The Life Story of Cambridge Water

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Cambridge, earlier called Newtowne, was settled in 1636. In 1637, Mr. John Harvard of Charlestown gave 1700 pounds and later his library of three hundred volumes towards the founding of a college in Newtowne. So Harvard College began in Cambridge.

Pure water was never a problem to the earliest settlers of Cambridge. A plentiful supply of pure water from such streams and springs as Menotomy River, Swamp Creek, Squaw Creek and Sachem Brook was utilized.

A Water Control Committee was appointed in 1700. Cattle were ordered pastured and watered at Charles River near the Watertown line. Refuse was dumped below the pasture. The Menotomy River was set aside for fishing and a weir constructed across it. Fish caught in the weir were divided among the settlers and the Indians.

The first Water Works Charter was granted to the Cambridgeport Aqueduct Company in April 1837, to bring water from springs on what is now Spring Hill in Somerville. The water flowed through wooden logs, and a limited amount was supplied to the lower Port for many years. Drinking water in other sections was obtained from wells. In some parts of the town of Cambridge, no houses were built because there was no well water to drink. Fire protection was nil. If a house caught on fire, it burned to the ground.

Cambridge, in 1846, had practically no sewerage system and very few private street lamps. Our highways at night were in darkness. The condition of the roads were wretched, and as for sidewalks, there were none. In the winter months, and in wet weather especially, transportation by horse and buggy was difficult and walking practically impossible.

All the days of the week, except Sunday, the streets were used for pasturing cows, so much so that it was quite difficult for women and children to make their way about town. The tax rate in 1846 was $5 per $1,000. Cambridge debt in 1846 was $22,000. The population was 13,000.

But the year 1846 was a memorable one for Cambridge. On March 17, 1846, Governor Briggs of Massachusetts signed the Legislative Act which incorporated the City of Cambridge. Thirty days later, the voters of Cambridge adopted this Act, and on May 4, the City Government was incorporated. James D. Green, the first Mayor of Cambridge, set an example of uprightness ability and faithfulness. His memory has been an inspiration to all who followed him as Mayor. Under his mayoralty, the Police Department was organized. Volunteer Fire Departments were formed, followed years later by our permanent Fire Department. A sewer system was voted but not installed until thirteen years later. Two bridges to Boston, for which people paid over $2,000,000 in tolls to cross, became free municipal property in 1858.

Chester W. Kingsley, a member of the Water Board from 1865 to 1894, reported that a Charter was granted the Cambridge Water Works in 1852. In 1861, the Cambridge Water Works was empowered to purchase the Cambridgeport Aqueduct Company, and the City of Cambridge, in April 1865, purchased the rights of the Cambridge Water Works. Thus, all the Water Works in Cambridge became City property at a total cost of $291,000. This included the pumping station, Fresh Pond with all land surrounding it, approximately 200 acres, the reservoir on Reservoir Street with 12" pipe to Fresh Pond, and the distribution system. In 1885, a reservoir was constructed on Reservoir Street, the highest land in Cambridge.

This reservoir, constructed of planks, was 165 feet square by 10 ft. high, covered and of 2,000,000 gallons capacity. It was 73 feet above Fresh Pond and 2300 feet from the engine house at Fresh Pond.

In 1887, Cambridge was authorized to purchase land and to take the water of Stony Brook, and its tributaries in the Waltham and Weston area, with the added right to take land for building a dam and developing a storage basin. Thus, Cambridge acquired 22 square mile of watershed. The population of Cambridge was approximately 60,000 at this time.

The year 1887 was also especially noteworthy for Frederick H. Rindge of California, a former Cambridge resident, gave to the City of Cambridge the Cambridge High School land and buildings for the Cambridge Public Library, Cambridge City Hall and Cambridge Manual Training School (later Rindge Tech), with the following inscription over its doorway; "Work is one of our greatest blessings, everyone should have an honest occupation."

In 1888, The Commonwealth of Massachusetts ceded its Great Pond Rights to the City of Cambridge with power to take all land and buildings around Fresh Pond for the purpose of preserving the purity of the water in the reservoir. Under the Act, the City took about 170 acres, removed all buildings thereon, such as the Fresh Pond Hotel, located on land now known as Kingsley Park. The area of pond and land was approximately 330 acres. A fine drive around Fresh Pond was constructed with a wooden fence enclosing the pond. The reservation has since been graded, especially the hill overlooking Fresh Pond and later known as Kingsley Park.

At the time of the 50th anniversary of the City of Cambridge, in 1896, Chester W. Kingsley, a member of the Cambridge Water Board for thirty years and its president for fourteen years, stated in his report, "Cambridge has an abundant supply of excellent water not surpassed by any town or city in Massachusetts and equaled by few."

Cambridge owes much to the wisdom and farsightedness of Chester W. Kingsley, known as the father of Cambridge water, and to the succeeding Board members who have served the City without compensation.

Cambridge population in 1897 was about 87,500. At this time the facilities developed for its water resources were:

1. Fresh Pond of 1,500 million gallons capacity with land of 165 acres acquired in 1853.

2. Stony Brook Reservoir of 400 million gallons capacity with land of 71 acres acquired in 1887. Stony Brook was dammed at Waltham adjacent to Summer Street.

3. Hobbs Brook Reservoir with land acquired in 1892 from Waltham, Lincoln and Lexington of about 558 acres, excavated and bottom rock lined. Dams erected for Lower Hobbs at Winter Street, Waltham. For Upper Hobbs at Trapelo Road, Lincoln, a reservoir of 2,700 million gallons capacity had been created. When filled, this reservoir stood at an elevation of 183 feet above sea level.

4. Payson Park Reservoir erected on 163 acres of land acquired from Belmont. Payson Park Reservoir of 43 million gallons capacity stands 178 feet above City of Cambridge base, or about the level of Harvard Memorial Hall Tower. Thus, the head for Cambridge water lines was established at 178 feet at Payson Park Reservoir in 1898.

The total land area used by the Cambridge Water Department in this acquisition program was approximately 1,416 acres.

The 2,000,000 gallon reservoir at the high point on Reservoir Street, which developed the head for the system before Payson Park Reservoir became available, was now deemed surplus. The land was sold because of its being valuable for residential purposes.

The rainfall from 1895 to 1905 averaged 44" per year. The highest rainfall was in 1898, when the rainfall totaled 52.4". The lowest rainfall was in 1894 when the rainfall was 35.8".

The population of Cambridge in 1905 was 97,800.

The rainfall from 1905 to 1915 averaged 36.2" per year. The highest rainfall was in 1914 when the rainfall totaled 40.7". The lowest was in 1911 when the rainfall was 28". However, the following year, Fresh Pond and Stony Brook were filled to overflowing and Hobbs Brook to 7½" below high water mark.

The 63" cement conduit from River Street, Waltham, to Fresh Pond was completed in 1915.

Total cost of the Cambridge Water Works up to April 1916 was $6,700,000.

Average daily consumption of water by Cambridge was 9.3 million gallons.

Edward W. Quinn was Superintendent of the Water Department from 1913 to 1917, and was succeeded by Timothy W. Good in 1917.

Cambridge's population census of 1920 was 109,500 - an increase of approximately 12,000 people in fifteen years.

In 1923, the new Cambridge water purification plant was completed on the shores of Fresh Pond. It consisted of a dual underground settling basin 137 feet long by 96 feet wide and 16 feet deep; a new building of the Georgian type, two-story structure 223 feet long by 71 feet wide with central tower housing the water tank; the first story was of concrete, the second story faced with tapestry brick. The structure housed ten rapid sand filters with beds 24 feet by 20 feet by 9 feet deep; administration offices, laboratory, facilities for chemical treatment of water, engine pumps, etc.

This new water purification plant, or filter plant, was dedicated June 1923, by impressive services with Cambridge officials at Kingsley Park. This gave Cambridge the most up-to-date and largest water purification plant in New England. A steam driven Worthington Pump, of 20 million gallon capacity, was purchased and installed in 1930, which provided dual pumping facilities.

The rainfall from 1915 to 1930 averaged 41.5". The highest was in 1923 of 51.3"; the lowest was in 1912 of 31.8".

Cambridge's population census of 1930 was 125,000.

Total cost of Cambridge Water Works up to January 1, 1939 was $9,250,000.

The Water Board, in 1932, installed a new pumping station and intakes at Fresh Pond, additional pipe capacity from Stony Brook, new filter beds at Fresh Pond and new mains in the distribution system. These works were required to meet the increasing industrial and population demands.

By act of the State Legislature, permission was granted in 1931 for a golf course on the shores of Fresh Pond. Cost was met by private subscription. Unemployed men were put to work building the golf course during the Depression. Professor Edwin H. Hall helped raise money. The earth removed during the construction of the purification plant in 1923 was used to fill in the low areas of the golf links.

In 1932, six new filter beds and a building were added making a total of sixteen beds for filtering 24 million gallons daily. The building and installation of two 7½ million gallon electric pumping units enabled an additional draw down of Fresh Pond.

A study of possible sources of pollution of the Cambridge water supply in Stony Brook and Hobbs Brook watershed was completed by Professor Whipple of Harvard and the State Director of Public Health, in 1934, which resulted in remedial action being taken during the succeeding years.

Cambridge Government

The original form of town government was the town meeting. In 1634, seven selectmen were elected as a governing body. Town Government itself continued until 1846 when Cambridge was incorporated as a City.

Cambridge City government consisted first of a Board of Alderman (11 members) and Common Council (20 members). In 1891, a new Charter, still with the bicameral Council and a Mayor, was put into effect.

In 1915, the Legislature passed a law for the first time setting up standard optional forms of City Government available to all Massachusetts cities except notably Boston. There were four charters to choose from; Plan A, Plan B, Plan C and Plan D.

A reform group in Cambridge successfully [advocated] for Plan B, a Mayor-Council form of Government, which was elected partly at-large and partly by wards.

In 1938, Plan E was added as a fifth optional form. Plan E provides nine Councilors elected at-large by proportional representation (PR). The Council then elects one of its members as Mayor and then appoints a City Manager. The School Committee is composed of six members elected directly by the voters by PR. The first Plan E Government took office January 1942.

The Mayor presides over the Council, is Chairman of the School Committee and is the ceremonial head of the City. The Council is the policy making body deciding upon three appointments, that of the City Manager, the City Clerk and the City Auditor.

The City Manager appoints the five members of the Water Board, who serve the City gratuitously. Since 1942, Cambridge has had two City Managers, John B. Atkinson (1942 to 1952) and John J. Curry (Aug 4, 1952 to present). [**Update**: John J. Curry (Aug 4, 1952 to 1967), Joseph Deguglielmo (1967-1968), James L. Sullivan (1968-1970), John Corcoran (1970-1974), James L. Sullivan (1974-1979), Robert W. Healy (1980-2013), Richard C. Rossi (2013-2016), Lisa Peterson (2016), Louis DePasquale (2016-2022), Owen O'Riordan (2022), Yi-An Huang (2022-present).]

Cost of the Cambridge Water Works to January 1939 was $9,250,000.

The population of the City of Cambridge in 1939 was 118,000.

In 1942, due to the increase in consumption of water, the City Manager appointed a committee, consisting of Professor Gordon M. Fair of Harvard University, Professor Thomas R. Camp of Massachusetts Institute of Technology and Mr. Frank P. Scully, to study the water situation of Cambridge.

The committee recommended that Cambridge install standby connections with the Metropolitan District's water system at three points.

The rainfall from 1937 to 1946 averaged 46.3". The maximum was in 1938 of 58.5"; the minimum was in 1941 of 32.2".

The water formerly flowing directly into Fresh Pond from Stony Brook is now partially diverted through a 42" pipe and enters the sedimentation basin of 1.5 million gallon capacity. Here alum is added to develop coagulation and to enhance sedimentation. The water then flows to the filter beds and passed through three feet of sand and gravel where the remaining suspended matter, caused by coagulation after chemical treatment, is removed. The water then passes over ripple plates in an aerator where gases, tastes and odors are removed. Before the water enters the clear water basin, chlorine is added in accordance with State Health requirement to insure the safety of the water. Finally, lime is added to restore alkalinity and to develop an anticorrosion control program. From the clear water basin, which has a capacity of four million gallons, the water is pumped to the Payson Park Reservoir for distribution to the consumers by gravity. [**Note**: Some or all of these facts have changed in the new Walter J. Sullivan Purification Facility.]

Hobbs Reservoir man-made, 100 acres, watershed 7.5 square miles.

Stony Brook water area 71 acres, watershed 17 square miles.

Fresh Pond water area 166 acres, watershed one square mile.

The storage capacity, figured at maximum elevations in the reservoirs, are:

	Elevation	Capacity	Acquired
Hobbs Brook	183 ft.	2,710 m.g.	1892
Stony Brook	83 ft.	400 m.g.	1887
Fresh Pond	17 ft.	1,500 m.g.	1852
Payson Park	178 ft.	40 m.g.	1898

In 1947, Mr. William McGuiness was appointed Superintendent of the Cambridge Water Department, succeeding Timothy W. Good who retired after thirty years of service. Mr. McGuiness has been Superintendent for nearly twenty years and has rendered excellent service.

The year 1950 marked the start of a program to improve the Cambridge Water system. The shortages of materials during the war and post-war years made it impossible to develop the improvement program at an earlier date. After years of study, under the guidance of Professor Howard M. Turner as President of the Cambridge Water Board, the expenditure of $1,5000,000 was approved by the City Council. This provided for a new pumping station, improvement and extensions for water treatment facilities at the filtration plat, work on the sedimentations basins, flocculation chambers, valve chamber, also for a new maintenance general shop building and garage.

For many years, the Department's shops, garages and general maintenance facilities were located on Auburn Street, south of Central Square. During the war years this property was sold to the Simplex Wire and Cable Company and the Department was housed in temporary quarters on New Street. In 1952, an appropriation in the amount of $310,000 was recommended by the Water Board and approved by the City Council for the construction of new maintenance general facilities on the Fresh Pond Reservation, adjacent to the water treatment plant and new pumping station. The building was constructed and the Department occupied the structure in December 1952.

Cambridge owes much to Professor Howard M. Turner and the Water Board for the program of the additions to the Cambridge Water Supply as published and reported in booklet form in 1932.

Also in 1950, the Metropolitan District Commission (MDC) accepted the City of Cambridge's offer to be connected to the Metropolitan system at three different locations; a 16" connection with Metropolitan 48" at Porter Square: a 20" connection at Massachusetts Avenue at Cambridge Common; and, a 30" connection at Broadway near Norfolk Street. These connections operate automatically and are controlled with pressure-regulating valves to supply emergency water and to maintain adequate pressures at large fires or during breaks in water mains.

Cambridge, under the sponsorship of the City Council and Mayor Edward A. Crane, convinced the Metropolitan District Commission (MDC) into accepting a connection fee of $10,000 per year. Cambridge presently pays the MDC for all water used at the rate of $120.00 per million gallons.

Water rates in Cambridge to users of Cambridge water were, in 1910, ten cents per 100 cubic feet, the lowest rate in the state. In 1949, the water rate was increased to thirteen cents per 100 cubic feet, and in 1957, the water rate was increased to sixteen cents per 100 cubic feet.

In 1959, the new liquid alum building was erected adjacent to the valve chambers building. Liquid alum is now delivered by truck and fed automatically to the flocculators.

The same year new, larger transformers were installed.

The citizens of Cambridge, at the November election in 1959, voted by a small margin to fluoridate Cambridge water. Dentists, physicians, engineers and people of authority considered fluoridated water a great health benefit to children's teeth up to age fifteen and of no detriment to other people's health. However, four years later, Cambridge citizens voted to remove fluoride form Cambridge water. Since February 1964, no fluoride had been added to Cambridge water.

In the spring of 1960, an engineering firm was engaged to make a survey of the water distribution system of the City. Under the supervision of John F. Glacken, Water Works Engineer, two draftsmen developed divisional, section maps of the City showing street lines and Water Works information such as location, size of pipe, valves and other pertinent information. A period of two years of field and office work was necessary to ascertain and verify the necessary information to develop a complete set of Water Works maps, which are composed of forty-two (42) sheets 24"x36" in size. In addition to acquiring the information to develop these maps, the coefficients of the trunk mains of the City were determined and all industrial and commercial meters tested for accuracy. It is the responsibility of the Chief Engineer to keep these records up-to-date.

As a result of this survey and other tests conducted by the Department, a cleaning and lining program to rehabilitate water mains in the transmission and distribution systems was inaugurated. Tests on certain pipes of approximately one hundred years in age found the wall structure to have a potential life expectancy of another one hundred years. The encrustation of tuberculation within the pipe seriously restricted the flow of the water main and required the rehabilitation program. The Department has maintained this program during the past fifteen years, has cleaned, and lined approximately 130,000 feet of pipe in the system varying from 42" to 6" in size.

In 1963, the obsolete electrical control panel for the treatment plant was replaced with a new and modern installation. On the operating floor level of the water treatment plant, adjacent to the Chemist's laboratory, a new and modern operating panel controlling complete plant operation was installed in conjunction with the replacement of the hydraulic filter valves in the galley of the original section of the plant built in 1923. Hobbs Brook Reservoir gatehouse was re-pointed and new sluice gates were installed.

North of the Fresh Pond Reservoir and adjacent to the golf links, a small pond know as Black's Nook had

become unsightly and was the burial ground for tree stumps from the last hurricane. An active group of women in the City known as the Cambridge Garden Club initiated a project to clean up and develop this area. Many truckloads of stumps; dead trees and other foreign material were removed. The area was graded, loamed and seeded. Over one hundred new trees and shrubs were planted. The improvement developed in the area during the past two years is a credit to these fine women. Recently a reception to the Club was held on the grounds to commemorate their achievements.

Water is today uppermost in everyone's mind. It is difficult for us to believe our supply of water no longer equals our demand. Rainfall is off seven inches since January 1, 1965, according to Metropolitan District Commission Director Harold J. Toole's report of July 1, 1965.

Lawns are brown, ponds and reservoirs are down. Rain has been a scarce commodity for several years around Boston. This past summer, the use of water for sprinkling lawns, filling swimming pools, for air conditioning and even general use has been severely restricted.

The drought, the last two or three years, has taxed the Cambridge water supply. Fresh Pond is at its lowest level. Stony Brook, Lower and Upper Hobbs, which should be full during early summer, are approximately twenty feet below capacity. The Cambridge Water Department is obliged to draw a large part of its water from the Metropolitan (current MWRA) supply.

Due to the foresight of our predecessors, Cambridge is connected to the Metropolitan and can automatically secure water from the Metropolitan District Commission from three separate locations.

When you turn on your faucet in your home to get a drink of water, this water may have originated in several places: Hobbs Reservoir, Stony Brook, Quabbin or nearer home from rainfall at Payson Park or Fresh Pond. Wherever it originated, it is one of the world's purest and most potable drinks.

Mr. Toole, Director of the Metropolitan District Commission Water Division, said that homes and other users in the system, population of about 1,800,000 would continue to have water for well over two years, even if it did not rain at all.

This is despite the fact that Quabbin Reservoir is at its lowest level, 15½ feet below capacity, since its was filled in 1946. Quabbin is the largest fresh water reservoir in the eastern United States. It is a fenced-in area in North Central Massachusetts, ten miles wide and eighteen miles long. The water in Quabbin is impounded by Winsor Dam and Quabbin Dike. From these, water flows to the Metropolitan system.

The Cambridge Water Board, consisting of John F. Davis, George Fantini, Michael J. Mahoney, J. Carrell Morris and Timothy F. White, with Superintendent William H. McGuiness, Water Works Engineer John F. Glacken and advisor, Professor Richard C. Woodward, is awake to the problems of water shortage and maintaining good water for Cambridge. They are seeking every additional source of water, improving its distribution and conserving its use. Most of the water problems, according to experts who are studying the problems throughout the United States, are due partially to distribution. Waste is a major factor in the country's water resources problem and pollution of these resources deprives the citizenry of many sections of the country of their God given right. We need more planning more than we need more water.

With the increased per capita demand and the population growth, it is imperative that proper planning be developed to meet this increased need.