

# HOW CITY GOT WATER

An Interesting History Given By Former Mayor Latrobe.

## FIRST LEGISLATION IN 1792

### Baltimore Water Company Gave Earliest Supply—How The System Was Built Up.

Public attention has been directed toward the Baltimore water supply by divers events recently, and this led former Mayor F. C. Latrobe to give an interesting history of the water supply in an interview yesterday. He said:

"A statement from the Water Board, which appeared in THE SUN a short time ago, that the receipts from water rents for the year 1904 would probably be \$135,000 less than the expenditures of that department, taken in connection with what might have been a water famine so fortunately relieved by the heavy rainstorm this month and the suggestions from time to time of impurities in the city water, to be relieved by the adoption of an expensive filtration system, cannot fail to direct public attention to this subject, and may therefore make the history of our water supply a matter of some interest. The statements in this connection are taken from a report which was prepared during one of my terms as Mayor.

"As far back as 1792, when Baltimore was a town, an act was passed at the November session of the Maryland Legislature, supplementary to an act entitled an 'Act to erect and establish an insurance company in Baltimore county, and for other purposes,' the ninth section of which provided that the directors of the insurance company might cause a subscription to be opened, divided into shares, for the purpose of supplying the town with water, the subscribers to be a body corporate, with the name of the Baltimore Water Company, to have the right to agree with parties for the use of water to be supplied by the said company. The insurance company did not, however, avail itself of this provision, and the people continued to get their water from springs and wells. The town had become a city in 1797, but it was not until 1800, when, after public attention had been directed by a visitation of yellow fever to the necessity of good and pure water, that the Act of 1800, Chapter 77, was passed, enabling the Mayor and City Council to introduce water into the city.

"In 1803, at the instance of Mayor Calhoun, our first Mayor, an ordinance was passed creating a board of twelve commissioners with ample authority to introduce into the city a supply of pure and wholesome water. The plans and efforts of these commissioners, who expected to obtain a water supply from what was known as Carroll's run, were stopped by injunctions obtained by property holders through whose lands the pipes were intended to be laid, and 1803 passed without any.

#### Citizens Take Matter Up.

"In his next message the Mayor plainly informed the Council that it was for the members of that body to decide whether it would be possible to adopt any measure that would relieve the situation. The Council replied by authorizing the Mayor to receive proposals at his office until June, 1804, for introducing 'a copious and permanent supply of water into the city by an individual or company,' and an advertisement was published to this effect. The citizens themselves then took the matter in hand and a public meeting was called for April 21, 1804, 'to devise some scheme to relieve the city from the unpleasant dilemma in which it was placed.' The meeting was held, Gen. Samuel Smith was made chairman, and it was then determined that a joint stock company should be raised to supply the city with water. A committee, consisting of Samuel Smith, William Cooke, Elias Ellicott, Robert Goodloe Harper, Thomas McElderry, Alexander McKim and John Eager Howard, was appointed to prepare articles of association, and report to an adjourned meeting on May 1, 1804, when commissioners were to be appointed to open books and receive subscriptions for stock of the company.

"There seems to have been much difficulty in obtaining subscriptions to the stock, but it must be remembered that the Baltimore of a century ago was not a very large city, and it was only by the personal efforts of the commissioners that insurance companies and other public institutions were prevailed upon to come forward and subscribe for the amount required. The board of directors was elected on May 24, 1804, and Mr. Jonathan Ellicott was employed as the surveyor and engineer. After much consideration and hesitation between the advocates of Gwynn's falls and Jones' falls, the latter was decided upon as affording the better advantages.

"It now became necessary to secure a site for the erection of the works, and in 1806 a purchase was made of the lot now occupied by the office of the Northern Central Railroad on Calvert street. The works, which were erected under direction of Mr. John Davis, consisted of a wheel and pumps, which forced the water into a reservoir on the southwest corner of Cathedral and Franklin streets. The water was obtained through a common mill race from what was known as Keller's dam, which supplied Salisbury Mill, the site of which was near the site of the old Belvedere bridge.

#### City Finally Takes Charge.

"The iron pipes first laid by the water company were imported from England, and were of the conical or tapering joint, for which the parallel joint has long since been supplemented. In the fall of 1805 the company was in condition to ascertain if the city would require water and in what quantity, 'to be delivered for public use for extinguishing fires, so that pipes might be prepared and laid adequate to the demand,' the company offering to furnish the necessary fireplugs 'at the rate of \$10 per annum for each.' This proposition was accepted at a special meeting of the City Council, but by a subsequent agreement the city undertook to construct the fireplugs at its own expense.

"The company soon after this erected a new pumping station on the site afterward occupied by the Pearl hominy mill, near the old Belvedere bridge, and built a reservoir on high ground at the northeast corner of what are now Chase and Charles streets, and, in addition, constructed the Mount Royal reservoir, which occupied the site in part of the Central Railroad Station on North Charles street, and was supplied with water by natural flow from the dam of the Laverle cotton factory.

"On May 11, 1852, the City Council authorized the appointment of Water Commissioners 'to inquire into and report upon the present mode of supplying the city with water, and its expense, as compared with that of other cities, the quantity and quality of such supply and the propriety and practicability of obtaining it from some other source.'

"The commissioners appointed were John W. Randolph, James Murray, Joshua Vansant, John King, J. J. Turner and Ross Wiggins. The result of their deliberations and intelligent investigation of the whole subject was that the time had arrived when the supply of the city with water ought no longer to be left in the hands of a private corporation, no matter how excellent its management, but should be in charge of and subject to the control of the city government. To this proposition no objection was made by the water company, which had again and again proposed to sell to the city and place the whole matter of the supply of water in the hands of the Mayor and City Council, where, in the opinion of the company, it properly belonged.

"At the January (1853) session of the Legislature authority was given to the Mayor and City Council to issue bonds 'to the amount of \$1,350,000 for the purchase of the water company's property, and subsequently an ordinance authorized the purchase from the Baltimore Water Company for that sum of certain of its corporate rights, privileges and franchises and all of its property comprised within the terms of the proposal of sale dated December 1, 1852, made in the communication from the president of the company to Joshua Vansant, chairman of the Board of Water Commissioners. This purchase was consummated and the city thus found itself in the place, to all intents and purposes, of the old Baltimore Water Company.

#### Many Improvements Needed.

"It was manifest to the city Water Commissioner, who now had charge of this department, that many improvements were necessary to increase the supply, either by a new system of works in connection with Jones' falls or by reinforcing it from other sources. The newspapers of that day will show the great difference of opinion prevailing in this connection. The Patapsco, Gwynn's falls, the Gunpowder and Jones' falls all had their strong advocates. The contest finally narrowed to the Gunpowder and Jones' falls. Majority and minority

reports were made, but the question was finally decided in favor of Jones' falls.

"In 1858, Thomas Swann, being Mayor, the Mayor and City Council, by ordinance, authorized the appointment of a Water Board, of which the Mayor was ex officio chairman. This board was required to mature and decide upon all plans with regard to the general policy of the department, the existing system and the procurement of an increased water supply from Jones' falls, the plans in this connection to be submitted to the City Council. Under this board the new Jones' falls water works was constructed. These works consisted of the reservoir known as Lake Roland, formed by a masonry dam across the ravine of that stream, 225 feet above tide and seven miles from the city, from which the water is conducted through a brick-arched, elliptical tunnel, four miles long and averaging five feet in diameter, to a semi-circular reservoir containing 400,000,000 gallons on the east side of the falls. It is thence brought through four 30-inch mains under the bed of the falls to Druid lake, the construction of which was commenced March 7, 1864, on the west side of the falls, 217 feet above tide, covering 53 acres and containing 420,000,000 gallons, from which it is distributed through the city.

"In connection with Druid lake there was afterward constructed the high-service reservoir in Druid Hill Park, 350 feet above tide four acres in area, containing 28,000,000 gallons, into which the water was pumped from the pumping station in the said park at the rate of about 6,000,000 gallons in 24 hours. Prior to the construction of Druid lake the water from Hampden reservoir had been conducted into a circular distributing reservoir known as Mount Royal reservoir, on the east side of what is now the Mount Royal avenue (Latrobe avenue) of Druid Hill Park. This reservoir is 150 feet above tide, containing 30,000,000 gallons.

#### Had To Look Further.

"Notwithstanding the confident assertions and opinions of the advocates of the Jones' falls supply in the controversy referred to, that there would be no want of water at any time thereafter, in the severe drouth of 1872 it became apparent that unless the Gunpowder was resorted to Baltimore would encounter the risk of a water famine in every dry summer. So evidently had this, I might say, almost been demonstrated that an ordinance was passed by the Mayor and City Council in 1872, Joshua Vansant being Mayor, providing for the construction of a temporary supply, or, as it might be called, a reinforcement of the Jones' falls supply. In 1874—Joshua Vansant still Mayor—a dam was constructed at Meredith's ford on the Gunpowder, from which an engine and two powerful pumps forced through a main over the dividing ridge between the Gunpowder and Jones' falls into the channel of Roland run, a tributary to Jones' falls above Lake Roland, 5,000,000 gallons in each 24 hours.

"The cost of this temporary supply was \$603,091.11, which was considerably within the estimate of \$700,000, on which the work was undertaken.

"The insufficiency of the Jones' falls supply having thus been thoroughly demonstrated, the Water Board, in 1872 (Joshua Vansant, Mayor), authorized and directed Robert K. Martin, civil engineer, to make all the necessary surveys and prepare plans for the construction of proper works providing for the permanent introduction of the waters of the Gunpowder as an additional water supply for Baltimore. These plans and surveys having had the approval of Charles P. Manning, consulting engineer, and being thoroughly discussed and digested by the Water Board, at the instance of the said board an ordinance was enacted February 12, 1874, authorizing the issue of city stock to the amount of \$4,000,000 to construct a proper system of works for obtaining a water supply from the Gunpowder river. The enabling act was passed by the Legislature on April 1, 1874, and ratified when submitted to the people by a vote of 14,120 to 6,127.

"After obtaining the proper authority, the Water Board provided, in 1875, to condemn the right of way for the introduction of the supply by natural flow from the Gunpowder river and, in November, 1875, the contracts were made for the construction of the entire line. The Water Board then consisted of Ferdinand C. Latrobe, Mayor and ex-officio president of the board; John R. Seemuller, secretary; John F. Hunter, George P. Thomas, Thomas Bond, George W. Porter and Thomas W. Hall, Jr. The several pieces of work connected with the Gunpowder supply were Loch Raven, which was the receiving lake in the bed of the Gunpowder falls; the dam across the Gunpowder falls; the tunnel or conduit from the dam to the receiving reservoir; Lake Montebello, which was a supply or storage reservoir, and subsequently Lake Clifton, also a storage reservoir, and the 40-inch pipe mains from Lake Clifton to the city limits.

#### Loch Raven Described.

"Loch Raven is 170 feet above tide, with a water area of 252 acres; capacity, 510,000,000 gallons, and at the time of its construction its depth varied from 4 to 20 feet. Its length is 4 3/4 miles and the width varies from 100 to 800 feet. The dam is built of rubble and white marble, with foundation on solid rock. The depth of the foundation is 13 feet below the original surface. The wings extend into the hill on each side 256 feet. The width of the overflow is 300 feet and the height from the extreme foundation to the overflow is 29 feet. The flow of water to the dam is controlled by a gatehouse, the chambers of which are built of white marble. Within the gatehouse are 17 iron gates, with openings 3 by 4 feet. The conduit is a continuous tunnel running from the dam to the storage reservoir, Lake Montebello.

"The time occupied in the construction of this tunnel was five years. Its depth below the surface varies from 65 to 330 feet; the internal diameter is 12 feet; the fall is one foot to the mile, and its length is seven miles. The capacity of discharge of the tunnel is 170,000,000 gallons in 24 hours. Two miles of the tunnel were through material arched with brick, the remaining five miles through hard rock, requiring no arching. A large body of water enters the tunnel from springs along its line.

"Lake Montebello, the storage reservoir of the Gunpowder water supply, is located at the southern end of the seven-mile tunnel. It is irregular in shape and covers an area of 60 acres. Its depth is 30 feet, with a capacity of 500,000,000 gallons. When full, the surface of the water is 163 feet above tide. There is a roadway one and one-half miles long around the lake. A gatehouse, situated at the entrance of the seven-mile tunnel, receives and distributes the flow of water. The gatehouse, built of white marble, is a compound one, and contains 29 3 by 4 feet iron gates.

"Lake Clifton is a storage reservoir for the Gunpowder supply. It is located one mile south of Lake Montebello, receiving its water from that lake through a 12-foot brick conduit. It is elliptical in shape, the short axis being 1,200 feet and the long 1,700 feet. Its water area is 30 acres, its depth 30 feet, its capacity 265,000,000 gallons, and the high of the water in the lake, when full, 163 feet above tide. The length of the roadway around the lake is three-quarters of a mile.

"The gate chambers located at the end of the conduit from Lake Montebello are built of rubblestone, brick and iron. Here 46 iron gates, of different sizes, control the flow of water, and by means of a combination of chambers, flumes and gates, the water is received and passed into the mains, and thence to the city. There have been placed in the several gatehouses on the line of the Gunpowder water supply 92 iron gates.

"The amount of the appropriation for the introduction of the Gunpowder water supply was \$4,000,000. Out of this sum the work was built and paid for, and the land and water rights were also purchased or condemned and paid for. The sale of the bonds, with the premium, amounted to \$4,122,003.73. The total cost of land, water rights and entire work was \$4,091,375.60, leaving an unexpended balance of \$30,628.13.

"This does not include Lake Clifton, which was not contemplated in the original plan of the Gunpowder works, but was subsequently rendered necessary on account of the muddy condition of the river, so frequent during the year, thus requiring increased lake storage. The water from the Gunpowder was turned on the city with elaborate ceremonies at the Battle Monument on October 10, 1881.

"The Water Board under whose administration the Gunpowder supply was completed consisted of Ferdinand C. Latrobe, Mayor and ex-officio president; Geo. W. Porter, secretary; John F. Hunter, George P. Thomas, Thomas Bond, William A. Fisher and N. Rufus Gill. Mr. Robert K. Martin was chief engineer, Mr. Charles P. Manning consulting engineer and William L. Kenly principal assistant engineer.

#### Vast Increase In Supply.

"In 1884 the maximum flow from Jones' falls supply was 90,000,000 gallons, the minimum flow was 8,000,000 and the average daily consumption for that year from this supply was 12,000,000. In 1884 the minimum flow from the Gunpowder was 115,000,000 gallons, while the daily consumption from that supply was 17,000,000. In other words, the daily consumption of water in the city 20 years since averaged 29,000,000 gallons. I see it is now stated

to be 75,000,000. In 1900 the minimum flow from the Gunpowder was 70,000,000, and from Jones' falls probably below 7,000,000 gallons. Even if the water was the same as in 1884, the minimum supply and average consumption are very close. This condition may arise in any prolonged drouth.

"The policy of the former Water Board was to continue the construction of storage reservoirs. After the completion of Lake Clifton the board recognized that further provision was necessary for the high-service storage of water. It therefore purchased the ground near the York road, a few miles from the city, and in 1887 began the construction of Lake Gullford. This reservoir, which was completed in 1894, is 350 feet above tide and has a capacity of 40,000,000 gallons. Its supply is drawn from Lake Clifton through the mains which were formerly used for the temporary reinforcement from the Gunpowder of the Jones' falls supply, these mains having been removed after the completion of the Gunpowder works.

"The extension of the city limits and building up of the northwestern suburbs in the neighborhood of Walbrook and West Arlington required an extension of two water mains, and in 1894 authority was obtained from the Legislature to issue a \$4,000,000 loan, \$2,000,000 of which was to be expended in this connection. This work included the new pumping station erected after 1895 on Norton avenue, near the falls; also the large distributing mains which have been laid on West Norton avenue and elsewhere, and was intended to provide also for an additional storage reservoir in the Walbrook or West Arlington neighborhood. The plans for this entire extension were made by Mr. Samuel Gray, of Providence, R. I., who was employed by the Water Board in 1894, and who was then recognized as being among the leaders of the profession of hydraulic engineers. Mr. A. M. Quick, the present Water Engineer, was one of his assistants.

#### Conditions Much Changed.

"The Gunpowder river, from which the main supply of water for the city is obtained, is a stream subject to sudden freshets from heavy rainstorms, and for a large portion of the year the water in Loch Raven is so muddy that it cannot be turned into the distributing or storage reservoirs. The cutting down of the forests and cultivation of the watershed above the dam causes in every rainstorm a drainage of the surface soil into the lake, which requires constant dredging to keep it of sufficient depth as a receiving reservoir.

"This lake presents, therefore, a very different appearance now from what it did at the time of its construction, and the maintenance of any depth at all is only by continued dredging.

"The same conditions are applicable to Lake Roland. In regard to the latter, the flow of water has so diminished since its construction that in the report of Water Engineer Robert K. Martin as far back as 1885 he states:

"During the year 1884 no water passed over Lake Roland dam from August 10 until December 7. For four months the supply of water from this source was obtained from storage of water and from streams flowing into the lake.

"Probably if the Gunpowder waterworks were to be now constructed, with our present knowledge it would not be the policy to attempt the construction of a receiving and supplying reservoir to be located in the bed of the stream from which the water is obtained. Experience has shown that such a work cannot be used for a supply or storage reservoir. This is, first, because for a large part of the year the water would be thickened with mud, and, second, because the drainage into it of the soil on the watershed would require its proper depth to be maintained by continuous dredging, which alone would muddy the water.

#### Wanted More Reservoirs.

"Recognizing the diminishing flow of the Gunpowder, as well as of Jones' falls, and the necessity of furnishing clear water to the city, the policy of the Water Board prior to 1895 was to provide additional storage reservoirs, and thus not only furnish clear water, but also insure against any danger of a water famine during a long dry period. In this connection we were following the plan of other cities, notably of New York and Boston. It was this policy that led to the construction of Lakes Clifton and Gullford and which led Engineer Gray to earnestly recommend the prompt construction of the additional reservoir, the cost of which was provided for in the \$2,000,000 water loan.

"The experience of the present summer admonishes us of this necessity, which was thus recognized some 10 years since. Nor, in my judgment, will that reservoir be sufficient. The Water Board probably will find another supply or storage reservoir will be required, located probably near the present Loch Raven, and before very long the board doubtless will also realize the policy of the abandonment altogether of the present Jones' falls supply.

"When the Gunpowder works were first constructed the supply from the two sources was kept separate, but for many years past the waters of the two supplies have been mingled, and none of us now can boast that we drink pure Gunpowder water.

#### Formerly Large Profits.

"Prior to 1895 the receipts of the city from its water rents exceeded the cost of maintenance of the department, and the reports will show a surplus of from \$40,000 to \$75,000 per annum. But subsequent legislation has so affected the revenue of this department that it was stated in a paragraph in THE SUN a short time since, based on information obtained from the Water Board, that there would probably be a deficiency this year of \$135,000. This would amount to over 5 cents on the tax levy.

"At one time there was an agitation of the question of free water—in other words, that there should be no direct charge for water. This was a popular cry, as would be the furnishing free of any necessary commodity. It would not be free water, however, for the cost of supplying the water would be assessed in the general tax levy, and, unless some limit should be put on the quantity to be so given free, it would require a much larger source than the Gunpowder, even with the Susquehanna added, to supply the demand, to say nothing of the size of the distributing mains that would be needed.

"It is not the water, but the distribution of water, that is expensive. I well recollect at one time an intelligent citizen asking me at the City Hall why the city should charge anything for water, when there was enough running to waste over the dam at Loch Raven to supply half a dozen flour mills.

"An examination of the reports of the water departments in other cities will show that one of the sources of municipal revenue is the sale of water. With us it has now become a source of heavy municipal expense. I notice that the present Water Board is directing its attention to this condition, which is a matter in which the taxpayer is largely interested."