970	68 93
M. H. Washburn	"	1	..	..	..	..	..	1	16,046	24 05
George Miles	Boil'r'm.	1	..	..	..	..	..	1	35,081	52 59
Downer Kerosene Oil Co.	Oil W'ks	2	1	1	..	..	..	4	1,341,100	2,011 66
S. Jenney & Co.	"	..	2	..	..	..	..	2	132,123	198 17
Maverick Oil Co.	"	..	1	..	..	..	..	1	214,615	321 91
Pierce & Canterbury.	"	..	1	..	..	..	..	1	118,760	178 12
Kidder, Vaughn, & Co.	"	..	1	..	..	..	..	1	31,751	47 60
Bowker, Torrey, & Co., Bowker st.	Marble Works	1	1	..	..	..	..	2	718,105	1,077 13
Bowker, Torrey, & Co., Foundry st.	"	1	1	..	..	..	..	2	Not using.	
Torreys & Co.	"	2	1	..	..	..	..	3	397,886	596 81
C. E. Hall & Co.	"	2	1	..	..	..	..	3	426,934	640 39
A. Wentworth & Co.	"	4	..	..	..	..	..	4	312,151	468 21
Richard Power & Son.	"	2	..	..	..	..	..	2	104,895	157 31
Jeremiah Carew	Stone Yd	2	..	..	..	..	..	2	18,999	28 48
Carew & Devine	"	..	1	..	..	..	..	1	58,733	88 10
E. F. Meaney	"	2	1	..	..	..	..	3	248,575	372 84
Folt & Sullivan	"	1	..	..	..	..	..	1	4,959	7 43
Geo. F. Chapin & Co.	Vinegar Works	1	..	..	..	..	..	1	53,441	80 14
Pike & Fabins	Pickle Factory	..	1	..	..	..	..	1	90,700	136 04
Horace H. Lewis	"	1	..	..	..	..	..	1	24,733	37 08
W. K. Lewis & Bros.	"	1	..	..	..	..	..	1	61,359	92 02
M. M. Pigott & Son.	"	1	..	..	..	..	..	1	26,360	39 53
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	108,798,001	$163,188 55

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	108,798,001	$163,188 55
E. T. Cowdrey & Co..	Factory.	3	..	..	..	..	..	3	114,373	171 53
Warner & Freeman..	SaltWks	1	..	..	..	..	..	1	21,611	32 40
Fobes, Hayward, &Co.	Confec'y	1	..	..	..	..	..	1	98,049	147 05
Chase & Co.....	"	1	1	..	..	..	..	2	285,121	427 65
A. F. Copeland, 4 Tremont row	"	3	..	..	..	..	..	3	108,518	162 77
E. M. Messenger	Resta'nt	1	..	..	..	..	..	1	19,630	29 43
Mrs. G. F. Harrington.	"	1	..	..	..	..	..	1	37,382	56 06
Marston & Cunio	"	1	..	..	..	..	..	1	66,138	99 19
W. L. Egerton	"	1	..	..	..	..	..	1	26,182	39 26
Frost & Dearborn....	"	..	1	..	..	..	..	1	65,258	97 87
George Fera	"	1	..	..	..	..	..	1	40,004	59 99
D. T. Copeland	"	..	1	..	..	..	..	1	97,283	145 90
F. E. Weber	"	1	..	..	..	..	..	1	67,370	101 01
R. B. Brigham	"	1	1	..	..	..	..	2	199,640	299 44
W. F. Bacon.....	"	1	..	..	..	..	..	1	16,379	24 55
A. W. Fisher	"	1	..	..	..	..	..	1	13,008	19 50
Campbell & Coverly .	"	1	..	..	..	..	..	1	47,781	71 64
W. G. Foley	"	1	..	..	..	..	..	1	37,074	55 59
Jones & Marshall....	"	1	..	..	..	..	..	1	29,952	44 91
O. S. Edgerly	"	1	..	..	..	..	..	1	6,609	9 89
C. H. Bailey	"	1	..	..	..	..	..	1	29,365	44 03
Mary Smith.....	"	1	..	..	..	..	..	1	15,123	22 66
R. M. Waitt	"	1	..	..	..	..	..	1	30,609	45 89
C. E. Bacon.....	"	1	..	..	..	..	..	1	48,998	73 48
Thomas Walton	"	1	..	..	..	..	..	1	21,119	31 65
J. Gallagher	"	1	..	..	..	..	..	1	40,755	61 12
Amount car'd forw'd	.....	..	..	..	..	..	..	..	110,381,332	$165,563 01

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd...	.....	..	..	..	..	..	..	..	110,381,332	$165,563 01
J. Swallow.....	Resta'nt	1	..	..	..	..	..	1	2,751	4 11
L. E. Stearns	"	1	..	..	..	..	..	1	21,574	32 29
S. A. Clough & Son..	"	1	..	..	..	..	..	1	20,514	30 75
S. S. Rankin.....	"	1	..	..	..	..	..	1	32,721	49 06
A. F. Copeland, 467 Washington st.....	"	1	..	..	..	..	..	1	79,077	118 60
J. Backus	"	1	..	..	..	..	..	1	58,600	87 88
E. G. Park	"	1	..	..	..	..	..	1	52,725	79 07
Brock & Coy, 243 Atlantic ave.....	"	1	..	..	..	..	..	1	35,106	52 64
Brock & Coy, 73 Clinton	"	1	..	..	..	..	..	1	42,953	64 41
Sheppard & Chamberlin	"	1	..	..	..	..	..	1	34,187	51 26
Durgin, Park, & Co..	"	1	..	..	..	..	..	1	42,586	63 85
Paul & Savoy	"	1	..	..	..	..	..	1	40,092	60 12
T. H. Smith	"	1	..	..	..	..	..	1	86,363	129 53
J. M. Learned.....	"	1	..	..	..	..	..	1	71,427	107 12
C. F. Kendall	"	1	..	..	..	..	..	1	61,514	92 25
Pearson & Macomber	"	2	..	..	..	..	..	2	44,912	67 35
J. H. Blodgett	"	1	..	..	..	..	..	1	90,126	135 17
R. R. & J. S. Higgins.	Saloon .	2	..	..	..	..	..	2	135,989	203 97
Atwood & Bacon	"	1	..	..	..	..	..	1	21,164	31 72
Smith & Wright.....	"	1	..	..	..	..	..	1	62,025	93 02
Elias Howe	"	1	..	..	..	..	..	1	76,253	114 36
Felton & Son.....	Distill'y	..	2	..	..	..	..	2	404,951	607 41
Jonas H. French	"	..	1	..	..	..	..	1	106,510	159 74
C. H. Graves.....	Rectifier	1	..	..	..	..	..	1	49,897	74 83
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	112,055,349	$168,073 52

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	112,055,349	$168,073 52
James Edmond & Co.	Fire Brick.	..	1	..	..	..	..	1	84,448	126 66
A. Hale & Co.....	Rubber Works.	1	..	..	..	..	..	1	52,685	79 01
Byron & Hall	Currier.	1	..	..	..	..	..	1	28,238	42 33
Byron & Hall, Ellsworth pl.	"	1	..	..	..	..	..	1	17,266	25 87
W. H. Swift & Co....	Fertiliz's	1	1	..	..	..	..	2	166,018	249 01
W. L. Bradley	"	..	1	..	..	..	..	1	376,990	565 47
W. H. Bowker & Co.	"	..	1	..	..	..	..	1	84,133	126 18
B. Randall.....	"	1	..	..	..	..	..	1	39,120	58 66
Boston Dye Wood & Chemical Co.....	Chemic's	..	3	..	..	..	..	3	1,541,839	2,312 74
W. H. Whitmore	"	..	1	..	..	..	..	1	58,315	87 46
G. W. & F. Appleton	"	1	..	..	..	..	..	1	Vacant.	
Preston & Merrill....	Extracts	..	..	1	..	..	..	1	166,060	249 08
Quirin & Nelson.....	Tannery	..	1	..	..	..	..	1	70,268	105 38
Mullen & Brown.....	"	1	..	..	..	..	..	1	51,795	77 67
R. W. Ames & Son ..	"	1	..	..	..	..	..	1	Vacant.	
F. P. Richard	"	1	..	..	..	..	..	1	17,302	25 93
Boston Forge Co.....	.....	..	1	..	..	..	..	1	526,444	789 66
Boston Lead Man'f'g Co.....	.....	1	1	..	..	..	..	2	141,539	212 30
A. N. Hardy	Pho'pher	1	..	..	..	..	..	1	15,776	23 64
Heliotype Printing Co.	.....	..	1	..	..	..	..	1	54,784	82 15
Suffolk Glass Co.....	.....	1	..	..	..	..	..	1	89,811	134 71
Washington Pipe Works.....	.....	..	1	..	..	..	..	1	Vacant.	
New England Pottery	.....	..	1	..	..	..	..	1	78,927	118 38
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	115,717,107	$173,565 81

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	115,717,107	$173,565 81
Simpson's Dry Dock Co.....	.....	..	1	..	..	..	..	1	96,639	144 94
Cunard Steamship Co.	.....	..	..	..	1	..	..	1	619,200	928 78
Union Freight Railway Co.	.....	..	..	..	1	..	..	1	185,210	277 81
W. B. Gleason & Co.	Carving	1	..	..	..	..	..	1	16,996	25 48
Hill & Wright	Coopers	1	..	..	..	..	..	1	1,606	2 40
Butchers' Slaughtering and Melting Association	.....	..	1	..	..	..	..	1	503,982	755 95
A. J. Tower	Skating Rink.	1	..	..	..	..	..	1	20,645	30 96
Parker & Huckins ...	"	..	1	..	..	..	..	1	8,746	13 11
Metropolitan Railroad Co.	Stables.	16	7	..	..	..	..	23	1,504,969	2,257 43
So. Boston Railroad Co.	"	2	3	1	..	..	..	6	689,633	1,034 38
Highland Railroad Co.	"	5	..	..	..	..	..	5	354,812	532 13
Union Railroad Co., Oak square	"	2	..	..	..	..	..	2	46,909	70 35
Draper & Hall.....	Stable ..	3	..	..	..	..	1	4	236,916	355 37
V. R. Bridgham	"	2	..	..	..	..	..	2	58,970	88 45
C. H. Foster	"	1	..	..	..	..	..	1	36,759	55 12
A. J. Child.....	"	1	..	..	..	..	..	1	58,903	88 34
E. A. Noyes.....	"	..	1	..	..	..	..	1	78,472	117 68
James W. Hale.....	"	1	..	..	..	..	..	1	23,995	35 97
E. A. Batchelder	"	1	..	..	..	..	..	1	31,926	47 87
Charles R. Smith	"	2	..	..	..	..	..	2	35,111	52 66
J. Austin Rogers	"	1	..	..	..	..	..	1	94,786	142 18
Norfolk House Stable	"	1	..	..	..	..	..	1	12,233	18 32
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	120,434,525	$180,641 49

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	120,434,525	$180,641 49
Charles Foster & Co.	Stable..	1	..	..	..	..	..	1	39,442	59 14
Parmenter & Sumner	"	1	..	..	..	..	..	1	28,704	43 04
Robert H. Douglass..	"	1	..	..	..	..	..	1	45,115	67 65
J. Frank Pickett.....	"	1	..	..	..	..	..	1	20,117	30 16
J. P. Barnard, 108 Chestnut street....	"	1	..	..	..	..	..	1	73,212	109 80
J. P. Barnard, cor. Brimmer and Chestnut streets	"	..	1	..	..	..	..	1	61,943	92 90
J. P. Barnard, Joy st.	"	3	..	..	..	..	..	3	136,566	204 82
A. Garcelon.....	"	2	..	..	..	..	..	2	58,136	87 18
Clark & Brown.....	"	1	..	..	..	..	..	1	52,443	78 65
N. B. Stevens, 4 Byron st.	"	1	..	..	..	..	..	1	22,277	33 40
J. E. Maynard	"	1	..	..	..	..	..	1	82,418	123 61
A. Goss	"	1	..	..	..	..	..	1	33,603	50 39
Adams Express Co...	"	1	..	..	..	..	..	1	52,562	78 82
John Eaton, Jr.....	"	1	..	..	..	..	..	1	18,778	28 15
John Peters.....	"	1	..	..	..	..	..	1	13,649	20 45
J. T. Manson	"	1	..	..	..	..	..	1	53,123	79 66
Warner & Tarbell ...	"	2	..	..	..	..	..	2	64,957	97 42
George M. King	"	1	..	..	..	..	..	1	69,463	104 18
Milo Whitney	"	1	..	..	..	..	..	1	31,941	47 90
Daniel Wood.....	"	1	..	..	..	..	..	1	64,226	96 32
T. D. Sullivan	"	1	..	..	..	..	..	1	24,593	36 86
Ham & Co.....	"	2	..	..	..	..	..	2	24,859	37 27
C. & E. Snow	"	1	..	..	..	..	..	1	11,406	17 09
Edgar Snow.....	"	1	..	..	..	..	..	1	4,424	6 62
Amount car'd forw'd.		..	..	..	..	..	..	..	121,522,482	$182,272 97

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	121,522,482	$182,272 97
Israel Tibbetts	Stable	1	..	..	..	..	..	1	35,451	53 15
James Jellison	"	1	..	..	..	..	..	1	35,770	53 64
John Miller	"	1	..	..	..	..	..	1	14,216	21 31
L. H. Brown	"	2	..	..	..	..	..	2	39,975	59 95
Harwood & Hackett	"	1	..	..	..	..	..	1	43,631	65 43
H. C. Nims	"	3	..	..	..	..	..	3	83,950	125 90
Boston Hotels Coach Co.	"	2	..	..	..	..	..	2	227,948	341 90
E. W. Murray, Berkeley street	"	1	..	..	..	..	..	1	29,805	44 68
E. W. Murray, Stanhope street	"	1	..	..	..	..	..	1	41,006	61 50
A. B. Atherton	"	1	..	..	..	..	..	1	45,763	68 62
Geo. S. Johnson	"	..	1	..	..	..	..	1	39,806	59 70
Johnson Bros.	"	1	..	..	..	..	..	1	16,565	24 82
T. Thaxter (3 mos.)	"	1	..	..	..	..	..	1	3,577	5 36
A. B. Winship	"	1	..	..	..	..	..	1	34,132	51 18
T. Thaxter & Co.	"	2	..	..	..	..	..	2	40,698	61 03
Miller & Robinson	"	3	..	..	..	..	..	3	41,719	62 56
Bailey & Jenkins	"	3	..	..	..	..	..	3	57,396	86 08
F. E. Pearson	"	2	..	..	..	..	..	2	66,694	100 03
A. D. Pattee	"	1	..	..	..	..	..	1	36,666	55 00
Nelson Brothers	"	..	1	..	..	..	..	1	21,123	31 67
Moses Coleman & Son	"	1	..	..	..	..	..	1	17,328	25 98
C. T. Walker	"	2	..	..	..	..	..	2	12,452	18 66
Northend & Foster	"	1	..	..	..	..	..	1	19,265	28 87
H. S. Harris	"	..	1	..	..	..	..	1	18,856	28 25
Riverside Club Stable	"	1	..	..	..	..	..	1	22,845	34 24
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	122,569,119	$183,842 48

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd...	.....	..	..	..	..	..	..	..	122,569,119	$183,842 48
Club Stable, Chardon street.....	Stable..	1	..	..	..	..	..	1	14,308	21 44
Beacon Club Stable..	"	1	..	..	..	..	..	1	18,940	28 39
Z. R. Folsom & Co...	"	1	..	..	..	..	..	1	51,304	76 93
Henry Beckwith.....	"	2	..	..	..	..	..	2	43,766	65 65
F. A. Phelps.....	"	1	..	..	..	..	..	1	49,999	74 97
A. P. Marion.....	"	1	..	..	..	..	..	1	30,855	46 25
Parker Bryant.....	"	1	..	..	..	..	..	1	29,852	44 76
B. W. Dean.....	"	2	..	..	..	..	..	2	39,893	59 82
John Trickey & Co...	"	1	..	..	..	..	..	1	81,013	121 49
M. & W. Ham.....	"	1	..	..	..	..	..	1	45,319	67 97
J. H. Pote & Co.	"	1	..	..	..	..	..	1	13,265	19 87
J. B. Cassidy & Bro..	"	1	..	..	..	..	..	1	23,286	34 91
Peck & Hall.....	"	1	..	..	..	..	..	1	40,519	60 76
J. Hale.....	"	1	..	..	..	..	..	1	29,788	44 66
Ware & Bussigny....	"	1	..	..	..	..	..	1	38,145	57 20
J. A. Riedel & Co....	"	1	..	..	..	..	..	1	31,375	47 04
Union Railway Co. Washington st.....	"	3	..	..	..	..	..	3	14,905	22 33
J. C. Richardson	"	1	..	..	..	..	..	1	14,460	21 67
E. R. Webster	"	1	..	..	..	..	..	1	17,752	26 61
Club Stable, 75 Chestnut st.....	"	1	..	..	..	..	..	1	29,401	44 08
C. S. Godfrey.....	"	1	..	..	..	..	..	1	28,697	43 03
Clark & Brown, 22 Charles st.....	"	..	1	..	..	..	..	1	129,389	194 07
Clark & Brown, 8 Lime st.	"	1	..	..	..	..	..	1	17,791	26 68
A. H. Foss.....	"	1	..	..	..	..	..	1	15,538	23 30
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	123,418,679	$185,116 36

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	123,418,679	$185,116 36
Cilly & Stimson	Stable	1	..	..	..	..	..	1	27,703	41 54
Club Stable, 44 Joy st.	"	1	..	..	..	..	..	1	36,018	54 01
Asa Critchett	"	1	..	..	..	..	..	1	19,741	29 51
A. S. Eaton	"	..	1	..	..	..	..	1	24,554	36 81
L. A. Noyes	"	1	..	..	..	..	..	1	17,740	26 58
Geo. D. Brown	"	1	..	..	..	..	..	1	20,269	30 38
J. H. Hathorne	"	..	1	..	..	..	..	1	137,569	206 33
H. D. Smith	"	1	..	..	..	..	..	1	27,096	40 63
M. Munroe	Stocky'd	..	..	..	..	1	..	1	424,014	635 99
Geo. W. Hollis (5mos.)	Slaughtering y'd	1	..	..	..	..	..	1	16,470	24 68
Boston Driving Ass'n.	.....	..	..	1	..	..	..	1	111,210	166 80
National Tube Works.	.....	..	1	..	..	..	..	1	76,248	114 36
Globe Nail Works	.....	1	1	..	..	..	..	2	114,813	172 20
Farrington & Hunnewell	Silversmiths	1	..	..	..	..	..	1	21,670	32 49
B. M. Cunningham	Laundry	1	..	..	..	..	..	1	166,862	250 27
I. H. Carey	"	1	..	..	..	..	..	1	37,313	55 95
Manley Howe	"	..	1	..	..	..	..	1	87,445	131 15
L. Prang & Co	Chromos	..	1	..	..	..	..	1	93,354	140 01
R. G. Morse & Co	Engine	1	..	..	..	..	..	1	23,056	34 56
Francis Brooks	"	1	..	..	..	..	..	1	41,343	61 99
Walworth Manuf. Co.	"	1	..	..	..	..	..	1	239,094	358 62
H. G. Denny	"	1	..	..	..	..	..	1	46,343	69 49
Porter & Co.	"	1	..	..	..	..	..	1	72,627	108 92
C. U. Cotting	"	..	1	..	..	..	..	1	26,487	39 71
Moses B. Wilde	"	1	..	..	..	..	..	1	51,207	76 80
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	125,378,925	$188,056 14

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	125,378,925	$188,056 14
John Foster	Engine	1	..	..	..	..	..	1	44,944	67 40
J. Montgomery Sears, 45 Arch st.	"	1	..	..	..	..	..	1	139,300	208 93
J. S. Potter	"	1	..	..	..	..	..	1	36,524	54 78
E. J. Brown (3 mos.)	"	1	..	..	..	..	..	1	4,682	7 02
John Briggs & Co.	Mill	1	..	..	..	..	..	1	100,269	150 39
J. S. Potter	"	..	1	..	..	..	..	1	111,749	167 60
S. B. Stebbins	"	1	..	..	..	..	..	1	95,993	143 97
L. W. Pickens	"	1	..	..	..	..	..	1	105,813	158 71
C. E. Folsom	"	1	..	..	..	..	..	1	21,723	32 56
Boston City Flour Mills	"	..	1	..	..	..	..	1	130,428	195 63
J. J. McNutt	"	..	2	..	..	..	..	2	277,970	416 93
Glendon Co.	"	..	1	..	..	..	..	1	105,160	157 72
Manson & Peterson	"	3	..	..	..	..	..	3	92,603	138 89
N. Littlefield	"	1	..	..	..	..	..	1	129,290	193 92
W. L. Sturtevant	"	1	..	..	..	..	..	1	104,183	156 25
McQuesten & Co.	"	1	..	..	..	..	..	1	64,659	96 97
J. F. Paul & Co.	"	..	2	..	..	..	..	2	314,553	471 81
Bugbee & Spooner	"	1	..	..	..	..	..	1	59,395	89 08
J. A. Robertson	"	1	..	..	..	..	..	1	89,973	134 93
Stetson, Moseley, & Co.	"	..	1	..	..	..	..	1	34,446	51 66
Chauncy, Page, & Co.	"	..	1	..	..	..	..	1	68,498	102 73
S. H. L. Pierce	"	1	..	..	..	..	..	1	118,343	177 49
A. J. Stearns & Son	"	..	1	..	..	..	..	1	6,366	9 54
Palmer, Parker, & Co.	"	1	..	..	..	..	..	1	96,469	144 67
J. F. Keating	"	1	..	..	..	..	..	1	80,360	120 52
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	127,812,618	$191,706 24

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	127,812,618	$191,706 24
Watson & Bisbee	Mill ...	1	..	..	..	..	..	1	58,781	88 15
Laming & Drisko....	"	1	..	..	..	..	..	1	49,511	74 26
Creesy & Noyes.....	"	1	1	..	..	..	..	2	194,046	291 05
Smith & Jacobs.....	"	1	..	..	..	..	..	1	94,949	142 41
B. D. Whitcomb	"	1	..	..	..	..	..	1	143,692	215 51
S. Crosby & Son.....	"	..	1	..	..	..	..	1	114,949	172 41
Nathaniel Cummings.	"	2	..	..	..	..	..	2	29,383	44 05
Nelson Curtis	"	1	..	..	..	..	..	1	11,889	17 82
Glover & Jones.....	"	1	..	..	..	..	..	1	Vacant.	
Atlantic Dyewood Co.	"	..	..	1	..	..	..	1	701,481	1,052 20
Standard Dyewood Mill.....	"	1	..	..	..	..	..	1	214,338	321 48
Knowles, Freeman, & Co.....	Fish Store.	1	..	..	..	..	..	1	49,117	73 66
G. B. Spaulding & Co.	Bacon Works.	..	1	..	..	..	..	1	45,405	68 08
Boston Water Meter Co., 29 Devonshire street.....	Testing Meters.	1	..	..	..	..	..	1	987	1 48
Boston Water Meter Co., Foster's wharf.	"	..	..	1	..	..	..	1	14,700	22 05
William Blanchard & Co.....	Bakery .	..	1	..	..	..	..	1	12,051	18 06
G. K. Withington&Co.	"	1	..	..	..	..	..	1	28,599	42 89
J. H. Chadwick	House & Fount'n.	1	..	..	..	..	..	1	2,330	3 48
Horatio Harris	"	1	..	..	..	..	..	1	Vacant.	
J. C. Nichols.....	Wharf purposes	1	..	..	..	..	..	1	11,570	17 34
Warren & Co., Agts..	Steamr's	..	..	1	..	..	..	1	219,824	329 71
Hingham Steamboat Co.	"	..	..	..	1	..	..	1	1,075,248	1,612 86
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	130,885,468	$196,315 19

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	130,885,468	$196,315 19
Portland Steam Packet Co.	Steam'rs	..	..	..	1	..	..	1	308,330	462 49
International Steamboat Co.	"	..	..	1	..	..	..	1	197,494	296 23
J. Henry Sears & Co.	"	..	..	1	..	..	..	1	120,074	180 10
Nantasket Steamboat Co.	"	..	..	..	1	..	..	1	263,885	395 82
H. F. Holmes, Ag't, Steamers	.....	..	..	1	..	..	..	1	39,408	59 10
House of Correction.	.....	..	..	..	..	1	..	1	1,777,870	2,666 79
Lunatic Hospital	.....	1	3	..	..	..	..	4	499,671	749 49
City Hospital	.....	1	7	..	..	..	..	8	1,347,141	2,020 69
Charity Building	.....	2	..	..	..	..	..	2	64,656	96 97
Temporary Home	.....	1	..	..	..	..	..	1	91,653	137 47
City Hall	.....	1	2	..	..	..	..	3	385,519	578 25
Wayfarers' Lodge	.....	..	1	..	..	..	..	1	61,051	91 56
Austin Farm	.....	..	1	..	..	..	..	1	224,619	336 92
Suffolk County Court House	.....	..	2	..	..	..	..	2	220,434	330 63
Suffolk County Jail	.....	1	1	1	..	..	..	3	214,441	321 65
Directors of Public Institutions	.....	2	3	1	..	..	..	6	962,867	1,444,28
South Ferry	.....	..	..	1	1	..	..	2	1,050,218	1,575 31
North Ferry	.....	..	..	..	1	..	..	1	787,050	1,180 58
Board of Health	Public Urinals	1	..	..	..	..	..	1	80,267	120 38
Police Station No. 1	.....	1	..	..	..	..	..	1	40,403	60 60
" " 2	.....	..	1	..	..	..	..	1	63,579	95 37
" " 3	.....	..	1	..	..	..	..	1	35,769	53 65
" " 4	.....	1	..	..	..	..	..	1	42,903	64 35
Amount car'd forw'd	.....	..	..	..	..	..	..	..	139,764,770	$209,633 87

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	139,764,770	$209,633 87
Police Station No. 5	.....	1	..	..	..	..	..	1	23,199	34 79
" " 6	.....	1	..	..	..	..	..	1	29,019	43 52
" " 7	.....	1	..	..	..	..	..	1	55,741	83 61
" " 8	.....	1	..	..	..	..	..	1	16,145	24 22
" " 9	.....	1	..	..	..	..	..	1	22,126	33 18
" " 10	.....	1	..	..	..	..	..	1	27,490	41 24
" " 12	.....	1	..	..	..	..	..	1	12,296	18 44
" " 13	.....	1	..	..	..	..	..	1	8,305	12 46
City Prison.....	.....	..	..	1	..	..	..	1	148,080	222 11
L. W. Morrill & Co..	Rotary Fan	..	1	..	..	..	..	1	17,952	26 91
John C. Miller	"	..	1	..	..	..	..	1	150,168	225 23
First Church	Organ ..	..	..	..	..	..	1	1	15,943	23 90
King's Chapel	"	..	..	..	..	..	1	1	11,999	17 99
Cathedral of the Holy Cross.....	"	..	..	..	..	..	2	2	24,500	36 75
Washington Lodge...	"	..	..	..	..	..	1	1	6,667	10 00
St. Mary's Church...	"	1	..	..	..	..	..	1	51,135	76 68
Tremont-st. M. E. Church	"	..	1	..	..	..	..	1	17,586	26 36
South Cong'l Church.	"	..	..	..	..	..	2	2	13,041	19 54
First Univ. Church ..	"	..	..	..	..	..	1	1	24,159	36 23
Columbus-av. Univ. Church	"	..	1	..	..	..	..	1	14,245	21 34
Shawmut Cong'l Soc'y	"	..	..	1	..	..	..	1	34,510	51 76
Church of the Holy Redeemer.....	"	..	1	..	..	..	..	1	17,400	26 10
Church of the Messiah	"	..	..	..	..	..	1	1	51,900	77 85
St. Patrick's Church (1 mo.).....	"	..	..	..	..	..	1	1	6,100	9 15
Amount car'd forw'd	.....	..	..	..	..	..	..	..	140,564,476	$210,833 23

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	140,564,476	$210,833 23
Church of the Immaculate Conception	Organ	..	..	..	..	..	1	1	52,053	78 05
Clarendon-st. Baptist Church	"	..	..	..	..	..	1	1	10,601	15 90
Second Church Soc'y	"	..	..	..	..	..	1	1	9,653	14 48
St. James Church	"	..	..	..	..	..	1	1	15,800	23 70
Brattle-st. Church	"	..	..	..	..	..	1	1	Vacant.	
Mason & Hamlin	"	..	..	..	..	..	1	1	1,600	2 40
Boston Society New Jerusalem	"	..	..	..	..	..	1	1	11,093	16 63
Second Hawes Unit. Soc'y	"	1	..	..	..	..	..	1	16,221	24 31
Old South Church Society	"	..	..	..	..	..	1	1	27,672	41 48
Trinity Church Soc'y	"	..	..	..	..	..	2	2	75,000	112 50
German Catholic Ch.	"	..	..	..	..	..	1	1	32,500	48 75
Church of the Good Shepherd	"	..	..	..	..	..	1	1	12,500	18 75
Central Cong'l Soc'y.	"	..	..	..	..	..	1	1	11,000	16 50
J. R. Pierce	"	..	..	..	..	..	1	1	1,200	1 80
Bancroft & Dyer	Elevator	..	1	..	..	..	..	1	78,435	117 63
John L. Gardner	"	..	..	1	..	..	..	1	15,334	22 99
Job F. Bailey	"	..	1	..	..	..	..	1	82,159	123 22
Henry S. Hovey	"	..	..	1	..	..	..	1	4,320	6 47
E. Williams	"	..	..	..	..	..	1	1	12,300	18 45
Sidney Squires	"	..	1	..	..	..	..	1	70,696	106 02
M. D. Spaulding	"	..	..	..	..	..	1	1	7,763	11 63
G. G. Hall	"	..	..	1	..	..	..	1	50,060	75 08
S. S. Dunn	"	..	1	..	..	..	..	1	2,868	4 30
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	141,165,304	$211,734 27

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	141,165,304	$211,734 27
Joel Goldthwait & Co.	Elevator	1	..	..	..	..	..	1	9,662	14 48
Chickering & Sons...	"	..	..	..	..	..	4	4	194,930	292 39
Odd Fellows Building	"	..	..	..	..	..	1	1	21,600	32 40
Davis & Co.....	"	..	..	..	..	..	2	2	64,033	96 05
L. Beebe & Sons	"	..	..	..	..	..	1	1	54,800	82 20
A. J. Stearns.....	"	..	..	..	..	..	1	1	11,200	16 80
James Tucker & Co..	"	..	..	..	..	..	1	1	155,200	232 80
Clark & Warren	"	..	..	..	..	..	1	1	62,275	93 41
E. H. Sampson	"	..	..	..	..	..	1	1	82,600	123 90
Stone, Bills, & Whitney	"	..	..	..	..	..	2	2	63,300	94 95
J. C. Haynes.....	"	..	..	..	..	..	1	1	118,700	178 05
Lewis, Brown, & Co..	"	..	..	..	..	..	1	1	159,600	239 40
Claflin & Thayer.....	"	..	..	..	..	..	2	2	174,350	261 51
McConnell & Gardner	"	..	..	..	..	..	1	1	113,900	170 85
W. E. Putnam & Co..	"	..	..	..	..	..	1	1	120,800	181 20
Henry Bond & Co....	"	..	..	..	..	..	1	1	94,000	141 00
J. S. Stone.....	"	..	..	..	..	..	1	1	134,800	202 20
Dennison Manuf'g Co.	"	..	..	..	..	..	2	2	214,900	322 35
A. Low & Co.	"	..	..	..	..	..	1	1	188,000	282 00
Clement & Colburn ..	"	..	..	..	..	..	1	1	112,800	169 20
Rhodes & Co.....	"	..	..	..	..	..	1	1	211,400	317 10
Carey & Fulton.....	"	..	..	..	..	..	1	1	211,500	317 25
Henry A. Gould.....	"	..	..	..	..	..	1	1	170,380	255 56
John Cummings & Co.	"	..	..	..	..	..	1	1	148,200	222 30
Pope Manf'g Co.....	"	..	..	..	..	..	1	1	Vacant	
Mrs. H. W. Harris ..	"	..	..	..	..	..	1	1	54,900	82 35
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	144,113,134	$216,155 97

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	144,113,134	$216,155 97
Mrs. H. W. Harris ..	Elevator	..	..	..	..	..	1	1	Vacant.	
Hotel Westminster...	"	..	..	..	..	..	1	1	55,600	83 40
Hotel Warwick.....	"	..	..	..	..	..	1	1	115,240	172 85
Hotel Lyndeboro'....	"	..	..	..	..	..	1	1	271,335	406 99
Hotel Clifford	"	..	..	..	..	..	1	1	171,910	257 86
Hotel Berwick	"	..	..	..	..	..	2	2	339,210	508 81
Hotel Edinburgh	"	..	..	..	..	..	1	1	241,855	362 78
Emerson & White....	"	..	..	..	..	..	1	1	117,730	176 58
J. Montgomery Sears, 154 Tremont st. ...	"	..	..	..	..	..	2	2	128,800	193 19
Mrs. J. Longley.....	"	..	..	..	..	..	1	1	4,367	6 54
J. B. Kimball & Co...	"	..	..	..	..	..	1	1	114,000	171 00
Notman & Campbell..	"	..	..	..	..	..	1	1	41,500	62 25
Martin, Skinner, & Fay	"	..	..	..	..	..	1	1	139,400	209 10
Vinal, Pope, & Co....	"	..	..	..	..	..	1	1	107,800	161 70
A. Storrs & Co.....	"	..	..	..	..	..	1	1	70,180	105 26
Abram French & Co.	"	..	..	..	..	..	1	1	128,220	192 32
Talbot, Wilmarth, & Co.	"	..	..	..	..	..	1	1	101,900	152 85
Albert Metcalf.....	"	..	..	..	..	..	1	1	12,400	18 60
Edward Spaulding...	"	..	..	..	..	..	1	1	75,200	112 79
Withington & Hall...	"	..	..	..	..	..	1	1	55,200	82 80
Bragg, Conant, & Co.	"	..	..	..	..	..	2	2	47,570	71 35
Fairbanks & Brown..	"	..	..	..	..	..	1	1	137,993	206 99
Grosvenor & Richards	"	..	..	..	..	..	1	1	52,500	78 75
W. E. Underwood ...	"	..	..	..	..	..	6	6	66,210	99 30
George D. Howe	"	..	..	..	..	..	2	2	185,187	277 76
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	146,894,441	$220,327 79

Name.	Class.	5.8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	146,894,441	$220,327 79
Converse & Stanwood	Elevator	..	..	..	..	..	1	1	53,720	80 57
John F. Mills estate	"	..	..	..	..	..	1	1	305,540	458 30
Daniels, Badger, & Co.	"	..	..	..	..	..	1	1	89.100	133 65
Wright, Worster, & Delano	"	..	..	..	..	..	1	1	118,413	177 62
Hotel La Fayette	"	..	..	..	..	..	6	6	383,400	575 10
Hotel Baldwin	"	..	..	..	..	..	1	1	129,000	193 50
Doll & Richards	"	..	..	..	..	..	2	2	106,500	159 74
S. G. Allen	"	..	..	..	..	..	1	1	70,295	105 43
Thomas Groom	"	..	..	..	..	..	1	1	61,950	92 91
Monks & Co	"	..	..	..	..	..	2	2	430,611	645 89
Enoch Page	"	..	..	..	..	..	1	1	Not using.	
F. R. Sears	"	..	..	..	..	..	1	1	7,830	11 79
Lawrence Building	"	..	..	..	..	..	1	1	Not using.	
S. D. Warren	"	..	..	..	..	..	1	1	25,673	38 49
Howe Bros.	"	..	..	..	..	..	2	2	26,630	39 93
Dyer, Taylor, & Co.	"	..	..	..	..	..	6	6	188,098	282 13
Henry Bond, 249 Purchase st.	"	..	..	..	..	..	1	1	168,600	252 90
Henry Bond, 87 High st.	"	..	..	..	..	..	2	2	63,150	94 72
David Parker & Co. 151 Summer st.	"	..	..	..	..	..	2	2	31,267	46 90
J. Montgomery Sears, 12 Arlington st.	"	..	..	..	..	..	1	1	63,201	94 77
A. W. Stetson	"	..	..	..	..	..	1	1	4,717	7 06
H. A. Turner & Co.	"	..	..	..	..	..	2	2	72,200	108 30
R. M. Hodges	"	..	..	..	..	..	1	1	15,505	23 24
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	149,309,841	$223,950 73

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	149,309,841	$223,950 73
J. H. Wright	Elevator	..	..	..	..	..	1	1	Not using.	
H. & J. Pfaff	"	..	..	..	..	..	2	2	395,661	593 47
Hotel Comfort	"	..	..	..	..	..	6	6	66,468	99 69
Duffy, Cashman, & Co.	"	..	..	..	..	..	1	1	65,440	98 14
Jones, Cook & Co.	"	..	..	..	..	..	1	1	41,650	62 47
Moses Williams	"	..	..	..	..	..	2	2	365,645	548 44
A. L. Dickerman	"	..	..	..	..	..	2	2	63,588	95 36
Peter C. Brooks	"	..	..	..	..	..	1	1	71,300	106 95
Continental Block	"	..	..	..	..	..	1	1	50,780	76 16
Gardiner, Murphy, & Co.	"	..	..	..	..	..	1	1	55,000	82 50
Mrs. T. B. Williams	"	..	..	..	..	..	1	1	42,891	64 32
E. R. Mudge	"	..	..	..	..	..	1	1	9,880	14 82
Howard Nat'l Bank	"	..	..	..	..	..	2	2	473,833	710 75
Sidney Bartlett	"	..	..	..	..	..	1	1	8,110	12 15
Wendell, Fay, & Co.	"	..	..	..	..	..	1	1	78,000	117 00
Continental B. Build'g	"	..	..	..	..	..	1	1	251,560	377 33
C. D. Swain & Co.	"	..	..	..	..	..	1	1	31,030	46 54
J. A. & W. Bird	"	..	..	..	..	..	1	1	143,200	214 80
Rice, Kendall, & Co. (5 mos.)	"	..	..	..	..	..	1	1	73,121	109 67
Mrs. D. B. Green (3 mos.)	"	..	..	..	..	..	1	1	5,793	8 68
Geo. W. Chipman & Co. (3 mos.)	"	..	..	..	..	..	2	2	20,730	31 09
D. W. King (4 mos.)	"	..	..	..	..	..	1	1	1,398	2 09
Loring Paper & Twine Co. (3 mos.)	"	..	..	..	..	..	2	2	13,430	20 14
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	151,638,349	$227,443 29

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd..	.....	..	..	..	..	..	..	..	151,638,349	$227,443 29
Henry L. Daggett ...	Elevator	..	..	..	..	..	1	1	5,761	8 64
A. Wentworth	"	..	..	..	..	..	1	1	17,900	26 85
Atlantic Nat'l Bank..	"	..	..	..	..	..	1	1	234,440	351 64
R. E. Apthorp	"	..	..	..	..	..	1	1	596,840	895 25
O. Ditson & Co., 453 Washington st.....	"	..	..	..	..	..	2	2	941,950	1,412 92
Banfield, Forristall, & Co.	"	..	..	..	..	..	1	1	327,240	490 85
J. & J. Dobson.....	"	..	..	..	..	..	1	1	58,390	87 58
Robbins & Kellogg...	"	..	..	..	..	..	1	1	137,680	206 51
Houghton & Coolidge.	"	..	..	..	..	..	1	1	138,690	208 02
Horswell, Kingsley, & French	"	..	..	..	..	..	1	1	48,436	72 64
J. T. Bailey	"	..	..	..	..	..	1	1	4,089	6 12
Z. A. Willard	"	..	..	..	..	..	2	2	58,020	87 03
Minot, Hooper, & Co.	"	..	..	..	..	..	1	1	286,460	429 67
J. P. Paine	"	..	..	..	..	..	1	1	100,700	151 05
Miss C. D. Brewer ..	"	..	..	..	..	..	1	1	847	1 27
J. M. Beebe	"	..	..	..	..	..	1	1	3,780	5 66
John Holman	"	..	..	..	..	..	1	1	65,270	97 90
Paul & Co.....	"	..	..	..	..	..	2	2	7,200	10 80
Oliver Ditson & Co., 445 Washington st.	"	..	..	..	..	..	1	1	101,710	152 55
W. H. Slocum	"	..	..	..	..	..	2	2	293,250	439 87
Charles H. Ward	"	..	..	..	..	..	1	1	89,220	133 82
Doe & Hunnewell ...	"	..	..	..	..	..	2	2	161,950	242 92
J. Cottle.....	"	..	..	..	..	..	2	2	157,970	236 95
A. A. Lawrence	"	..	..	..	..	..	2	2	10,780	16 16
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	155,486,922	$233,215 96

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd ..	.....	..	..	..	..	..	..	..	155,486,922	$233,215 96
David Parker & Co., 147 South st.....	Elevator	..	..	..	..	..	2	2	136,460	204 68
Henry Woods	"	..	..	..	..	..	1	1	5,923	8 88
Mass. Charitable Mechanics Association	"	..	..	..	..	..	2	2	52,901	79 34
A. Bushby.....	"	..	..	..	..	..	1	1	20,406	30 59
Pratt, Warren, & Co.	"	..	..	..	..	..	2	2	35,070	52 59
Boston Cold Storage & Freezing Co.....	"	..	..	..	..	..	3	3	84,050	126 06
James L. Little.....	"	..	..	..	..	..	1	1	19,810	29 71
Levi Bolles	"	..	..	..	..	..	1	1	104,100	156 15
S. N. Brown, Jr., 119 Commonwealth ave.	"	..	..	..	..	..	1	1	6,655	9 98
A. P. Morse.....	"	..	..	..	..	..	1	1	68,675	103 00
Joseph Peabody	"	..	..	..	..	..	1	1	20,790	31 17
S. N. Brown, Jr., 1 Huntington ave....	"	..	..	..	..	..	1	1	4,293	6 42
F. O. White	Motor	..	..	..	..	..	1	1	10,200	15 30
E. N. Yerxa	"	..	..	..	..	..	1	1	18,300	27 45
L. W. & H. F. Morse.	"	..	..	..	..	..	1	1	5,200	7 80
Jacob Wirth	"	..	..	..	..	..	1	1	72,000	108 00
A. J. Knight	"	..	..	..	..	..	1	1	Not using.	
Cobb Bros.	"	..	..	..	..	..	1	1	34,900	52 35
W. E. Richards	"	..	..	..	..	..	1	1	16,400	24 60
Atlantic Tea Co.....	"	..	..	..	..	..	1	1	64,400	96 60
E. D. Bangs & Co. ..	"	..	..	..	..	..	1	1	172,500	258 75
B. F. Tyler.....	"	..	..	..	..	..	1	1	6,300	9 45
Naylor & Co.....	"	..	..	..	..	..	1	1	75,800	113 70
T. H. Foley.....	"	..	..	..	..	..	1	1	21,200	31 80
Amount car'd forw'd.	.....	..	..	..	..	..	..	..	156,543,255	$234,800 33

Name.	Class.	5-8 inch.	1 inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Cubic Feet.	Revenue.
Amount br't forw'd	.....	..	..	..	..	..	..	..	156,543,255	$234,800 33
Brokers' Board	Motor	..	..	..	..	..	1	1	11,400	17 10
J. H. Pierce & Co.	"	..	..	..	..	..	1	1	12,400	18 60
E. F. Wilder (6 mos.)	"	..	..	..	..	..	1	1	6,200	9 30
Lond. Tea Co. (5 mos.)	"	..	..	..	..	..	1	1	6,900	10 35
William Tufts (6 mos.)	"	..	..	..	..	..	1	1	74,320	111 48
John Lyons (6 mos.)	"	..	..	..	..	..	1	1	13,900	20 85
James O. Gray (4 mos.)	"	..	..	..	..	..	1	1	7,200	10 80
The German American Co.	"	..	..	..	..	..	4	4	23,500	35 25
Cobb, Bates, & Yerxa	"	..	..	..	..	..	1	1	5,300	7 95
Cedar Grove Cemet'y	Cemet'ry	..	..	..	1	..	..	1	138,220	103 66
Forest Hills Cemet'y.	"	..	..	..	1	..	..	1	425,720	319 28
Paul Knowles and others	Marine Watermen, as per contract	..	..	..	3	..	..	3	435,281	816 09
Total	.....	..	..	..	..	..	..	..	157,703,596	$236,281 04

Statement showing the number of houses, stores, steam-engines, etc., in the city of Boston, supplied with water to the 1st of January, 1881, with the amount of water-rates received for 1880: —

33,338	Dwelling-houses (51,212 families)	$491,318 71
28	Boarding-houses	1,387 25
1,554	Model houses (Tenements, 8,375)	39,282 93
11	Lodging-houses	308 00
18	Hotels	913 92
5,882	Stores and shops	65,125 16
507	Buildings	22,986 29
895	Offices	8,516 91
42	Public-halls	663 96
5	Theatres	157 67
29	Private schools	561 00
22	Asylums	1,530 00
7	Hospitals	301 50
63	Greenhouses	1,579 58
148	Churches	2,358 00
10	Market-houses	825 00
92	Cellars	654 00
210	Restaurants	6,179 87
884	Bars and saloons	14,611 57
15	Club-houses	343 33
32	Photographers	918 50
40	Packing-houses	1,459 50
1,934	Stables	14,491 60
53	Factories	1,887 00
5	Bleacheries	115 50
118	Bakeries	1,256 33
11	Freight-houses	239 38
5	Gasometers	79 00
2	Cemeteries	15 83
4	Bath-houses	65 00
4	Ship-yards	67 50
3	Dry-docks and engines	100 00
160	Shops and engines	8,818 98
17	Factories and engines	1,274 13
9	Printing and engines	802 43
2	Founderies and engines	136 50
2	Bakeries and engines	104 00
24	Stationary engines	2,388 10
10	Pumping-engines	92 50
62	Discharging and pile-driving engines	700 00
	Amount carried forward	$694,616 43

	Amount brought forward	$694,616 43
10	Armories	178 00
2,079	Hand-hose	11,975 00
11	Fountains	130 00
32	Tumbler-washers	480 00
104	Beer water-pressures	520 00
55	Laundries	1,451 51
8	Aquariums	65 00
17	Railroad stations	313 00
	Steam and tug-boats	9,174 52
11	Motors	60 00
1	Laboratory	50 00
2	Ice companies, washing ice	21 00
1	College	40 00
	Miscellaneous	195 92
	Jamaica Pond Aqueduct Company	943 41
	Street-sprinkling	1,684 61
	Building purposes	2,823 49
	Metered water (9 months)	175,875 64
1	Police-station	31 00
1	Police lockup	6 00
	Steamer "Protector"	100 00
45	Fire-engines, hose, and hook and ladder houses	990 00
7	Chemical engine-houses	105 00
3,969	Fire hydrants	71,442 00
129	Reservoirs	2,322 00
	Steamer "W. M. Flanders"	170 00
	Repair shop	35 00
	Public schools	3,796 00
	Paving Department	423 75
	Internal Health Department	1,540 00
	Common Sewer Department	200 00
	Lamp Department	42 25
	Committee on Common and Squares	385 00
	Committee on Bridges	82 00
	District Court-house	49 50
	Branch libraries	76 50
	Directors of Public Institutions	263 00
	Mount Hope Cemetery	45 02
	Steamer "J. P. Bradlee"	200 00
	Steamer "Samuel Little"	100 00
		$983,001 55

The following table exhibits the yearly increase of water-takers since January 1, 1850 : —

					Takers.	Increase.
From January 1,	1850,	to January 1,	1851,		13,463	
" "	1851,	"	1852,		16,076	2,613
" "	1852,	"	1853,		16,862	786
" "	1853,	"	1854,		18,110	1,308
" "	1854,	"	1855,		19,193	1,023
" "	1855,	"	1856,		19,998	805
" "	1856,	"	1857,		20,806	808
" "	1857,	"	1858,		21,602	796
" "	1858,	"	1859,		22,414	812
" "	1859,	"	1860,		23,271	857
" "	1860,	"	1861,		24,316	1,045
" "	1861,	"	1862,		25,486	1,170
" "	1862,	"	1863,		26,289	803
" "	1863,	"	1864,		26,851	562
" "	1864,	"	1865,		27,046	195
" "	1865,	"	1866,		27,489	443
" "	1866,	"	1867,		27,754	265
" "	1867,	"	1868,		28,104	350
" "	1868,	"	1869,		29,738	1,634
" "	1869,	"	1870,		31,500	1,762
" "	1870,	"	1871,		36,132	4,632
" "	1871,	"	1872,		38,716	2,584
" "	1872,	"	1873,		40,688	1,972
" "	1873,	"	1874,		42,345	1,657
" "	1874,	"	1875,		44,676	2,331
" "	1875,	"	1876,		46,885	2,209
" "	1876,	"	1877,		48,328	1,443
" "	1877,	"	1878,		49,970	1,642
" "	1878,	"	1879,		51,523	1,553
" "	1879,	"	1880,		52,268	745
" "	1880,	"	1881,		53,254	986

The following table exhibits the yearly revenue from the sale of Cochituate water since its introduction into the city, October 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
Amount carried forward					$512,276 29

Amount brought forward				$512,276 29
From January 1,	1853, to January 1,		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 .	862,704 08
" "	1873, "		1874 .	917,415 92
" "	1874, "		1875 .	977,020 48
" "	1875, "		1876 .	1,005,120 94
" "	1876, "		1877 .	1,029,643 70
" "	1877, "		1878 .	1,015,562 89
" "	1878, "		1879 .	1,010,584 30
" "	1879, "		1880 .	1,025,803 14
" "	1880, "		1881 .	1,039,896 17
" "	1881, to May 1,		1881 .	826,881 85
				$18,084,093 36

DRINKING–FOUNTAINS.[1]

There are fifty-three drinking-fountains established within the city limits: —

City Proper.

* Boston Common (6).
North square.
Washington street, near Elm.
" " opposite Blackstone square.
Atlantic avenue, junction Commercial street.
" " head of Rowe's wharf.

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

Atlantic Avenue, near N. Y. & N. E. R.R. freight-house.
Haymarket square.
Causeway street, at Boston and Lowell R.R. depot.
" " junction Merrimac street.
Charles street, opposite the Jail.
" " between Boylston and Beacon streets.
" " near Boylston street.
Beacon street, near Charles street.
Tremont street, near Clarendon street.
Albany street, opposite Water-works, pipe-yard.
Mt. Washington avenue, near the drawbridge.

East Boston.

Maverick square.
Central square.
Bennington street, junction Chelsea street.

South Boston.

Foundry street, opposite First street.
Fourth street, near Foundry street.
" " junction Emerson street.
" " corner of Q street.
Telegraph Hill.
Sixth street, near P street.
Washington Village, junction Dorchester avenue and Dorchester street.

Roxbury.

Albany street, junction Dearborn street.
Beacon street, junction Brookline avenue.
* Eliot square.
Eustis street, near Washington street.
Heath street, near Tremont street.
Pynchon street, near Roxbury street.
Tremont street, junction Cabot street.

West Roxbury.

Centre street, junction Day and Perkins street.
Centre and LaGrange streets, West Roxbury village.
Morton street, junction South street.
Roslindale, Taft's Hotel.
Washington street, near Williams street.

Dorchester.

Commercial street, opposite Beach street.
Neponset avenue, corner Walnut street.

Upham's Corner.
Glover's Corner.
Grove Hall.

Brighton.

Barry's Corner.
Market street, Cattle-fair Hotel.
Union square.
Western avenue, Charles-river Hotel.

There are nineteen stand-pipes now located for street-sprinkling purposes, as follows: —

Tremont street and Hammond park.
Clay street, corner Tremont street.
Eliot square.
Brookline avenue, corner Longwood avenue.
St. James street, corner Warren street.
Blue Hill avenue, between Waverley and Clifford streets.
Warren street, corner Gaston street.
Egleston square, corner Walnut avenue.
Dale street, opposite Harvard avenue.
Upham's Corner.
Field's Corner.
Dorchester avenue, near Savin Hill avenue.
Dorchester avenue, at Old Boston line.
Beach street, Harrison square.
Union square, Brighton.
Washington street, corner Winship street, Brighton.
Chestnut Hill avenue, corner of South street.
Dudley street, opposite Harvard avenue.
Paris street, corner of Meridian street.

Statement showing the Number and Kind of Water Fixtures contained within the Premises of Water-takers in the City of Boston, January 1, 1881, as compared with previous years.

1878.	1879.	1880.	
8,716	8,900	9,228	Taps. These have no connection with any drain or sewer.
81,842	84,138	84,498	Sinks.
43,044	46,034	46,116	Wash-hand basins.
15,121	15,751	16,623	Bathing-tubs.
24,956	26,142	27,535	Pan water-closets.
777	726	349	Hopper water-closets.
22,006	22,855	23,563	" " automatic.
619	622	583	" " waste.
1,478	1,386	1,069	Urinals.
2,226	2,450	2,972	" automatic.
17,517	18,406	19,139	Wash-tubs. These are permanently attached to the building.
534	590	607	Shower-baths.
237	211	197	Private hydrants.
853	1,004	956	Slop-hoppers.
125	138	139	Foot-baths.
220,051	229,353	233,574	

Respectfully submitted,

WM. F. DAVIS,
Water Registrar.

REPORT OF THE MYSTIC WATER REGISTRAR FOR THE YEAR 1880-81.

OFFICE OF THE MYSTIC WATER REGISTRAR,
BOSTON, CHARLESTOWN DISTRICT, May 1, 1881.

LEONARD R. CUTTER, Esq.,
Chairman Boston Water Board: —

SIR, — I herewith present the Annual Report of the Mystic Water Registrar, for the year ending April 30, 1881.

The total number of water-takers now entered for the year 1881, is 16,427, distributed as follows: Charlestown District, 6,164; Chelsea, 4,748; Somerville, 4,683; Everett, 832.

The total amount of water-rates received from May 1, 1880, to May 1, 1881, is as follows: —

Charlestown District		$102,823 90
Chelsea		55,205 98
Somerville		59,664 88
Everett		8,297 71
		$225,992 47
The amount paid the cities of Chelsea, Somerville and town of Everett, as per contract, is	$26,695 28	
The amount received for water used in previous years is .	9,646 14	
The net receipts for water furnished during the year are .	189,651 05	
		$225,992 47
In addition to the above amount there has been received for labor and material furnished for work outside this department, but connected with the Water Works, the sum of .	$769 77	
Fines, non-payment . . .	368 00	
Fees, summons . . .	260 75	
Off and on water for repairs .	123 00	
		1,521 52
Total amount received during the year .		$227,513 99

The expenses of the office during the year ending April 30, 1881, including all charges for collection in Chelsea, Somerville, and Everett, were $7,436.86.

Table showing the number of places turned off for non-payment of rates during the year 1880, the number turned on again, and the number still remaining off.

	Number turned off.	Number turned on.	Number remaining off.
Charlestown District	75	68	7
Chelsea	114	96	18
Somerville	65	55	10
Everett	17	12	5
Total	271	231	40

STAND-PIPES FOR STREET WATERING.

The whole number in use in this department is 32, distributed as follows: —

Charlestown District.

Cambridge street, near Stickney & Poor's factory.
" " railroad.
Rutherford avenue, near City stables.
" " Allen street.
South Eden street, " Main street.
Prescott " " Harvard School building.
Monument square, " Laurel street.

Chelsea.

Cary square, corner Forsyth street.
Broadway, near Stockton street.
" " Cary avenue.

Somerville.

Washington street, corner Boston street.
" " Myrtle street.
" near Union square.
Summer street, " Elm street.
" " Laurel street.

Somerville avenue, near Poplar street.
" " Cambridge line.
" " Merriam street.
" " Mossland street.
Broadway, " Franklin street.
" opposite Public park.
School street, near Somerville avenue.
Spring street, " "
Beacon street, " Cooney street.
Pinckney street, " Pearl street.
Pearl street, " Cross street.
Thurston street, " Broadway.
Highland avenue, corner Medford street.

Everett.

Broadway, near Engine-house.
" " Pleasant street.
" " Chandler's.
Main street, " Chelsea street.

Drinking-Fountains.

The whole number in use in this department is 21, distributed as follows: —

Charlestown District.

City square, corner Park street.
Chelsea street, " Wapping street.
Bunker Hill street, corner Tufts street.
Canal street, " South Eden street.
Main street, " Hancock square.
" near Tufts wharf.
Austin street, opposite Front street.

Chelsea.

Broadway square.
" near bridge.
Winnisimmet street, near Ferry.
Pearl street, corner Marginal street.
Eastern avenue, corner Crescent avenue.

Somerville.

Union square (2).
Broadway, corner Walnut street.

Highland avenue, corner Walnut street.
Medford street, " Central street.
Davis square (2).
Broadway, opposite Public Park.

Everett.

Main street, junction Broadway.

One of the fountains in Union square, one at the corner of Highland avenue and Walnut street, one at Davis square, Somerville, and one on Broadway, near the bridge, Chelsea, have automatic fixtures regulating the water supply. The others are so arranged that the water flows continuously.

Table showing the Number and Size of Meters, also the Number of Motors in the Mystic Water Department.

	Size of Meters.								
	$\frac{5}{8}$ inch.	$\frac{3}{4}$ inch.	1 inch.	$1\frac{1}{2}$ inch.	2 inch.	3 inch.	4 inch.	Motors.	Total.
Charlestown District . .	41	1	24	2	20	3	3	2	96
Chelsea . .	23	4	11	. . . .	6	1	. . . .	2	47
Somerville .	10	2	9	1	5	. . . .	2	2	31
Everett . .	. . . .	1	4	. . . .	2	. . . .	. . . .	. . . .	7
Total . . .	74	8	48	3	33	4	5	6	181

Table showing the Number of Dwelling-Houses, Stores, etc., supplied with Mystic-Pond Water.

	Dwelling-Houses.	Families.	Stores and Saloons.	Manufactories.	Offices, Halls, and Clubs.	Churches.	Stables.	Public Schools.	Fire Hydrants.	Miscellaneous.
Charlestown District	4,802	8,236	527	82	128	14	414	101	237	96
Chelsea	3,782	4,928	322	58	71	13	378	69	137	55
Somerville	3,646	4,972	163	23	32	13	667	82	278	57
Everett	623	711	19	10	8	1	145	10	68	16
Total	12,853	18,847	1,031	173	239	41	1,604	262	720	224

Table showing the Number and Kind of Water Fixtures contained within the Premises of Water-takers.

	Taps.	Sinks.	Wash-hand Basins.	Bath-Tubs.	Water Closets.						Urinals.	Wash-Tubs.	Hand Hose.	Private Hydrants.
					Pan.	Self-acting.	Hoppers.	Waste.	Automatic.	Slop-Hoppers.				
Charlestown District	1,449	9,937	1,830	836	1,462	2,591	45	39	122	15	85	791	301	33
Chelsea	811	6,230	1,373	853	1,221	1,529	10	32	67	3	51	515	285	12
Somerville	1,227	5,929	1,498	1,109	1,360	1,331	41	45	21	5	80	635	534	11
Everett	251	789	121	90	96	36	1	1	1	.....	5	49	125	3
Total	3,738	22,885	4,822	2,888	4,139	5,487	97	117	211	23	221	1,990	1,245	59

METER STATEMENT.

The following Table exhibits the Class of Premises to which Meters are attached, together with the Amount of Revenue received during the Year 1880.

Name.	Class.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Gallons.	Revenue.
CHARLESTOWN DISTRICT.												
United States of America	Navy Yard	..	..	..	..	..	..	2	..	2	26,408,325	$5,281 66
United States of America	Marine Barracks	..	..	..	..	..	1	..	..	1	2,739,000	547 80
Wilkesbarre Coal Co.	Hoisting Engines	..	..	..	1	..	..	..	..	1	608,775	121 75
Boston & Maine Railroad Co.		1	..	1	..	1	2	..	..	5	25,352,456	5,070 49
Eastern Railroad Co.		1	..	1	..	6	..	..	..	8	25,070,821	5,014 16
Fitchburg Railroad Co.		3	..	..	..	3	..	..	..	6	28,708,066	5,741 61
Boston, Lowell, & Nashua Railroad Co.	Elevator	1	..	..	..	1	..	..	..	2	1,184,063	236 81
Charlestown Gas Co.	Gas Works	2	..	..	..	1	..	..	..	3	1,478,490	295 69
William T. Van Nostrand & Co.	Brewery	..	..	..	..	1	..	..	..	1	4,807,658	961 53
Waverley House	Hotel	..	..	3	..	..	..	..	..	3	1,292,557	258 51
J. T. Hicks	Hall	..	..	1	..	..	..	..	..	1	105,226	21 04
Chapin, Trull & Co.	Distillery	..	..	1	..	..	..	..	..	1	1,234,620	246 93
Prescott School		..	..	..	1	..	..	..	..	1	610,725	122 14
Oriental Oil Co.	Oil Works	..	..	1	..	..	..	..	..	1	1,239,045	247 80

Bunker Hill School	Primary	..	..	1	..	..	..	..	..	1	604,718			120 94	
Thomas Cunningham	Boiler Maker	..	..	2	..	..	..	..	..	2	1,337,055			267 42	
Hallowell Granite Co.	Granite Works	..	..	1	..	..	..	..	..	1	585,271			117 05	
Hubbard & Blake	Tannery	1	..	..	..	1	..	..	..	2	2,839,943			567 98	
Tudor Company	Factory	1	..	..	..	..	..	..	..	1	5,775			1 15	
Tucker Manufacturing Company	"	..	..	..	..	..	..	1	..	1	3,403,500			680 69	
American Wood Preserving Co.	"	..	..	..	..	1	..	..	..	1	555,750			111 15	
Geo. H. Buxton	Stable	1	..	..	..	..	..	..	..	1	137,304			27 46	
M. Rogan	Hoisting Engines	1	..	1	..	1	..	..	..	3	642,781			128 55	
George E. Rogers	Stable	1	..	..	..	..	..	..	..	1	221,363			44 27	
Edmands & Co.	Cement Pipe Works	..	..	1	..	..	..	..	..	1	174,841			34 97	
D. H. Pattee & Co.	Factory	1	..	..	..	..	..	..	..	1	85,530			17 10	
St. Francis de Sales Church	Organ	..	..	..	..	..	..	..	1	1	300,750			60 15	
Davidson Rubber Co.	Factory	..	..	1	..	..	..	..	..	1	1,645,875			329 17	
Kennan, French & Co.	"	..	..	1	..	..	..	..	..	1	1,395,525			279 10	
Merchants' Tobacco Company	"	1	..	..	..	1	..	..	..	2	905,298			181 05	
C. G. McIntosh	Wool Washing	..	1	..	..	..	..	..	..	1	352,523			70 50	
Samuel W. Brown Manufacturing Company	Factory	1	..	..	..	..	..	..	..	1	171,090			34 21	
Wemyss Bros.	"	..	..	1	..	..	..	..	..	1	589,153			117 83	
Stickney & Poor	"	1	..	..	..	..	..	..	..	1	376,523			75 30	
George S. Hall	Currier	1	..	..	..	..	..	..	..	1	170,160			34 03	
Amount carried forward		..	..	..	..	..	..	..	..	..	137,340,555	.....		$27,467 99	.....

METER STATEMENT. — *Continued.*

Name.	Class.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Gallons.	Revenue.
Amount brought forward		..	..	..	..	..	..	..	..	..	137,340,555	$27,467 99
CHARLESTOWN DISTRICT. — *Continued.*												
Owen Callahan	Currier	1	..	..	..	..	..	..	..	1	154,646	30 93
F. C. Sewall	Factory	1	..	..	..	..	..	..	..	1	62,911	12 58
Merriam & Norton	"	1	..	..	..	..	..	..	..	1	67,365	13 47
Nathaniel Tufts	"	1	..	..	..	..	..	..	..	1	111,331	22 26
Robert Webb & Co.	"	1	..	..	..	..	..	..	..	1	56,341	11 26
Foundry Supply Co.	"	1	..	..	..	..	..	..	..	1	108,113	21 62
Anthony Waterman	Mill	..	..	1	..	..	..	..	..	1	1,411,238	282 25
Page & Littlefield	"	..	..	1	..	..	..	..	..	1	589,208	117 84
Powers, Melvin, & Co.	Grain Mill	..	..	1	..	..	..	..	..	1	1,378,268	275 65
Middlesex Railroad Co.	Stable	3	..	..	..	2	..	..	..	5	2,044,366	408 87
John P. Barnard	"	..	..	1	..	..	..	..	..	1	905,371	181 07
Wm. S. & Geo. O. Wiley	"	..	..	1	..	..	..	..	..	1	511,651	102 33
Wm. S. & Geo. O. Wiley	"	1	..	..	..	..	..	..	..	1	332,558	66 51
T. J. Priest	"	2	..	..	..	..	..	..	..	2	478,133	95 62
Union Club Stable	"	1	..	..	..	..	..	..	..	1	289,870	57 97

Boston Ice Company	Stable	1	..	..	..	..	..	..	..	1	130,898		26 18		
George W. Maynard	"	1	..	..	..	..	..	..	..	1	179,556		35 91		
Jesse Rideout	"	1	..	..	..	..	..	..	..	1	240,083		48 01		
N. Y. Brintnall	"	2	..	..	..	..	..	..	..	2	174,983		34 99		
H. T. Meserve	Boarding	1	..	..	..	..	..	..	..	1	87,978		17 59		
J. V. N. Stults	"	1	..	.	..	..	..	..	..	1	169,733		33 95		
Cook, Rymes, & Co	Machinists	..	..	1	..	..	..	..	..	1	789,630		157 93		
Johnson & Young	Lobster Boiler	1	..	..	..	..	..	..	..	1	305,618		61 12		
Union Methodist Church	Organ	1	..	..	..	..	..	..	1	2	86,168		17 23		
Joseph Gahm	Beer Factory	..	..	1	..	..	..	..	..	1	76,620		15 32		
Sebastian Gahm	Restaurant	1	..	..	..	..	..	..	..	1	154,626		30 92		
J. C. Nichols	Storehouse & Wharf	..	..	..	..	1	..	..	..	1	161,078	148,398,896	32 21		$29,679 58
CHELSEA SUPPLY.															
United States of America	Marine Hospital	..	..	..	..	1	..	..	..	1	1,099,350		219 87		
United States of America	Naval Hospital	..	..	..	..	1	..	..	..	1	1,105,650		221 13		
City Hotel	Hotel	1	..	..	..	..	..	..	..	1	530,430		106 08		
Chelsea Gas Light Co	Gas Works	1	..	1	..	..	..	..	..	2	342,163		68 43		
E. E. Sibley, Agent	Laundry	..	..	..	..	1	..	..	..	1	4,154,255		830 85		
Charles A. Campbell	Wharf & Stable	1	..	..	..	1	..	..	..	2	528,620		105 72		
Eastern Railroad	Station	..	..	1	..	..	..	..	..	1	293,403		58 68		
Boston Elastic Fabric Co.	Rubber Works	1	..	..	..	1	..	..	..	2	4,008,500		801 70		
Amount carried forward		..	..	..	..	..	..	..	..	..	12,062,371	148,398,896	$2,412 46		$29,679 58

METER STATEMENT. — *Continued.*

Name.	Class.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Gallons.		Revenue.	
Amount brought forward		..	.	..	..	..	..	..	..	..	12,062,371	148,398,896	$2,412 46	$29,679 58
CHELSEA SUPPLY. — *Continued.*														
P. F. McDonough	Currier	..	..	1	..	..	..	..	..	1	706,306		141 26	
Thomas L. Appleton	Factory	1	..	..	..	.	..	..	..	1	580,036		116 00	
Henry Sawyer	"	1	..	..	..	..	..	..	..	1	36,383		7 28	
J. W. Stickney	"	1	..	..	..	..	..	..	..	1	191,918		38 38	
Thomas Marlin & Bro.	Rubber Works	1	1	..	..	..	..	..	..	2	221,265		44 25	
C. F. Austin & Co.	Bakery	1	..	..	..	..	..	..	..	1	65,558		13 11	
John Follis	Currier	..	1	..	..	..	..	..	..	1	45,503		9 10	
R. Holman & Co	Factory	1	..	..	..	..	..	..	..	1	581,296		116 25	
Thomas Cunningham	"	1	..	..	..	..	..	..	..	1	427,793		85 55	
J. B. Alley & Co	Tannery	..	..	1	..	..	..	..	..	1	1,204,586		240 91	
C. W. Killam	Factory	1	..	..	..	..	..	..	..	1	35,250		7 05	
L. L. Pease	Stable	1	..	..	..	..	..	..	..	1	333,698		66 74	
John W. Bartlett	"	1	..	..	..	..	..	..	..	1	211,651		42 33	
Lynn & Boston Railroad Company	"	..	..	2	..	..	..	..	..	2	956,200		191 24	
George Dyer	"	1	..	..	..	..	..	..	..	1	201,253		40 25	

Union Park Stable	Stable	1	..	..	..	..	..	..	1	203,836		40 77		
J. A. Tutien	"	1	..	..	..	..	..	..	1	149,150		29 83		
Daniel Curry & Co	Oil Works	1	..	1	..	..	..	..	2	282,218		56 44		
Chapman & Soden	Factory	1	..	..	..	..	..	..	1	53,295		10 66		
J. H. Wilkinson	Building	..	..	1	..	..	..	..	1	472,546		94 51		
Bisbee Iron Foundry	Foundry	..	..	1	..	..	..	..	1	207,001		41 40		
Boston Rubber Co.	Factory	..	..	1	..	..	..	..	1	1,732,433		346 48		
J. J. White	Currier	..	1	..	..	..	..	..	1	73,298		14 66		
H. W. Ladd	Factory	1	..	..	..	..	..	..	1	118,718		23 74		
Cobb, Bates, & Yerxa	Store	..	..	..	..	..	..	1	1	117,750		23 55		
George B. Guild & Co	"	..	..	..	..	..	..	1	1	70,500		14 10		
Samuel Cabot, Jr	Ammonia Works	1	..	..	..	..	..	..	1	209,550		41 91		
George E. Downes	Salt Works	1	..	..	..	..	..	..	1	248,288		49 66		
Magee Furnace Co	Foundry	..	..	1	..	1	..	..	2	2,032,485		406 49		
Winnisimmet Ferry Co		..	..	..	..	..	1	..	1	3,384,400		676 88		
P. McCullough	Tannery	1	..	..	..	..	..	..	1	274,238		54 84		
Hawthorn School		..	1	..	..	..	..	..	1	199,605	27,690,378	39 92		5,538 00
SOMERVILLE SUPPLY.														
W. K. Lewis Bros.	Pickles	1	..	1	..	..	..	..	2	874,396		$174 87		
Skilton, Foot, & Co.	"	1	..	..	..	..	..	..	1	671,198		134 23		
Thomas Emerson	"	..	..	1	..	..	..	..	1	849,012		169 80		
Amount carried forward		..	..	..	..	..	..	..	..	2,394,606	176,089,274	$478 90		$35,217 58

METER STATEMENT. — *Continued.*

Name.	Class.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	3 inch.	4 inch.	Indicator.	Total.	Gallons.		Revenue.	
Amount brought forward		..	..	..	..	..	..	..	..	..	2,394,606	176,089,274	$478 90	$35,217 58
SOMERVILLE SUPPLY. — *Continued.*														
Amos Haynes	Vinegar Works	3	..	..	..	..	..	..	..	3	603,389		120 68	
W. A. Sanborn & Co	Brick Yard	1	..	..	..	..	..	..	..	1	299,468		59 89	
Reitenbach Bros. & Mink	Factory	..	..	1	..	..	..	..	..	1	506,836		101 37	
Chas. H. North & Co.	Slaughter House	..	..	..	..	..	..	1	..	1	9,526,411		1,905 28	
J. J. Clapp & Co.	Grain Mill	..	1	..	..	..	..	..	..	1	50,835		10 16	
Sylvester & Co.	Spike Foundry	..	..	1	..	..	..	..	..	1	490,508		98 10	
Union Hall Building Co.	Building	..	..	1	..	..	..	..	..	1	192,600		38 52	
Union Horse Railway	Stables	1	..	1	..	..	..	..	..	2	378,698		75 74	
J. H. Ferris	Saloon	..	..	..	..	..	..	..	1	1	237,000		47 40	
American Tube Works		..	..	1	..	1	..	..	..	2	3,226,846		645 36	
Geo. W. Wyatt & Co.	Brick Yard	1	..	..	..	..	..	..	..	1	161,588		32 32	
High School		..	..	..	..	1	..	..	..	1	413,625		82 72	
Foster School		..	..	..	..	1	..	..	..	1	444,773		88 95	
Luther V. Bell School		..	..	..	..	1	..	..	..	1	195,750		39 15	
Middlesex Bleachery		..	..	..	..	..	..	1	..	1	3,733,900		746 78	

Somerville Flour Mills	Grain Mill	..	..	1	..	..	..	..	1	344,754		68 95		
Fitchburg Railroad Co.	Paint Shop	1	..	..	..	..	..	..	1	257,800		51 57		
H. A. Pratt	Stable	1	..	..	..	..	..	..	1	328,600		65 72		
J. P. Squires & Co.	Slaughter-House	..	..	..	..	1	..	..	1	221,475		44 29		
Central Savings Bank	Building	..	..	1	..	..	..	..	1	288,548		57 70		
Prescott School		..	..	..	1	..	..	..	1	530,175				
Somerville Journal	Printing Office	..	..	..	..	..	..	1	1	369,000		73 80		
Dr. T. A. Paine	Steam Shovel	..	..	1	..	..	..	..	1	601,603		120 32		
											25,798,788			$5,159 70
EVERETT SUPPLY.														
A. Cochrane & Co.	Chemical Works	..	..	2	..	1	..	..	3	4,493,321		$898 66		
David Washburn	Brick Yard	..	..	1	..	1	..	..	2	722,310		144 46		
E. B. Spaulding	"	..	..	1	..	..	..	..	1	69,390		13 88		
George A. Sammett	Greenhouse, etc.	..	1	..	..	..	..	..	1	214,908		42 88		
											5,499,929			1,099 88
Total		..	..	..	..	..	..	..	..		207,387,991			$41,477 16

Statement showing the amount of water-rates received since the introduction of Mystic-pond water, November 29, 1864. Also the amount paid the several districts supplied under existing contracts: —

	Amount received.	Paid under Contract.	Net amount.	Total amount received.	Total amount paid under contract.	Net amount to Mystic Water Works.
Charlestown, 1865	$27,045 10		$27,045 10			
" 1866	47,247 16		47,247 16			
" 1867	60,188 83		60,188 83			
" 1868	68,815 32		68,815 32			
" 1869	74,369 81		74,369 81			
" 1870	82,230 79		82,230 79			
" 1871	87,259 70		87,259 70			
" 1872	97,727 36		97,727 36			
" 1873	99,455 66		99,455 66			
" 1874	111,420 30		111,420 30			
" 1875	118,568 00		118,568 00			
" 1876	116,271 17		116,271 17			
" 1877	109,963 25		109,963 25			
" 1878	104,174 76		104,174 76			
" 1879	98,313 88		98,313 88			
" 1880	102,590 50		102,590 50			
" May 1, 1881	74,874 99		74,874 99			
				$1,480,516 58		$1,480,516 58
East Boston, 1870	$54,885 28	$15,015 06	$39,870 22			
" 1871	63,371 71	18,348 73	45,022 98			
" 1872	70,957 40	21,383 02	49,574 38			
" 1873	77,480 79	23,992 38	53,488 41			
" 1874	77,776 91	24,122 83	53,654 08			
" 1875	70,256 26	21,102 53	49,153 73			
" 1876	72,046 78	21,818 74	50,228 04			
" 1877	66,637 43	19,655 03	46,982 40			
" 1878	65,088 96	16,535 63	48,553 33			
" 1879	56,165 94	32,139 10	24,026 84			
" 1880	50,973 39	10,889 36	40,084 03			
				725,640 85	255,002 41	500,638 44
Amount carried forward			. . . . .	$2,206,157 43	$225,002 41	$1,981,155 02

	Amount received.	Paid under contract.	Net amount.	Total amount received.	Total amount paid under contract	Net amount to Mystic Water Works.
Amount brought forward	. . . . .	. . . . .		$2,206,157 43	$225,002 41	$1,981,155 02
Chelsea, 1868 (6 mos.)	$3,632 80	$544 92	$3,087 88			
" 1868–69	19,548 14	2,932 22	16,615 92			
" 1869–70	26,474 26	4,294 85	22,179 41			
" 1870–71	31,161 56	5,290 39	25,871 17			
" 1871–72	38,714 16	7,178 54	31,535 62			
" 1872–73	42,239 50	8,171 85	34,067 65			
" 1873–74	45,169 46	9,050 85	36,118 61			
" 1874–75	50,644 51	10,757 90	39,886 61			
" 1875–76	50,934 20	10,873 66	40,060 54			
" 1876–77	49,893 35	10,468 02	39,425 33			
" 1877–78	49,496 59	10,348 99	39,147 60			
" 1878–79	50,368 45	10,647 79	39,720 66			
" 1879–80	51,785 24	11,214 09	40,571 15			
" May 1, 1881	53,462 31	11,884 92	41,577 39			
				563,524 53	113,658 99	449,865 54
Somerville, 1869 (6 mos.)	$6,572 62	$985 89	$5,586 73			
" 1870	13,189 89	1,978 49	11,211 40			
" 1871	20,029 68	3,005 94	17,023 74			
" 1872	25,275 13	4,055 02	21,220 11			
" 1873	30,930 81	5,232 70	25,698 11			
" 1874	37,325 96	6,831 48	30,494 48			
" 1875	47,912 43	9,873 73	38,038 70			
" 1876	49,743 55	10,423 08	39,320 47			
" 1877	49,873 19	10,461 97	39,411 22			
" 1878	53,581 31	11,932 52	41,648 79			
" 1879	54,329 13	12,231 65	42,097 48			
" 1880	56,988 65	13,295 45	43,693 20			
" May 1, 1881	51,029 38	10,911 75	40,117 63			
				496,781 73	101,219 67	395,562 06
Amount carried forward	. . . . .	. . . . .		$3,266,463 69	$439,881 07	$2,826,582 62

	Amount received.	Paid under contract.	Net amount.	Total amount received.	Total amount paid under contract.	Net amount to Mystic Water Works.
Amount brought forward	. . . . .	. . . . .		$3,266,463 69	$439,881 07	$2,826,582 62
Everett, 1872-73	$3,603 34	$540 51	$3,062 83			
" 1873-74	4,365 84	654 88	3,710 96			
" 1874-75	4,677 58	701 63	3,975 95			
" 1875-76	5,861 80	879 28	4,982 52			
" 1876-77	6,548 38	982 26	5,566 12			
" 1877-78	7,401 99	1,110 29	6,291 70			
" 1878-79	7,429 06	1,114 36	6,314 70			
" 1879-80	7,642 05	1,146 33	6,495 72			
" May 1, 1881	7,934 30	1,190 14	6,744 16			
				55,464 34	8,319 68	47,144 66
Total to May 1, 1881 . . .	. . . . .	. . . . .		$3,321,928 03	$448,200 75	$2,873,727 28

The water-supply for the East Boston district having been transferred from the Mystic to the Cochituate Department, causes a falling off in the total amount of revenue received, the number of water-takers, fixtures, etc., as compared with the previous year.

The water-rates received from the remaining districts show an increase of eleven thousand four hundred and fifty-three dollars ($11,453).

Yours respectfully,

JOSEPH H. CALDWELL,
Mystic Water Registrar.

REPORT OF THE SUPERINTENDENT OF THE WESTERN DIVISION, 1880–81.

CHESTNUT HILL RESERVOIR, May 1, 1881.

LEONARD R. CUTTER, Esq., *Chairman Boston Water Board:*—

SIR, — In compliance with a rule of the Board, I submit herewith the annual report of this Division for the past official year.

SUDBURY RIVER BASINS.

These basins were placed in my charge on Oct. 15th. During the summer a vegetable plant called the Anaboema had developed in Basins 1 and 3, rendering their water somewhat objectionable; but as the season was one of unusual drought, and Basin 2 had already been exhausted, there was no alternative but to draw from Basin 3, that being the least affected of the two basins. It was found that during the passage of the water through Farm pond the vegetable matter was somewhat decreased in amount. The water in Basin 2 has been excellent in quality, and from this source the city has been mostly supplied.

BASIN 1.

The water from this basin has been used but for three days, from January 20th to January 23d, at which time the vegetable growth had almost entirely disappeared. It has been kept practically full during the whole year, the lowest point reached being 6.85 feet below high-water mark, or grade 154.15, and the highest 159.66, when the spring freshets were passing over the dam.

The gate-house and dam are in excellent condition. Some experiments have recently been made to ascertain the exact coefficient of flow for each flood-gate, and indices have been placed in connection with the screws of the gates to determine their exact opening when raised for the passage of water. Water has been wasted into the river from Feb. 13th to the present time in varying quantities, sometimes reaching nearly a billion of gallons in twenty-four hours.

BASIN 2.

The water in this basin was drawn down to grade 157.04 during the summer. On November 2d, it having filled to

163.67, it was used for the supply of the city, and has continued to furnish water for this purpose, with slight interruption for purposes of repairs, during the rest of the year. The lowest elevation has been 155.32; the highest 167.44. During the winter a substantial boat-house was built on the shore, near the gate-house. Some old houses have been removed and the grounds graded, and a large number of loose stones and stone walls near the upper end of the basin have been piled together preparatory to grading. The gate-house and dam are in good condition. The flash-boards were placed in position on April 8th.

BASIN 3.

By October 29th this basin was drawn down to the lowest point reached during the year, viz., 159.59. The gates being then shut the water rose to 165.19 on December 19th, when it was again used for the supply of the city, falling to 163.02 on December 22d. The gates being again shut it increased to 164.39 January 7th, and was drawn down to 163.05 January 11th. On February 1st the surface was at grade 168.38, and on the gates being opened it fell to 164.47 on February 10th. No more water was drawn until March 16th, when the basin was full and running over the dam.

THE TEMPORARY DAM

on Sudbury river has not yet been abandoned. During the early part of the winter the northerly shore having shown some signs of washing, it was paved for a distance of 125 feet.

FARM POND

has been kept at about high-water mark during the year. The borders are in excellent condition, as are also the dam, gate-houses, and other structures around the pond.

LAKE COCHITUATE.

On the 1st of May, 1880, the surface of the lake stood at elevation 134.00, thirteen feet above the invert of the aqueduct and within four inches of high-water. On May 4th this latter point having been reached, the stop-planks were taken out, and for ten days water was allowed to waste at the outlet. The lake was kept full until the middle of June, at which time the surface began to lower steadily until January 10, 1881, at which time the elevation was 125.30, a little over four feet above the bottom of the aqueduct.

This was the lowest point reached during the year, about a foot lower than the lowest point of the previous year. As

the supply in the Sudbury was low the Board purchased two sets of pumps and engines for use at the lake in case of emergency. These have been stored at Chestnut-Hill reservoir and a corrugated iron house built over them. A storm of rain and snow of about $2\frac{1}{2}$ inches caused a rise of the lake, which continued until March 11th, when the surface stood at 133.50. On that day the stop-planks were removed, and water allowed to waste to the present time. The lake is now as near high-water mark as it is prudent to allow. No water has been drawn from the Sudbury source into the lake during the year. In the winter months the cucumber taste developed in the water to such an extent that it was thought best to discontinue the supply from this source, and on February 26th the head-gates were shut, since which time no Cochituate water has been run to the city. A marked improvement in the taste, though not in the color, of the water in the city immediately ensued. No good reason has ever been assigned for this peculiar taste in the Cochituate water. The conditions for a good supply were never better. The meadows on the south side of Central turnpike have been kept covered with a good depth of water, by means of the dam built last year, as have also the Hanchett meadows, while as the lake lowered, all the water from Pegan brook was filtered through the new gravel dam. Notwithstanding these unusually favorable conditions, the lake water has been unfit for use, as far as the palate is concerned, for more than two months.

No new work has been attempted at the lake during the past year. Some old buildings, which were too rotten for service, have been torn down, and a substantial shed for the storage of carriages and carts has been built.

The grounds have been somewhat improved by these changes.

The Pegan-brook cases, which at the time of the last report were being heard before the State Board of Health, were decided in favor of the city. An appeal was made by the parties complained of to a sheriff's jury, as provided by law. The decision was in favor of the individuals, but, on an appeal to the Supreme Court, the cases have been decided finally against the parties on points of law.

The town of Natick is now obliged to maintain Willow bridge.

Dug and Dudley Ponds.

The only water received from Dug pond was from March 9th to April 12th, when one foot in depth was running over the dam.

On Oct. 13th the stop-planks at Dudley pond were removed.

The water at that time was four feet below high water, and it was drawn off to within eighteen inches of the outlet pipe. On Dec. 7th the stop-planks were replaced.

The Cochituate Aqueduct.

With the completion of the Sudbury system the necessity for straining this structure has gradually diminished. From May 1st until Aug. 15th five feet of water were run. On the latter date the supply was increased six inches, falling, later, with the surface of the lake until Jan. 20th, when the head gates were shut down. They were reopened on Feb. 5th, but finally, on Feb. 26th, were permanently closed, on account of the continued bad taste in the lake.

The exterior structures on the line of this aqueduct have been thoroughly overhauled during the past year. Many of the culverts and waste weirs were found in very bad condition. This was more apparent after the copings and upper courses were removed. A careful examination of the effects of frost and time on these structures, after the lapse of thirty-three years, shows conclusively that nothing but heavy walls, properly backed and drained in the rear, will prevent the ultimate destruction of wing walls, copings, and parapets by frost.

The following repairs were made: —

Dedman's Brook Waste Weir. — Begun June 25th; finished July 31st. Wing walls backed with rubble. Copings reset. American cement, 2 parts; bank sand, 1 part. Whole of exterior joints cut out at least one inch, and pointed in Portland cement, — 3 parts cement, 1 part sand. One-third of the interior pointed. Flagging to roof pointed with oil cement. Drains of broken stones were built back of wings 2 feet thick, 4 feet below grade. Total cost, $377.16.

Stevens' Brook. — Begun Aug. 2d; finished Aug. 10th. Portion of foundation relaid. Capping stones reset. All of the masonry pointed. Portland cement, 3 parts; fine beach sand, 1 part. Wing walls drained. Cost, $118.43.

Morton Culvert. — Aug. 11th to Sept. 1st. Wing walls nearly all relaid. Coping stones dowelled to wings. Drains built around masonry, and exterior pointed in Portland cement. Cost, $260.94.

Wellesley Culverts. — Sept. 2d to Sept. 16th. Treated in same manner as Morton culvert. Cost, $150.88.

Kingsbury Culvert. — Sept. 18th to Sept. 28th. Masonry taken down at both ends of culvert and heavier walls built. On the south side the granite was backed with rubble. Brick work on north side replaced with rubble. All laid in cement,

1 part, sand, 1 part. The exterior pointing done in Portland cement. Culvert walls backed with small stones. Cost, $131.88.

Grantville Waste Weir.—Sept. 28th to Oct. 11th. Masonry found in good condition, with exception of copings, which were reset, and the wings drained. Exterior pointed in Portland cement. Cost, $166.08.

Culvert, east of Waste Weir.—Oct. 12th to Oct. 13th. Parapet relaid, and backed with rubble and broken stone drains. Pointed in Portland cement. Cost, $26.92.

Culvert at Newton Lower Falls.—Oct. 14th. Coping relaid. Rear of culvert drained, and masonry pointed in Portland cement. Cost, $13.00.

Woodward-street Culvert.—Oct. 15th to Oct. 23d. Granite all relaid and backed with rubble. Pointing done in Portland cement. Cost, $88.40.

Newton Centre Waste Weir.—Oct. 26th to Oct. 29th. Roof pointed in oil cement. Cost, $16.79.

All the trees and brush growing on the line of the aqueduct, between Cochituate and Newton Centre, have been removed, with the exception of a few trees left for ornamental purposes. Fences have been built on the city line, near Wellesley depot and Woodward street, Newton. The shutting off of the lake water in February has given an excellent opportunity for a careful examination of the interior of the aqueduct and for repairs.

Under authority from your Board I have organized a gang of masons and laborers for systematic work, which is now in progress. In general, the interior has been cleaned by thorough brushings several times from Dedman's brook to Charles river, and from Newton Centre to Brookline reservoir. All the cracks on the top and sides have been repaired from Station 293+80 in Grantville to the high embankment at Newton Lower Falls, and the invert from Grantville waste weir to Station 67, and the whole interior from Webber's waste weir to Brookline reservoir. The bottom cracks, where they were bringing water, have been pointed with cold lead; elsewhere the invert has been repaired with Portland cement, the top and sides with Norton American cement.

The Sudbury River Aqueduct

has been doing good service during the whole year. It has carried generally from twenty to forty millions of gallons daily to the city.

In December, a continuous bottom crack, 1,155 feet in length, in the Sherborn swamps, was repaired. It extended from Station 171+45 to Station 183, and was about $\frac{1}{16}$ in.

in breadth. No further movement has been noticed in places repaired last year, and the interior may be said to be in perfect order. The gate-houses and gates are all in excellent condition. Indices with verniers have been added to the head-gates at Farm pond. About 1,700 feet of the embankment at Bacon's brook has been reloamed and sodded; as have also the embankments at Sherborn and Newton Highlands. About five miles of fencing have been built during the season, in places where it was necessary to protect the embankments from cattle. The fences were built of chestnut posts and three spruce rails, by day's labor, in a thorough and, I believe, durable manner, at a cost of a little less than seven cents per running foot. During the summer the following culverts and structures were pointed. The joints were dug out in all cases at least one inch before the cement was placed. A record is here made of the mixture of cement and the kind of joint for the purpose of ascertaining the relative durability.

No. 3.	Portland	cement,	3 parts;	bank	sand,	1 part.	Concave	joint.
" 4.	"	"	"	"	"	"	"	"
" 6.	"	"	"	"	"	"	Flat	"
" 7.	"	"	"	"	"	"	"	"
" 9.	"	"	"	"	"	"	"	"
" 10.	"	"	"	"	"	"	"	"
" 13.	"	"	"	"	"	"	Concave	"
" 14.	"	"	"	"	"	"	"	"
" 15.	"	"	"	"	"	"	"	"
" 16.	"	"	"	"	"	"	"	"
Course brook waste-weir.			Portland	cement,	3 to 1.		"	"
Bacon's	"	"	"	American	"	1 to 1.	"	"
Fuller's	"	"	"	"	"	3 to 1.	Convex	"
No. 17.	American	cement,	1 part;	bank	sand,	1 part.	Concave	"
" 18.	"	"	"	"	"	"	"	"
" 19.	"	"	"	"	"	"	Convex	"
" 20.	"	"	"	"	"	"	"	"
" 21.	"	"	"	"	"	"	"	"
" 22.	"	"	"	beach	"	"	"	"
" 24.	Portland	"	2 parts;	"	"	"	"	"
" 26.	American	"	1 part;	bank	"	"	Flat	"
" 27.	"	"	"	"	"	"	"	"
" 28.	"	"	"	"	"	"	"	"
" 29.	"	"	"	"	"	"	Convex	"
" 30.	"	"	"	"	"	"	Flat	"
" 31.	"	"	"	"	"	"	"	"
" 32.	"	"	"	"	"	"	Convex	"
" 33.	"	"	"	"	"	"	"	"
" 34.	"	"	3 parts;	beach	"	"	"	"
" 35.	"	"	"	"	"	"	"	"
" 36.	"	"	"	bank	"	"	"	"
" 37.	Portland	"	"	"	"	"	"	"

BROOKLINE RESERVOIR.

The laying of a new 48-inch main last season rendered the emptying of this reservoir, during the spring, a comparatively safe operation. Under authority from your Board

this work was undertaken. On March 23d, the surface of the water being at elevation 122.97, the aqueduct was shut off, and the water lowered to 120.47 by the consumption in the city. The effluent gates were shut on March 28th, and the blow-off into the brook leading to Muddy river opened. As the water receded the stone paving was thoroughly washed and cleaned of moss, and, at the same time, the bottom of the reservoir was stirred, to get rid of as much of the deposit as possible. There were about nine inches of mud on the bottom, as nearly as could be told when the cleaning began, and, when the bottom was laid bare, about four or five inches of the heavier particles remained. A long rope was run through blocks on both sides of the reservoir, and a drag pulled backwards and forwards by horses. Later a steam-pump was erected on a raft, and a jet of water directed through a hose into the sides and bottom. This apparatus was found very efficient. On April 8th the water had receded to grade 109, and the upper half of the reservoir was bare. The mud was then hoed into piles, and, after drying a few days, hauled out by teams. On April 14th the water was all out of the reservoir.

Notwithstanding the greatest care was taken in emptying, the slopes below the berme at the lower end are so steep that there was a constant tendency of the banks to slide. These spots were afterwards heavily riprapped. The interior of the effluent gate-house was thoroughly cleaned, and the joints cut and pointed, after which the brick-work was well plastered with Portland cement. The gates were overhauled and dipped and furnished with new rods. The lower ends were keyed, instead of being provided with nuts, and the rods were protected with brass at the guides. About 1,200 feet of the coping around the reservoir were raised and reset, and about 500 feet of riprapping done. The work is now nearly ready for the water to be let on.

Chestnut-Hill Reservoir.

No new work has been done at this reservoir during the year. The grounds, gate-houses, walks, and driveway have keen kept in good order.

A table of rainfall at this point is annexed, and also a list of tools and other movable property connected with the department.

Very respectfully yours,

DESMOND FITZGERALD,

Superintendent.

Table of Rainfall at Chestnut-Hill Reservoir, for year ending Dec., 1880.

Date.	Inches.	Snow or rain.	Duration.
Jan. 4	.01	Rain	9 to 10 p.m.
" 6	.45	"	1.30 to 10.15 p.m.
" 9	.08	"	1.30 to 7 p.m.
" 12	.76	Rain and Snow	5.30 p.m. to 4 p.m.
" 13			
" 15	.03	Rain and Snow	5.30 to 7.30 p.m.
" 20	.70	Snow and Rain	7.30 a.m. to 1 a.m.
" 21			
" 22	.35	Rain	7.15 p.m. to 7 a.m.
" 23			
" 27	.49	"	11.15 a.m. to 6.30 a.m.
" 28			
" 31	.08	"	2 to 8.30 a.m.
Total .	2.95		
Feb. 3	.30	Snow	4 a.m. to 11.30 p.m.
" 10	.03	"	7.30 a.m. to 9.30 p.m.
" 12	.68	Rain	6 a.m. to 2 p.m.
" 13			
" 13	.84	"	6.30 p.m. to 3 a.m.
" 14			
" 15	.03	Snow	10 a.m. to 7.30 p.m.
" 18	.12	Rain	7.30 to 11.45 p.m.
" 23	.42	Rain and Snow	8 a.m. to 5 p.m.
" 26	.08	Rain	5.30 to 11.15 p.m.
" 28	.62	"	9.30 p.m. to 9 a.m.
" 29			
Total .	3.12		
Mar. 3	.22	Rain	8.15 p.m. to 2 a.m.
" 4			
" 5	.35	"	5.50 to 10.30 a.m.
" 7	.31	Snow	8.30 p.m. to 1.30 a.m.
" 8			
Mar. 9	.05	Snow	6 a.m. to 10.30 p.m.
" 11	.11	"	10.30 a.m. to 8.15 a.m.
" 12			
" 14	.07	Snow and Rain	6.20 a.m. to 1.30 p.m.
" 16	.68	Snow and Rain	5 a.m. to 9.15 a.m.
" 17			
" 19	.32	Snow	10.45 a.m. to 1 a.m.
" 20			
" 20	.02	Rain and Snow	5.20 p.m. to 6.30 a.m.
" 21			
" 27	.69	Snow	2 p.m. to 5.30 p.m.
" 28			
Total .	2.82		
Apr. 3	.47	Rain	6 p.m. to 3 a.m.
" 4			
" 4	.03	"	7 to 10.30 p.m.
" 6	.05	"	7.15 to 9.10 p.m.
" 16	.77	"	8.30 a.m. to 2.15 a.m.
" 17			
" 20	.07	"	3 to 5 p.m.
" 24	.23	Snow	1 to 8.30 a.m.
" 30	.79	Rain	12.30 to 7.15 a.m.
Total .	2.41		
May 2	.62	Rain	8 a.m. to 2.15 p.m.
" 13	.13	"	11.05 a.m to 5 p.m.
" 13	.06	"	7.50 to 10 p.m.
" 18	.31	Showers	7 a.m. to 10.30 a.m.
" 19			
" 28	.25	Rain	2.40 to 3.45 p.m.
" 30	.34	"	11.30 a.m. to 11 a.m.
" 31			
Total .	1.71		

Table of Rainfall at Chestnut-Hill Reservoir. — CONTINUED.

Date.	Inches.	Snow or rain.	Duration.
June 2	.29	Rain	12.10 to 8.45 a.m.
" 6	.05	Showers	9 a.m. to 2.30 p.m.
" 8	.04	"	12.30 a.m. to 7 p.m.
" 12	.18	Rain	5 to 5.45 p.m.
" 26	.11	"	1.45 to 2 p.m.
" 28	.05	"	3.45 to 4 p.m.
Total .	.72		
July 2	.66	Rain	1.25 a.m. to 2.30 p.m.
" 3	.31	"	5.45 a.m. to 2.30 p.m.
" 4	.07	"	9.45 p.m. to 12.15 a.m.
" 5	.09	"	10.05 to 10.45 p.m.
" 9	.28	"	8.15 to 9.45 a.m.
" 12	1.33	"	9 p.m. to 9.30 a.m.
" 13			
" 15	.36	"	10 a.m. to 4.30 p.m.
" 16	.23	"	10.15 a.m. to 1.30 p.m.
" 20	1.99	"	1 p.m. to 4 a.m.
" 21			
" 22	.58	"	6 p.m. to 5.30 a.m.
" 23			
" 27	.24	"	7.20 to 10.45 p.m.
Total .	6.14		
Aug. 3	.62	Rain	4 p.m. to 12.30 p.m.
" 4			
" 4	.56	"	2.20 p.m. to 7 a.m.
" 5			
" 21	.05	"	5.25 to 6.15 p.m.
" 29	.129	"	1.50 p.m. to 10 a.m.
" 30			
Total .	2.52		
Sept. 9	1.00	Rain	5 p.m. to 3 p.m.
" 10			
Sept. 13	.71	Rain	10 p.m. to 3 p.m.
" 14			
" 28	.04	"	3.45 to 4.15 p.m.
Total .	1.75		
Oct. 5	.25	Rain	1 to 4.30 p.m.
" 12	.20	"	3.30 to 4.15 p.m.
" 17	.12	"	5 to 8 p.m.
" 22	1.69	"	1.15 p.m. to 3 a.m.
" 23			
" 23	.05	"	4.20 to 5 p.m.
" 26	.03	"	7.30 to 9 p.m.
" 30	.71	"	7 p.m. to 7.30 a.m
" 31			
" 31	.03	"	10.45 to 11.30 a.m.
Total .	3.08		
Nov. 5	.25	Rain	12.30 p.m. to 2 a.m.
" 6			
" 6	.43	"	7.30 p.m. to 5 a.m.
" 7			
" 11	.41	"	9.15 a.m. to 6 p.m.
" 15	.05	Snow	12.15 to 5 p.m.
" 20	1.04	Rain	12.45 to 8 p.m.
" 25	.02	Snow	12.10 to 3 a.m.
" 28	.03	Mist	Mist in p.m.
Total .	2.23		
Dec. 1	.77	Snow	4.30 a.m. to 6 p.m.
" 5	.51	Rain	9.30 a.m. to 5.30 p.m.
" 10	.01	Snow	9.15 a.m. to 1 p.m.
" 14	.38	Rain	10.30 p.m. to 5 a.m.
" 15			
" 27	.07	Snow	4.30 to 10 p.m.
" 29	.31	"	6 a.m. to 11.50 p.m.
Total .	2.05		

Total for year 31.50

LIST OF CITY PROPERTY ON THE WESTERN DIVISION.

1881.

Chestnut-Hill Reservoir.

Effluent Gate-House.

1 hand-pump, 1 12-ft. ladder, 3 wrenches, 100 ft. of hose, 120 ft. gas-pipe, 1 rattan broom, 1 set evaporation apparatus, 4 stop-plank hooks, 1 blow-off wrench, 2 gate-wrenches, 32 ft. galv. chain, lock, etc., 1 fountain nozzle, 33 stop-planks, 1 step-ladder, 5 pictures, 1 gauge, 1 thermometer, 1 broom, 2 brushes and dust-pan, 2 lanterns, hydraulic apparatus, 1 settee, 1 mat, 1 nozzle, 3 oil-cans and tunnel, 1 scrubbing-brush, 1 sponge, 1 window-brush, 2 wire scoops, 2 wrenches.

Terminal Chamber.

1 broom, 1 settee, 1 dust-pan and brush, 1 coal-box, 1 20-ft. ladder, 1 boat, 1 step-ladder, 2 lanterns, 1 duster, 3 oil-cans, 1 pair rubber boots, 1 iron rake, 1 mat, 2 stop-plank hooks, 25 stop-planks, 1 wire scoop.

Intermediate Gate-House.

18 stop-planks, 1 wrench.

Influent Gate-House.

26 long stop-planks for conduit, 14 stop-planks, 4 hooks, 1 extra brass screw.

Office.

1 safe, 3 desks, 6 chairs, 3 stools, 5 pictures, 1 telegraph instrument, 2 sets scales, 1 stove, 2 reflecting lanterns, 11 lanterns, 22 brooms, 1 hook-gauge, 2 inkstands, 2 thermometers, 2 copper pans, 2 tumblers, 1 kettle, 48 pairs rubber boots, 7 rubber coats, 8 gauging-floats, 1 drawing-table, 1 sink, pump, wash-basin, and 6 towels, 1 automatic rain-gauge, 1 book-case, 1 barometer.

Tool-House.

½ box glass, 1 copper elbow, 13 galls. lard-oil and cans, 10 galls. kerosene-oil and cans, 2 galls. glycerine, 12 bird-houses, 15 conduit reflectors, 3 screen-doors, 75 lbs. waste,

16 padlocks, 24 boxes candles, 6 bars soap, 1 gross matches, 25 paint-brushes, 1 chimney-brush, 4 whitewash-brushes, 1 bunch tacks, 5 rolls wicking, 2 ice-chisels and hooks, 1 ice-saw, 2 glass-floats, 1 Johnson pump, 12 window-screens, 1 water-tank, 2 rain-gauges, 2 horse-bonnets, 2 shades, 7 draft-chains, 8 striking-hammers, 2 hand-hammers, 8 sledge-hammers, 2 paving-hammers, 2 axes, 4 screen-bars, 15 iron bars, 26 square shovels, 8 snow-shovels, 41 round pointed shovels, 8 scufflers, 39 picks, 8 grub-axes, 53 pick-handles, 13 sledge-handles, 7 trowels, 6 rifles, 1 lot of cord, 37 hoes, 2 1-bushel baskets, 4 1½-bushel baskets, 1 4-bushel basket, 2 sand-sieves, 1 pruning-saw and knife, 3 border-knives, 1 beadle, 7 paving-rammers, 1 root-puller, 6 manure-forks, 1 limb-cutter, 1 gaff-hook, 1 California pump-belt, 25 ft. wire fence, 2 pulleys, 14 drills, 1 copper tamping-rod, 2 iron spoons, ½ box whetstones, ½ can palm-oil, 1 screen-brush, ½ bag grass-seed, 15 lbs. oakum, 6 doz. hay-caps, 1 rubber tank-hose, 1 writing-desk, 1 cross-cut saw, 2 small tin dippers, 12 pails, 2 heavy buckets, 1 tin boiler, 1 hay-knife, 7 sponges, 1 grate, 5 lbs. powder, 14 spades, 10 points, 3 chisels, 3 grass-hooks, 3 watering-pots, 3 feed-baskets, 6 rattan brooms, 9 snaths, 22 iron rakes, 34 wooden rakes, 13 hay-forks, 2 hay ropes, 1 oil cabinet, 15 lbs. axle-grease, 4 rubber blankets, 16 kegs nails, 6 plough-points, 1 cement testing-machine, 100 ft. of hose, 10 scrubbing-brushes, 10 spading-forks, 2 coal-shovels, 1 lot of leather belting, 2 sets falls, 1 lot of rope, 2 painters' jacks, 2 spare boxes for gates at Br. Res., 8 small stone-hammers.

Old Blacksmith's Shop.

1 observatory and instruments, 2 pieces canvas, 4 pairs oars, 2 boats, 1,000 shingles, 1 flume, 1 post-spoon, 1 iron cover, 5 bbls. Portland and 9 bbls. American cement, ¼ bbl. black oil, 1 lot crusher-plates, 1 large screen, 12 signs, 1 iron bedstead, 1 bbl. paint, 1 manhole grate, ½ cask red paint, 1 house force-pump, 1 lot of chains, 3 stoves, 10 ft. lead pipe.

Stable.

8 horses, 1 pig, 5 horse-blankets, 2 sets double harness, 1 hay rigging harness, 2 express harnesses, 2 driving harnesses, 9 halters, 4 cart harnesses, 1 harness pan, 2 galls. neats'-foot oil, sleigh-bells, 6 surcingles, 1 stove, 1 stable sponge, 6 curry-brushes and combs, 1 set lead chains, 1 hay-cutter, 1 knee-pad, 210 bushels oats, 10 bushels cracked corn, 200 lbs. shorts, 6 tons hay, 2 brooms, 1 open buggy, 1 covered buggy, 1 buffalo and lap-robe, 1 duster, 1 jack, 1 watering-

pot, 1 whip, 2 forks, 24 stop-planks, 7 ft. 6 in. long, 80 stop-planks, 7 ft. long, 4 bbls. spikes, 7 and 10 inches long and $\frac{1}{2}$ inch square, 1 14-ft. lever, 4 mortar and 19 brick hods, 1 truck, 1 wooden pump, 3 cans, 300 bolts, assorted sizes, cast-iron pipes and 4 elbows, lot of old iron.

Carpenter's Shop.

1 stove, 1 clock, 30 ft. clear white-pine, 100 ft. ash, 400 spruce clapboards, 3 hand-saws, 1 panel-saw, 1 bit stock and bits, 1 level, 8 planes, 8 augers, 1 pair dividers, 6 chisels, 1 axe, 2 gauges, 10 fence-rails, 4×4, 1 wood-saw, 1 water-tank, 1 lot screws, 2 hammers, 1 compass-saw, 1 fence-wrench, 2 ladles, 2 rubber belts, 2 jack-screws, 15 lbs. green paint, 1 can japan, $\frac{1}{2}$ bbl. boiled linseed-oil, 25 galls. raw linseed-oil, 1 gall. black paint, 1 gall. varnish, $\frac{1}{2}$ can spirits of turpentine, 3 cans paint-preserver, 1 galv. chain and pulley, 1 belt-stretcher, 1 rotary pump, 5 tons hard coal, 1 ton soft coal, 1 Blake pump, 1 portable boiler, 1 feed-pump, 1 portable engine, 1 glue-pot, 1,400 lbs. lead, 6 hand-screws.

Blacksmith's Shop.

1 forge, 1 anvil, 1 set tools, 1 vice, 1 beast-drill, 3 stock-dies and tape, 1 ratchet and drill, 5 files, 75 lbs. iron, 200 lbs. scrap iron, 4 pairs pipe-tongs, 2 solid die-plates, 75 ft. steam-pipe, 3 cold chisels, 2 monkey-wrenches, 1 soldering-iron.

Yard.

1 12-horse power engine, 2 cans, 1 portable building and shed, 60 ft. 4-inch suction pipe, 1 piece of lead suction-pipe (siphon), 30 ft. of 4-inch iron suction-pipe, 6 ft. 8-inch drain-pipe, 8 ft. 6-inch drain-pipe, 3 ft. 30-inch drain-pipe, 19 fire buckets, 1 carryall, 1 sleigh, 2 express wagons, 1 2-horse wagon, 4 carts, 2 water-carts, 1 hay wagon, 1 pung, 2 2-horse sledge, 1 2-horse truck, 1 drag, 1 road roller, 1 pair large wheels, 2 moving wheels, 4 roller wheels (1 horse-power), 2 hand-carts, 2 hand-rollers, 2 sets lead bars, 1 fire-engine, 2 jacks, 2 conduit forms, 1 step-ladder, 1 30-ft. ladder, 1 28-ft. ladder, 1 20-ft. ladder, 2 12-ft. ladders, 1,200 bricks, 2 loads sand, 1 lot cast-iron grates, 1 lot clay, 1 scraper, 2 snow-ploughs, 1 plough, 1 harrow, 1 hay-tedder, 55 granite-bounds, 5 cedar-posts, 1 rain-gauge, 6 gravel-screens, 10 wheelbarrows, 115 pickets, 1 tool-box, 2 grind-stones, 2 engines and pumps, 1,000 ft. spruce boards, 2,500 ft.

spruce plank, 2,200 ft. spruce fence boards, 2,500 ft. of grooved spruce sheeting, assorted lot of old lumber.

Brookline Reservoir.

1 writing-desk, 2 keys, 1 book, 1 inkstand, 1 pitcher, 1 tumbler, 1 spittoon, 1 lantern, 1 stove and 32 ft. of pipe, 2 elbows, 1 coal-hod, shovel and 2 pokers, 1 stove-brush, 2 settees, 1 chair, 2 towels, 2 floor-mats, 1 pair rubber boots, 1 scythe, 1 pick, 3 shovels, 2 rakes, 1 hoe, 1 sickle, 1 scuffler, 1 spade, 2 pails, 1 rammer, 1 cold-chisel, 4 notices, 1 iron ladder, 1 ladder, 1 step-ladder, 1 bar, 3 thermometers, 5 locks, 1 key, 1 sponge, 1 pair clipping-shears, 1 dust-pan and brush, 1 duster, 1 bushel basket, 1 wheelbarrow, 1 broom, 1 dust-brush, 1 rattan broom, 1 border knife, 2 scrubbing-brushes, 1 watering-pot, 1 axe, 1 gauge, 1 40-inch gate-key, 2 36-inch gate-keys, 1 30-inch gate-key, 2 wheels, 1 wrench, 1 cover, 2 air-cock wrenches, 1 gate frame, 2 chamber wheels, 1 crank, 89 stop-planks, 3 gas fixtures, 6 screens, 4 iron rods, 2 screen doors, 6 window screens, 4 48-inch connection keys, 1 wrench, 1 iron cover, 1 wooden cover.

Lake Cochituate.

1 oil-cloth carpet, 1 air-tight stove, 12 dining-chairs, 1 extention table, 1 parlor table, 1 mirror, 1 horse, 1 express wagon, 1 carryall, 1 cart and harness, 2 sets scales, 1 rain-gauge, 4 picks, 1 long-handle shovel, 1 long-handle spade, 2 spades, 3 round-point shovels, 3 square-point shovels, 2 snow shovels, 2 sickels, 3 hoes, 2 scythes, 3 wrenches, 1 striking-hammer, 1 saw, 1 hatchet, 1 axe, 1 grub-axe, 2 sand-sieves, 2 gravel screens, 3 brooms, 5 candlesticks, 3 buckets, 2 whitewash brushes, 38 stop-plank, 1 12-inch pump, 1 18-inch pump, 3 12-inch copper pipe, 12 inches sheet-iron pipe, 3 bars, 1 pinch bar, 1 road roller, 1 set of screens in gate-house, 2 grindstones.

Farm Pond Gate-House.

1 stove, stove-pipe, shovel and hod, 1 dust-pan and brush, 1 piece zinc, 1 bag waste, 1 broom, 1 hammer, 1 screw-driver, 2 screw bars, 2 wrenches, 2 gate-handles, 1 screen-brush and rake, 2 pairs rubber boots, 1 shovel, 1 step-ladder, 1 chair, 1 11-ft. ladder, 1 22-ft. ladder, 1 table, 2 gauges, 56 stop-planks, 1 wood-box, 1 coal-box, 1 closet, 2 stop-plank hooks, 2 lanterns, box of rotten stone, 1 tin pan, stove-blacking and brush, 1 oil-cup, 3 cans, 1 qt. kerosene-oil, 1 piece of rope, $\frac{3}{4}$ ton of coal, 3 water-pails, 2 wrenches, 1 yd. linen, 1 box candles, 1 boat.

Tool-House and Office, South Framingham.

4 axes, 4 shovels, 2 hammers, 3 cans, 2 stone-breakers, 2 pails, 1 iron rake, 1 water-tank, ¾ ton coal, 4 kegs nails, 1 tool-chest, 3 saws, 1 level, 2 planes, 2 bit-stocks, 4 augers, 1 square, 1 trowel, 1 bevel, 1 wrench.

Tool-House, Farm Pond.

5 wheelbarrows, 1 bale oakum, 1 cross-cut saw, 3 lanterns, 4 shovels, 1 axe, 3 grub-axes, 1 pick, 3 hoes, 2 rattan brooms, 2 iron rakes, 2 ice-hooks, 3 leaf-hooks, 3 scythes, 1 lawn-pump, 1 sand screen, 1½ kegs of spikes, 1 keg nails, 1 stove, 1 sprinkler, lot of old iron and lumber.

Course Brook Water Weir.

1 pick, 1 long-handle shovel, 1 shovel, 1 iron rake, 1 spade, 1 wheelbarrow, 1 pail, 1 ice-cutter, 2 cans, 1 oil-cup, 1 pair rubber boots, 1 cement-box, 2 boxes candles, 1 broom, 1 rattan broom, 12 stop-planks, 4 stop-plank hooks, 1 paint-can.

Bacon's Brook Waste Weir.

2 wheelbarrows, 2 iron rakes, 2 long-handle spades, 1 ice-cutter, 1 piece of rope, 2 sickles, 1 pick, 1 hand-barrow, 1 oil-can, 1 oil-cup, 1 long-handle shovel.

Rosemary Brook Blow-Off.

1 gate-wrench, 1 ladder.

Fuller's Brook Waste Weir.

1 wheelbarrow, 2 shovels, 1 ice-cutter, 2 reflectors, 12 stop-planks, 2 stop-plank hooks, 1 rattan broom, 1 box candles, 2 pails, 1 bag, 1 long-handle shovel.

Tool-Shed, near Fuller's Waste Weir.

3,000 hard bricks, lot of old lumber.

West Siphon Chamber.

1 coal-hod and poker, 1 dust-pan, 2 bushels coal, 2 qts. paint, 1 gallon varnish, 2 qts. linseed-oil, 1 qt. of thinning, 20 lbs. salt, 2 wooden horses, 52 stop-planks, 4 stop-plank hooks, 2 paint brushes, 1 pail, 8 pairs rubber boots, 2 locks, 3 iron hooks, 2 reflectors, 1 iron rake, 2 shovels, 1 mat, 1

piece rope, 1 scrubbing-brush, 3 brooms, 1 stool, 2 boxes candles, 4 oil-cans, 1 oil-cup, 1 tool-box, 1 rasp, 2 lbs. nails, 1 pick, 3 wheelbarrows, 1 bag, 1 wrench, 2 ladders, 1 cement-box, 1 piece canvas, $\frac{1}{4}$ gross matches, 1 50 ft. tape.

East Siphon Chamber.

52 stop-planks, 3 iron rakes, 2 wheelbarrows, 3 long-handle shovels, 3 grub-axes, 4 sickels, 1 spade, 1 boat, 1 square, 1 straight edge, 2 ladders, 2 stop-plank hooks, 1 jug, 5 drills, 6 iron wedges, 6 brooms, 1 qt. paint, 1 can, 3 jointers, 11 points, 4 chisels, 1 auger, 2 bars, 1 ice-cutter, 1 hay-fork, 1 manure-fork, 5 shovels, 1 hammer, 1 saw, 1 keg nails, 19 boxes candles, 1 pail, 3 pairs rubber boots, 3 iron hooks, 2 reflectors, 6 bbls. sand, 4 bbls. American cement, 3 bbls. Portland cement, 1 ice-saw, 2 rattan brooms, 1 hatchet, 1 mud-digger, 3 picks, 2 large drills, 1 maul, 1 ladle, 3 long-handle spades, 3 bush scythes, 3 oil-cups, 4 oil-cans, 1 roll sheet-lead, 3 hoes, 2 pieces rope.

Clarke's Waste Weir.

12 stop-planks, 2 stop-plank hooks, 1 shovel, 1 bar, 1 pail, 1 long-handle shovel, 1 wheelbarrow, 1 wooden roller, 1 iron rake.

REPORT OF THE SUPERINTENDENT OF THE EASTERN DIVISION.

Boston, May 1, 1881.

Leonard R. Cutter, Esq., *Chairman Boston Water Board:*

Sir, — I herewith submit my report for the year ending with April 30th: —

New 48-inch Main.

This line, beginning at the Chestnut-Hill Reservoir and ending at the junction of Brookline, Brighton, and Commonwealth avenues, was commenced in the latter part of June and completed on the 1st of December. The whole length is 16,239 feet. Up to the present time no leak has been discovered. A connection between the 40-inch main on Brookline avenue and the 36-inch and 30-inch mains on Tremont street, with a 30-inch pipe through Francis street, for a better distribution, is yet to be made.

East Boston.

The pipes for the High-service were laid during the season. The whole length of the different sizes (12, 10, and 6-inch) is 7,428 feet.

Main Pipe.

The whole number of feet of the different sizes laid during the year is	64,139
Relaid and changed in sizes	4,892
	69,031, equal to $12\frac{1}{5}\frac{6}{2}\frac{2}{8}\frac{3}{0}$ miles.
Total number of miles to date	$384\frac{2}{5}\frac{8}{2}\frac{0}{8}\frac{5}{0}$.

Service-Pipes.

Whole number put in	962
Length in feet	23,912
Total number to date	46,315

Of the relaying of enlarged sizes, the following table shows the change in sizes: —

Street.	Between what streets.	Size now.	No. of feet.	Size form'ly
Eastern avenue . .	Commercial and the water.	6-in.	403	4-in.
Constitution wharf.	Commercial and the water.	6 "	204	4 "
Arnold street . . .	Washington and Shawmut ave.	6 "	499	4 "
Bolton	F and Dorchester.	6 "	357	4 "

RELAID.

Pynchon st., bet. Roxbury and Center st.	12-inch.	1,804	feet.
Hampshire st., bet. Vernon and Clay	6-inch.	679	"
Mt. Vernon st., bet. Boston and Dorchester ave.	6-inch.	142	"
Rutland st., bet. Shawmut ave. and Tremont st.	6-inch.	804	"

TAKEN UP.

12-inch iron pipe	211	feet.
9-inch iron pipe	42	"
6-inch iron pipe	166	"
4-inch iron pipe	1,463	"
2-inch lead pipe	19	"
1½-inch iron pipe	491	"
⅝-inch lead pipe	179	"

Statement of Location, Size, and Number of Feet of Pipe laid in 1880.

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	BOSTON.		
Huntington ave	Newton and B. & A. R.R. Bridge	16	177
	Total 16-inch		177
Newbury	Hereford and W. Chester Park	12	108
Gloucester	Commonwealth ave. and Newbury	"	242
Newton	Carlton and Huntington ave	"	690
	Total 12-inch		1,040
Mercantile	Clinton and South Market	6	200
	Total 6-inch		200
Cazenove place	Chandler and Columbus ave	4	72
	Total 4-inch		72
	SOUTH BOSTON.		
Fifth	Q and the Water	12	6
A	First and Congress	"	2,351
First	H and I	"	210
Congress	East of A	"	439
	Total 12-inch		3,006
A	First and Congress	8	18
	Total 8-inch		18
Fifth	Q and the Water	6	120
Baxter	From D	"	36
A	First and Congress	"	45
	Total 6-inch		201
A	First and Congress	4	5
	Total 4-inch		5

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	EAST BOSTON.		
White	For High Service	12	1,073
Brooks	" "	"	27
	Total 12-inch		1,100
Brooks	For High Service	10	1,076
Chelsea	" "	"	596
Marion	" "	"	211
Bremen	" "	"	2,118
Maverick	" "	"	984
Cottage	" "	"	813
	Total 10-inch		5,798
Brooks	White and Eagle	8	128
	Total 8-inch		128
Butler ave.	From Saratoga	6	938
Meridian	Monmouth and Eagle	"	530
Brooks	White and Eagle	"	66
	Total 6-inch		1,534
Maynard's wharf	From New	4	420
	Total 4-inch		420
	BOSTON HIGHLANDS.		
Beacon	St. Mary and Commonwealth ave.	48	2,964
	Total 48-inch		2,964
Francis	Brookline ave. and Tremont	30	1,007
	Total 30-inch		1,007
Beacon	St. Mary and Commonwealth ave.	16	243
Terrace	Parker place and New Heath	"	37
	Total 16-inch		280

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	BOSTON HIGHLANDS. — *Continued.*		
Mt. Seaver ave.	Maple and Montana	12	369
Heath	Centre and Pynchon	"	25
Brighton ave.	Beacon and St. Mary	"	13
Pynchon	Roxbury and Heath	"	102
Parker Hill ave.	Parker and Parker Hill Reservoir	"	1,064
Parker	Parker Hill and Fisher ave.	"	30
	Total 12-inch	.....	1,603
Atwood ave.	From Day	8	153
Gilbert	Hoffman and Roy	"	28
Wyman	Centre and Chestnut	"	1,220
Chestnut ave.	Sheridan ave. and Wyman	"	153
Montana	Mt. Seaverns ave. and Georgia	"	93
Blue Hill ave.	Quincy and Hayward	"	340
	Total 8-inch	.....	1,987
Wilmot	Bainbridge and Elmore	6	163
Colby	From Washington	"	215
Nichols court	From Phillips	"	201
Oriental court	" "	"	223
Cedar	Pynchon and Centre	"	25
Delle ave.	From Parker	"	76
Wyman	Centre and Chestnut	"	08
Maple	Mt. Seaver ave. and Schuyler	"	73
Pynchon	New and Old Heath	"	10
Park	Brookline ave. and Binney	"	214
Bragdon	Washington and Amory	"	326
Notre Dame	Bragdon and Codman	"	405
Hayward	Blue Hill ave. and Warren	"	258
Wyman	Lamartine and Chestnut	"	264
Tremont	Francis and Hillside ave.	"	20
Parker Hill ave.	Parker and Parker Hill Reservoir	"	8
	Amount carried forward	.....	2,499

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	Amount brought forward	.....	2,499
	BOSTON HIGHLANDS. — *Continued.*		
Elmore	Wilmot and Walnut ave.	6	77
Wilmot	Bainbridge and Elmore	"	78
Highland Park ave.	Fort ave. and Highland Park st.	"	79
Centre	Highland and Pynchon	"	138
	Total 6-inch	.....	2,861
Edgewood	Blue Hill ave. and Warren	4	977
Smith-st. court	Nichols court and Smith	"	52
	Total 4-inch	.....	1,029
	DORCHESTER.		
Norfolk ave.	Oak and Franklin	12	255
Lawrence "	Cedar and Myrtle	"	413
Blue Hill "	Norfolk and Oakland place	"	211
	Total 12-inch	.....	879
Park	Millet and Kilton	8	242
Pleasant	Cottage and Stoughton	"	493
	Total 8-inch	.....	735
Mt. Vernon	Carleton and Pumping-Station	6	3,131
Virginia	Bird and Davenport ave.	"	165
Dickens	Adam and Clayton	"	941
Greenwich	Dorchester ave. and Commercial	"	1,051
Clapp	Boston and Oak	"	1,402
Columbia	Washington and Blue Hill ave.	"	74
Bowdoin	Bellevue and Hamilton ave.	"	11
Victoria	From Dorchester ave.	"	400
Highland	High and East	"	358
Fenton	From Greenwich	"	102
Lawrence ave.	Cedar and Myrtle	"	7
	Amount carried forward	.....	7,642

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	Amount brought forward	.....	7,642
	DORCHESTER. — *Continued.*		
Carlton	From Crescent ave.	6	41
Elmo	Erie and Blue Hill ave.	"	73
Dix	Adams and Dorchester ave.	"	230
Withington	Norfolk and Euclid	"	219
Coleman	Hamilton ave. and Bellevue	"	845
Green Hill	Mill and Harrison	"	432
Harrison	From Green Hill	"	176
Minot pl.	" Minot	"	60
Elton	Dorchester ave. and Auckland	"	321
New	Pleasant and Dorchester ave.	"	264
Oak ave.	From Plain	"	326
Millet	Park and Wheatland ave.	"	201
Oakland pl.	Blue Hill ave. and Oakland	"	398
Blue Hill ave.	Norfolk and Oakland pl.	"	11
Centre	Dorchester ave. and Adams	"	376
Pleasant	Pearl and Cottage	"	8
Pearl	Dorchester ave. and Pleasant	"	57
Bowdoin	Bellevue and Olney	"	12
Glide	Minot and Chickatawbut	"	306
Adams	Oak ave. and Minot	"	8
Patterson	From Codman	"	65
Virginia	Davenport ave. and Bird	"	137
Orchard	From Boston	"	171
Spring	" Savin Hill ave.	"	30
Leonard	Clayton and Granger	"	50
	Total 6-inch	.....	12,459
	WEST ROXBURY.		
Washington	Poplar and Roslin ave.	20	14
	Total 20-inch	.....	14

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	WEST ROXBURY. — *Continued.*		
LaGrange	Centre and Linnet	12	1,260
Poplar	Metropolitan ave. and Charles	"	365
Brown ave.	Poplar and Ashland	"	682
Washington	Poplar and Dudley	"	1,447
Birch	South and Prospect	"	909
May	Centre and Pond	"	107
Corey	Centre and Weld	"	814
LaGrange	Jordan and Pleasant	"	235
	Total 12-inch	.....	5,819
Boylston	A and Centre	8	303
Albano	Roslin ave. and Washington	"	628
	Total 8-inch	.....	931
Keyes court	From Keyes	6	126
LaGrange	Centre and Linnet	"	8
Brown ave.	Poplar and Sharon	"	7
Ashland	Albion and Sheldon	"	82
Hathaway	South and Centre	"	233
Boylston	A and Centre	"	7
Washington	Albano and Dudley	"	12
Birch	South and Prospect	"	8
Corey	Centre and Weld	"	7
Albano	Roslin ave. and Washington	"	8
Poplar	South and Washington	"	296
LaGrange	Jordan and Pleasant	"	10
	Total 6-inch	.....	804
Perkins court	From Perkins	4	120
May	Centre and Pond	"	19
	Total 4-inch	.....	139

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

In what Street.	Between what Streets.	Diam. of Iron Pipe in In.	Feet of Pipe.
	BRIGHTON.		
Beacon	Chestnut-Hill Reservoir and Brookline Line	48	1,275
	Total 48-inch		1,275
Beacon	At Chestnut-Hill Reservoir	36	55
	Total 36-inch		55
Essex	Brighton ave. and Cambridge Line	16	330
	Total 16-inch		330
Everett	Lincoln and Pleasant	12	958
	Total 12-inch		958
Bigelow	Brooks and Faneuil	8	884
	Total 8-inch		884
Rockland	Chestnut Hill ave. and Washington	6	695
Bigelow	Brooks and Faneuil	"	11
Allston square	From Allston	"	286
Everett	Lincoln and Adams pl.	"	8
School	From Market	"	75
Colwell ave	From Chestnut Hill ave	"	180
	Total 6-inch		1,255
Essex	Brighton ave. and Cambridge Line	4	20
	Total 4-inch		20
	BROOKLINE.		
Beacon	St. Mary to Brighton Line	48	12,000
	Total 48-inch		12,000
Beacon	Englewood ave. and Kent	16	152
	Total 16-inch		152

RECAPITULATION.

SECTION.	1880-1881.	DIAMETER OF PIPES IN INCHES.										
		48	36	30	20	16	12	10	8	6	4	Totals.
Boston	Total number of feet laid	....	....	....	....	177	1,040	....	....	200	72	.....
	Stopcocks in same	....	....	....	....	....	2	....	1	4	....	.....
South Boston	Total number of feet laid	....	....	....	....	....	3,006	....	18	201	5	.....
	Stopcocks in same	....	....	....	....	....	3	....	....	....	....	.....
East Boston	Total number of feet laid	....	....	....	....	....	1,100	5,798	128	1,534	420	.....
	Stopcocks in same	....	....	....	....	1	4	3	5	7	4	.....
Boston Highlands	Total number of feet laid	2,964	....	1,007	....	280	1,603	....	1,987	2,861	1,029	.....
	Stopcocks in same	....	1	....	....	3	1	....	2	10	1	.....
Dorchester	Total number of feet laid	....	....	....	....	....	879	....	735	12,459	....	.....
	Stopcocks in same	....	....	....	....	....	....	....	1	19	....	.....
West Roxbury	Total number of feet laid	....	....	....	14	....	5,819	....	931	804	139	.....
	Stopcocks in same	....	....	....	....	....	7	....	1	3	1	.....
Brighton	Total number of feet laid	1,275	55	....	....	330	958	....	884	1,255	20	.....
	Stopcocks in same	....	1	....	....	1	1	....	1	3	1	.....
Brookline	Total number of feet laid	12,000	....	....	....	152	....	....	....	....	....	.....
	Stopcocks in same	....	1	....	....	2	....	....	....	....	....	.....
	Sums of pipes	16,239	55	1,007	14	939	14,405	5,798	4,683	19,314	1,685	64,139
	Sums of stopcocks	....	3	....	....	7	18	3	11	46	7	95

Statement of the Length of different Sizes of Pipes laid, and the Number of Stopcocks put in, to May 1, 1881.

	Diameter of Pipes in Inches.															Aggregate.
	60	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	..	22,247	23,166	20,070	26,770	5,773	5,823	20,489	117,761	...	655	33,880	324,981	94,677	..	
Number of Stopcocks in same	..	6	6	9	11	11	9	47	256	...	...	106	881	416	..	
Feet of Pipe laid in Boston Highlands	...	...	...	185	1,116	11,427	6,200	12,410	88,829	...	916	9,154	167,567	30,343	238	
Number of Stopcocks in same	...	...	...	2	2	9	4	24	131	...	...	17	371	130	2	
Feet of Pipe laid in South Boston	...	...	...	...	...	...	13,645	....	50,131	...	105	5,174	129,532	37,175	..	
Number of Stopcocks in same	...	...	...	...	...	...	6	....	80	...	...	9	248	112	..	
Feet of Pipe laid in East Boston	...	...	...	...	...	1,463	15,972	2,152	37,815	15,721	218	23,202	88,375	6,931	..	
Number of Stopcocks in same	..	...	...	...	...	...	8	6	49	6	...	20	161	59	..	
Feet of Pipe laid in Dorchester	...	...	...	...	...	7,784	3,698	456	106,849	...	1,340	28,487	131,875	4,331	..	
Number of Stopcocks in same	..	...	...	...	...	5	2	1	125	...	...	43	256	26	..	
Feet of Pipe laid in W. Roxbury	...	...	...	...	...	...	24	2,916	78,018	...	...	38,249	48,079	1,591	..	
Number of Stopcocks in same	..	...	...	...	...	...	...	1	76	...	...	46	98	15	..	
Feet of Pipe laid in Brighton	..	1,275	...	55	...	...	...	9,305	43,655	...	...	22,656	23,428	540	..	
Number of Stopcocks in same	..	...	...	1	...	...	...	6	59	...	...	33	55	4	..	
Feet of Pipe laid in Newton, Needham, C. H. Reservoir, and Framingham	266	16,051	1,435	1,111	2,140	...	20	2,043	....	...	...	....	360	....	..	
Number of Stopcocks in same	..	...	...	2	...	...	2	4	....	...	...	....	2	....	..	
Total length of Pipe laid	266	39,573	24,601	21,421	30,026	26,447	45,362	47,748	525,101	15,721	3,234	160,802	914,197	175,588	238	2,030,325 ft. equal to 384 miles 2,805 ft.
Number of Stopcocks put in	..	6	6	14	13	25	29	87	780	6	...	274	2,072	762	2	4,076

Statement of Service-Pipes laid in 1880.

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.
1½	2	84	....	....	1	35	....	....	....	....	....	....	....	....	3	119
1¼	1	22	....	....	....	....	....	....	....	....	....	....	....	....	1	22
1	11	341	....	....	4	59	....	....	1	18	....	....	....	....	16	418
¾	13	319	3	101	....	....	1	17	2	50	....	....	1	180	20	667
⅝	145	4,999	64	1,508	27	640	133	3,466	217	5,901	151	3,570	85	2,602	822	22,686
Aggregate															962	23,912
Making total number up to May 1, 1881															46,315	

Repairs of Pipes during the Year 1880.

WHERE.	DIAMETER OF PIPES IN INCHES.																
	40	36	30	24	20	16	12	8	6	4	3	2	1½	1¼	1	¾	⅝	½	Total.
Boston	1	2	2	12	1	9	2	1	37	29	2	2	37	1	9	2	627	3	779
South Boston	.	.	.	.	1	.	2	.	2	3	.	.	.	.	1	1	119	10	139
East Boston	.	.	.	1	4	.	.	.	2	1	.	.	.	.	.	.	57	1	66
Boston Highlands	.	.	.	3	1	.	2	.	1	1	.	1	.	.	1	.	42	2	54
Dorchester	.	.	.	.	.	.	1	.	7	.	.	.	.	.	.	.	4	1	13
West Roxbury	.	.	.	.	.	.	1	2	3	.	.	.	1	.	.	.	2	.	9
Brighton	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	3	.	4
	1	2	2	16	7	9	8	3	52	35	2	3	38	1	11	3	854	17	1,064

Of the leaks that have occurred on pipes of 4 inches and upwards: Joints, 91; settling of earth, 17; defective packing, 3; defective pipe, 4; defective stop-cock, 2; struck by pick, 2. Total . .	119
Stoppages by fish, 7; gasket, 9	16
Of 3-inch and on service-pipes: Joints, 9; settling of earth, 240; settling of wall, 1; settling of sewer, 2; defective pipe, 49; defective coupling, 12; defective packing, 13; defective faucet, 5; coupling loose at main, 11; by frost, 9; stiff connections, 95. Total	446
Stoppages by fish, 279; by rust, 161; by dirt, 32; by gasket, 11	483
Total	1,064

Statement of Number of Leaks and Stoppages, 1850–1880.

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	594	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
1876	214	734	948
1877	109	801	910
1878	213	1,024	1,237
1879	211	995	1,206
1880	135	929	1,064

HYDRANTS.

During the year 133 hydrants have been established, and 82 abandoned.

	ESTABLISHED.					ABANDONED.				
	Boston Lowry.	Y.	Post.	Lowry.	Boston.	Y.	Post.	Lowry.	Boston.	Dif.
Boston	17	..	4	3	= 24	10	..	3	10=23	1
South Boston	10	..	5	1	= 16	7	..	..	3=10	6
East Boston	2	..	3	..	1= 6	2	..	..	= 2	4
Boston Highlands	4	..	7	3	11= 25	4	..	6	2=12	13
Dorchester	17	3	11	1	9= 41	17	..	6	1=24	17
West Roxbury	13	..	1	..	= 14	8	1	..	= 9	5
Brighton	1	..	3	..	3= 7	1	..	..	1= 2	5
	64	3	34	8	24=133	49	1	15	17=82	51

Total amount up to May 1, 1881.

Boston	1,326
South Boston	493
East Boston	301
Boston Highlands	801
Dorchester	700
West Roxbury	336
Brighton	212
Deer Island	16
Brookline	8
Charlestown	3
Chelsea	8
	4,204

29 hydrants have been taken out and replaced by new or repaired ones, and 124 boxes have been taken out and replaced by new ones. The hydrants have had the usual attention paid them.

STOPCOCKS.

95 new stopcocks have been established this year. 41 boxes have been taken out and replaced by new ones. All the stopcocks have had the proper attention paid them.

Statement of Pipes and other Stock on hand, exclusive of Tools, May 1, 1881.

	DIAMETER IN INCHES.														
	60	48	40	36	30	24	20	16	12	10	9	8	6	4	3
Pipes	2	2	40	30	48	32	53	38	442	158	4	484	1,477	29	20
Blow-of Branches	.	2	. .	. .	1	1	. .	2	19	3	. .	. .	. . .	. .	.
Y Branches	.	.	. .	. .	2	1	1	1	. .	. .	. .	. .	. . .	. .	.
4-Way Branches	.	.	2	1	2	10	5	14	50	. .	. .	35	. . .	. .	.
3-Way Branches	.	.	6	6	6	5	. .	18	25	12	. .	26	45	13	.
Flange Pipe	.	.	1	1	. .	1	. .	2	3	. .	. .	. .	. . .	. .	.
Sleeves	1	2	6	10	6	3	8	2	13	24	. .	45	52	21	8
Clamp Sleeves	.	.	. .	2	7	. .	. .	. .	3	. .	. .	. .	2	. .	.
Caps	1	.	2	2	2	2	2	. .	8	5	. .	11	8	10	.
Reducers	1	1	4	3	2	7	9	4	14	. .	26	9	17	. .	.
Bevel Hubs	.	.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	6	3	.
Offset Pipes	.	.	. .	. .	. .	. .	. .	. .	17	. .	. .	34	15	15	.
Yoke Pipes	.	.	. .	. .	. .	. .	. .	. .	6	. .	. .	13	13	1	.
Manhole Pipes	.	.	1	. .	2	. .	. .	. .	. .	. .	. .	. .	. . .	. .	.
One-eighth Turns	.	.	1	2	4	9	12	9	43	3	. .	49	36	2	.
Pieces of Pipes	1	2	4	2	3	4	5	2	1	1	. .	5	4	. .	.
Curve Pipe	.	2	6	4	13	18	10	2	39	3	. .	31	36	7	.
Quarter Turns	.	.	. .	2	10	4	11	10	52	2	. .	36	40	2	15
Double Hubs	.	.	. .	. .	. .	. .	3	8	. .	. .	. .	. .	13	. .	.
Blow-off and Manhole	.	.	. .	2	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	.
Plugs	.	.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	4	2	.
Thawing Clamps	.	.	. .	. .	. .	. .	. .	. .	12	. .	. .	7	12	12	.
Straps	.	.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1	2	.
Branch Openings	.	.	4	. .	18	3	. .	. .	. .	. .	. .	. .	. . .	. .	.
Stopcocks	.	.	1	2	5	1	2	4	4	. .	. .	13	16	1	.
Manhole Branches	.	.	2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	.

Lowry Hydrants. — 15 Lowry hydrants, 50 barrels, 43 pots, 5 gaskets, 10 valves, 10 chucks, 42 wastes, 2 covets, 210 bolts.

Post Hydrants. — 1 post hydrant, 21 pots, 19 barrels, 2 valves, 16 caps, 1 cover.

Boston Hydrants. — 30 Boston hydrants, 11 extension pieces, 10 frames and covers, 64 covers, 7 bends.

Boston Y's. — 2 Boston Y's, 1 cover, 5 pots.

Boston Lowry's. — 2 Boston Lowry hydrants, 37 gaskets, 119 bolts.

For Stopcocks. — 1 4-inch screw for waste weir, 1 do. for Brookline reservoir, 110 lbs. washers, 49 bolts, 2,807 lbs. iron castings, 300 lbs. composition, 60 lbs. brass, 209 mallable nuts.

Meters in Shop. — 7 3-inch, 6 2-inch, 1 1½-inch, 25 1-inch, 38 ⅝-inch.

Stock for Meters. — 49 1-inch cocks, 8 ⅝-inch do., 1 4-inch clock, 2 3-inch, 10 ⅝-inch, 2 2-inch connection pieces, 4 1-inch do., 6 ⅝-inch do., 20 rubber nipples, 14 fish boxes.

For Service-Pipe. — 41 2-inch nipples, 34 2-inch nuts, 4 2-inch valves, 11 2-inch screw nipples, 43 2-inch tubes, 5 2-inch valves, 41 2-inch male couplings, 31 1½-inch nipples, 35 1½-inch cocks, 43 1½-inch nuts, 18 1½-inch tubes, 7 1¼-inch cocks, 32 1¼-inch male couplings, 17 1¼-inch nuts, 6 1-inch air plugs, 24 1-inch cocks, 50 1-inch T cocks, 42 1-inch sidewalk cocks, 46 1-inch tubes, 41 1-inch male couplings, 33 1-inch crooked cocks, 5 1-inch air cocks, 52 1-inch nuts, 92 ¾-inch cocks, 64 ¾-inch nuts, 109 ¾-inch tubes, 44 ¾-inch T cocks, 51 1-inch male couplings, 52 ¾-inch nuts, 110 ⅝-inch cocks, 52 ⅝-inch crooked cocks, 65 ⅝-inch right angle cocks, 50 ⅝-inch T cocks, 66 ⅝-inch straight cocks, 20 ⅝-inch thawing-cocks, 21 ⅝-inch sidewalk cocks, 26 ⅝-inch thawing-couplings, 366 ⅝-inch nuts, 234 ⅝-inch tubes, 27 ⅝ × ½-inch tubes, 213 ⅝-inch nipples, 19 ⅝-inch Y cocks, 52 ½-inch straight cocks, 48 ½-inch nuts, 6 ½-inch crooked cocks, 30 ½-inch tubes, 524 boxes, 33 extension tubes, 109 telescope tubes.

Lead Pipe. — 326 lbs. 2 ½-inch lead pipe, 1,632 lbs. 2-inch pipe, 1,366 lbs. 1½-inch lead pipe, 2,135 lbs. 1¼-inch pipe, 1,020 lbs. 1-inch pipe, 251 lbs. 1-inch tin-lined pipe, 139 lbs. ¾-inch pipe, 366 lbs. ⅝-inch tin-lined pipe, 61 lbs. ⅝-inch block-tin pipe.

Blacksmith Shop. — 648 lbs. Norway iron, 238 lbs. shoe shapes, 1,565 lbs. refined iron, 346 lbs. square cast steel, 177 lbs. Octagon steel, 92 lbs. calking steel, 535 lbs. horse-shoes.

Carpenter's Shop. — 2 Lowry hydrant boxes, 6 post do., 4 Boston Y do., 53 stopcock boxes, 3 meter boxes, 39,000 feet spruce, 20 feet maple, 20 feet ash.

Tools. — 1 steam-engine, 1 large-hoisting-crane, 3 boom derricks, 8 hand geared do., 8 set of shears and rigging for same, 8 tool houses, 4 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 pipe, 2 engine lathes, 1 foot do., 1 hand do., 1 Pratt & Whitney 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., 7 wheelbarrows, also a lot of patterns where we obtain castings.

Stable. — 13 horses, 13 wagons, 2 buggies, 6 pungs, 1 sled, 2 sets runners, 2 carts, 17 sets harness, 30 blankets, 3 buffalo robes, 1½ tons hay, 10 bushels grain, 1 jigger, 3 lap robes, 2 hay cutters.

Beacon Hill Reservoir. — 1 large composition cylinder, 1 16-inch jet, 1 6-inch composition jet, 3 composition jets, 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. — 15,127 lbs pig lead, 100 lbs. gasket, 1 fountain basin, 1 stone trough for drinking fountain, 140 cords wood, 1 thawing-boiler, 1 hose carriage, 1 garden pump, 48 3-inch earthen pipe, 12 paving brick, 90 gallons kerosene-oil, 40 gallons linseed-oil, 3 bbls. cement, lot of old bolts.

Respectfully submitted,

E. R. JONES,

Superintendent Eastern Division.

REPORT OF THE SUPERINTENDENT OF THE MYSTIC WATER WORKS.

CHARLESTOWN DISTRICT, BOSTON, May 1, 1881.

LEONARD R. CUTTER, Esq., *Chairman Boston Water Board:*

SIR, — My annual report for the year ending April 30 is herewith respectfully submitted.

MYSTIC LAKE.

During the month of June, at Mystic Station, in Winchester, the low level of the water being favorable, a large amount of muck was wheeled up from areas that are usually flowed, and deposited along the shore. This work was continued through the season until December 14, at Wedge and Whitney's ponds, and a part of the Abbajona river, near Moseley's, in Winchester, and also in Mystic lake, at Mystic street, above the Everett estate, and above Bacon's bridge. The stone-work at the Overflow Dam, including the wing-walls and all the piers, has been thoroughly examined and repointed, the low level of the water favoring the work; and I consider all that work in very excellent condition.

MYSTIC SEWER.

This sewer is in good order its entire length, together with all its branch connections and cesspools.

CONDUIT.

The conduit, having been cleaned and examined the previous year, was not drawn off the past year, but it is probably in good condition. The collection on the screens at the gate-chamber was very slight, indicating but very little growth of vegetable matter in the conduit. The screens at the gate-chamber have been entirely renewed during the year.

PUMPING–STATION.

The pumps are in good working order, and have required but slight repairs. The water cylinders, suction and delivery pipes, and other iron-work connected with them, will need

repainting during the coming year. In the boiler-room, the older set of boilers are now being overhauled and repaired. One of them has had an entire new set of tubes and a new sheet over the furnace, and the others are now being thoroughly inspected. The walls and ceiling of the engine-room have been repainted. The engine-house and coal-shed, dwelling-houses and stable, are in good condition, requiring only the usual repairs.

Distributing Mains.

In this district these mains have been extended 296 feet, and 11,914 feet have been relaid, all with iron pipe. Of the amount relaid, 240 feet were enlarged from 1 to 4 inch in diameter; 672 feet, from 2 to 4 inch; 3,446 feet, from 4 to 6 inch; and 624 feet, from 4 to 8 inch. There were also 600 feet reduced from 8 to 6 inch.

The City of Chelsea having filled in and made solid about 275 feet of their end of Chelsea bridge, the 16-inch supply main through that portion was relaid and the location changed.

The number of hydrants has been increased 18, viz., 5 Lowry, and 13 Post, and 2 Flush hydrants have been discontinued.

There have been 27 breaks, and 19 leaks on the distributing mains during the year.

In Chelsea the distributing mains have been extended 100 feet, in Somerville 1,331 feet, and in Chelsea there has been 1, and in Somerville 8, additional hydrants located during the year.

Service-Pipes.

There have been 36 new service-pipes entered, and 131 repaired or altered. Of these, 10 tin-lined were changed to lead; 12 changed from "Y" branch to single supplies; 7 were renewed and 5 relaid and enlarged; 12 were altered for various reasons. There were 50 stoppages, of which 27 were by frost, 17 by fish, and 6 by rust. 800 service-boxes were renewed, 425 with iron boxes, and 375 with wood.

In Chelsea 42 new service-pipes have been entered; in Somerville, 94; and in Everett, 23.

The appended tables show the number of feet of pipe laid and relaid, the amount now connected with the works, the number of gates and hydrants, and the stock on hand at the end of the year.

Respectfully submitted,

CHARLES H. BIGELOW,
Superintendent.

Distribution Pipe Relaid in Charlestown in 1880-81.

Streets.	Original Size.	Size of Pipe.				Kind of Pipe.
		4 inch.	6 inch.	8 inch.	16 inch.	
		Feet.	Feet.	Feet.	Feet.	
Pine	1 inch.	240	....	....	....	Iron.
Tremont	4 "	291	....	....	....	"
Russell	4 "	....	....	624	....	"
Bartlett	6 "	....	648	....	....	"
Sullivan	4 "	....	852	....	....	"
Mason place	2 "	12	....	....	....	"
Wesley place	2 "	12	....	....	....	"
Harvard	6 "	....	16	....	....	"
Vine	8 "	....	....	600	....	"
Decatur	6 "	....	28	....	....	"
Moulton	6 "	....	900	....	....	"
Bunker Hill	8 "	....	....	600	....	"
Jackson	6 "	....	41	....	....	"
Jerome place	4 "	....	16	....	....	"
Ferrin	4 "	....	1,145	....	....	"
Warren	6 "	....	864	....	....	"
Soley	4 "	....	54	....	....	"
Monument avenue	4 "	36	....	....	....	"
Pleasant	4 "	....	83	....	....	"
Thompson	4 "	....	12	....	....	"
Cordis	6 "	....	61	....	....	"
Church court	2 "	12	....	....	....	"
Albion court	4 "	48	....	....	....	"
Baldwin	4 "	....	48	....	....	"
Irving place	4 "	48	....	....	....	"
Forbush court	4 "	24	....	....	....	"
Gibbs lane	4 "	15	....	....	....	"
Chestnut	4 "	....	756	....	....	"
Bow	8 "	....	600	....	....	"
High	8 "	....	....	1,596	....	"
Hill	2 "	204	....	....	....	"
Webster	4 "	....	384	....	....	"
Carried forward	.....	942	6,508	3,420	....	....

Distribution Pipe Relaid. — *Continued.*

Streets.	Original Size.	Size of Pipe.				Kind of Pipe.
		4 inch.	6 inch.	8 inch.	16 inch.	
		Feet.	Feet.	Feet.	Feet.	
Brought forward	. . . . .	942	6,508	3,420	. . . .	. . . .
Edgeworth	4 inch.	24	. . . .	. . . .	. . . .	Iron.
Parker	6 "	. . . .	120	. . . .	. . . .	"
Elm	6 "	. . . .	36	. . . .	. . . .	"
Wood	6 "	. . . .	36	. . . .	. . . .	"
Cross	4 "	. . . .	24	. . . .	. . . .	"
School	4 "	. . . .	24	. . . .	. . . .	"
Chelsea bridge	16 "	. . . .	. . . .	. . . .	48	"
Concord	4 "	. . . .	48	. . . .	. . . .	"
Mystic avenue	4 "	72	. . . .	. . . .	. . . .	"
Arlington avenue	6 "	. . . .	84	. . . .	. . . .	"
Garden court	2 "	216	. . . .	. . . .	. . . .	"
Brighton	2 "	216	. . . .	. . . .	. . . .	"
Eastern R.R., Prison Point	4 "	96	. . . .	. . . .	. . . .	"
Totals		1,566	6,880	3,420	48	

Extension of Distribution Pipes in Charlestown in 1880-81.

Streets.	Size of Pipe.		Kind of Pipe.	Total Feet.
	4 inch.	6 inch.		
Sever	10	. . . . .	Iron.	10
Ham's Court	12	. . . . .	"	12
Winchester	120	. . . . .	"	120
Monument square	. . . . .	18	"	18
Mead	. . . . .	12	"	12
Chelsea bridge	. . . . .	24	"	24
Fremont	100	. . . . .	"	100
Totals	242	54	. . . . .	296

Service-Pipes Laid in Charlestown in 1880–81.

Size.	¼ inch.	⅝ inch.	¾ inch.	1 inch.	2 inch.	Total No.	Total Feet.
Number	5	27	2	1	1	36	876

CHARLESTOWN.	Relaid	6,932 feet.
	Relaid and enlarged . .	11,914 "
	Extension	296 feet.
	Laid previous	154,598 "
	Aggregate	154,894 feet, or 29 miles 1,774 feet.
CHELSEA.	Extension	100 "
	Laid previous	149,363 "
	Aggregate	149,463 feet, or 28 miles 1,623 feet.
SOMERVILLE.	Relaid	1,340 feet.
	Extension	1,331 "
	Laid previous	236,653 "
	Aggregate	237,984 feet, or 45 miles 384 feet.
EVERETT.	Laid previous	76,024 feet, or 14 miles 2,104 feet.
ENGINE-HOUSE GROUNDS, SOMERVILLE.	Laid previous	287 feet.

Total amount of distribution pipe, 117 miles 892 feet.

Summary of Pipes, Gates and Hydrants, connected with the Works, May 1, 1881.

Pipes.	36 inch.	30 inch.	24 inch.	20 inch.	16 inch.	12 inch.	10 inch.	8 inch.	6 inch.	4 inch.	3 inch.	2 inch.
Iron	974	7,354	16,867	200	14,512	11,527	8,253	15,196	28,910	13,649	21,456	666
Cement	.....	17,515	.....	3,980	6,916	12,042	20,483	60,018	176,718	282,302	31,190	8,892
Totals	974	24,869	16,867	4,180	21,428	23,569	28,736	75,214	205,628	295,951	52,646	9,558

Aggregate ..... 759,620 feet, or 143 miles 4,580 feet.

Gates.	30 inch.	24 inch.	20 inch.	16 inch.	12 inch.	10 inch.	8 inch.	6 inch.	4 inch.	3 inch.	Total.
	11	7	4	21	43	41	107	353	491	64	1,142

Hydrants.	Charlestown.	Somerville.	Chelsea.	Everett.	Medford.	Total.
Lowry	174	3	.....	1	.....	178
Flush	32	26	5	.....	5	68
Post	50	249	132	68	5	504
	256	278	137	69	10	750

Statement of Stock on Hand May 1, 1881.

	Diameter in Inches.										
	36 inch.	30 inch.	24 inch.	20 inch.	16 inch.	12 inch.	10 inch.	8 inch.	6 inch.	4 inch.	3 inch.
Pipes	3	19	14	5	2	186	88	160	230	186	15
Quarter Bends	. .	. .	2	. .	10	11	17	16	31	21	. .
Eighth Bends	. .	. .	. .	. .	8	10	16	13	19	22	. .
Sixteenth Bends	. .	. .	. .	. .	14	11	10	11	14	16	. .
Offsets	. .	. .	. .	. .	. .	8	6	11	9	12	. .
Reducers	. .	. .	1	1	3	15	10	19	6	. . .	. .
3-way Branches	. .	. .	1	. .	24	41	30	22	45	24	. .
4-way Branches	. .	. .	. .	. .	. .	6	3	8	12	. . .	. .
Y Branches	. .	1	. .	. .	. .	. . .	. .	. . .	. . .	. . .	. .
Sleeves	. .	6	8	8	6	19	25	31	20	11	58
Gates	. .	. .	. .	1	. .	. . .	1	2	1	2	1
Curves	. .	6	. .	. .	. .	. . .	. .	. . .	. . .	. . .	. .

Hydrants. — 32 Lowry hydrant barrels, 29 pots, 23 frames, 650 lbs. special castings, 40 gaskets, 25 wastes, 50 bolts, 18 rubber valves, 170 lbs. blanks.

Meters. — 5 1-inch, 1 2-inch, 2 3-inch, 3 4-inch, 26 frames, 37 covers, 7 boxes, 23 2-inch connections, 13 1½-inch connections, 39 1-inch connections, 6 ⅝-inch connections, 59 lbs. brass wire.

Services. — 13 ½-inch service-stops, 53 ⅝-inch do., 9 ¾-inch do., 7 1-inch do., 23 ⅝-inch corp. stops, 5 ¾-inch do., 6 1-inch do., 40 ⅝-inch for cement pipe, 10 ¾-inch do., 12 1-inch do., 23 2-inch sol-nipples, 11 1-inch do., 13 ¾-inch do., 54 ½-inch do., 70 lbs. block-tin, 75 lbs. solder, 122 brass bolts, 34 box covers, 180 iron boxes.

Lead Pipe. — 6,218 lbs. ½-inch, 2,898 lbs. ⅝-inch, 810 lbs. ¾-inch, 805 lbs. 1-inch, 627 lbs. 1 ½-inch, 720 lbs. 2-inch.

Miscellaneous. — 640 lbs. pig lead, 11 kegs nails, 11,800 feet spruce Kyanized lumber, 20 double loads of gravel, 25 double loads of sand, 2 garden hydrants, 11 lbs. rubber, 8 casks cement, 1 do. calcine plaster, 36 lbs. galv. iron, 1 box tin, 50 lbs. red lead, 50 gallons linseed-oil, 1 bbl. blk. varnish, 4 gallons shellac, 4 gallons alcohol, 100 lbs. white lead, 100 lbs. jute, 100 lbs. hay rope.

CIVIL ORGANIZATION OF THE WATER WORKS, FROM THEIR COMMENCEMENT, TO MAY 1, 1881.

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.

A. FTELEY, Resident Engineer on construction of Sudbury-river works, from May 10, 1873, to April 7, 1880.

JOSEPH P. DAVIS, City Engineer. From Nov. 25, 1872, to March 20, 1880.

HENRY M. WIGHTMAN, City Engineer. From April 5, 1880, 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 January 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 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 resigned May 31, 1875 . . . . . Six months.
L. MILES STANDISH, elected August 5, 1875, to July 31, 1876 . . . . . One year.

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, 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.
JOHN 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, 75, and 76†	Five years.
LEONARD R. CUTTER, 1871, 72, 73, 74, 75, and 76†	Six years.
L. MILES STANDISH, 1860, 61, 63, 64, 65, 66, 67, 74, 75, and 76†	Ten years.
CHARLES E. POWERS, *1875, and 76†	Two years.
SOLOMON B. STEBBINS, 1876†	One year.
NAHUM M. MORRISON, 1876†	One year.
AUGUSTUS PARKER, 1876†	One year.

*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 reëlected in 1868. Alexander Wadsworth served six years, 1864–69, and was reëlected 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.

†Served until the organization of the Boston Water Board.

‡Deceased.

BOSTON WATER BOARD, *Organized July 31, 1876.*

TIMOTHY T. SAWYER, from July 31, 1876, to May 5, 1879.
LEONARD R. CUTTER, from July 31, 1876, to present time.
ALBERT STANWOOD, from July 31, 1876, to present time.
FRANCIS THOMPSON, from May 5, 1879, to present time.

ORGANIZATION OF THE BOARD FOR YEAR 1880–81.

Chairman.
LEONARD R. CUTTER.

Clerk.
WALTER E. SWAN.

Superintendent of the Eastern Division of Cochituate Department.
EZEKIEL R. JONES.

Superintendent of the Western Division of Cochituate Department.
DESMOND FITZGERALD.

Superintendent of Mystic Department.
CHARLES H. BIGELOW.

Water Registrar of the Cochituate Department.
WILLIAM F. DAVIS.

Water Registrar of the Mystic Department.
JOSEPH H. CALDWELL.

City Engineer.
HENRY M. WIGHTMAN.