New Bedford, Mass.

# CITY DOCUMENTS

---

## Municipal Register 1915,

## Mayor's Address to the Council

## Annual Reports, Etc.

**FOR THE YEAR 1914.**


**CITY OF NEW BEDFORD**

**MASSACHUSETTS**

# OLD DARTMOUTH

# HISTORICAL SKETCHES

# No. 42.

---

Being the proceedings of the Old Dartmouth Historical Society, held in their building, Water Street, New Bedford, Massachusetts, on April 19, 1915.

---

## THE DEVELOPMENT OF THE NEW BEDFORD WATER SUPPLIES.

Presented by Robert C. P. Coggeshall.

**PURCHASE STREET PUMPING STATION, 1870.**

# THE DEVELOPMENT OF

# NEW BEDFORD WATER SUPPLIES.

R. C. P. COGGESHALL

A supply of good water was a factor always considered by our ancestors, in determining a location for permanent settlement. Good spring water was always preferred, but if not found, shallow wells were sunk from which water was obtained by buckets raised by poles or pulleys or by long balance poles.

The accumulation of organic matter, due to increase in population, gradually polluted such waters. This was especially true in congested districts, where such supplies also became insufficient. In every community the waters of certain wells were preferred because they were thought to be superior in quality. Citizens would sometimes reject the water of their own wells, and travel long distances to obtain the better water. Certain wells were known as "tea water wells" because it was thought that better tea could be brewed therefrom.

New York had its famous "Tea Water Pump Garden" situated at what is now the junction of Chatham and Roosevelt streets. This was a famous resort in Revolutionary times, where tea and stronger beverages could be obtained. The streets in its vicinity were often obstructed by the vehicles of the rich and fastidious, waiting their turn at the pump. The place finally became so congested that the New York common council in 1797 ordered "the spout of the pump to be sufficiently raised and lengthened to permit pedestrians to pass beneath it."

In the early days of our own city, certain wells came to have a good repute. Leonard B. Ellis has told of a well of delicious water which existed in Rose Alley in 1815 and which supplied that neighborhood. The town pump in City Hall square and the inverted cannon fountain on Rodman street at Water street, were liberally patronized and gave satisfaction to their users.

At the opening of the last century the science of delivering wholesome, liberal, and reliable supplies of water to congested districts was little understood. The appliances and methods necessary to accomplish this result had not then been developed. The average well was unsatisfactory. It might be dry when needed, or unsafe for domestic use at other times. The growing agitation for more water and that of better quality was making itself felt. Private water supply companies began to organize to improve conditions. It later developed that the majority of these enterprises were based more upon the health of the investors' pocketbooks than upon any anxiety concerning the physical well-being of their patrons. Such companies were content to do as little as possible. Their plants were crudely constructed and clumsily operated. The nearest supply was taken in preference to going a longer distance to get something better. Their capacity was limited at best and growing tree roots completely filling the log pipes would cut off the supply. The customers were dissatisfied and constant friction between company and taker became rampant, generally resulting in a short life for the company.

I am now going to relate the story of the Manhattan Company of New York City. Its promoters induced the citizens of that city to believe that their whole concern was to supply

them with pure and wholesome water, while all the time they were inwardly conniving to accomplish something very different.

Until very recently anyone happening to pass the northwest corner of Reed and Centre streets in the city of New York could observe through the windows of the building located there, a large cast-iron water tank which was supplied with water from a large well beneath, by means of a steam pump. This interesting relic has existed for over one hundred years, and its former use is practically forgotten by everyone except the owners, the Manhattan Water Company. Due to a curious legal fiction, that company must continue to maintain the semblance of a water plant in order to keep its charter, which is an exceedingly valuable document since under a "joker" clause it has built up the great Bank of the Manhattan Company of New York City. The tank was removed last June (1914), but the Water Company will continue the maintenance of pump and well.

The granting of this charter to the Manhattan Company establishing a water supply to the City of New York was an historic event and thereby hangs a tale.

Corporate Banking in New York City began with the organization of the Bank of New York by Alexander Hamilton in 1784. For fifteen years this bank, together with the New York branch of the first Bank of the United States, were the only banks doing business in either the City or State of New York. With Hamilton and the Federalists in control of the legislature, new bank charters were unobtainable. This monopoly of banking facilities in the City and State was of great strategic value to the political party in control, and naturally aroused jealousy and resentment among the members of the opposition whose leader was Aaron Burr.

In 1798, New York City suffered from a severe yellow fever epidemic which was attributed to the poor water supply. Upon the assembling of the legislature in 1799 an association of individuals, among whom Aaron Burr was the moving spirit, applied for a charter for the purpose of "supplying the City of New York with pure and wholesome water." With a capital of $2,000,000, the project was an ambitious one for those days. Burr used his influence as a member of the assembly in persuading that body to feel that as there was a great uncertainty as to the probable cost of the proposed water works system, permission should be granted the company to invest all surplus capital in other directions.

The eighth clause of the charter, which attracted but little attention at the time, was really the most important one. It reads as follows:

"And be it further enacted, that it shall, and may be lawful for the said company to employ all such surplus capital, as may belong or accrue to the said company, in the purchase of public or other stock, or in any other monied transactions or operations not inconsistent with the constitution and laws of this State, or of the United States, for the sole benefit of the said company."

Availing itself of the powers conveyed by the above clause, the Manhattan Company formed a powerful bank, which was the real object of the incorporators. Only enough was done in the matter of introducing water necessary to hold the charter.

It is evident that the legislature expected the Manhattan Company to obtain an ample and satisfactory supply from the Bronx River or some other stream from the wording of the charter which grants the Company the right "to erect dams, or other works across, or upon any stream or streams of water, river or rivers, or any other place or places, where they shall judge proper for the purpose of raising such stream or streams, or turning the course thereof, or of making use of such streams, rivers, or places for constructing or working of any necessary engines, or to construct, dig or cause to be opened any canals or trenches whatsoever for conducting of such stream or streams or any other quantity of water from any source or sources that they may see fit."

Instead of obtaining an ample supply from the Bronx or some other stream or streams the Manhattan Company proceeded to sink a series of large wells at the location stated at the beginning of this story. At that time this was a thickly populated location totally unfit to produce wholesome and pure water. The water was pumped from these wells into a reservoir located on Chambers street from whence it was distributed in hollow logs of small bore generally through the city south of City Hall. The company laid about 25 miles of pine log pipe of different sizes and supplied about 2,000 houses.

I herewith present to you a sample section of one of these log pipes. This was rescued from a street in lower New York some years ago by Andrew Snow of South Dartmouth, who was then living in New York and by him presented to the speaker.

The quality of the water was exceedingly poor and caused constant irritation and complaint. Cartoons issued at the time indicate that "Pure Manhattan" and very muddy and uninviting water were regarded as synonymous terms. The citizens of New York endured this nuisance for over thirty years, during which time constantly increasing agitation resulted in the introduction of the Croton Supply in 1842. Shortly after the Manhattan Company closed its activities and practically retired as a water distributor.

Boston had its Jamaica Pond Aqueduct Company which flourished several years previous to 1848. This Company led the waters of Jamaica Pond into Roxbury and Boston, using for that purpose pitch pine logs, none larger than a four-inch bore. The extent of their operations did not exceed fifteen miles of distribution logs. As can well be imagined, this supply was neither satisfactory nor adequate, and with the advent of the much superior Cochituate supply the business of this company vanished.

In 1799 the Massachusetts general court passed an "act enabling proprietors of aqueducts to manage the same." This act was a long document in 12 sections regulating the business of furnishing water supplies. This was followed by the appearance of many aqueduct companies throughout the state. Most of these were insignificant affairs and the majority have long since been forgotten. One case of this very kind is identified with our own city and no one living today seems able to give much information as to the extent of its activities. It flourished between 1803 and 1822. The books of records, dividends, stock transfers, with a few scattering papers have recently been rescued and are now deposited in the Free Public library. These documents have little to say regarding the plant, its actual cost and manner in which it was operated. In the absence of the treasurer's accounts I am unable to give any statement whatever regarding receipts and expenditures, neither can I give a list of the streets in which logs were placed, the number of service supplies, or the rates that were charged.

With the help of these papers and stray bits of information I have woven the following story: An association was formed in Bedford village in 1803 for the purpose of furnishing a water supply. The paper soliciting subscriptions to the stock was dated July 14, 1803. It states that the said subscribers associate

"For the purpose of conducting the water from the southwest part of the village of Bedford through the most convenient streets to the four corners, so-called, and from thence to such parts of the village as shall be thought best. Do agree to take the number of shares as set against our names, and no more. That the association shall consist of fifty shares and when the whole number of shares shall be subscribed, do agree to pay such installments thereon as a committee (which shall be appointed for that purpose) shall assess from time to time.

"And having assumed the name of the First Aqueduct association, do further agree that the business shall be transacted by that name, that each share shall be entitled to one vote provided, however, that no person shall have more than five votes.

"And there shall be annually appointed a treasurer and committee who shall assess such sums of money as shall be wanted for the purpose aforesaid, and who shall have power to make contracts in behalf of the association, viz: for purchasing a lot, digging a fountain, procuring and sinking the logs, to make contracts with such people as may wish to take the water, and keep the aqueduct in repair and to examine the treasurer's accounts."

The stock must have been quickly taken for upon the next day the first meeting of the association was held, with Charles Russell as moderator, Joseph Ricketson clerk, and Jonathan Allen treasurer. A committee of six was appointed with full power to attend to all duties stated in the last paragraphs of the subscription paper given above and, in addition, they were directed "to assess such sums of money from time to time as may be wanted for this purpose, provided such sums shall not exceed, in the whole, twenty-five dollars per share.

We can only surmise as to just what they did. They must have made a contract with Caleb Jenne (one of the stock holders) to dig the fountain (well) and very shortly there was some sort of disagreement for at a meeting held a month later a vote was passed allowing Caleb Jenne sixty dollars over and above the agreement made with him by the committee, whereupon the committee in charge "prayed for dismission" which was promptly granted and a new committee appointed.

Caleb got the best of the first committee but that did not end his troubles for two months later his work is very sharply criticised. The

association then voted: "That in their opinion Caleb Jenne did not build the fountain walls in a sufficient manner and that he shall build the western wall (which has now fallen down) at his own expense." The standing committee was directed to repair the damage and "keep an account of the expense and when Caleb Jenne shall have paid the amount of said expense he shall be discharged from all further demands."

Caleb must have been terribly slow in effecting a settlement, for two years later the directors are instructed to "call upon Caleb Jenne to fulfill and complete his contract." This is the last mention of the matter but I doubt whether Caleb Jenne ever finished that job.

That the fountain was finally finished, log pipes installed, and water delivered to customers is attested to by an article which appears in the Columbia Courier of July 4, 1805. After a brief description of a slight fire occurring in the house belonging to John Gerish, it goes on to say:

"As every person who was at the fire must have been sensible of the great deficiency in the number of leather buckets, and as their great utility is so very apparent, the inhabitants are requested to call on Joseph Ricketson, who has opened a subscription for the purpose of obtaining an adequate supply.

"As one means of obtaining a plentiful supply of water in case of fire, we would respectfully suggest to the selectmen the propriety of placing conductors (hydrants) at proper distances from each other in the pipes belonging to the First Bedford Aqueduct corporation. This measure is authorized by an act of this state respecting aqueducts."

Joseph Ricketson's subscription paper for obtaining a new supply of fire buckets appears among the aqueduct papers in the Free Public Library. There were twenty-seven subscribers agreeing to furnish a pair of buckets; sixteen subscribers one dollar each; four subscribers two dollars each; one five dollars and James Arnold and William Rotch, Jr., subscribed twenty dollars each.

Whether or not any connections for fire protection were made with the aqueduct as suggested by the newspaper article just read I have no means of knowing.

On February 25, 1804, the association was incorporated into a body politic by the name of the First Bedford Aqueduct association as authorized by the laws of the commonwealth. Heretofore it had been known as the First Aqueduct association. Soon the directors have trouble trying to deal with people conniving at their neighbors and others, taking water from their pipes who have not purchased that privilege.

So it appears that people actually stole water in those good old days. That practice has not yet gone out of fashion. The directors attempted to stop this by making rules and establishing fines, but judging from complaints made in later meetings, they never wholly succeeded.

In 1807 the directors purchased a second lot adjoining the first and excavated the second well.

In 1811 complaints are made by the directors that many persons who take the water make great waste of it, and that others have refused or neglected to pay therefor. Resolved—That it shall be the duty of the directors for the time being to inform the proprietor and occupant of the house of the neglect, and if neither will agree to pay the amount due, and where water is wasted, engage to make an economical use of it, that they shall immediately cut off the log leading to such premises. But when the contract has been made with a tenant who has removed, or is about to remove from the premises, that the director may in such case let the logs remain, provided the new tenant or proprietor shall engage to pay for the water; and further it shall be the duty of the directors to agree with all that shall engage to take the water that they shall pay for the time they may engage without any abatement even should the water fail for any part of the year, or should it at any time be necessary to draw off the water for the purpose of repairs.

On February 29, 1812 the directors are authorized to use the money in the hands of the collector and treasurer for the purpose of digging a new fountain or any other method of obtaining more water and should the sums be insufficient, to make an assessment on the proprietors.

The third well was finally dug and some sort of a scrap occurred, for at the next annual meeting a new set of directors was elected and authorized to call upon the former directors for a settlement.

It was the custom of the treasurer to report the cash balance on hand at each annual meeting, whereupon the directors would either vote a dividend or would direct the income to be used for repairs. After 1814 this balance is not given and the last annual meeting appears to have been held in 1819. On April 8, 1822, the

last record states that Gideon Howland, Jr., Peter Barney and Abraham Sherman, Jr., be a committee to dispose of the lots of land belonging to the association. This was done and the final dividend on the capital stock was paid September 28, 1822.

It appears that this association was a mutual association of proprietors, divided into fifty assessable shares in which the association has the right to sell any share for non-payment of assessment. The assessment was first limited to twenty-five dollars per share, but this limit was cancelled with the incorporation of the association in 1804. Whether or not assessments exceeding twenty-five dollars per share were ever made we do not know but the directors had the right to do so. I think it probable that an assessment was made in 1812 when the third well was constructed, for in 1814 one share was attached for failing to pay assessment and afterwards transferred to the association.

When the affairs of the association were closed in 1822 the capital stock was valued at $1,335.25 and $27.25 per share was paid to the stockholders. The association paid six dividends exclusive of the final stock dividend as follows:

1806—$4 per share.
1808—$5 per share
1809—$2 per share.
1810—$2 per share.
1814—$3 per share.
1816—$3 per share.

The project proved to be a poor investment. This fact, together with the final failure of the supply, caused the abandonment of the scheme.

The fountain lot, so called, measured 236 feet north from Walnut street on west side of Sixth street and 102 feet west from Sixth street on the north side of Walnut street, and contained 89 rods. They were acquired from Abraham Russell in two purchases, the first January, 1805, the second February, 1807. The amount paid was $1073.25. This land is now owned and occupied by Dr. Kirby and Dr. Whitney. The fountains were three large wells connected together and covered by a low triangular roof parallel with Sixth street, with end facing upon Walnut street (Standard, Aug. 26, 1868). From this reservoir the log pipe extended easterly in Walnut street, and it is presumed that they finally supplied the region of the "four corners,' so called. The logs were suplied and bored by Benjamin Taber at his water-power mill at the Head of the River. The water department has occasionally come across remains of these logs in past excavations. Many dwellings that were so situated that water could be carried to them by gravity, were supplied from this source. When the enterprise was new it bid fair to be successful, but the supply proved inadequate to meet the growing demands. The simple machinery was too crude and perishable and finally the delivery of the log pipes became obstructed by the roots of trees with which the streets were lined. A tiny hole in the log would attract a fibre of root which would force its way through to the water under whose nourishment it would grow until the pipe was filled and the flow of water completely cut off.

When the affairs of the association were finaly wound up in 1822 the wells were filled with stone, but the springs therein continued for many years to supply the fire reservoir at the northwest corner of Walnut and Sixth street. The springy condition of the land in this location exists to this day, in spite of all the drains that have been placed in that region.

The following is a complete list of the 36 stockholders of this company, of whom 31 were original stockholders, at various times during its existence:

Jonathan Allen, Gideon Allen, Aqueduct association, Uriah Brownell, Peter Barney, Joshua Baker, Bedford Bank, Caleb Congdon, Allen Case, Jonathan Card, Cornelius Grinnell, Isaac Howland, Jr., Peleg Howland, Gideon Howland, Jr., Joseph Howland, 2d, William Howland, Stephen Hathaway, Caleb Jenne, Jr., William James, Matthew Myrick, Silas Parker, Abijah Packard, Daniel Ricketson & Son, Gilbert Russell, Charles Russell, Davis Russell, Elihu Smith, Gideon Shepherd, Abraham Shearman, Jr., Daniel Taber, Benjamin Taber, Jr., Francis Taber, Barnabas Taber, Gardner Taber, Taber's wharf, Sands Wing.

In the early days there was a natural water course having its origin in a cedar swamp west of the County street court house, according to Thomas M. Stetson (see Ellis's History, page 63). It trickled eastward, crossing County, Eighth, Sixth streets, Library square, Pleasant street, near the north line of the Bates & Kirby property. A short distance east of Pleasant street it touched the southwest corner of the historical "ten acre lot" purchased of Joseph Rotch from Joseph Russell in 1765. Continuing easterly parallel with the south line of the 'ten acre lot,' it gave name to the 'fountain lot,' so called (J. V. Spare Dry Good Co.) because

of the numerous boiling springs of excellent quality which appeared here.

The brook now acquired the character of a 'little spring brook" and it is so described in the deed of the 'ten acre lot.' The "fountain lot" (Note: Please observe that there were two fountain lots in the village, the other being the aqueduct supply at Sixth and Walnut street) justified the establishment of Willard Sears' tannery to the south. The brook continued easterly, crossing Purchase street and Acushnet avenue. Here it was augmented by the entry of a little water course from the north (see Leonard map).

Further on it turned abruptly to the south and crossed Union street at the present location of J. & W. R Wing's store. Here was a street bridge, and Daniel Ricketson tells us of leaning upon the railing of this bridge to watch the surging water beneath. It then continued to the corner of Second and Spring streets, where it passed through a sizable pool and thence eastward in what is now Spring street, where it entered the river a short distance east of Water street. This water course at Library square and at the fountain lot was developed by the town for fire protection and other uses as will be seen later.

Some time previous to 1838, a sizable fire reservoir had been constructed by the town upon this fountain lot. This reservoir extended into Purchase street as far as the curbing of the west sidewalk.

A store building occupied by Samuel Bennett (1840-50) stood directly over the water and the reservoir extended west of the building. The New Bedford directories, 1838-52, include a list of the public fire reservoirs. Concerning the one under consideration it says:

"One on Purchase street near the First Congregational church, under the building occupied by Samuel Bennett. (The directories locate Samuel Bennett at 41 Purchase street). Two engines can have access to this reservoir on Purchase street, and two or three on the platform in the rear. The entrance to the rear is on Purchase street through the premises of Willard Sears."

When the speaker was recently engaged in laying the water main in Purchase street incidental to the widening of that thoroughfare he uncovered the open end of this reservoir beneath the westerly sidewalk. It was then filled with earth.

Mr. Crapo is authority for the statement that a log pipe connecting with this reservoir ran north and east in Purchase, William and Rodman streets. On its passage it furnished supplies to the fire reservoir at the northwest corner of William and Second streets, and the continuously running inverted cannon fountain on the south side of Rodman street, east of Water.

In March, 1855, Joshua B. Ashley, chief engineer of fire department, reports that he has thoroughly repaired this Purchase street (fountain lot) reservoir. In 1857 Mr. Ashley reports that:

"The property of Purchase street, a few rods south of William street, on which a reservoir formerly was located, and from which the reservoir on the corner of William and Second streets was supplied, having changed hands, the city was deprived of its use, and it became necessary to find some other supply to take its place. Accordingly, a well was dug on Cheapside, from which, as a head, pipes were laid down William street to the reservoir at Second street and also down Union street to the new reservoir corner of Fourth street, which will contain 2600 barrels. This was filled from the head alone in 32 1-3 days during the dryest season of the year, and the stream has been constantly running since, the over supply being led into the supply sewer. The water from the roof of Ricketson's block has also been led into this reservoir."

This was the time that the late George Tappan purchased the fountain lot, and proceeded to erect the present building thereon. He named it China Hall and it retained that name for many years. How the water gushing forth from the bubbling springs was finally disposed of I do not know.

Regarding the well on Cheapside which Mr. Ashley says has been dug. In some way this was a connection with the large reservoir in City Hall square near Sixth street. It was fed by the springs of the brook which we have been considering. The speaker has been in this reservoir more than once. It consisted of three circular connecting walls, each about 10 to 12 feet in diameter. Thus it was about 30 feet long and held from 10 to 12 feet of water. The famous town pump entered the central well. This reservoir was probably constructed shortly after the building of the city hall. It does not appear in the directory list of 1841, but it does appear in 1845. It has been claimed by older citizens that this reservoir yielded an unfailing supply, but this is inaccurate. It was completely exhausted

in the fiercest portion of the great fire of April, 1859, and in 1909 when abandoned and filled up, prior to the placing of foundations of stack room of public library, it was pumped dry in less than an hour.

The reservoir on Purchase street, south of Union, constructed by Mr. Ashley to replace the "fountain lot" reservoir, was abandoned and partially filled up about the time of the erection of the Institution for Savings building. This filling was completed about a month ago with the relaying of the electric car tracks in Purchase street. The controlling valves mentioned in Mr. Ashley's report of 1857 by which the surplus supply was led into the public sewer, was rescued by the speaker a few weeks ago, in relaying the water main in Union street.

Thus all traces of the water course which at one time was a feature of the town and village have now vanished.

The New Bedford Steam Mill corporation was incorporated in 1846 with George Hussey as president and Samuel Rodman, treasurer. This was a cotton mill enterprise located at the northeast corner of Hillman and Water streets. In a few years it was changed over to a flour mill. To obtain a supply of boiler water for this industry a log pipe was laid in Hillman street connecting with the springs at the fire reservoir in that street west of Purchase street, and delivering at the boilers of the mill.

Previous to the advent of the city water supply the water boat owned by Benjamin Rodman was in evidence throughout the city water front whenever a vessel was seeking a supply of water. As I remember, it was a sloop of clumsy model with the word Water, in large letters, upon the main sail. The water was delivered through a rotary pump, the operation of which resembled the turning of a grindstone. This boat received its supply at the head of the dock between the George Howland and Samuel Rodman wharf.

The land at the southeast corner of Hillman and Second streets was formerly the property of Samuel Rodman. There was a large carpenter's shop located on this corner and facing Second street. This was occupied at one time by Ezra Clark. Just south of this shop was the pump which delivered the water at the cap log of the dock from whence it flowed into the tank of the water boat. One William H. James operated this pump in Benjamin Rodman's interest. The neighbors declared that he became enamored with the poetry of motion both vertical and circular and that once having established a natural rythm in late afternoon he would go fast asleep and never miss a stroke until he woke up, which sometimes was the dawn of the following day.

The late fifties found the business of our city in a seriously depressed condition. The day of the highly prosperous whaling voyage was over. The development of the oil wells in Pennsylvania had delivered a staggering blow to this once thriving industry. Added to this came the great financial panic of 1857 the effect of which was keenly felt for many years. Then followed the depressing days of the Civil war period. Yet it was right here amidst all these demoralizing conditions that the agitation for a public water supply had its birth. There was a class of bright young men who believed that a revival of material prosperity could be obtained only through new enterprises. Manufacturing seemed to be the one industry which should be developed. Manufacturing, however, required water and that was lacking. They decided that this barrier must be removed and an agitation was fostered to that end which finally resulted in bringing the desired element to our doors. The controversy continued through all the Civil war period. The heavy tax payers as a rule were opposed and the younger element in favor. Mr. Crapo says "that a proposition to expend several million dollars today would not excite such a bitter struggle." Mr. Crapo was a progressive in those days and was occasionally addressed as "Water Works Crapo" by those not in sympathy with his position.

The first public movement in relation to the introduction of water into the city was made by the late Frederick S. Allen, when he introduced an order in the city council on March 8, 1860, which passed both branches of the city government calling for the appointment of a committee "to consider the practicability and expediency of introducing a permanent supply of fresh water into the city and report some plan, with the probable cost of doing so, and that said committee be allowed six months to report thereon." This committee was appointed.

Let me state right here that from this date on a joint committee from both branches of the city council has been annually appointed. A complete list of these committees appears in an appendix to this paper.

In July, the committee reported that they had visited several localities, but in the absence of surveys were unable to present estimates of cost. They were allowed three hundred dollars for further research. On December 21, they reported that the examination had been continued by William F. Durfee and George A. Briggs under the direction of Captain Charles H. Bigelow, and that the results would appear in Captain Bigelow's report.

The subject was then referred to the next city government. Mayor Isaac C. Taber in his inaugural address of January 7, 1861 said, "that the introduction of water involving, as it does, so much importance in the sanitary, economical, and business interests of the city. I should be unwilling to leave the subject without urging it strongly upon your attention with the hope that at an early date the subject may be resumed and carried through to a successful consummation."

Another joint special committee was appointed on January 17th. (See appendix). This committee consumed most of the year in its investigations. The report was dated December 21, 1861. In addition to the main report which is signed by Isaac C. Taber as chairman, it contains the reports of Captain Charles H. Bigelow, engineer, and George A. Briggs, city surveyor. Captain Bigelow was a United States engineer and was then in charge of construction of fortifications at Clarks point.

Their reports indicate that all available drainage areas between Sniptuit pond on the east and Watuppa pond on the west, including the Middleboro lakes, had been visited and examined. Captain Bigelow has something to say in regard to all the places which he visited; but he declares his preference for a storing reservoir in the Acushnet valley near the Ansel White Mill dam, with an aqueduct with regular descent along the west bank of the Acushnet river to a receiving reservoir in the north part of the city; thence by pumping to a distributing reservoir somewhere on Windmill Hill, from thence to be distributed through the streets of the city.

Windmill Hill is now known as Mt. Pleasant street. How many present remember the old windmill that stood there in the early sixties? As I recall, it was of the type similar to those which are still to be seen in Portsmouth, R. I. It was located on the west side of Mt. Pleasant street, a short distance south of the French cemetery. Captain Bigelow's report contains a table of level notes in which he gives heights in various locations in the city, such as the underpinning of city hall, water table County Street Methodist church, underpinning of William G. Taber's fence, southeast corner of County and North streets, sill of windmill, Nash road at railroad crossing, surface of Long Pond, etc. These heights are interesting now, because of the fact that they refer to a zero of mean high water in New Bedford harbor. This was a result of a long series of observations of tide levels. The datum then established by Captain Bigelow has since been the basis of all city engineering operations. To Captain Bigelow must be given the credit of pointing out the possibilities of the Ansel White pond reservoir location. In fact, the entire system as he then outlined it was practically the same scheme as was later developed by Mr. McAlpine and Mr. Briggs.

Mr. Briggs's report was upon the gauging of the streams and the results of calculations as to quantities of water that may be collected under stated conditions. The committee's report takes Captain Bigelow's estimates as a basis and adds to it detailed estimates for installing distribution mains. Captain Bigelow died here shortly after making this report.

In his inaugural address of January 6, 1862, Mayor Taber recommends delay because of the "present distracted condition of our country, and the constantly repeated calls upon our city for relief and the comparatively large outlay by the city for the encouragement of enlistments and the defence of our harbor."

A few days later an order was passed authorizing the mayor to petition the general court for authority to introduce water into the city, and a committee (see appendix) was appointed to take charge of the matter.

There was no other movement of any importance during 1862. Mayor Taber died in Septmber, 1862, and George Howland, Jr., was chosen to fill the vacancy.

In January 5, 1863, Mayor George Howland, Jr., presented a discouraging aspect of the subject in his inaugural address. Mr. Howland at this time was bitterly opposed to the project. He told Mr. Crapo that if the introduction of water became an assured fact he, with most of the community, would never, never have it introduced into their homes. I now quote a few paragraphs which undoubtedly reflected the opinion of the

majority of the tax paying citizens at that time.

"Were we not already supplied, so far as sanitary or culinary purposes are concerned, with as good and as pure water as any community can require, the subject would present itself to my mind in a very different aspect.

"Who among us for his own personal or domestic use, would if water were distributed through our streets, introduce it into his private premises? Probably very few if any; the only purposes for which we want it then, as it seems to me, is for manufactories and the extinguishment of fires."

He then inquires, "What assurance have we that our own capitalists will embark in new ventures or capital will come from abroad to establish new branches of industry among us if the contemplated plan is consummated?"

We shall see a little later a reason which may have had an influence in favor of Mr. Howland's revisal of opinion, in regard to the pure water that was being supplied from the residential wells throughout the city.

His discouraging remarks, however, did not dampen the ardor of those who were pushing the matter.

A few days after Mayor Howland's address, the Rev. William J. Potter gave a pulpit view of the business interests of our city, in which he said: "To start business requires personal effort, labor, assiduity and the utmost physical and mental activity. Folded hands will not do it; sleeping brains will not do it; waiting for something to turn up will not do it; for to those who so wait, nothing will ever turn up. Nothing but mould and poverty and death." After an analysis of the many suggestions that had been made in the direction of securing an improved business condition, he refers to the water question at considerable length. I quote one paragraph:

"If it be said that water is wanted before new business can be further introduced the reply is: Ten miles north of us are vast sleeping ponds, which are only waiting to be touched with the spirit of the age, in order to fly into steam and be set to lifting trip-hammers or turning spindles. They are sleeping now like our city in violation of the law of the nineteenth century."

This sermon was distributed throughout the city in printed form and its logical conclusions attracted a great deal of attention.

Early in the month of January, 1863, the city council committee was appointed (see appendix) to make surveys, obtain estimates, to inquire into the feasibility and cost of the operation, and to obtain the necessary authority from the general court. Three hundred dollars were placed at the disposal of this committee.

The professional services of City Surveyor George A. Briggs, and Professor George I. Chase of Brown university, were engaged to make the necessary investigations.

The act, for supplying the city of New Bedford with pure water, was passed by the legislature on April 18, 1863. It provides for commissioners to construct the works, gives power for the taking of lands and water rights, authorizes the issue of bonds, gives authority for the city council to organize a department with full power for management, and makes it the duty of the council to establish water rates. It contained a referendum clause, to the effect, that all its provisions would be void unless accepted by the voters within one year.

It was desirable that the reports of the experts should be distributed to the voters in printed form, previous to the taking of the vote. Meanwhile the experts consumed the larger part of a year with their investigations, and their reports were not printed for distribution until March, 1864.

Professor Chase's report concerned the physical properties of the Acushnet valley; the results determined by the chemical analysis of samples of water, and the influence likely to be exercised by decaying vegetation on margin and bottom of reservoir site. He also reports on samples taken from several wells within the city limits all of which were found to be inferior in every way to that of the Acushnet supply.

One of these samples was taken from the well supplying Mayor George Howland's residence on Sixth street. He was so aggressive in opposing the introduction of water and was so positive of the purity of his well that Mr. Crapo finally prevailed upon him to allow Professor Chase to collect a sample for analysis so that a comparison might be made. Mr. Howland consented and this was done and Mr. Howland was visibly embarrassed when Professor Chase reported the well to be overloaded with chlorine and the water to be of a very suspicious quality. Hereafter Mr. Howland had little to say concerning the introduction of water.

His aggressive opposition ceased and when the water finally flowed through his street he promptly applied for its introduction into his house.

Mr. Briggs's report was devoted to estimates of cost based upon proposition of a storage reservoir to be located as later constructed, from which a brick conduit was to bring the water to the city by gravity, leaving out all calculations for pumping and distribution. He also reports adversely upon the proposition for obtaining a supply from the Burgess swamp, situated west of Cedar and north of Kempton street.

The distribution of these reports in printed form to the voters was shortly followed by an acceptance of the legislative act for supplying the city of New Bedford with pure water. This vote was taken on April 14, 1864. Yeas 781, nays 594.

The work had now so far progressed that its final accomplishment seemed assured. This was the view which Mayor Howland expressed in his inaugural address of January, 1864.

No progress was made during the year 1864, other than the appointment of the city council committee.

In the inaugural address of January 2, 1865, Mayor George Howland, Jr., very briefly alludes to the subject, he calls attention to the acceptance of the act by the voters in the previous April, and adds:

"The act is therefore within the control of the city to be carried into effect at such time as the city council may determine."

The full city council, together with Mr. McAlpine and other invited guests made a visit to the location of proposed storing reservoir and the Middleboro ponds, in April, 1865. There were some happenings upon that trip that have never been forgotten. A heated discussion occurred between Loum Snow and James B. Congdon as to capacity of the flow at the Ansel White dam, Mr. McAlpine's statements were questioned by Mr. Snow and upheld by Mr. Congdon. All this afforded amusement for the others.

Mr. Carpenter had been previously commissioned to provide a dinner for the party at his tavern in Lakeville, bordering on Assawamsett pond. (This was later the Eben Perry place.) He took great pains in providing an attractive spread. After the entire company were seated at the table, a silence came over the group out of respect to a number of Friends who were of the party. Just at this moment, Mr. Carpenter, who was standing at the opposite side of the table from the kitchen door which was open, yelled in stentorian tones to Mrs. Carpenter, who was within the kitchen, inquiring in language strongly emphasized by profanity, what she had done with the chicken fixings and other things. The effect was that of a bomb. George F. Kingman says that he immediately grabbed Mr. Carpenter and told him to stop all such talk. Some were terribly shocked, others amused. It is said that one good Friend lost his appetite with that blast, but my good friends George F. Kingman and David B. Kempton always declared that it had an appetizing effect upon them.

On July 20, 1865, a joint committee of the city council was appointed to make further investigations (see appendix). This committee entered upon the work in a most vigorous manner. They retained the services of Hon. William J. McAlpine, an hydraulic engineer of national reputation, to be assisted in his work by Professor George I. Chase and George H. Briggs, city surveyor. The report of the committee in October, 1865, includes the reports of Professor Chase and Mr. McAlpine. The report of Professor Chase is largely devoted to the analysis of samples. Mr. McAlpine's report was a remarkably able document. He examines with clearness and fullness, every phase of the question. He considers and presents estimates for taking supplies from the following sources:

1—A reservoir to be formed upon the Acushnet river by the construction of a dyke at Dog Fish bar.

2—The Acushnet which was later constructed.

3—A modification of the Acushnet.

4—Long Pond.

5—Turner's Mills.

6—Smith's Mills.

He considers the advantages and disadvantages in each of these projects and gives the reasons which induced him to recommend for adoption, the Acushnet plan, substantially as submitted by Mr. Briggs.

It is interesting now to recall the severe criticisms that were made at this time by those who declared Mr. McAlpine's comprehensive plan to be positively reckless. One factor proposed Tripp's brook valley (Burgess swamp) as the source of supply, and the foolishness of this project is shown by the fact that the stream mentioned was some years later converted into a sewer known as the Tripp's brook sewer. Another scheme was to draw upon the supply of Fresh river at Smith's Mills, and that was regarded with favor by many. Others

preferred Turner's pond. Tobey's pond, now known as Sassaquin, was suggested as a good source, but investigation found it to be lacking in the essential qualities necessary for a water supply. It was even proposed to dam the Acushnet river at Dog Fish bar. Those who proposed this scheme admitted that the water might be brackish, but what of that, it was needed only for manufacturing purposes and it did not matter. We cannot now understand how some of these schemes, which today seem positively ridiculous, could ever have been seriously considered.

The reports of the committee was signed by Warren Ladd, chairman. The committee were not united in this recommendation. Four of the number, Joseph Knowles, Matthew Howland, Charles H. Gifford and David B. Kempton, submitted what they termed the minority report. They gave great credit to Mr. McAlpine for the able manner in which he had investigated the subject, and gave full credence to his statements and conclusions. They approve of all that portion of the undertaking that sets forth the Acushnet as a source of supply with the brick conduit to the receiving reservoir in the north part of the city. They recommend for adoption the plan proposed by Mr. McAlpine as the modified Acushnet plan.

The minority report was adopted by the city council on Nov. 30, 1865. The modified plan contemplated the use of the Ansel White dam and pond and conveying water by brick conduit to a receiving reservoir in the city, from whence it was to be distributed on as high a grade as it would naturally flow.

On the same day an ordinance was passed "to regulate the proceedings of the commission for supplying the city of New Bedford with pure water." The body was designated "the New Bedford Water Commissioners" in accordance with the provisions of the act of the general court.

William W. Crapo, Warren Ladd and David B. Kempton were chosen water commissioners for a term of two years as provided for by the legislative act. Messrs. Crapo and Ladd had been warm friends of the project from its inception. Mr. Kempton at first was very skeptical as to the feasibility of the introduction of water. He represented the conservative sentiment of the community. This commission became a very happy and harmonious family and each did good work. As Mr. Kempton became better acquainted with the situation his opinion yielded to the proofs and arguments in favor of the work as it was finally constructed.

The board of water commissioners was organized on December 13, 1865. Mr. Crapo, chairman, and James B. Congdon, clerk. Shortly after organization George A. Briggs was appointed chief engineer and William J. McAlpine was retained as consulting engineer.

The city council committee for 1866 was appointed (see appendix). Mayor John H. Perry briefly alludes to the water question in his inaugural of January 1, 1866.

In less than two months we find the water commissioners pleading with the city council for a change in the plan. They recommend that the Wilson dam should be erected at once, thus avoiding the delay contemplated by the minority report. The council authorized such changes in the plan as the commissioners may deem most expedient and gave them authority to exercise their own discretion as to the extent of grubbing, excavating and dredging the proposed reservoir.

The growth and decay of microscopic organism in water supplies, do an immense amount of mischief and is the source of constant annoyance to those in charge. No natural water which is exposed to light and air is ever entirely free from these green dust-like plants known as algae.

"The number of individuals is almost infinite and under favorable conditions they increase with great rapidity. Their appearance gives a decidedly green or greenish-yellow tinge to huge bodies of water and their death and decay often cause considerable offence to the sense of smell, of those in the vicinity and to the sense of taste to those obliged to drink the water."

While the plant is alive and growing there is little taste or odor given to the water, hardly noticeable if the water is iced. When the plants enter into the first stage of decay, the water acquires a peculiar taste and odor. Light and a certain degree of temperature are required for a normal growth, and the decay often takes place in the mains and service pipes, it will not infrequently happen that the water in a reservoir or pond will have almost no taste while the water delivered to consumers will be decidedly unpleasant. There is one species known as the "anabena" that is particularly dreaded by all water officials. That particular plant flourishes in the Acushnet reservoir and all water takers realize its effect upon

the water. The "spongilla" is also abundant there and it is always an unwelcome visitor.

The water commissioners fully realized the possibility of trouble from the causes just described and the subject gave them much concern. Professor Chase in his earliest report had emphasized the importance of removal of all vegetable deposits from margin and bottom of proposed reservoir to insure acceptable tasting water at all times. Mr. Briggs had roughly estimated the cost of this work known as grubbing and cleaning, to be $100,000. This was so large a sum that the commissioners hesitated. They visited kindred works where similar conditions existed. This included visits to Hartford, New Britain and New Haven, Conn. They visited the New Britain reservoir with F. T. Stanley, who had charge of its construction. They consulted with Professor B. Silliman, Jr. at New Haven, a noted water supply expert of that day. The consensus of opinion which they obtained led them to believe that an extensive grubbing and cleaning process could safely be omitted. That if the reservoir were maintained at a high water level for a few years an offensive odor and taste would probably appear occasionally during the first year, but that the annoyance would diminish year by year until it entirely ceased.

This grubbing operation somehow seemed to be a subject which caused many citizens to view it in a whimsical light and when the commissioners returned from their Connecticut journey they received the attention of the know-it-all critics of that day, in the form of newspaper squibs and back-store gossip.

James B. Congdon, then clerk of the commissioners, added to the fun by contributing the following, which he styles an impromptu:

THE WATER BOARD ON A BENDER.

Behold the Board on a Bender bent,
And gravely chat upon pipes, brick and mortar—
As forth to the land of the Blue-Laws they went,
To taste of the tipple and talk about water.

And safe returned from their venturesome trip—
Each fault-finding tax-payer quietly snubbing—
When charged with an overlarge outlay for flip—
Each dollar for grub, saved a dollar for grubbing.

The operations up to November, 1866, were carried out upon the lines of the limited plan adopted with the exception of change stated in previous paragraphs by which the supply to the citizen was to be confined to those portions of the city which could be reached by gravity.

On November 20, 1866, the water commissioners call the attention of the council to the importance of making provision for the distribution of the water. The plan recommended by Mr. McAlpine would include an engine, engine house, a force main, a distributing reservoir and ten miles of distributing mains, in addition to the work that they were authorized to construct. The necessary authority was granted by the council on December 20, 1866. This change in plan nearly doubled the importance and extent of the work and involved a much larger expenditure than was contemplated by the plan first adopted by the council.

Mayor John H. Perry in his address to the city council January 7, 1867, reviews the progress of the work.

We now have the enterprise well underway upon the lines on which it was later finished. It is not the purpose of this paper to deal with the constructive parts in detail, but merely to outline the history in a general way.

The storing reservoir was completed in July, 1867, when the gates were closed and the reservoir rapidly filled. On February 15, at ten o'clock in the forenoon, Thomas Hersom, the well known soap manufacturer, was driving to the city from Long Plain, when crossing the Acushnet river bridge at Leonards, he saw a flood coming down the valley. Realizing the dam had given way he drove post-haste to the city and notified Mr. Ladd of the casualty; stopping at each mill site on the way and advising the owners of the coming flood. Beyond the damage done to the dam itself, and the destruction of the highway bridge at Leonards, little injury was sustained by the sudden rush of so large a body of water. The break was caused by the action of water upon the quicksand upon which the foundations of gate house and dam rested. Repairs were made during the following summer and fall.

Andrew G. Pierce was mayor in 1868 and 1869. In both of his inaugural addresses he enlarges upon the progress of the work.

Under the provisions of the legislative act, the terms of the commissioners expired November 30, 1867. An ordinance was passed under which the old board was re-elected for two years or until completion of work.

A brief description of the work as completed is as follows: A storing reservoir had been artificially formed by the construction of a dam across the valley of the Acushnet about seven miles north of the centre of the city and half a mile down stream from the Ansel White dam. The high water level of this reservoir is elevation 40. Invert of conduit is elevation 30. Area of water shed 5.1 square miles. Area water surface full reservoir 300 acres, (estimated contents) 300 million gallons, allowing 600,000 gallons per day per square mile, its full capacity may be placed at 3,000,000 gallons per day through the dryest year.

An egg shaped brick conduit connects this resevoir with the receiving reservoir on Coggeshall street. This conduit is three feet horizontal, four feet vertical. Invert at storing resevoir elevation 30 feet, at receiving resevoir, elevation 26.82 feet. Grade six inch per mile. Capacity 7,000,000 gallons per 24 hours with full resevoir.

Receiving resevoir water area 1.1 acres, elevation high water 30 feet, depth 12 feet, capacity 3,000,000 gallons.

The Purchase street pumping station was equipped with notable pumping engine especially designed by Mr. McAlpine, by means of which water was pumped from the receiving reservoir to the Mt. Pleasant reservoir on Mt. Pleasant street. The water surface of Mt. Pleasant reservoir has an area of 3.1 acres, elevation high water 154.8, depth 18 feet, capacity 15,000,000 gallons. From this reservoir the water flows by gravity through the distributing mains of the city.

By the end of 1870, 17½ miles of distributing mains had been installed. Of this number a little over 9½ miles were of the wrought iron cement lined type of pipe all of which has since been replaced by cast iron pipe.

George A. Briggs was assisted in his engineering operations by Engineers George B. Wheeler, William B. Sherman, Roswell E. Briggs and Israel C. Cornish.

The following table will illustrate the growth of the supply:

| Year | Population | Mileage of Distribution Mains | No of Services | No. of Meters | Average Daily Cons. in Gals. | Gals. per Capita |
|---|---|---|---|---|---|---|
| 1870 | 21,320 | 17 | 553 | | 329,375 | |
| 1875 | 25,895 | 35 | 2311 | 9 | 1,136,835 | |
| 1880 | 26,845 | 42¼ | 3798 | 22 | 2,014,200 | |
| 1885 | 33,700 | 50¼ | 4965 | 67 | 2,876,167 | 85 |
| 1890 | 41,500 | 62½ | 6394 | 123 | 4,066,200 | 98 |
| 1895 | 56,300 | 76¼ | 8027 | 254 | 4,711,866 | 84 |
| 1900 | 62,500 | 92¾ | 9280 | 1429 | 6,320,542 | 101 |
| 1905 | 75,000 | 104¼ | 10477 | 2434 | 7,093,187 | 95 |
| 1910 | 99,000 | 137 | 12769 | 6106 | 7,864,323 | 79 |
| 1914 | 108,000 | 162 | 14407 | 13788 | 7,432,137 | 69 |

Water was delivered through the distributing pipes for the first tine on November 25, 1869. On the afternoon of that day a display of hydrant streams was made on Purchase street between Union and Elm streets.

Application No. 1 for a service supply was made by William J. Rotch for his residence on Orchard street at the head of Madison street.

Application No. 2 was made by Elisha Thornton 98 Cottage street and was the first service installed October 27, 1869.

The total number of applications since made has been over 16,000.

---

The term of Water Commissioners expired November 30, 1869 when the Acushnet Water Board was created by ordinance for the care and management of the New Bedford Water Works. This board consisted of five members the same as today, three at large with the mayor, George B. Richmond and C. M. Peirce, Jr. president of the common council, ex officio. Messrs. Crapo, Kempton and Ladd became the first members at large, and George A. Briggs was elected the first superintendent.

In 1882 the name Acushnet Water Board was changed to that of New Bedford Water Board.

In 1871 George A. Briggs resigned as superintendent and Israel C. Cornish was elected his successor.

The financeering of this enterprise was lightened by the assistance which was supplied by the use of the Sylvia Ann Howland bequest.

The one hundred thousand dollars which was bequeathed in aid of the introduction of water was at once applied in meeting construction expenses.

The bequest of the second one hundred thousand dollars which constitutes the educational and Free Public Library fund was invested by the city council in the cost of the water works, the city engaging to provide

the annual income and apply same for the purposes set forth in the will.

The city council's appropriations to December 1, 1870 was $700,000. This includes the $200,000 bequeathed by Sylvia Ann Howland which deducted leaves $500,000 as the amount of water bonds issued up to that time.

After the storing reservoir was finished and filled it was found to be impossible to keep the water level at high water mark during the summer months. It settled two or more feet each year and in 1886 it shrank 7 feet. This of course exposed large areas of vegetable deposits to the action of the blistering summer sun. Periods of offensive tasting water came altogether too frequently and there was much complaint on the part of the takers.

The longest and most intense visit was in 1885 when the causes were thoroughly investigated by Professor William Ripley Nichols who advised aeration and filtration method treatment but thought that a direct connection with Little Quitacus pond might result in obtaining better water.

The consumption was now fast outgrowing the capacity of this reservoir and the board knew that more water must soon be obtained.

---

The next year the city came very near facing a water famine. It was the closest call we ever had when in October the reservoir level allowed a depth of less than three feet to enter the conduit.

A hurried connection was made with Little Quittacus pond. After that supply had been provided it was possible to maintain the reservoir level near that of high water throughout the summer. It also improved the color and the periods of bad taste were of less intensity and not as frequent. This reservoir was abandoned for regular use on July 10, 1899.

One point should be emphasized, the storing reservoir water was a pure, safe and healthy water, even in the days when its taste was unpleasant. At such times those in charge fairly earned their honor by the patience which they exercised in listening to the complaints that came from every direction. The people were very restive under the annoyance that it was impossible to avoid, and the assurance of the highest authorities that there was nothing harmful or noxious in the water did little toward removing their impatience. During the worst epidemic it was my custom to have a tank of stiff lemonade mixed each morning and placed in my outer office. The lemon juice killed the musty taste of the water. When a complainant entered and stated his trouble he was invited to sample the water furnished to the office, he was told that it did not seem to have a disagreeable taste. He was apt to be cautious about the first cup, after which he partook freely and departed in a more comfortable frame of mind than he possessed when he entered.

Within a year after the introduction of water a large reinforcing main was started from the distributing reservoir, south through the Cedar street district, to overcome the loss of pressure which existed in that area.

In April, 1872, George B. Wheeler was elected superintendent in place of Israel C. Cornish, who resigned. During Mr. Wheeler's administration, a second pumping engine (Worthington, three million) was installed in the Purchase street pumping station, and the stand-pipe was erected on Mt. Pleasant street opposite the distributing reservoir.

In April, 1877, William B. Sherman was elected superintendent and during his administration many improvements were made.

During that year the reinforcing main of 1872 was continued in Ash, Bedford, Borden and Grinnell streets to Water street.

In the early 70's the water board adopted the policy of maintaining the Acushnet storing reservoir at a reduced level in the early part of each year, hoping thereby to diminish the periods of objectionable tasting water. This nearly resulted in a water famine in November, 1877, when the reservoir level settled to 68 inches below high water. This caused much anxiety and it was deemed wise to move in the direction of obtaining additional water from either Long or Little Quittacus ponds.

During the winter of 1877-78 Mr. Sherman made extensive surveys to locate possible routes from both ponds.

Upon April 13, 1878, the General Court passed an Act authorizing the City of New Bedford, the use of water from either pond under certain restrictions.

On August 1, 1878 the city council authorized the water board to use its discretion in the selection of ponds, and to take water therefrom whenever they deem it expedient.

On November 12, 1878 the water board voted in favor of Long pond as the source of supply. Mr. Sherman's plans called for an open canal connecting Long pond with the head waters of the Acushnet river. The

water level of Long pond is ten feet higher than that in the storing reservoir. There was to be a controlling gate house at its entrance at Long pond. Estimates of cost were prepared. Plans were made and all necessary documents filed. The required land was taken and settlements were made with the owners thereof, and all preliminary work was completed. This action left the work in condition to be taken up and completed at any time when the water board considered it expedient. Nothing further was ever done. The city's rights here still exist.

In 1878-79 a new boiler house and coal shed were erected at the Purchase street pumping station, replacing smaller structures which were demolished, and two new boilers were installed.

In 1879 James H. Hathaway was elected city treasurer in place of James B. Congdon, who declined a re-election on ccount of ill health; a little later Mr. Hathaway was elected water registrar. Mr. Congdon had been identified with the works from its very beginning.

William B. Sherman resigned as superintendent and clerk of the board on June 9, 1881 and R. C. P. Coggeshall was elected to fill the vacancies.

In providing a distributing system, it is a recognized practice among hydraulic engineers that the largest takers (manufacturing and fire protection) should determine the size of the distributing mains. The domestic draught in any given area, say a quarter of a mile square, is but a small fraction of the possible manufacturing or fire draught. The domestic draught is distributed with approximate uniformity over its entire area. Pipes for domestic supply alone might start with main arteries and taper down to small veins at the extremity of the area. Manufacturing and fire protection often demand all the water a system can supply at one point, and this point may happen to be anywhere. It is in one case distribution and in the other concentration. In planning works it is of the utmost importance to be able to concentrate the full supply at the point where it is likely to be needed.

When the water commissioners constructed the works they provided a distributing system for the city as it then existed with its 21,000 inhabitants. They did not provide for concentration at the extremities for the reason that nothing was then in existence that warranted their so doing. The only large mill in the city at that time was the Wamsutta, which had its own water supply from Rodman's pond, so they were not likely to require large amounts from the city mains. It was impossible to forecast the future of the green fields and still pastures which then existed in every direction at the extremities of the city, and no one suspected the the tremendous textile activity which came later. The Potomska mills came during the 70's for which the supply was adequate.

By 1880 the city had gained over 6000 in its population and both the Wamsutta and Potomska had built additional mills. Conditions rapidly changed in 1882 with the construction of the Acushnet, Grinnell and Oneko mills. Let me say right here that New Bedford differs from other large mill centres in this respect. Fall River factories draw upon Watuppa lake; Lowell, Lawrence and Manchester upon the Merrimac river, Holyoke upon the Connecticut river, and the public water supplies of those cities supply only a small proportion of the manufacturing water. The mills of New Bedford have no auxiliary fresh water supply, so every drop must be obtained from the city mains. In 1882 the water board was confronted with four strong petitions from different sections of the city at the same time. The drop in pressure and lack of supply was proving a serious impediment to the new enterprises. The water board well knew that to provide satisfactory deliveries required more than the mere enlargement of certain pipes. The maximum daily consumption was hovering around 4,000,000 gallons. There was only one pump (McAlpine) to provide this supply and that was becoming worn after thirteen years' service. More pumping facilities were badly needed. A special appropriation by the city council enabled the water board by 1886 to place the pumping capacity upon a more reliable basis than had hitherto existed. This work consisted in providing new pump wells; new connections with the receiving reservoir; an addition to the engine house; a new five million Worthington pump; a new force main to the Mount Pleasant distributing reservoir and the beginnings of a twenty-inch reinforcing main which in a few years continued through State, Pleasant, William and Sixth streets to Grinnell street. From that time to the present, more or less of larger sized pipe has been laid each year, replacing the small mains of earlier days, especially the wrought iron cement lined pipe. A great deal of this work has been required to

provide the concentration ability needed by the new mills that have appeared during the last thirty years.

The energetic members of the water board of these days were George R. Stetson, William N. Church and David B. Kempton. For many weeks much of their time was required and freely given and the work was faithfully executed.

The consumption of the summer of 1886, as has already been stated, was beyond the capacity of the storing reservior to supply. The water level by October had droppped over seven feet and the city with all its new industries was facing a problem. A quick connection was made with Little Quittacas pond by cleaning out what was known as the Dry Swamp Ditch. This ditch is said to have been dug by Ansel White about 1830 in an attempt to obtain more water for his mill pond. It had not been in use for many years and had completely filled up with vegetable decay. After this connection had been completed it was possible to maintain a well filled storing reservoir throughout the summer months for many years.

On March 24, 1887 the Massachusetts general court passed an act enabling the city to use the water of Little Quittacus Pond.

---

In 1890 a new chimney and a large addition to coal shed was constructed at the Purchase Street Pumping Station.

In 1892 a "Belpaire" type of boiler replaced two boilers which were worn out. The old chimney was removed and a meterological observatory was erected upon the location.

In 1893 it was necessary to deepen and enlarge the dry swamp ditch.

We have now arrived at a critical point in the history of the Acushnet supply. The population has passed the 55,000 mark. The city is spreading out in every direction. Building has invaded large areas of high elevation to supply which will require the construction of a high service system. The amber colored water of the Acushnet supply with its marked periods of disagreeable taste and odor is a source of criticism. The conduit must at times be strained to its utmost capacity to satisfy the consumption; the capacity of the Mount Pleasant reservoir is not equal to modern requirements. An increased pressure for fire protection purposes has become very necessary. In short the Acushnet suppiy is now worn out and in many respects outgrown.

It was perhaps fortunate that so many defects in the orignal system appeared at the same time, otherwise the board would have probably yielded to the great temptation to patch up the old system.

As they came to appreciate these many shortcomings they decided to submit the whole question to experts for study and recommendations. Messrs. George E. Rice and George E. Evans were employed to do this work, which occupied several weeks. They finally submitted an elaborate report in which every phase of the question was considered and discussed. They presented alternative plans, including the possibilities of patching up the old system with the addition of a separate system for high service supply; but in the end they strongly recommended the adoption of an entirely new plan which later was accepted and constructed.

It is not the purpose of the writer to enter into the history of the "Further Supply" at this time. That will be left for consideration in a later paper.

The worn-out Acushnet plant continued to supply the city during the period of the "Further Supply" construction. On three occasions its capacity was taxed to its utmost limit proving to the satisfaction of the water board that the construction of the new supply had been begun none too soon.

The transfer of supply from the old to the new system was made at 6 o'clock on the morning of July 10, 1899.

Since its abandonment, the old system has been held intact as a reserve supply. Its pumps have since been occasionally operated allowing certain repairs to be made. Should occasion require it is possible to pump a portion of the daily supply through these pumps.

The growth of a city is always intimately connected with its water supply. It does not require many years for a city to outgrow a well conceived plan. The early water commissioners thought that they had planned for at least fifty, and probably for 75 years. The plant lasted just thirty years. Exactly the same length of time that the original Cochituate aqueduct unaided continued to supply Boston. The original Croton aqueduct of New York lasted 42 years but was badly strained in the latter part of its career. Thus we see that our early commissioners were fully as far seeing as those in charge of similar affairs in larger cities.

The board of water commissioners had a hard time of it during the con-

struction period. The disposition of the owners of land required was to hold same at prices far in advance of its real value. This made it difficult to effect settlements. They were the targets of criticism and ridicule and on one occasion an individual advertised and gave a ridiculous lecture in Liberty hall upon "The Rise and Fall of the Mighty Water Works of New Bedford." At the time of the construction of the further supply 1894-98 Mr. Kempton was a member of the board. He had the satisfaction of being one of the construction agents of both works.

The water board of the late 90's were often severely criticised and Mr. Kempton often referred to the days when the original commission was under fire and would say: "I have an impression that 25 years from now there will be as little criticism of the work in which we are now engaged and that there will be just as much commendation bestowed upon this board, as is now freely given to William W. Crapo, Warren Ladd and David B. Kempton for their service of 25 years ago."

From the date of the introduction of water in 1869 to the present time no one subject has been the theme of more controversy than that of water rates.

The first schedule was passed by the city council on January 1, 1870. This list was based upon figures similar to those adopted in other water departments throughout the state. The first faucet was placed at $5 and the maximum charge for one family was $22. For manufacturing purposes the charge was 15 cents per thousand gallons.

These charges were deemed excessive by many and agitation resulted in a reduction of fifty per cent in all flat rates, while the manufacturing rate was placed at 2½ cents per thousand gallons. This revision took effect July 1, 1872.

The Sylvia Ann Howland bequest had its influence in determining the low manufacturing rate.

In 1875, Mr. Crapo, who was about to begin his congressional career, sent a letter to Mayor Abraham H. Howland, Jr., resigning his membership in the water board. In that letter he reviews the past activities of the board and expressed himself in sympathy with a readjustment of the water rates. I quote a few paragraphs: "The water rates as now established, pay the expenses of maintaining and operating the works, but reimburse a portion only of the yearly interest paid on the water bonds. The deficiency is met by general taxation, which falls upon our citizens and corporations, irrespective of their use of the water.

Those who have no benefit contribute toward the payment of this interest equally with those who enjoy them.

The consumption of water in New Bedford is now so extensive that if the moderate charges made in other New England cities were established here, it would enable this department to be self-sustaining."

Later he expressed the opinion that the manufacturing interests should have the benefit of the income of the Sylvia Ann Howland fund.

Mr. Crapo's words attracted much attention. The water ordinance required a revision of the water rates in 1877. On May 3rd of that year the city council established rates in which no important change was made from those heretofore in force.

On May 1st, 1878, the water board sent a communication to the city council strongly recommending a revision of the rates in the direction of placing the department upon a self-sustaining basis. The charges recommended were placed at about the same figure as obtained in other New England cities. Metered water was placed at thirty cents per thousand gallons. This measure was killed by the city council.

Beginning at this time and continuing for many years, the question of water rates was a veritable fire-brand for violent controversy between three factors, viz.: free water advocates, those who desired no change, and those who wished to see a self-sustaining department.

Early in the year 1883 the city council requested the water board to prepare a revised tariff of rates and submit same with recommendations that they be adopted as an ordinance. This was done but its passage was defeated by the city council.

Exactly the same thing was repeated in 1884 and again in 1885 when the agitation was the most bitter struggle of the many attempts to revise the rates. This was largely caused by an attempt to obtain a legislative bill authorizing the city of New Bedford "to create from its recipts from the price of the rent of water, a sinking fund for the payment at maturity, of the water bonds of said city now outstanding."

An increase in water rates would have been required to meet this condition. When this was realized public meetings in protest to this bill were held and the discussions were long and varied. I remember two items that were humorous but convincing. One citizen declared that water should be

free as the air we breathe, whereupon Benjamin Reed of the Standard force replied, "So it is out in the Ansel White pond. It is your privilege to go there and take it by the pailful, and bring it home, but I suspect that by the time your wife asked for the second pailful you would be willing to pay a good price for a faucet in your house rather than repeat the journey."

Another reply was to this effect, "It is true that the air is free to all, but how free would air be if you had to bring it seven miles underground in a pipe and then pump it into a reservoir."

The measure was again killed and water rates were not considered again for twenty years.

Meanwhile a large number of careful water takers had discovered that by proper care a saving over the fixture rate could be effected by the use of meters. They passed the word along and the sentiment in favor of metered supply was soon in ascendency. Thus the interest in fixture charges was passing in favor of the policy of one unit price to all. As long as the manufacturer was charged 2½ cents per thousand gallons there was more or less discontent among those who were obliged to pay the fifteen cent rate, but when the manufacturing rate was by the ordinance of 1905 placed at the same figure, while not pleasing to the manufacturer it proved satisfactory to all others. The manufacturers in turn were discontented when by ordinance of 1906 a five cent rate was allowed to one mill. The agitation which followed resulted in the ordinance of 1908, which repealed the five cent rate and placed all manufacturing rates at 10 cents per thousand gallons, where it now remains. The ordinance of 1909 provided for the metering of all supplies, the abolishment of fixture rates automatically with the installation of meters. All supplies in this city are now measured through about 14,000 meters.

---

The joint committees of the City Council upon Water Works and Water Supply from the beginning have been:

1860

Aldermen, John Hunt, Nathan Lewis, William H. Reynard. Councilmen, Frederick S. Allen, Eben Perry, Edmund Anthony, Nathan E. Hammett.

1861

Mayor, Isaac C. Taber. Aldermen, Nathan Lewis, William H. Reynard. Councilmen, Cornelius Howland, Frederick S. Allen, John H. Perry, George R. Taber.

1862

Aldermen, Warren Ladd, William H. Reynard. Councilmen, George Howland, Jr., Edward T. Taber, J. A. Brownell, Charles M. Pierce, Jr.

1863

Aldermen, Warren Ladd, John H. Perry. Councilmen, Charles H. Taber, Caleb Hammond, Elijah H. Chisholm, George F. Kingman, Charles H. Gifford.

1864

Mayor, George Howland, Jr. Aldermen, Warren Ladd, Eben Perry. Councilmen, William G. Taber, L. M. Kollock, George F. Kingman, J. P. Knowles, Jr.

1865

Aldermen, Warren Ladd, Joseph Knowles, Cornelius Howland. Councilmen, Charles H. Gifford, David B. Kempton, John W. Macomber, Elijah H. Chisholm, Caleb Hammond.

1866

Aldermen, George G. Gifford, George F. Kingman. Councilmen, Andrew G. Pierce, John W. Macomber, John P. Knowles, 2nd.

1867

Aldermen, George G. Gifford, George F. Kingman. Councilmen, Andrew G. Pierce, Horatio Hathaway, William Gordon, Jr.

1868

Mayor, Andrew G. Pierce. Aldermen, George H. Dunbar, Elijah H. Chisholm. Councilmen, Horatio Hathaway, William Gordon, Jr., John W. Macomber.

1869

Mayor, Andrew G. Pierce. Aldermen, Joseph H. Cornell, Elijah H. Chisholm. Councilmen, Horatio Hathaway, James C. Hitch, John H. Mackie.

1870

Aldermen, George G. Gifford, Isaaac C. Sherman. Councilmen, John H. Mackie, James C. Hitch, William T. Soule.

1871

Aldermen, George G. Gifford, Samuel C. Hart. Councilmen, John H. Mackie, William H. Sherman, Abram T. Eddy.

1872

Aldermen, William Bosworth, Samuel C. Hart. Councilmen, Charles M. Pierce, Jr., Joseph G. Dean, Loum Snow, Jr.

1873

Aldermen, Frederick S. Allen, Andrew G. Pierce. Councilmen, James H. C. Richmond, William J. Norton, Samuel Dammon.

1874

Aldermen, Joseph R. Read, William J. Kilburn. Councilmen, Augustus Swift, Hiram W. Wentworth, John H. Rounds.

1875

Aldermen, James D. Thompson, George R. Stetson. Councilmen, William A. Beard, Rufus A. Soule, George H. Freeman.

1876

Aldermen, Jonathan C. Hawes, George R. Stetson. Councilmen, John P. Taylor, Lemuel T. Terry, John Wing.

1877

Aldermen, George Howland, Jr., Henry T. Wood. Councilmen, Charles W Coggeshall, Benjamin Dawson, John E. Murphy.

1878

Aldermen, John Hastings, Shearjashub T. Viall. Councilmen, Albert G. Stanton, Walter Clifford, Francis C. Terry.

1879

Aldermen, Otis A. Sisson, William H. Sherman. Councilmen, Morgan Rotch, Simeon Hawes, Loum H. Faunce.

1880

Aldermen, John Wing, John McCullough. Councilmen, Morgan Rotch, Ezekiel C. Gardner, Loum H. Faunce.

1881

Aldermen, James E. Stanton, Isaac N. Marshall. Councilmen, Hiram B. Coffin, John A. Russell, Philip C. Tripp.

1882

Aldermen, Thomas Donaghy, Dana B. Humphrey. Councilmen, Phineas White, Henry Howard, William E. Clarke.

1883

Aldermen, Stephen W. Hayes, James C. Stafford. Councilmen, Henry Howard, William E. Clarke, Orlando F. Bly.

1884

Aldermen, Andrew B. Hathaway, John P. Taylor. Councilmen, Orlando F. Bly, Frederick Swift, Thomas Boardman.

1885

Aldermen, Edward T. Pierce, Wendell H. Cobb. Councilmen, William A. Church, Arthur E. Perry, Robert Snow.

1886

Aldermen, Edward T. Pierce, Wendell H. Cobb. Councilmen, William A. Church, Robert Snow, John F. Canny.

1887

Aldermen, Edward T. Pierce, Wendell H. Cobb. Councilmen, Stephen D. Pierce, Frank E. Sawin, James W. Kane.

1888

Aldermen, Stephen A. Brownell, Wendell H. Cobb. Councilmen, James W. Kane, Andrew G. Pierce, Jr., William N. Church, Jr.

1889

Aldermen, Edward T. Pierce, James Delano. Councilmen, John J. Howland, Andrew G. Pierce, Jr., William N. Church, Jr.

1890

Aldermen, Charles F. Shaw, James Delano. Councilmen, Eliot D. Stetson, William A. Church, George W. Parker.

1891

Aldermen, Wendell H. Cobb, Stephen H. Brownell. Councilmen, George W. Parker, Martin P. Fichtenmayer, Isaac L. Ashley.

1892

Aldermen, William H. Rankin, Stephen H. Brownell. Councilmen, Stephen B. Wilbur, Charles T. Luce, James Slater.

1893

Aldermen, Oliver W. Cobb, George F. Brightman. Councilmen, William T. Taylor, Edward G. Reynolds, Martin H. Sullivan.

1894

Aldermen, George F. Brightman, Arthur E. Perry. Councilmen, Harry B. Wood, Henry T. Ashley, Lewis E. Milliken.

1895

Aldermen, John H. Barrows, William R. West. Councilmen, Harry B. Wood, Charles H. L. Delano, James C. Platt.

1896

Aldermen, John H. Barrows, J. Arthur Taylor. Councilmen, Edward G. Reynolds, John D. Wilson, Henry T. Ashley.

1897

Aldermen, Henry P. Jenney, Samuel C. Hunt. Councilmen, Joseph Magnant, Frank A. Habicht, William Bamford.

1898

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Joseph H. Sullivan, Ernest Findeisen, Abbott P. Smith.

1899

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Ernest Findeisen, Joseph H. Sullivan, Weston C. Vaughan, Jr.

1900

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Ernest Findeisen, Robert S. Gorham, John Hannigan.

1901

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Patrick H.

Reardon, Robert S. Gorham, Robert L. Baylies.

1902

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Robert L. Baylies, Patrick H. Reardon, Stanislaus J. Desautel.

1903

Aldermen, Henry P. Jenney, Charles H. Brownell. Councilmen, Joseph H. Handford, John V. Thuot, Abbott P. Smith.

1904

Aldermen, Henry P. Jenney, John Hannigan. Councilmen, Joseph H. Handford, John V. Thuot, Lewis E. Milliken.

1905

Aldermen, Charles H. Adams, Frederick A. Dammon. Councilmen, Samuel Whitlow, George J. Allen, Charles S. Ricketson.

1906

Aldermen, Ernest A. Dionne, Frederick A. Dammon. Councilmen, Henry J. Gurl, Charles A. McAvoy, William K. Lees.

1907

Aldermen, Samuel Higham, Joseph Chausse. Councilmen, Joseph R. Glennon, J. Ernest Dionne, John Halliwell.

1908

Aldermen, Francis P. Washburn, Joseph Chausse. Councilmen, Joseph Morency, Samuel T. Rex, Clarence H. Brownell.

1909

Aldermen, Samuel F. Winsper, Joseph Chausse. Councilmen, William Burke, Stephen D. Perry, George C. Hatch, Jr.

1910

Aldermen, John Hannigan, Joseph R. Glennon. Councilmen, Samuel A. Percy, Henry E. Woodward, James Cawley.

1911

Aldermen, John Hannigan, Joseph Chausse. Councilmen, Samuel A. Percy, Henry E. Woodward, Daniel J. Sullivan.

1912

Aldermen, John Hannigan, John F. Hatch, Jr. Councilmen, Hubert S. Kelleher, Samuel A. Percy, Henry E. Woodward.

1913

Aldermen, William K. Lees, Aldege Chausse. Councilmen, Robert Burke, Wanton H. S. Beauvais, Joseph H. Fernandes.

1914

Aldermen, Aldege Chausse, William K. Lees. Councilmen, George D. Lacroix, Alfred Leveille, Samuel A. Percy.

1915

Aldermen, Mortimer McCarty, Edward L. Cronin. Councilmen, George D. Lacroix, John H. Hollihan, Robert Burke.

The Water Board consists of the Mayor and President of Common Council, ex-officio, and three members elected at large. The board was designated as the "Acushnet Water Board" from its creation in 1869 to 1882 inclusive. Since 1882 it has been named "The New Bedford Water Board." The following have been its members:

---

MAYORS AND PRESIDENTS OF WATER BOARD.

Andrew G. Pierce—1869.
George B. Richmond—1870, 1871, 1872, 1874, 1878.
George H. Dunbar—1873.
Abraham H. Howland, Jr.—1875, 1876.
Alanson Borden—1877.
William T. Soule—1879, 1880.
George Wilson—1881, 1882, 1883, 1884.
Morgan Rotch—1885, 1886, 1887, 1888.
Walter Clifford—1889, 1890.
Charles S. Ashley—1891, 1892, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1907, 1910, 1911, 1912, 1913, 1914.
Jethro C. Brock—1893.
Stephen A. Brownell—1894.
David L. Parker—1895, 1896.
Thomas Thompson—1906.
William J. Bullock—1908, 1909.
Edward R. Hathaway—1915.

---

PRESIDENTS OF THE COMMON COUNCIL.

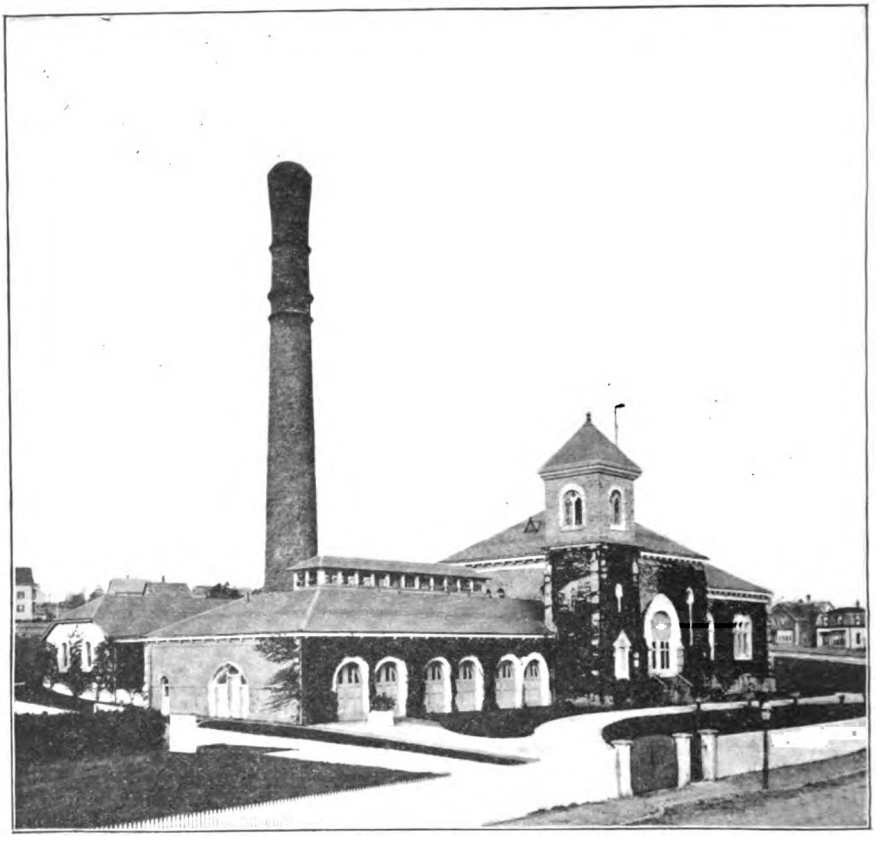
Horatio Hathaway—1869.
Charles M. Pierce, Jr.—1870, 1871.
Henry F. Thomas—1872, 1873.
Rufus A. Soule—1874.
Edwin Dews—1875, 1876.
William H. Matthews—1877.
Thomas R. Rodman—1878.
Robert W. Taber—1879, 1880.
Isaac B. Tompkins, Jr.—1881, 1882, 1883, 1884.
Edmund Wood—1885, 1886.
William A. Church—1887, 1906.
Stephen D. Pierce—1888.
William A. Tucker, 1889, 1890.
Joseph Dawson—1891.
William G. Kirschbaum—1892.
Samuel C. Hart—1893.
John A. Barrows—1894.
Oliver Prescott, Jr.—1895.
Arthur L. Blackmer—1896.
George P. Bailey—1897.
Stephen A. Brownell—1898.
John L. G. Mason—1899, 1900, 1901.

Samuel Higham—1902, 1903, 1904, 1905.
Francis P. Washburn—1907.
Patrick Loftus—1908.
J. Ernest Dionne—1909.
D. Herbert Cook—1910, 1911.
Frederick H. Taber—1912.
Richard Knowles—1913.
Henry E. Woodward—1914.
James F. Collins—1915.

---

MEMBERS AT LARGE.

William W. Crapo—1869, 1870, 1871, 1872, 1873, 1874, 1875.
Warren Ladd—1869, 1870, 1871, 1872.
David B. Kempton—1869, 1870, 1871, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898.
George Howland, Jr.—1871, 1872, 1873, 1874, 1875, 1876, 1877.
Henry J. Taylor—1872, 1873, 1874.
Frederick S. Allen—1874, 1875.
Thomas Bennett, Jr.—1875, 1876, 1877, 1878, 1879, 1880, 1881.
Henry F. Thomas—1875, 1876, 1877, 1878, 1879, 1880.
Thomas W. Cook—1877, 1878, 1879, 1880.
George R. Stetson—1880, 1881, 1882, 1883, 1884, 1885.
William N. Church—1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893.
Henry Howard—1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894.
Edmund Wood—1893, 1894, 1895, 1896, 1897, 1898, 1899.
Thomas B. Tripp—1894, 1895, 1896, 1897, 1898, 1899, 1900.
Robert W. Taber—1898, 1899, 1900, 1901, 1902, 1903, 1904.
Samuel C. Hunt—1899, 1900, 1901, 1902, 1903.
Zephaniah W. Pease—1900, 1901, 1902, 1903, 1904, 1905, 1906.
George H. Hedge—1903, 1904.
Lettice R. Washburn—1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915.
William E. Smith—1904, 1905, 1906, 1907, 1908, 1909, 1910.
William H. Pitman—1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915.
Francis P. Washburn—1910, 1911, 1912, 1913, 1914, 1915.



**PURCHASE STREET PUMPING STATION,**
**Showing Development Between 1870 and 1899.**