

SOMERVILLE,  
PAST AND PRESENT

An Illustrated Historical Souvenir

COMMEMORATIVE OF THE TWENTY-FIFTH ANNIVERSARY OF THE  
ESTABLISHMENT OF THE CITY GOVERNMENT OF  
SOMERVILLE, MASSACHUSETTS.

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# HISTORY OF THE WATER-WORKS.

BY FRANK E. MERRILL.

## CHAPTER XIX.

As Somerville has always been dependent upon neighboring municipalities for its water-supply, it becomes necessary to treat the subject-matter of this chapter somewhat comprehensively and touch upon features which might, otherwise, be considered out of place in a history of our local water-works system.

Although the need of a proper supply was for many years acknowledged, the small population of the town precluded the possibility of its taking advantage of any opportunity of obtaining an independent supply from the several sheets of water which lie within a comparatively short distance of its borders.

The first organized company to do a water business within the limits of the town was the Cambridge Aqueduct Company, which was chartered in 1837, to furnish water to the residents of the lower section of Cambridgeport, and a tract of land on the southerly slope of Central Hill was purchased for the control of the abundant springs then existing in that locality. This water was conveyed to Cambridge through wooden logs bored out to a diameter of four inches, and many persons are now living who recall the excellent service done by that somewhat primitive system, as well as the exceptionally pure quality of the water furnished by these springs. At that period Somerville, or, as it then was, Charlestown, was a sparsely settled farming district, but the residents in that section through which the pipes were laid appreciated the luxury of having the water brought into their houses, and a number of them are recorded as becoming consumers and so remaining until the discontinuance of the system.

In 1842, the town of Somerville was set off from Charlestown with a population of about 1000, the most of whom were dependent on wells and springs for water for their household uses. As early as 1849, the mother city began to experience the advantages of a piped system of water supply, as at that time the passage of a legislative act was obtained authorizing the city of Boston to supply East Boston with Cochituate water. This pipe line, when constructed, passed through Charlestown, and the act required hydrants to be erected along its course: these were intended to be used for fire purposes only, but, to some extent, they were made available for domestic service. The partial benefits obtained from this source finally led the authorities to efforts to procure an abundant supply for fire, domestic and

manufacturing purposes. In 1860, application was made to the legislature for the grant of powers to enable the city of Charlestown to obtain a supply of water. This met with much opposition from land-owners, towns and cities, as well as from ship-owners and builders from Medford and East Boston, and even from the merchants of Boston in behalf of Boston Harbor, which it was feared would be injuriously affected if the proposed dam should be erected at the outlet of Mystic Lake, thus stopping the flow of fresh water from the ponds. In 1861, the act was passed under which the present works were constructed, and the city was authorized to sell its surplus water to the towns through which the pipes should pass.

As a large portion of these works are located in Somerville and are the present source of Somerville's water-supply, it seems proper in this place to give a brief description of the Mystic water-system, although, at that time, it possessed no direct interest for Somerville.

The legislative act referred to authorized the city of Charlestown to take water from the northerly division of Mystic pond, and permitted the waters to be raised seven feet above the original level of the pond.

Mystic Lake is a familiar name to all residents of Somerville, but not all are acquainted with the picturesque beauties of that sheet of water which has served our homes for a generation, and fewer still are informed regarding those features which are interesting from a water-works point of view. The northerly portion of the lake from which the water is taken is situated in the towns of Winchester and Arlington and the city of Medford, and is about four miles distant from Somerville city hall. It has an area of about two hundred acres when flowed to the level authorized by the act, and a storage capacity at that level of 380,000,000 gallons of water. The area of the country forming the drainage basin is thirty-one square miles, and the lake receives water from springs abounding in its vicinity and from streams rising as far away as Reading and Wilmington. The daily yield of the lake has been estimated at 30,000,000 gallons. The potable qualities of Mystic Lake, in the early days of its use as a water-supply, were considered excellent, but the great increase of population along its watershed in recent years has had its natural effect and produced a marked deterioration. Much good has been accomplished by the Boston Water Board in conjunction with the Metropolitan Park Commission and other authorities, in removing sources of pollution which had sprung up along its borders, but it is doubtful if the water ever regains its former purity.

The dam, at the outlet of the lake, is fifteen feet wide on top, and is, in height, eleven feet above high-water mark of Boston harbor, or four feet above the authorized limit of flowage. The conduit which conveys the water from the lake to the pipe-chamber on the north bank of Mystic River is 7.453 feet in length, and is constructed of hydraulic brick masonry eight inches in thickness, five feet eight inches in height and five feet wide. The total fall to the pipe-chamber is nine inches, and the conduit is calculated to convey 35,000,000 gallons each twenty-four hours. From the pipe-house the water is conveyed in two thirty-six-inch iron pipes under the Mystic River



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to the pump-well in the engine-house, whence it is raised by the powerful engines to an elevation of 147 feet, through a thirty-inch pipe, to the reservoir on College Hill, a distance of 3,277 feet.

The reservoir, which has become a familiar feature among Somerville's attractions, is situated on College hill. It is both receiving and distributing in its scope. In shape it is a parallelogram 350 feet by 560 feet, and its water-surface covers an area of about four and one-half acres. It is twenty-five feet in depth and is divided into two portions nearly equal in contents, by a partition wall five feet below high-water line. At high-water mark the capacity is 26,244,415 gallons. The top of the embankment is 150 feet, the top water-line 147 feet, and the bottom water-line 124 feet above high-water level of the harbor. The embankments are nineteen and one-half feet in width at the top, are laid out with concrete walks and furnished with seats, making an attractive promenade to which many resort to enjoy the beautiful scenery spread out in all directions.

From the reservoir the water is conducted through two pipes, the first one laid being of cast iron, twenty-four inches in diameter, and the other, laid in 1870, being thirty inches in diameter and constructed of wrought iron sheets, securely riveted, lined inside with cement and imbedded in a thick layer of the same material. These pipes deliver the water to the Charlestown city system and to the distributing pipes of Somerville.

After the necessary preliminaries, work was commenced on the construction of the reservoir on College hill, then called Walnut hill, September 27, 1862, with appropriate ceremonies. Considerable progress was also made in that year on the contract for the dam and conduit. The construction of the engine-house was commenced in 1863 and completed in 1864, and in the latter year the water was brought into Charlestown amid great rejoicing and a general celebration of the event.

Shortly after the completion of its supply main the city of Charlestown made a connection in Broadway opposite Franklin street, and laid its pipes through Franklin, Pearl, Myrtle and Washington streets to the McLean Asylum, this being the first introduction of Mystic water to the houses of Somerville. During the three following years quite a large territory in East Somerville and Winter Hill was brought into the Charlestown system, the expense of the work being borne first by the city; subsequently the cost of the pipe and laying was borne by the city, and the expense of trenching was paid by the parties for whose convenience the pipe was laid; and finally the entire cost was required from the parties supplied with water. Later these pipes were purchased by the town from the parties who had been assessed for their construction.

By the year 1867 the town of Somerville had arisen to the importance of a prosperous community of about 12,000 inhabitants, imbued with the spirit of enterprise and mindful of the necessity of soon procuring from some source an abundant supply of water for the protection of their homes from fire as well as the enjoyment of its use for domestic purposes.

The subject was introduced to the inhabitants of the town by a petition presented at a town meeting held November 5, 1867: at this meeting the

town took its first action in regard to the introduction of Mystic Lake water when it was "Voted: That Nathan Tufts, Jr., Aaron Sargent, George O. Brastow, S. A. Carlton, Christopher E. Rymes, Thomas Cunningham and Levi Russell be a committee to take the whole matter of contracting with the city of Charlestown for a supply of Mystic water into consideration, confer with the Charlestown authorities, propose some plan and report at the next town meeting."

At a town meeting held April 13, 1868, the committee submitted a full report on all the matters delegated to them, and recommended the election of a committee to be called the "Somerville Mystic Water Committee," with authority to make any and all arrangements in regard to the introduction, distribution and supply of the water.

This report was accepted and adopted, an appropriation of \$30,000.00 was made, and Aaron Sargent, C. E. Rymes, R. A. Vinal, R. E. Demmon and Cutler Downer were elected to constitute the first "Somerville Mystic Water Committee."

The first work of the committee was to procure the necessary legislation to authorize the making of a contract with the city of Charlestown for the use of Mystic water, and permit the laying of the distribution pipes.

The desired act (Chap. 202, Statutes of 1868) was passed by the legislature and approved May 14, 1868, the first section being as follows:—

"The town of Somerville is hereby authorized to lay, construct and maintain within the limits of said town such pipes, aqueducts and structures in connection with the water-works or aqueducts of the City of Charlestown as may be requisite for the purpose of supplying water to the inhabitants of said town for the extinguishment of fires and for other uses."

Immediately upon the passage of this act the committee made application to the city council of Charlestown for the terms upon which that city would supply this town with water, and reported their progress at a town meeting held September 18, 1868. At this meeting a proposition was strongly advocated for the establishment of an independent system of water-works in connection with the waters of Spot Pond in Stoneham, five and one-half miles distant from the town line, or of Lake Quanapowitt in Wakefield, seven and one-half miles distant. After much discussion these schemes were decided unfeasible and it was "Voted: That the town will introduce water in pursuance of the authority granted to the town" by the act above referred to.

The contract with the city of Charlestown for the use of Mystic water was made on September 21, 1868. By the terms of the contract the city of Charlestown agreed to furnish the water, collect the water-rentals, and to pay to the town of Somerville a percentage of the rents collected in Somerville, on the following sliding scale, viz.:—

On annual receipts up to \$20,000	. . . . .	15 per cent.
From 20,000 to \$30,000	. . . . .	20 "
From 30,000 to 40,000	. . . . .	25 "
From 40,000 to 50,000	. . . . .	30 "
On the amount in excess of \$50,000	. . . . .	40 "



WILLIAM FRANKLIN HALL.

The town of Somerville on its part agreed to lay and maintain the distribution pipes and fixtures and to pay the same rates for the use of the water as was charged to the inhabitants of Charlestown. By the terms of the agreement the payment for the use of fire-hydrants was fixed at the sum of \$28 for each 350 inhabitants based on the semidecennial census.

On August 14 a contract was made with the Patent Gas and Water Pipe Company of Jersey City for furnishing the pipe and gates for the season's use; on September 11, a contract was made for the trenching, and on October 8, 1868, the work of laying the pipe was commenced by the town of Somerville. Connection was made with the Charlestown pipe in Broadway at the Medford town line and the pipe was continued through Medford and Central streets, Somerville avenue and Washington street to the grounds of the McLean Asylum, there connecting with the pipe which had been laid by the city of Charlestown. This pipe in Medford and Central streets was twelve inches in diameter, was made of wrought iron lined with cement, and it is an interesting fact that this section of pipe, the first that was laid by the town, is to-day performing satisfactory service after a period of twenty-eight years.

This kind of pipe was laid up to the year 1884, when, on account of increasing trouble from bursts, and on account of the decline in cost of iron pipe, it was abandoned, and cast-iron pipe has been used exclusively since that time.

In 1869 the pipes laid in Somerville by the city of Charlestown were purchased from that city, and in the following year a line of pipe which had been laid through Sacramento street to the American Tube Works was purchased from the city of Cambridge, thus bringing the entire system under the control of the town authorities.

The rapid growth of the town rendered a change of organization desirable, and in 1872 the city of Somerville was incorporated. On the 13th day of January, 1872, by provisions of Chap. 182, Acts of 1871, the "Somerville Mystic Water Board" springs into existence, composed of five members, each elected annually by joint ballot of the city council in convention.

On July 1, 1886, after many years of agitation and effort on the part of the several boards, a modification of the water contract was secured, by the terms of which the city of Boston, who had meanwhile assumed the Mystic water-works through the annexation of Charlestown, agreed to rebate to the city of Somerville fifty per cent of the water-rates collected from Somerville consumers. This increased the city's revenue from this source from \$21,444.91 in 1885 to \$42,650.57 in 1886.

While the larger portion of the city's territory was, by this time, enjoying the advantages of an abundant water-supply, the high lands, embracing some of the otherwise most favored localities, were deprived of a satisfactory service, the height of the water in the reservoir being insufficient to give the pressure necessary to supply residences in these elevated sections of the city. In 1889, in consequence of these conditions, plans were perfected for the erection of a high-service plant, and in the following year the

system was put into operation, and in its results has proved the wisdom and foresight of those who urged its construction and carried it through to a successful termination.

The plant comprises a brick engine- and boiler-house, one high-duty pumping engine, two steel boilers, a wrought iron standpipe, and a system of force and distributing mains ranging in size from fourteen-inch to six-inch.

The portion of the city now covered by the high-service system comprises 309 acres, or about one-eighth of the entire land area of the city. The water is draughted from the thirty-inch main in Broadway near Cedar street to the pumping station one-eighth mile distant. It enters the pump under an average pressure of thirty-eight pounds, and is thence raised to the standpipe on the summit of Spring Hill. The elevation of the base of this standpipe is 144 feet above tide-marsh level. The erection of the standpipe was commenced September 9, 1889, and was completed November 23 of the same year, and was filled with water the first time on March 1, 1890. The standpipe is 30 feet in diameter, 100 feet in height and has a capacity of 528,768 gallons.

The pump was made by Henry R. Worthington, New York, and is a compound condensing engine with two fourteen-inch high pressure and two twenty-four and a half-inch low pressure cylinders, with two fourteen-inch double-acting water plungers of eighteen-inch stroke. The contract called for an engine of 2,000,000 gallons daily capacity and a duty of 50,000,000 foot-pounds. At the trial the engine developed a duty of over 64,000,000 and a capacity of over 2,200,000. The steam was generated in one sixty-inch boiler, and this was in operation until 1894, when a duplicate boiler was erected for alternation. The total cost of construction of the high-service plant was about \$75,000.

March 11, 1891, passage was obtained of a legislative act reducing the membership of the Somerville Mystic Water Board from five to three, to be appointed by the mayor, subject to confirmation by the board of aldermen, the term of office to be three years, one member being appointed annually; thus ensuring a practically permanent and efficient organization. The present Board consists of George D. Wemyss, president; George A. Kimball, and Wm. Franklin Hall.

The several boards who have had charge of the affairs of the water department since its organization have, with the co-operation of the town and city governments, been enabled to keep pace with the rapid growth of the city and have met all reasonable demands for the extension of the system. This has resulted in the occupancy of a very large portion of the city's territory, and the network of pipes of the Somerville water-system covers practically the entire district.

Starting with two and a half miles of pipe, nineteen hydrants and twenty stop-gates in 1868, the city now possesses a system comprising about 75 miles of mains, 58 miles of service connections, 700 hydrants, 900 stop-gates, 50 water-posts, 8 drinking fountains and 9,000 service taps.

The amount of bonds issued on funded debt account for the construction and maintenance of this system has been \$1,005,000, and payments have been made, to January 1, 1896, of \$683,500, leaving the water indebtedness at that date \$321,500. Since 1892 no water bonds have been issued, the entire expenses of the department, including its interest account and reduction of its funded debt, being paid from its earnings, and no call is made on the tax-payers for its support.

The expenditures for construction account to January 1, 1896, have been \$667,976.93, and the total revenue from sale of the water up to that time was \$795,466.94; the water income for the first year being \$911.39, and for 1895 \$89,431.46. These figures well serve as an indication of the growth and prosperity of our city.

The great influx of population to the commercial centers produces new conditions; new conditions demand new resources, and what served well the requirements of our fathers does not satisfy the necessities of their children. This is an era of progression and evolution, and the Mystic water-system is destined to succumb to the ever onward march of progress and will soon become a thing of the past. It has well played its part in the prosperity of our city, but its safe capacity for supplying our homes with water has already been exceeded, and its absorption into the greater and more comprehensive scheme which the early future has in store for it will not be regretted.

Already we hear the sounds of preparation and soon we shall receive the full benefits of that gigantic enterprise undertaken by the Commonwealth to bring down the head waters of the Nashua to supply the necessities of her chief city and its outlying municipalities.

Somerville looks forward to the realization of this grand scheme of water-supply with almost as much anticipation as, in the earlier days, she regarded the introduction of the Mystic water; and this fact justifies a brief outline of its important features.

The agitation for an increased water-supply for the district included within a ten-mile limit of Boston led to the formation of the Metropolitan Water Board, who have, by legislative enactment, acting in behalf of the Commonwealth, formulated a plan to take the water of the south branch of the Nashua river from a point in the town of Clinton, Mass., and convey the same to the inhabitants of the so-called Metropolitan District, of which Somerville is an important factor. The streams which unite in West Boylston to form the south branch of the Nashua river take their rise on the easterly and southerly slopes of Mt. Wachusett, in the central part of the State.

The plan contemplates a storage reservoir in Clinton which will wipe out the present location of a thriving town, four cotton-mills, four churches, six schoolhouses and nearly seven miles of railroad, and will require 1,711 inhabitants to seek other homes.

The reservoir is to be nearly eight miles long by two miles maximum width, with a shore line of over thirty-five miles, its surface of 6.56 square

miles forming the largest body of fresh water in Massachusetts. Its maximum depth is 129 feet with an average of 46 feet, and it will contain 63,068,000,000 gallons, its capacity being greater than that of any existing reservoir, and four times that of all the Boston water-works reservoirs combined. The elevation of the level of full reservoir is 385 feet above the level of high tide in Boston harbor. The entire cost of constructing this reservoir is estimated to be about \$9,000,000.

The dam to hold back this enormous body of water is to be constructed of solid masonry across a narrow gorge; it will be 1,250 feet in length, 129 feet in height above the level of the ground, 119½ feet in thickness at its foundation and 19 feet thick at the water-level.

The water is to be conveyed from the reservoir through an aqueduct eleven feet six inches wide by ten feet six inches high, with a daily delivering capacity of 300,000,000 gallons, for a distance of 8.87 miles, nearly two miles of which is in tunnel: thence by open channel 3.03 miles to Reservoir No. 5 in Southboro, from which place it will flow through existing aqueducts and reservoirs to the reservoir at Chestnut Hill. At this point the water which is destined to supply the North Metropolitan District will be lifted by three high-duty low-service pumps, each of 40,000,000 gallons daily capacity, to a height of thirty to forty feet, whence it will flow through two forty-eight-inch iron pipes to Spot Pond in Stoneham, which will serve as an equalizing and distributing reservoir. On the line of one of these mains, near Spot Pond, is to be erected a pumping station for the entire northern high-service district, which will be equipped with high-duty engines of great capacity. The reservoir to be used in connection with this branch of the system is to be located in the Middlesex Fells, is to have its water-surface 270 feet above high-tide level, and is to contain about 35,000,000 gallons. From this reservoir the highlands of our city will derive their water-supply, and the lower sections will be served direct by the forty-eight-inch pipes, one of which will pass through Willow avenue in West Somerville and the other through Union square and Walnut street, on their way to Spot Pond.

Although the main desideratum is pure water in abundant quantity, Somerville expects to enjoy from this system the subsidiary advantages of increased pressure in its local system; cutting off the expense of maintaining a local pumping station; increase in water revenue due to our ability to secure more favorable terms than are at present enjoyed; and the removal of a certain feeling of prejudice against our city which has prevailed to some extent on account of the unfavorable quality of our present water-supply.

Somerville's interest in the Mystic system will cease by legislative enactment on the first day of January, 1898, and she will then become a consumer in this great Metropolitan Water-System.