

"URBS IN HORTO."

HISTORY

OF

CHICAGO.

FROM THE

EARLIEST PERIOD TO THE PRESENT TIME.

IN THREE VOLUMES.

VOLUME I.—ENDING WITH THE YEAR 1857.

BY A. T. ANDREAS.

CHICAGO:

A. T. ANDREAS, PUBLISHER.

1884.

(4) Robert H. Foss, Charles McDonnell; (5) John C. Haines, Thomas James; (6) Asahel Pierce, Henry Smith; (7) Peter Turbot, Charles Sloan; (8) William B. Herrick, James Lane; (9) Samuel McKay, Michael McDonald.

1849—Mayor, James H. Woodworth, elected March 6; Clerk, Sidney Abell; Attorney, O. R. W. Lull; Treasurer, William L. Church; Aldermen—(1) Peter Page, R. C. Bristol—(James Carney elected to fill vacancy caused by resignation of Mr. Bristol); (2) George W. Snow, H. L. Rucker; (3) William H. Adams, William Jones; (4) A. G. Throop, R. H. Foss; (5) E. H. Chapin, John C. Haines—(A. S. Sherman elected to fill vacancy caused by resignation of Mr. Chapin); (6) Daniel Richards, Asahel Pierce—(G. W. Wentworth elected to fill vacancy caused by Mr. Pierce's resignation); (7) George Brady, Peter Turbot—(Elihu Granger elected to fill vacancy caused by resignation of Mr. Turbot); (8) H. R. Payson, William B. Herrick; (9) F. C. Hagemann, Samuel McKay—(R. J. Hamilton elected to fill vacancy caused by resignation of Mr. McKay).

1850—Mayor, James Curtiss, elected March 6; Clerk, Sidney Abell; Attorney, Henry H. Clark; Treasurer, Edward Manierre; Aldermen—(1) Peter Page, James Carney—(E. B. Williams elected to fill vacancy caused by resignation of Mr. Carney); (2) I. L. Milliken, G. W. Snow (A. Loyd elected to fill vacancy caused by Mr. Snow's resignation); (3) S. J. Sherwood, W. H. Adams; (4) R. H. Foss, A. G. Throop; (5) John C. Haines, A. S. Sherman; (6) G. W. Wentworth, Daniel Richards—(E. G. Meek elected to fill vacancy caused by the death of G. W. Wentworth); (7) Elihu Granger, George Brady; (8) John C. Dodge, George F. Foster; (9) R. J. Hamilton, F. C. Hagemann.

1851—Mayor, Walter S. Gurnee, elected March 4; Clerk, Henry W. Zimmerman; Attorney, Henry H. Clark; Treasurer, Edward Manierre; Aldermen—(1) John Sears, Jr., Peter Page; (2) Hugh Maher, I. L. Milliken; (3) William Wheeler, S. J. Sherwood; (4) A. G. Throop, R. H. Foss; (5) J. L. James, John C. Haines; (6) Daniel Elston—(James M. Hannah elected to fill vacancy caused by ineligibility of Daniel Elston; James M. Hannah resigned, and Henry Smith was elected to fill vacancy); (7) Read A. Williams; (8) Charles E. Moore, Elihu Granger; (9) Robert Malcolm, John C. Dodge; (10) F. C. Hagemann, W. L. Newberry.

1852—Mayor, Walter S. Gurnee, elected March 2; Clerk, H. W. Zimmerman; Attorney, Arno Voss; Treasurer, Edward Manierre; Aldermen—(1) Eli B. Williams, John Sears, Jr.; (2) I. L. Milliken, Hugh Maher; (3) O. J. Rose, William Wheeler; (4) Charles McDonnell, A. G. Throop; (5) John C. Haines, J. L. James; (6) A. C. Ellithorpe—(Mr. Ellithorpe's election contested and T. B. Dwyer elected), Henry Smith; (7) Ezra Taylor, Charles E. Moore; (8) Andrew J. Brown, Robert Malcolm; (9) John H. Kinzie, W. L. Newberry—(Henry A. Mitchell elected to fill vacancy caused by resignation of Mr. Newberry).

1853—Mayor, Charles M. Gray, elected March 14; Clerk, H. W. Zimmerman; Attorney, Arno Voss; Treasurer, Edward Manierre; Aldermen—(1) A. D. Taylor, Eli B. Williams; (2) John Evans, I. L. Milliken; (3) J. H. Gray, O. J. Rose; (4) William Kennedy, Charles McDonnell; (5) William H. Scoville, John C. Haines; (6) William Carpenter, Thomas B. Dwyer; (7) Michael O'Neil, Ezra Taylor, (Maurice Evans elected to fill vacancy caused by Mr. Taylor's resignation); (8) Francis A. Hoffman, Andrew J. Brown; (9) Henry A. Mitchell, John H. Kinzie.

1854—Mayor, Ira L. Milliken, elected March 13; Clerk, H. W. Zimmerman; Attorney, Patrick Ballingall; Treasurer, Uriah, P. Harris; Aldermen—(1) Eli B. Williams, A. D. Taylor; (2) L. D. Boone, John Evans; (3) William L. Church, J. H. Gray; (4) J. C. Outhet, William Kennedy—(Robert H. Foss elected to fill vacancy caused by death of Mr. Kennedy); (5) J. D. Ward, William H. Scoville; (6) William Wayman, William Carpenter; (7) Elihu Granger, Michael O'Neil; (8) W. H. Stickney, Francis A. Hoffman—(B. W. Thomas elected to fill vacancy caused by resignation of Mr. Hoffman); (9) Morgan L. Keith, Henry A. Mitchell.

1855—Mayor, Levi D. Boone, elected March 8; Clerk, H. W. Zimmerman; Attorney, J. A. Thompson; Treasurer, William F. De Wolf; Aldermen—(1) Sylvester Sexton, Eli B. Williams—(James Long, elected to fill vacancy caused by Mr. Williams's resignation); (2) R. M. Hough, Thomas Allen; (3) Lorenzo Fletcher, William L. Church; (4) William Colby, J. C. Outhet; (5) C. N. Holden, J. D. Ward; (6) A. C. Ellithorpe, William Wayman; (7) James L. Howe, Elihu Granger; (8) Samuel Ashton, William H. Stickney—(Stephen D. LaRue elected to fill vacancy caused by Mr. Stickney's resignation); (9) Samuel McKay, Morgan L. Keith.

1856—Mayor, Thomas Dyer, elected March 10; Clerk, H. W. Zimmerman; Attorney, J. L. Marsh; Treasurer, O. J. Rose; Aldermen—(1) James Long, Sylvester Sexton; (2) Lucius A. Willard, Thomas Allen—(Owen Kendall, elected to fill vacancy caused by Mr. Allen's resignation); (3) Calvin DeWolf, Lorenzo Fletcher; (4) Samuel Myers, William Colby; (5) Russell Green, C. N. Holden; (6) Henry Greenebaum, A. C. Ellithorpe; (7) John Dempsey,

James L. Howe; (8) S. D. LaRue, Samue. Ashton—(Conrad L. Nichoff elected to fill vacancy caused by Mr. Ashton's resignation); (9) Michael Diversey, Samuel McKay.

1857—Mayor, John Wentworth, elected March 3; Clerk, H. Kreismann; Attorney, John C. Miller; Comptroller, Samuel D. Ward, appointed March 19; Treasurer, C. N. Holden; Aldermen—(1) William Bross, James Long; (2) O. Kendall, L. A. Willard—(Jacob Harris elected to fill vacancy caused by Mr. Willard's resignation); (3) Hiram Joy, Calvin DeWolf; (4) J. M. Kennedy, Samuel Myers; (5) Artemus Carter, Russell Green; (6) George Sitts, Henry Greenebaum; (7) John Dunlap, John Demsey; (8) Christian Wahl, S. D. LaRue; (9) Philip Conley, Michael Diversey; (10) Dennis Coughlin, J. Schmidt.

WATER WORKS.—The first public effort made by Chicago to assist her inhabitants to a supply of fresh water, dates from November 10, 1834, when the Board of Trustees paid \$95.50 for the digging of a well in Kinzie's addition. But the settlers early cast longing eyes towards the lake, realizing that that source of water supply was the true one and not to be compared to the sluggish and unprepossessing river. For some years private enterprise reaped a comfortable little financial harvest in the operation of water carts, which ran to and from the lake. These carts were two wheeled vehicles, upon which hogsheads were mounted. Having driven into the lake, generally at the foot of Randolph Street, the watermen loaded up their reservoirs by means of pails, and then commenced their journeys "around town." Backing their carts up to the doors of their customers' houses, with a short leathern hose they filled the barrels or other receptacles placed there for the purpose. The price per barrel varied, according to competition, from five to ten cents. But there came a time when water-carts, tin cans, wooden pails and barrels were deemed too crude as "water works," and when even such persuasive and enterprising carriers as Peter Wolfe were thought to be behind the times. January 18, 1836, the State Legislature passed a law incorporating the Chicago Hydraulic Company. On March 19, an organization was effected as follows: George W. Dole, president; Gurdon S. Hubbard, David Hunter, Gholson Kercheval, William Forsythe, directors; and Edward W. Casey, secretary. The other incorporators were James H. Campbell, R. A. Kinzie and Solomon Wells. The capital stock was limited to \$250,000. The charter was to continue in force seventy years. The company was allowed four years from the passage of the act in which to commence the construction of the necessary works. Although incorporated, the panic of 1837 so disarranged the affairs of the new company that it did not get fairly to work until 1840, when the four years had nearly expired. Ira Miltimore was then appointed machinist and superintendent of the works, and commenced at once to build a reservoir at the corner of Lake Street and Michigan Avenue, on the ground afterward occupied by the Adams House. Not until the spring of 1842 was this first water works system completed. The American of May 24 speaks in glowing terms of the purity of the supply. The same paper of June 10 gives the following interesting facts in regard to the completion of the great undertaking:

"The whole outlay of the company has been about \$24,000. A large two-story brick building has been erected with a pier running into the lake. The steam engine is of 25-horse power. The working-barrel of the pump is fourteen inches in diameter and forty-four inches stroke—double action. The suction pipe by which the water is drawn from the lake, is also fourteen inches in diameter, and three hundred and twenty feet in length. The pump raises upward of twenty-five barrels of water per minute, thirty-five feet above the level of the lake. There are two reservoirs, each of the capacity of one thousand two hundred and fifty barrels, one only of which is complete. A space of about fifty minutes is required to fill each of the reservoirs, equivalent, of course, to raising one thousand two hundred and fifty barrels in fifty minutes. The

reservoir is of sufficient elevation to throw the water into the second story of any building in the city. About two miles in length of pipe are now laid down. The machinist under whose direction these works have been put into such complete and successful operation is Mr. Ira Miltimore. We allude to this gentleman with the more pleasure that it was for a long time confidently predicted that his undertaking would prove an entire failure. We know that though he had perfect confidence in his ability to accomplish his task, these predictions were to him a source of constant and harassing anxiety. It can scarcely be imagined how keenly intent were his feelings when the works were upon the point of being put into operation. The triumph, or it might be the disgrace, of the machinist was at hand. His feelings at that moment were assuredly not to be envied. They were to be envied when the regular evolution, the easy play, the harmonious action of every part of the machinery, announced the complete triumph of skill.*

Elsewhere, and officially, the old hydraulic works have been described as consisting of an 18-inch inlet nearly seven hundred feet long, extending from a crib in the lake to a well fifteen feet deep, the inlet bending down nearly to the bottom; of pumping works on the lake shore at the foot of Lake Street; and of wooden supply pipes, of which latter, before the abandonment of the works, there were several miles, none of which exceeded six inches in diameter. The wooden pipes were frequently dug up, in excavating for the laying of sewers and iron water pipes, and appeared to be perfectly sound, twenty-five years after they were laid.

The Common Council in December, 1841, contracted with the Hydraulic Company to supply the city with water for the extinguishment of fires. The schedule of rates for domestic and manufacturing supply was published in April, 1842, and ranged from \$10 per annum for a family of five persons, to \$500 for large services in manufactories. The pipes from the mains to buildings were furnished at private expense.

In 1842 James Long entered into arrangements with the Hydraulic Company to do their pumping for supplying the city with water for ten years, without cost to the company, in return for the free use of the surplus power of their engine. Subsequently Mr. Long referred to the difficulties of his post in the following words: "In winter the pipes would be disarranged by the heaving of the frost, and I had frequently to spend hours at a time to caulk up the joints by throwing on water and thus freezing up the cracks before we could make the pumps available. When the end of this pipe from the pier was first put down it was three or four feet below the surface of the lake, but in 1842-43 the lake had receded so far as frequently to leave the end out of water, particularly when the wind blew from the south." In addition to the work which he accomplished for the city, Mr. Long erected the "Hydraulic Mills," corner of Lake Street and Michigan Avenue, which he operated with the "surplus power of the twenty-five horse engine." The building cost about \$12,000, was of three run of stone, and the mill did good business until the second water works were constructed, in 1853, when the enterprise was abandoned.

The great expectations entertained regarding the blessing which was to be brought to the homes of the people of Chicago were not realized, even within the next decade. During the fall of 1847, especially, the water supply was of a quality which called for purification. In August, ex-Street Commissioner Phillip Dean cleaned the works and repaired them. He was then acting as agent. But citizens were already putting the pertinent inquiry, "What good can Mr. Dean do, unless the pipe is extended out into pure water?"

The matter was so serious that everyone took part in the discussion. In the spring of 1848, at the season

* Captain Miltimore, to whose judgment and engineering skill early Chicago is greatly indebted, died in Janesville, Wis., June 9, 1879.

when little fishes were generally pumped into the reservoirs and thus distributed over the city, to the horror of the clean and fastidious housewife, the public prints were full of "water works," and many shafts of ridicule were leveled against the primitive system of supply under which the city was suffering. A committee was appointed by the Chicago Mechanics' Institute, consisting of S. D. Childs, A. F. Bradley and W. H. Kennicott, to suggest a plan for getting water from the lake. They reported in May with a diagram, and proposed to lay down a pipe three feet below low-water mark; to extend it out into the lake at a point opposite First Street to a sufficient distance to pass the muddy water, and then to continue the pipe down the center of said street, crossing the Chicago River near Mr. Gage's steam mill, and continuing it to the western boundary of the city. At the crossing of each alternate street lateral branches might be taken; the pipes to be of wood and to cost about \$2,000 per mile. By carrying the pipes into twenty feet of water and attaching an elbow to that end, at least ten feet from the bottom, the water so drawn would be equally free from the floating impurities and the disturbances of the bottom; the water thus drawn to be introduced into two reservoirs, to be erected at the margin of the lake, each capable of holding twenty thousand cubic feet of water. Into the one nearest the lake the water should be first introduced, drawn off from the top and carried by an elbow to the bottom of the second reservoir, from which it should be drawn off again near the top, to be carried through the city by wooden pipes running down First Street. The works then in operation (so it was computed) were throwing into the reservoirs a column of water equal to twenty-eight thousand cubic feet every twelve hours. This was drawn from the bottom of the lake, poured into the top of the reservoir and taken out at the bottom where the sediment must, of necessity, have been thrown.

Another influence, besides the quality of the water-supply, was at work to bring the life of the old Hydraulic Company to an end. A portion of the South Side, and a very small part of the West Side, were well supplied with water, while the whole of the North Side, and large districts of the other territory, were obliged to depend upon wells and the watermen, a number of whom were still kept busy bringing water from the lake. Many poor people, who were not able to take advantage even of these necessities to health, drew their supply from the filthy river. During 1850 the company laid one mile of pipe, making in all nine and a quarter miles in use. Of one thousand hydrants, eight hundred were used by families, the remainder by stores, public houses, livery stables, etc. It was estimated that not over one-fifth of the city was being supplied by the company. For a large and rapidly growing city this state of affairs was alarming, especially as the general health was perceptibly suffering. In April, 1850, a meeting of citizens was held at the city hall for the purpose of devising means of supplying the city with pure and wholesome water. The following gentlemen, with the chairman of the meeting, Peter Page, were appointed to obtain facts and suggest remedies: South Division, R. H. Foss and T. M. Moody; West Division, A. S. Sherman and Luther Marsh; North Division, R. J. Hamilton and William E. Jones. It was through the efforts of these gentlemen, sustained by the general public sentiment, that a company was incorporated by the city during the succeeding session of the Legislature. The act approved February 15, 1851, to incorporate the Chicago City Hydraulic Company, provided for the organization of a board of water commissioners,

comprising John B. Turner, Horatio G. Loomis and Alson S. Sherman. This board entered on their duties of office June 16, 1851, and ten days later William McAlpine was appointed chief engineer. Under his directions the second water-works of Chicago were constructed. To point out distinctly the reason which the city assigned for the construction of such expensive works, an enumeration of buildings, etc., in which water-pipe were proposed to be first laid, was made in July, 1851. The total amount estimated to accrue from water-rates for the year succeeding the completion of the water-works was \$37,366.

"The commissioners stated that the water will be taken from the lake north of the pier, at or near the termination of Chicago Avenue. There will ultimately be required in the carrying out of this plan three reservoirs, one of which will be located in each division of the city. The water will be taken from the lake at a distance of about six hundred feet from the shore, and conducted by an inlet pipe to a well, which will be within the engine-house, on or near the beach. From this well the water will be forced into the reservoirs, to a height of eighty-five feet above the surface of the lake and about seventy-five feet above the surface of the general level of the city, by a non-condensing engine of about 170-horse power. The pipes used will be of iron. Iron tanks will be used for the reservoirs. The estimated cost of constructing the work upon this plan, including the cost of about forty-eight lineal miles of distribution pipe, which it is supposed will be adequate to supply the inhabitants of the city, when its population will be one hundred thousand souls, is \$570,000."

Engineer McAlpine made his report September 26, 1851. His assistant, E. W. Smith, had remained in Chicago for over a month, to take soundings in the lake at the several places suggested by the board of commissioners, and also to examine the branches of the river where the water pipes were proposed to be carried. Mr. McAlpine submitted four plans, with estimates for the cost of carrying them out. The plan substantially adopted was the fourth. An estimate was made that the total cost of constructing the works would be \$335,439.59 and that the annual expenses would amount to \$18,000. The whole plan was submitted, as applying to a city which should number one hundred and sixty-two thousand souls in 1875! The system was considered as amply sufficient to cover any possible growth of the future, and the estimate was considered by many to be quite extravagant.

It would not be in human nature for the old Hydraulic Company to allow the new corporation to prosecute their enterprise without bitterly opposing it. The former claimed exclusive rights, and held that before the commissioners could proceed a step they must first purchase the old company's property and franchise, or its franchise alone. The Hydraulic Company claimed, without the income which was then being derived from water rents, that the tables of the new commissioners would be \$15,000 less yearly than they calculated. As to the paucity of the water supply they stated,* that a "charter was obtained for supplying the North Division of the city with water, but excepting such preliminary steps as were thought necessary to secure their charter, we believe they have advanced no farther. In 1850-51, the charter was extended, and calculating to supply the whole city, the company finding the limit of \$250,000 in their charter too small, they are seeking power to borrow at once \$350,000." After showing the advantages which the city would gain by purchasing their works, and that it was impossible for them to levy taxes upon the territory now occupied by them, the directors of the company intimated that unless the matters were settled, an injunction would be brought to prevent the building of the new works. The directors of the old

Hydraulic Company, at this time were B. S. Morris, William Wheeler, B. W. Raymond, J. H. Foster and M. Laffin.

On March 2, at the regular municipal election, only five hundred and thirteen votes were cast against the adoption of the system proposed by the Chicago City Hydraulic Company. Of the four thousand four hundred and forty-five persons voting at that time, one thousand two hundred and forty-four did not signify whether they cared for the works or not.

In compliance with a request from the old Hydraulic Company a special committee of the Common Council suggested that the water commissioners purchase their entire interests for \$30,000, or their franchises for \$15,000, the Hydraulic Company to retain their property and income of works until July 4, 1853. The paper, however, was laid on the table and could not therefore be considered as having received a municipal indorsement. The water commissioners then went on to negotiate their \$400,000 bonds with Duncan, Sherman & Co., of New York City. The first loan was made in April—\$250,000, payable in twenty years. In June the New York Tribune reports: "Under the active demands for the Chicago City Six's, which was fast exhausting the supply, Messrs. Duncan, Sherman & Co. have advanced the rate to ninety-seven and one-half and accrued interest. They are selling faster than the city officers execute and forward them."

The Hydraulic Company got out an injunction, but the two rivals compromised their difficulties under the 19th section of the act of incorporation of the new water company, which reads as follows

"Said commissioners may purchase the corporate rights and real and personal property, fixtures and stock of every name and description of the Chicago Hydraulic Company, and when such purchase shall be made, the said commissioners shall succeed to and become invested with all the powers, rights, privileges and immunities exercised and enjoyed by the Chicago Hydraulic Company, under their charter, and shall continue to supply water to the citizens of Chicago, under the same, and collect the money and rents therefor, in all respects as fully and effectually as the Chicago Hydraulic Company can or may do, until the said commissioners, acting under the provisions of this act, shall have completed their arrangements, machinery, engines, pipes, buildings and other things provided for in this act for the purpose of providing the said city with pure and wholesome water; after which time the said Chicago Hydraulic Company, and their said charter, shall become extinct and null: Provided, always, that if the said commissioners cannot agree with the said Chicago Hydraulic Company as to what sum shall be paid the said Chicago Hydraulic Company for their property, rights and privileges, then the said company shall have the right to establish, by satisfactory proof, the actual cost of their said property, before the Judge of the Circuit Court of Cook County, upon petition to him in term time or vacation, and no greater sum shall be paid for the same than the Judge shall decide the actual cost to have been."

In April and August two loans were effected with the above-named banking-house. The net amount realized from the sale of the \$400,000 bonds—six per cent, twenty-five years—was \$361,280. The difficulties between the two companies having been amicably adjusted, the water commissioners pushed their work along with commendable energy.*

The works were commenced in the summer of 1852, and were situated near the lake, at the foot of Chicago Avenue. The pump-well was built, and a portion of the thirty-inch inlet pipe was laid towards the lake, and the foundations of the building and tower were put in, which closed the work for the season. During the spring and summer of 1853 the buildings and tower were finished, and several attempts made to put in place the thirty-inch wooden inlet pipe, which was designed to

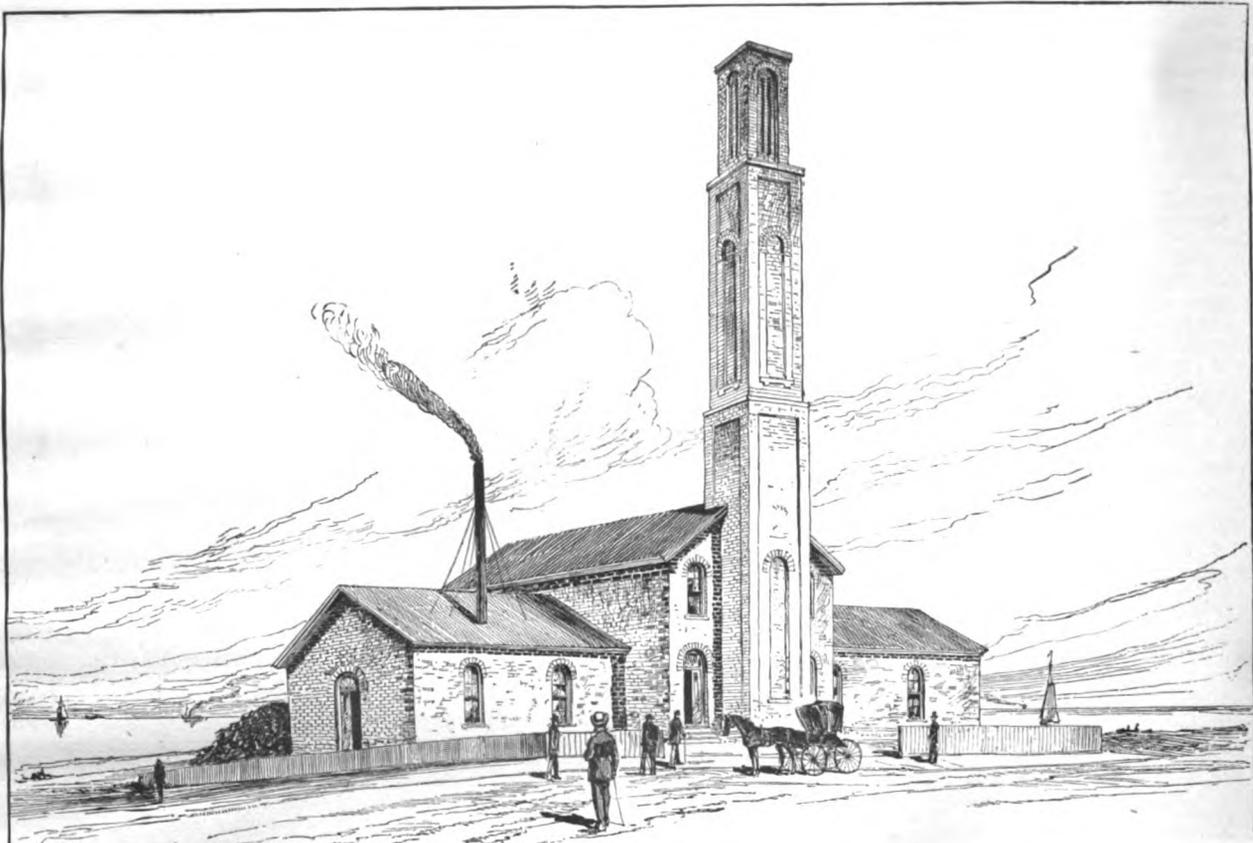
* See report of February, 1852, made by Hydraulic Company directors, filed in City Clerk's office.

* For many of the facts in regard to the Chicago City Hydraulic Works, see official reports of De Witt C. Cregier, present superintendent of the Department of Public Works.

extend six hundred feet into the lake, and terminate in a crib of timber. The efforts to complete this were unsuccessful. The boisterous condition of the lake rendered it difficult to secure the crib in place, so the work was abandoned and the water received in a pipe, close to the shore. During the fall of 1853 the stand-pipe was put up, and the condensing and non-condensing engines were erected. The former was started December 16, 1853, and the supply of water for the city commenced in February, 1854. The original

Iron Works, New York, as were also the engines erected in 1857 and in 1867. The non-condensing engine, erected in 1853, was horizontal. It was located on the south side of the main building, having a steam cylinder of eighteen inches, and six feet stroke, with one double-acting pump of the same dimensions. This engine was built by H. Moses, of Chicago. It was removed in the latter part of 1856 and a larger one substituted.

During the first four months water was supplied but nine hours per day, and none on Sunday except in case



WATER WORKS.

pump-well was rectangular, twenty by thirty feet, and twenty-five feet deep from floor of engine-house to bottom. The walls were of stone, six to seven feet thick. Upon those walls the engines were located; the buildings were of brick, forty by fifty feet in the clear, and two wings for boiler-rooms, each thirty and one-half by forty and one-half feet in the clear. The water tower was square, composed of brick fourteen feet at the base, eleven feet at the top and one hundred and thirty-six feet high. The interior was divided by a wall, one part designed for a smoke chimney, the other for the iron stand-pipe. The foundation rested upon a bed of sand, some six feet below the surface, and at one time the tower leaned fourteen inches from a vertical line. It was, however, by an ingenious method made plumb, and remained so until its demolition. The original pumping-machine consisted of a vertical beam engine, located on the north side of the building, having a steam cylinder of forty-four inches diameter and a stroke of nine feet, with two single-action pumps of thirty-four inches in diameter and five and one-half feet stroke. This engine was in use sixteen years, and continued through 1869. It was built at the Morgan

of fire; after that the supply was continued regularly throughout the twenty-four hours. At this time there were but few water-takers, and having no reservoir, the water was allowed to run to waste through the fire-hydrants, in order to keep the small engine running. In the early part of 1854 the twelve-inch river pipe at State Street was broken by an anchor dragging from a vessel. This accident required the supply for the West Division to be forced through an eight-inch pipe across the river at Kinzie; and thence by a twelve-inch pipe across the river at Adams Street for the South Division. As a temporary resort a large rubber pipe, manufactured at Boston, was procured. On its arrival its strength was found inadequate to the pressure. A new wrought iron pipe, thirty inches in diameter was subsequently put down at State Street and was in use in 1869. This new main was manufactured by Charles Ressig, of Chicago, at a cost of \$3,561, and was laid by S. S. Durfee, at an additional cost of \$2,000. The connecting main was completed October 1, 1854. Thirty and one-half miles of pipe were laid up to December 31, 1854. The total cost of the works at that date was \$393,045.32. During the first year much trouble was experienced from sand

being driven from the inlet pipe into the pump-well. The mouth of the pipe being only a few inches under water, near the shore, was exposed to the heavy waves of the lake. On one occasion the water was entirely stopped by a vast number of insects accumulating on the strainer. To protect the inlet-pipe from those obstacles, a break-water or basin was constructed in 1855. This being dredged to a considerable depth fully answered its purpose, and was in use until the completion of the first lake tunnel. In June, 1852, the water commissioners purchased from P. F. W. Peck a piece of land upon which to erect the South Side reservoir. The lots had a frontage of 217 1/2 feet upon Adams Street, and cost the city \$8,750. The reservoir was completed in November, 1854. It was filled within ten feet of the top, or twenty-eight feet deep, on November 22, and the next morning it was found that the immense weight of water had caused the masonry to settle so that fissures were discernible on every side of the building. The water was immediately drawn off, and the various methods of patching up the job, which had already cost \$60,000, were canvassed. Various plans were laid before the Council and a committee was appointed to examine them. This committee could not agree upon one thing, viz.: that it was necessary to construct substantially a new building. The water commissioners, therefore, strengthened the cracked walls as best they could with rods and braces, so that the tank could be partially filled with water and thus do some service during the winter. Pending the repairs of this reservoir the engines were run day and night. A portion of the thirty-inch inlet-pipe from the lake to the well was found to be defective, and a new one, three by four feet square, made of oak plank, was put in at a greater depth. Considerable difficulty was experienced in laying this pipe, involving the removal of the east wall of the engine house. Upon completion of the lake tunnel this arrangement was also abandoned and served subsequently as a waste-pipe for the water from the air pumps of the several engines.

In June, 1855, the reservoir was strengthened after the accident of the preceding fall, until it would hold eighteen feet of water, which, with other charges for repairs and general expenses, brought up the construction account to \$380,070.73. A large fracture was found in the main pipe near the standing column of the works, on December 22, 1855. Notice was immediately given that the water would be cut off at Monday noon. Care was taken to have the reservoir full, and a man was kept stationed there with orders to turn on the water instantly in case of fire. The pipe was repaired within a few days, and but little inconvenience was felt by the people.

Up to December 31, 1855, there had been expended upon the construction and extension of the water-works system \$496,849.64. The whole amount of bonds issued by the water commissioners had been \$650,000. Over forty-one miles of pipe had been laid, and 4,251 buildings were supplied with water.

During the early part of 1856 the quantity of water used was nearly equal to the maximum capacity of the high pressure engine. Therefore it was necessary to replace it with a much larger one. A contract was made with the Morgan Iron Works for the construction of the south engine, which was set up and put in operation July, 1857. This engine was similar in construction to the condensing engine previously referred to, with a steam cylinder of sixty-inch diameter, stroke of ten feet, two single acting pumps, each forty-inch diameter, six and one-fourth feet stroke. Much difficulty was experienced in preparing a foundation for this engine, as a portion of the only pump-well then built,

from which the city supply was pumped, as well as the site of the old high-pressure engine, was to be occupied. However, the high-pressure engine was moved to a temporary site, where it might be used until the new works were ready. The labor of setting the stone was carried on during the night only. While constructing the foundation, no water could be admitted to the well, which seriously retarded progress. The daily supply of water was uninterrupted, and the reservoir in the South Division kept full, so that in case of fire the water therefrom might be admitted to the mains. In the summer of 1857 a twenty-four inch main was laid from the pumping works to the West Division, crossing the river at Chicago Avenue, by means of a wrought-iron pipe. Soon after it was completed, the river portion was rendered useless by a pile twelve inches in diameter being accidentally driven through it, permitting the water to flow into the river. From this accident the engine narrowly escaped injury by the sudden reduction of load. The damaged pipe was taken up, repaired and placed in its original position.

Up to 1857 two engines had been built by the North Side pumping-works. The first one, that of 1853, was put in operation December 16. It had a capacity of seven and one-half million gallons every twenty-four hours; steam cylinder, forty-four inches in diameter, nine feet stroke; length of working beam, thirty feet; weight, nine tons; diameter of fly-wheel, twenty-four feet; cost of engine and boiler, \$24,500. The engine of 1857 was put in operation in July; capacity, thirteen million gallons every twenty-four hours; steam cylinder, sixty inches in diameter; ten feet stroke; working-beam, thirty feet; weight, sixteen tons; diameter of fly-wheel, twenty-four feet; cost of engine and two boilers, \$59,000. Some parts of the engine were made to conform to the conditions of the building. Owing to the position of the tower, the valve-gear or customary front of the engine was placed on the side, as it was deemed imprudent to cut the corner of the tower to admit locating the front in the usual place. In December, 1853, water was first pumped into the pipes to test them, and the first hydrant was opened on North Clark Street, near the bridge. The first permits to take water from the distribution pipes were granted February 12, 1854, to residents of the North and West divisions. Pipes were tapped February 15, and water introduced into the buildings of the city for the first time.

Following is a table exhibiting the "finances" of the water-works from 1854-57:

YEARS.	COST OF WORK.	OPERATING EXP. AND INTEREST.	REVENUE.
1854	\$393,045 32	\$38,128 51	\$26,808 50
1855	496,849 64	59,051 27	54,739 19
1856	641,509 93	73,087 23	76,806 36
1857	738,436 51	85,170 61	97,008 55

On May 1, 1857, the works were supplying seven thousand and fifty-three buildings with water, for \$85,012 per annum. May 6, 1861, the Board of Public Works was instituted. Following is the roster of commissioners up to the time of the establishment of the new board:

1851—John B. Turner, Alson S. Sherman, Horatio G. Loomis; 1853—J. H. Woodworth, George W. Dole, John C. Haines; 1855—Orrington Lunt, George W. Dole, John C. Haines; 1857—George W. Dole, John C. Haines, Orrington Lunt; 1860-61—Orrington Lunt, Noah Sturtevant, Edward Hamilton, Benjamin Carpenter. The officers during the terms of the several boards of water-commissioners were as follows, in the order stated, viz.: Secretaries—Henry Tincker (?), P. R. Forrest, A. W. Tinkham, Thomas Forrest; Superintendent—B. F. Walker; Clerks—W. R. Larrabee, J. H. Bross; Engineer—Dewitt C. Cregier; Assistants—William Moses, H. M. Fuller, and F. Trautmann.