

1626.

HISTORY
OF
PENOBSCOT COUNTY
MAINE,
WITH
ILLUSTRATIONS AND BIOGRAPHICAL SKETCHES.

CLEVELAND:
WILLIAMS, CHASE & CO.

1882.



done a good work with other associations, in correcting all abuses coming within the statute, and is still at work.

SUNDRY ASSOCIATIONS AND SECRET ORDERS.*

The Bangor Female Charitable Society was organized in 1820; the Corban Society, in 1825; Bangor Band, 1859; St. John's Band, 1877; Bangor Horticultural Society, 1868; Bangor Art Association, 1875.

Masonic.—Rising Virtue Lodge, No. 10, organized in Hampden, September 16, 1802; Elisha Skinner, first Master. In 1808 it was removed to Bangor. Mount Moriah Chapter, R. A. M., No. 7, was chartered January 18, 1827. Bangor Council of Royal and Select Masons, No. 5, chartered June 28, 1848. St. John's Commandery, Knights Templars, chartered September 17, 1850. St. Andrew's Lodge, No. 83, chartered February 6, 1856. DeBouillon Conclave, No. 2, Knights of the Red Cross of Constantine, instituted May 5, 1875.

I. O. O. F.—Katahdin Encampment, No. 4, chartered September, 1844; Penobscot Lodge, No. 7, organized February 15, 1844. Oriental Lodge, No. 60, organized 1851.

Knights of Pythias.—Norombega Lodge, No. 5, organized April 24, 1872.

Royal Arcanum.—Bangor Council, No. 123, instituted July 18, 1878.

Knights of Honor.—Bayard Lodge, No. 294, instituted May 31, 1876.

The Hibernian Mutual Benevolent Association was organized February 24, 1867.

* From the notes of Mr. E. F. Duren.

CHAPTER XXXV.

THE WATER WORKS.*

Legislative Authority—Act Accepted by the People—The First Board of Water Commissioners—Report of the Engineer—Report of the Board—Estimates—Contract with the Holly Manufacturing Company—Location at Treat's Falls—The Work Begun—Progress to January 18, 1876—To January 1, 1877—Completion of the Works—Operations of 1877-78—Of 1879-80—Of 1880-81.

The act of Legislature, for supplying the city of Bangor with water, was approved by Governor Dingley February 22, 1875. Its first section provides that "the city of Bangor is hereby authorized to take, hold, and convey into, about, and through the city of Bangor, from any point in Penobscot River that may be deemed expedient, between the foot of Treat's Falls, in Bangor, and the head of McMahan's Falls, in Veazie, water sufficient for the use of said city and the inhabitants thereof, for the extinguishment of fires, domestic uses, and creating steam; and may flow, take, and hold, by purchase or otherwise,

* Important aid has been derived in the preparation of this sketch from the documentary History of the Bangor Water-works, published by the Water Board in 1877.

any lands or real estate for laying and maintaining aqueducts or pipes for conducting, discharging, disposing of, and distributing water, and for constructing and maintaining reservoirs, dams, and such other works as may be deemed necessary or proper for raising, forcing, retaining, distributing, discharging, or disposing of said water, and for the erection of any works for said purposes, and for sinking wells or making excavations for the filtration of water."

By the amendments of 1876 the clause in this section reading "for the extinguishment of fires, domestic uses, and creating steam," was struck out, and the words, "for all municipal and domestic uses," were inserted.

The city is authorized to erect and maintain a dam across the river of not more than twelve feet high above mean high tide, for the retention of water for these specified purposes. Bonded or script indebtedness of the city might be created, for the exercise of the powers granted by the act, to the amount of \$350,000; any bonds issued to be made payable in thirty years from their date, with interest at six per cent. per annum, payable semi-annually. The provisions of the act, so far as the water-service is concerned, might be extended to the town of Brewer, with the assent of its inhabitants at any legally called meeting.

March 8 of the same year, at the regular annual municipal election in Bangor, the provisions of the act were accepted by the people by a vote of 2,776 yeas to 79 nays. Eight days thereafter, at the request of the Water Board, \$1,000 were appropriated at a special meeting of the City Council for a preliminary survey of the site proposed in the act for the location of the water-works.

Messrs. George Stetson, Gorham L. Boynton, and Luther H. Eaton, had been designated in the act as the original Board of Water Commissioners, to hold office respectively, in the order named, three, four, and five years. On the 4th of May, 1875, however, Mr. Boynton resigned in a modest note, and the City Council unanimously chose Mr. William T. Pearson to fill the vacancy.

Mr. Eaton, of the Board, was designated as the Engineer of the works. On the 17th of March, with a sufficient corps of assistants and laborers, he began the preliminary survey contemplated by the action of the Common Council the day before; and in his first report to the Board, submitted June 3, he said:

These examinations embraced five separate and distinct points, namely: At Treat's Falls; at Spratt's Point, so called; at Webster's Point; at Howard's Ledge, and at the Orcutt Pitch, so called. The three first were made thoroughly, embracing quite a large area of the river bottom; the two last to a more limited extent. The results of these surveys have been presented to you in the form of plan and profiles for your consideration. An examination by a line of proved levels was made of the height of the apron of the Veazie mills above mean high tide at Webster's Point, and was found to be twelve feet and three inches. The height of mean tides may be found, upon a more extended observation, to vary somewhat from that assumed at this time; but not largely. The height of the water in the mill pond was found to be twenty-four feet above mean high tides; this was previous to any rise having taken place in the river from spring rains or melting snows. The height of the track of the European & North American Railway, at Webster's Point, was found to be seventeen feet and four inches; at Treat's Falls, nineteen feet and four inches above the mean high tides. The elevation of Mount Hope Cemetery, near the Soldiers' Monument, was found to be thirty-seven feet, and the

traveled road in Brewer, across the flats, from eighteen feet and nine inches to twenty-three feet above mean high tides, with but a short distance of the lowest elevation; not taking into consideration a distance of about one hundred feet, where a small brook crosses—in that it was found to average about ten feet.

In view of these ascertained facts, it is the opinion of your engineer that a dam may be erected eight feet above the indicated mean high tide, without sensibly injuring the power at the Veazie mills, or flowing to an injurious extent the land of proprietors upon the river above the dam.

His report was in favor of Webster's Point as presenting "the best physical features for a site for a dam." Twenty-three and three-fourths acres of land would there be available for further development of the works and water-power, against thirteen and one-fourth at Treat's Falls or Spratt's Point. He thought that the dam could be erected here, with head-gates, sluice, and fish-way, and race-way for pumping house, complete, for \$150,000.

At the same date—June 3, 1865—the Water Board reported to the City Council, giving also their opinion that "the site at the Webster farm is the most eligible." The President of the Holly Manufacturing Company, at Lockport, New York, and Mr. Holly himself, added their judgment in favor of this site. This company offered to construct and furnish everything necessary for the introduction of the water into the city, except the dam or power for working the pumps, for \$195,000; and on the 15th of July a contract was closed with it for buildings, machinery, piping, etc., in accordance with a resolve passed June 30, expressing as "the sense of the City Council of Bangor, that the Water Commissioners proceed at once to contract for a system of water works, and also for the erection of a dam, not to exceed twelve feet above mean high tide, and do all other things necessary to be done for the purpose of supplying the city with water for municipal purposes."

Colonel J. T. Fanning, an hydraulic engineer, who had been employed to put in the water-works at Manchester, New Hampshire, was engaged to assist Engineer Eaton in making plans and estimates; "and his practical experience," says the Board in its first report, "was of great service in making an estimate of the expense and for laying the pipes, etc." Mr. Emery, a practical builder of dams, and constructor of those at Waterville and Augusta, was induced to come to Bangor and submit his opinion of the best method of constructing the dam here, and estimate of the expense. The wooden dam constructed by him at Waterville was personally inspected by one of the Board. A majority of the Board, accompanied by one of the Aldermen of the city, subsequently made a tour of inspection to the water-works of a number of the Eastern cities—specially, it would seem, to compare the two systems of supply, by gravitation and by direct force, as in the Holly system. Their decision was reported June 30, in favor of the latter.

Colonel Fanning's estimate of the cost of introduction of the water, through about seventeen miles of main and street-piping, but not including the dam or power to operate the pumps, was \$270,000. Mr. Eaton estimated the cost of dam, shore connections, wing-dams, head-gates, flumes, and fish-ways, at \$150,000; Mr. Emery of the dam alone at \$85,050.97. Both plans contemplated

a dam built of timber, filled entirely with stones, making a solid mass of timber and stone, with boiler-plate iron on top for protection against ice and other drift, and constructed in a most thorough manner for strength and durability, having stone and masonry at the shore connections, where exposed to decay. The Board accordingly reported the entire first cost of the works as likely to reach \$450,000. It was further estimated that the average annual receipts from water-rates the first four years would be \$27,931.68, or 6.2 per cent. upon the total cost of construction.

In preparation for the beginning of the work, the Water Power Company already existing in Bangor agreed to transfer its franchise to the city, and the owners of a large part of the shores and adjacent grounds on both sides of the river near the proposed site of the dam, made a donation of all necessary lands and shores that might be required for the works or for the sites of mills and manufactories at the dam.

June 5, 1875, another appropriation was made by the City Council, of \$1,000 for the further prosecution of the survey, and a loan of the city's credit to the amount of \$350,000—all that was allowed by the act—was authorized.

It was finally determined to adopt the site at Treat's Falls, which is nearer to the city than Webster's Point, allowing some economy in the use of main-pipe, and providing, it was thought, a better site for a pumping-house. Operations in preparation for the site of the buildings were here begun promptly by the Holly Company, and a contract was made with a Philadelphia house for the full amount of pipe required. This was delayed in manufacture and transmission, and did not arrive until late in November. Upon arrival of the first cargo, trenching and pipe-laying in the streets were begun. The verbal pledges of the company that Bangor laborers would be employed, were faithfully kept, as also all written parts of the contract.

By the 18th of January, 1876, 76,672 feet of main and smaller pipe had been laid, leaving but 279 feet under the contract to be put down. An additional order had been given the company, however, for 14,450 feet of pipe, of which 11,349 had been laid, or 88,021 (over sixteen and three-fifths miles) in all. The whole contract amount would have been laid before the ground froze hard, had the pipe been delivered by the time agreed in Philadelphia—the 15th of October.

About one-half of the dam had been finished, except gravelling. The shore approaches, constructed of heavy stone masonry, were nearly finished on both sides of the river. Another dam-builder, William A. P. Richardson, of Turner's Falls, Massachusetts, had been engaged upon this work from the beginning, to much advantage. The entire length of the dam was to give nine hundred feet of over-fall, with a sluice or roll-way for the passage of boats, rafts, logs, or other lumber, as required by the act of the Legislature.

The works were sufficiently advanced to be in full operation night and day, with four plunge-pumps. They were so far operated by steam, awaiting the use of the

water-wheels. The Board had received \$287,001, of which \$285,000 were realized by the sale of the city bonds; and had expended \$274,648.47, of which \$180,036.72 had been paid to the Holly Company. The Board reported an additional estimate of \$50,000 for necessary parts of the work, making the total cost half a million of dollars.

In accordance with this and other recommendations of the Board, an act was procured at the pending session of the Legislature (approved February 11, 1876) to amend the act of 1875, and accepted by the people by a vote of 2,449 to 129. It authorized the raising of \$500,000 upon the credit of the city, for the purposes of the works, and made other important changes, including the limitation of the term of service of the original Board of Commissioners to the 1st of January, 1877. At that time Messrs. Stetson, Pearson, and Eaton made their final report, in which they say :

The works contemplated at the outset, viz., the supplying of the city with water through a series of pipes by means of direct pumping, has been accomplished, and tested to a strain on the entire system equal to a gravitation pressure of four hundred and sixty feet in height, and has now been in operation for a year, driven by the steam engine purchased of the Holly Manufacturing Company as a reserve in case of accident to the water-wheels, or that from clogging with anchor ice they may be rendered temporarily inefficient. The dam has been completed, with the exception of the fishway now in process of construction on the Brewer end; this will require some six weeks more to complete. The sluice or roll-way provided for the passage of rafts and lumber was found from defective plan to work badly, and in the high freshet of last fall was injured to such an extent that it has been found necessary to reconstruct a large portion of it. This work is now about to be commenced, and it is hoped that the repairs will be completed before the rise of the river consequent upon the spring rains. The Board of Commissioners found themselves unable to agree upon the proper manner to construct this roll-way, and called to aid them at arriving at the best plan upon which to build it, such of our citizens and others as were supposed to have practical knowledge of sluices, mainly lumber merchants, millmen, and raftsmen, together with the master workman upon the dam; and after listening to various propositions, instructed the master workman or dam builder to construct the roll-way as in his judgment, after giving due consideration to the various suggestions of the persons consulted, would best serve the purpose for which it was intended. This resulted as above stated, unsatisfactorily.

The fish-way is being built on plans furnished by the State Commissioners under authority vested in them by the statutes of the State, and is believed to be well adapted to the very important interest it is intended to subserv. The expense of the structure has been very materially increased in consequence of being obliged to construct it at the inclement season of the year in which it is being built, resulting in a large degree from delays forced upon the Board of Commissioners by action of parties beyond their control, delaying the resumption of work upon the dam some four to six weeks after the proper season has arrived to recommence; since the resumption of the work it has been pushed vigorously with all the force that could be economically employed.

The pump-room is now being prepared for heating by steam, which will be accomplished in a few days, when the use of steam as a motor will be dispensed with, and the water wheels, which are now ready, will be used instead; a low pressure of steam will be maintained upon one of the boilers sufficient for heating purposes only.

The capacity of the cylinder pumps is three million gallons in twenty-four hours, though they may be driven to a much larger performance than that in case of exceptional demand for water. The capacity of the rotary is sixteen gallons per revolution, and with the wheels running at a rate of speed to supply with the cylinder pumps three million gallons per day, this would give about two million five hundred thousand gallons in twenty-four hours additional, or in other words it has a capacity of about five-sixths of the cylinder pumps.

The pressure maintained at the pumps when the wheels are attached will be ordinarily one hundred and ten pounds per square inch, which is sufficient for domestic service upon the highest ground in the city, and

affords abundant pressure for fire purposes in the lower and business portions of the city. There has been found no lack of power at any time to meet the sudden emergencies from fires; and in no instance has fire been allowed to spread from the building in which it has taken, and in only one instance has a building been burned to the ground.

The filter, originally designed to be a single chamber fifteen feet wide by one hundred and fifty feet long, was enlarged to one of two chambers, each twelve and one-half feet wide by one hundred and fifty feet long, with a separate room for section chamber of twelve and one-half feet wide by forty feet long, and so arranged that one chamber may be closed and drained for cleansing, leaving the other in service; so that there need be no resort to unfiltered water. This entailed an additional expense of about \$3,000.

The dwelling, which is being finished off over the machinery-room of the wheel-house, for the occupancy of the engineer and his assistant, will be ready to be occupied about the 1st of April, and will afford a commodious tenement.

The original contract with the Holly Company for piping had been much enlarged, and pipes had also been laid by the Commissioners; so 20.541 miles of main- and sewer-pipe were now down. Twenty-two more hydrants had been set than were in the original plan. The drinking-fountain had been erected on the southerly approach to the post-office, and two other fountains, for man and beast, were on hand, but not set. The total cost of the work so far was \$447,022.66, of which the Holly Company had been paid, upon its contract and for extra service, \$196,126.58. It was thought that \$40,000 more would complete the works. Water-rates to the amount of \$4,325 had been paid into the city treasury.

In the official year 1878-79 1,782 feet of mains were added to the facilities of the works. Services to the number of 1,058 were taken by the people in 1877-78, and 1,224 in 1878-79. In December, 1878, the dam was injured by the ice during a freshet, and an appropriation of \$8,000 was made the next year to repair it and to build a new log-sluice. Only \$5,473.28 were expended at the time, however.

In the fiscal year 1879-80 \$14,928.65 were realized from the water-service, against \$13,325.04 the previous year. One thousand nine hundred and one feet of main pipe had been laid, and one new hydrant set, with twenty-five additional services.

In 1878-79 260,544,130 gallons were pumped during the year, being a daily average of 713,819. In 1879-80 a total of 240,099,860 gallons was pumped, and in 1880-81 370,651,782, or an average per day of 1,015,484. On some days more than 1,500,000 gallons were used. One hundred and ten service-pipes were added the latter year, making an aggregate of 1,458, which earned \$25,855.87 to the credit of the works. Two piers and an abutment were built this year, at a cost of \$974.81. The engines of the Maine Central Railroad were now supplied by the Holly water.