

# REPORT

OF THE

Board of Water Commissioners

TO THE

COMMON COUNCIL

OF THE

CITY OF DETROIT;

TOGETHER WITH THE

## REPORTS

OF THE

SUPERINTENDENT AND ENGINEER, AND SECRETARY:

TO WHICH IS APPENDED A

REPORT OF PROF. S. H. DOUGLASS,

UPON THE ANALYSES OF WATERS.

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DECEMBER 31, 1853.

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DETROIT:

PRINTED BY GEORGE E. POMEROY & CO., TRIBUNE BUILDINGS.

1854.

# REPORT

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## SUPERINTENDENT AND ENGINEER.

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OFFICE OF WATER WORKS, }  
Detroit, Dec. 31, 1853. }

*To the Water Commissioners of the City of Detroit.*

GENTLEMEN—In operating the works under your charge, during the past season, it is gratifying to observe the decided improvement in their efficiency. A better and more constant supply of water has been furnished, giving greater satisfaction to the consumers; and, notwithstanding the large increase of inhabitants, and the consequent further demand upon the works, there has been much less water pumped than in the year previous. By an examination of the following table, it will be observed that, during the last eight months of 1852,\* 20,069,684 gallons more were delivered than during the cor-

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\* A register of the duty of the engines was not kept until May, 1852, when it was first commenced. A correct comparison of the consumption of water for the whole of the two years cannot, therefore, be made.

For the want of elevated ground, they are compelled to make use of a tower and tank similar to the one in use at Detroit. The tank is made of boiler iron, braced across its centre with wrought-iron rods, is sixty feet diameter, twenty-eight feet deep, and contains about four hundred and ninety-three thousand gallons. Other reservoirs, of like capacity, will be constructed as required.

The works are calculated to furnish a daily supply of three millions of gallons, and have cost about \$400,000. The unprecedented growth of that city will probably require the immediate extension and enlargement of the works.

## HISTORY OF THE DETROIT WATER WORKS.

In order to preserve a record of facts in regard to the commencement and growth of the Detroit Water Works, I have compiled the following history. This is, in truth, a history of the advancement of the city, and is another light by which to estimate the future progress of this, and other American cities.

Detroit was visited, by the whites, as early as 1610, and its actual settlement dates from 1701.

The nature of the soil upon which the city is situated is, for the most part, a stiff and impermeable clay. On this account, the water obtained from wells is of a very inferior quality, as it drains into them from the surface only, during the seasons of rain, and has not the benefit of a filtering soil. There are very few of the wells that yield a supply through the summer months, and within the limits of the city there is not what can be really termed a spring. To this insufficient supply of water from wells may be attributed the establishment in Detroit of works for distributing water, by artificial means, to the inhabitants, at a much earlier period in her history than in any of her sister cities.

To the early settlers and *habitants*, as well as to the present population, the Detroit was the unfailing source of the supply of water; and it was furnished to the former in casks and barrels, hauled in carts, and in buckets slung at either end of wooden yokes, which were borne on the shoulders of the worthy pioneers; and the ordinances of the trustees compelled each citizen to keep on his premises a cask containing a certain amount of water, and so arranged, with poles for handles, that it could be brought into immediate use in case of fire. That the citizens might have a more ready and convenient means of obtaining water from the river, it was provided, in an act passed August fifth, 1824, by the Governor and Legislative Council of the Territory of Michigan, "authorizing Peter Berthelet to erect a wharf on the River Detroit, in continuation of Randolph street, and running to the ship channel of said river," as one of the conditions of the grant "that the said Peter Berthelet, his heirs and assigns, shall, at all times during the existence of the above grant, at his own, or their own expense, erect, make, and keep in repair, at some convenient place, at or near the end of the said wharf, next the channel of the river, a good and sufficient pump, at which all persons who may reside within the city of Detroit, shall be at all times free of wharfage or other expenses, entitled to take and draw water for their use and convenience, and for that purpose a free use of said wharf shall be given, for carts, wagons, sleighs, or other machinery, to be used in drawing and carrying away the water."

Under the authority of this act, a dock was constructed at the foot of Randolph street, and filled in with logs, dirt, stones, &c.; and the manner in which this filling was done was the cause of the serious delay and damage to the contractors in putting down the outlet of the Randolph street sewer during the past summer. The pump was duly erected upon the dock, and there remained for the use of the public until the nineteenth day of March, 1835, when it was removed, by order

of the Common Council, in accordance with a petition of the citizens.

The want of a distribution of water for domestic use, and for protection against fire, had long been severely felt ; and many discussions were had as to a remedy, but no plan could be agreed upon. These facts became somewhat noised abroad, and reached the quiet town of Aurelius, Cayuga County, New York, and Bethuel Farrand, (father of Jacob S. Farrand, of this city,) and a pump maker, by the name of Rufus Wells, both of that place, determined to make an effort to obtain the right to construct the necessary works, and supply the city with water. With the view of obtaining this right, Mr. Farrand, in the winter of 1824 and 1825, came on foot from Aurelius to Detroit, by the south shore of Lake Erie, and on the seventeenth day of February, 1825, submitted to the Common Council a proposition for supplying the city with water, which was discussed, and postponed until their next session ; and a resolution was passed, calling a meeting of the Freemen, to take the matter into consideration. Meetings of the Freemen were held at the Council House on the nineteenth and twenty-first of February, at which the subject was fully discussed and approved, and the details of the agreement with Mr. Farrand were referred to the Common Council, with instructions, however, that one of the conditions must read, " That if the Common Council shall at any time desire to re-assume the privileges to be granted him by such agreement, they shall have the right so to do, upon paying him a full and fair compensation, to be agreed upon between the said Common Council, and the said Bethuel Farrand; and, in the event of their not agreeing, the said compensation to be ascertained by twelve disinterested persons, to be chosen mutually by the parties aforesaid."

A meeting of the Common Council was also held upon the twenty-first, at which the Mayor, John R. Williams, the Recorder, Andrew G. Whitney, and Alderman Peter J. Desnoyers, were appointed a committee, to make a contract with Mr. Farrand ;

and on the twenty-second the Committee reported to the Council " An Act granting to Bethuel Farrand, and his legal representatives, the sole and exclusive right of watering the city of Detroit, and for other purposes," which was accepted, and passed.

Mr. Farrand, having succeeded in his object, returned to Aurelius, travelling on foot through Canada. In May, 1825, Mr. Farrand and Mr. Rufus Wells, with their families, arrived in Detroit, and at once commenced preparations for constructing the works. They spent the summer on the Clinton river, cutting and rafting tamarac logs. In the fall of 1825, Mr. Farrand transferred his interest to Rufus Wells, and moved to Ann Arbor, where he resided until his death, in August, 1852. Mr. Wells continued to prosecute the work; and on the thirtieth of March, 1827, the Common Council passed an ordinance, granting to Rufus Wells, or his legal representatives, the exclusive right of supplying the city of Detroit with water, and repealing the act previously passed, in the name of Bethuel Farrand. Shortly after this the works were completed, and the water introduced. The pump house was erected on Berthelet's wharf, at the foot of Randolph street. It was a frame building, twenty feet square, and had a cupola forty feet high. The water was raised by two pumps of five inches bore, driven by horse power, into a forty gallon cask, at the top of the cupola, From thence the water was led through tamarac logs, of four and a half inches interior diameter, to the reservoir, which was situated upon the rear of the lot now occupied by the Firemen's Hall, and fronting on Randolph street. The reservoir was sixteen feet square, and six feet deep, giving a capacity of nine thousand five hundred and eighty imperial gallons. The reservoir was constructed of two-inch white oak planks, and caulked with oakum, and was placed upon a timber frame, sixteen feet high, and covered with a shingle roof. From the reservoir a line of logs, of three and a quarter inches bore, was laid down Jefferson avenue, on either side, as far as " Schwartz's tavern," which was situated about

where Andrew's livery stable now stands, between Cass and First streets. Logs were also laid through parts of Larned and Congress streets, and on Jefferson avenue, above Randolph street, as far as Brush street. The row of buildings still standing on the south side of Larned street, between Griswold and Shelby streets, and owned by Joseph Campau, were supplied with water from the works; and upon one occasion, one of the tenants having carelessly knocked the plug out of the log, left the water running into the cellar nearly all day, the effect of which was to diminish the contents of the reservoir, and stop nearly every hydrant in the city.

At this time the city contained about fifteen hundred inhabitants. For the use of water, families were uniformly charged ten dollars per annum, and the largest amount paid was forty dollars, which was for the supply to "Woodworth's Hotel." Mr. Wells adopted the system of "payments quarterly in advance," which has been continued to the present time. Mr. Wells remained sole proprietor of these works until the spring of 1829, when other parties became interested with him, and, on the third day of June, 1829, the Common Council, on the application of Rufus Wells, passed an ordinance, giving to Rufus Wells, Phineas Davis, Jr., Lucius Lyon, and A. E. Hathon, the sole and exclusive right of supplying the city of Detroit with water, until the year 1850; thereby repealing the ordinance of March 30th, 1827. These persons being entirely satisfied of the incapacity of the then existing works, resolved upon an immediate enlargement; and, in accordance with their wishes, on the fifteenth day of June, 1829, the Common Council appointed a committee, consisting of the Mayor, Jonathan Kearsley, and Alderman Thomas Palmer, to designate a proper site for the location of a reservoir, for the purpose of watering the city; and also to appoint a place for the Water Company to make the experiment of boring for water; and on the seventeenth, on the application of Phineas Davis, Jr., recommended by the above committee, a part of the south end of lot number eight, on the south

side of Fort, between Shelby and Wayne streets (now occupied by H. P. Baldwin), was granted to Rufus Wells and others, for that purpose. Lots seven, eight and nine were also reserved from sale, they at that time being the property of the city. The Hydraulic Company, as Rufus Wells and his associates were then called, accepted this grant, and during the summer of 1829 commenced boring for water at the locality specified; and the experiment was continued into the following winter, under the superintendence of a Mr. Faling. The Company expended about six thousand dollars in this experiment, and bored a hole of four inches diameter, to the depth of two hundred and sixty feet.

Ten feet of alluvial earth was first passed through. Next a stratum of tenacious marly clay, with veins of quicksand, one hundred and fifteen feet. Two feet of beech sand, with pebblestones, succeeded, and rock was then struck. It consisted of a stratum of geodiferous lime rock, sixty feet in depth. The auger then penetrated sixty-five feet into lias, in the course of which it fell into a cavity two and one-fourth inches in depth. A stratum of carbonate of lime, impregnated with salt, in a rather friable and yielding form, succeeded. This would appear to be a subordinate bed in the lias, for the latter was again found below it, and the boring continued eight feet. At this depth no water had been obtained, and the Company resolved to abandon the project, and erect pumping works, for obtaining the supply from the river. In order the more readily to accomplish this, and that they might not be so severely restricted in their endeavors to serve the public, they asked of the Common Council the repeal of several unjust provisions of the ordinance under which they were operating, and an extension of the life of the charter to the year 1865. This subject was brought before the Council, in a petition from Lucius Lyon, on the twenty-second day of June, 1830. This application gave rise to a good deal of excitement, and after having been discussed and sifted at seven sessions of the Common Council, and two public meetings, was finally passed on the twenty-ninth day of June, 1830.



The obnoxious amendments were, the extension of time, the provision that the Company should no longer be required to furnish the service pipes, penstocks, and fixtures used by individuals, but the consumers were to put them in at their own expense; and that, at the expiration of the charter, the Company should surrender all their property, effects, and rights to the Common Council, "on being paid by the said Common Council what shall at that time be the estimated value of the same, to be ascertained by a jury of twelve disinterested men, six of whom are to be chosen by each party;" while, by the previous act, the works were to have been surrendered to the Common Council without compensation. Shortly after this, Mr. Wells disposed of his interest in the works to E. P. Hastings, and Mr. Wells' connection with the works ceased. Mr. Wells now resides at Lexington, Sanilac County, in this state, and is seventy-six years of age.

In the season of 1830, the Company constructed new works, and the water was introduced in the fall of that year. The reservoir was constructed of brick, eighteen feet square, and nine feet deep, enclosed by a wooden building, and situated upon the same lot where the experiment of boring had been made. The water was pumped into the reservoir by means of a ten-horse-power engine, driving a rotary pump, and was forced through a three-inch iron pipe. The engine was constructed at Buffalo, and was the second stationary engine brought into this state. It was owned by De Garmo Jones, Josiah R. Dorr, and Harvey Williams, who were associated together, and known as the Detroit Iron Company. Their foundry and machine shop was situated on the south-west corner of Jefferson avenue and Cass street, and the engine was used to furnish power for their works, as well as to do the duty of raising the water to the reservoir of the Hydraulic Company. The pumping pipe was laid by Solomon Davis. The city was supplied from the reservoir through two lines of wooden logs, of three inches bore. During the winter of 1830 and

1831, all but four of the hydrants were rendered useless from freezing, and remained in that condition until spring. The same was the case with many of the logs which had not been laid at sufficient depth in the ground. The reservoir was also found extremely defective.

On the second day of March, 1831, the Legislative Council granted a charter, incorporating the Detroit Hydraulic Company. This charter was no more than a ratification of the ordinance previously passed by the Common Council, and was granted to E. P. Hastings, Lucius Lyon, P. Davis, Jr., and A. E. Hathon.

In 1831, the company constructed a second reservoir. It was forty feet square, and ten feet deep, and built with oak plank. This was also enclosed by a building, and joined the brick one built the year previous. They also re-laid the greater part of the logs, in order to prevent a second freezing.

As the Iron Company could no longer furnish power for pumping water, the Hydraulic Company obtained a site, and constructed an engine house on the north side of Woodbridge street, between Cass and Wayne streets. Here they erected a twenty-horse-power engine, built by the Iron Company. They used the same three-inch pumping pipe, and at first drove a rotary pump; but that not succeeding, it was replaced by a double-acting force pump, similar to those in use at the present works.

From the first organization of the Company to the first day of January, 1833, A. E. Hathon was the managing agent of the Company. David French succeeded him as Superintendent. Charles Howard ran the engine at the Iron Works at the commencement, and afterwards at the Hydraulic Works.

The Company continued to extend their works in the face of an increasing pecuniary loss on the striking of their yearly balances, and with the gloomy pleasure of hearing their customers declare, and, reading the "resolves" of the Common Council that the water they delivered came few and far between, and

was by no means clear, pure, and wholesome, and with the melancholy satisfaction of knowing it was all true.

The project of purchasing for the city the works and rights of the Company was frequently broached in the Common Council, but without effect, until the twenty-seventh day of April, 1836, when the Recorder, A. D. Fraser, and Alderman John Farrar, were appointed a committee to examine and report as to whether the Company had violated and forfeited their charter, and the following is their report made thereon :

“ The Committee appointed to investigate the facts relative to the question whether or not the Hydraulic Company have violated their charter, report—

“ That, in discharging the duties imposed on them by the resolution of the Board, they have examined the works of the Hydraulic Company, and possessed themselves of all the information on the subject committed to them which the short time allowed them to report would admit of, and they feel bound to state, as their opinion, that the charter of the Company has been violated at least in two important particulars.

“ 1st. They have for years failed to furnish a constant supply of water to the inhabitants of the city. Failures in this respect happen most frequently in the winter ; and the only excuse offered for their occurrence is, that the pipes are affected by the frost. An answer to this may be found in the charter itself. It provides that ‘ the pipes and other fixtures for conveying the water shall be laid in such a manner as not to be subject to frost or other injury.’

“ 2nd. The most important violation has been a failure, on the part of the Company, to do that which constituted the primary consideration in conferring the grant of a charter, viz.: ‘ supplying the city with pure, clear, and wholesome water, from the channel of the Detroit river.’ Your Committee are of the opinion that there has been a decided failure in this respect ; that the irregular supply furnished has been far from being

pure and wholesome ; that it has endangered the health of our citizens ; and that, from the present condition of the works, their location, and other circumstances, it is utterly impracticable for the Company to furnish pure and wholesome water. They conceive that this can only be done by the removal of the works to some point on the river above the city ; and they consider that the health and convenience of the citizens demand the immediate adoption of measures for the accomplishment of that object.

“ In conclusion, your Committee are constrained to say that the charter of the Hydraulic Company has, in their opinion, been forfeited, and that all rights and privileges thereby granted have become null and void, and have reverted to the Corporation.”

The report was concurred in, and it was “ Resolved, that, with a view of an immediate removal of the inconveniences arising from the failure of the Water Works, a committee be appointed to ascertain the terms upon which the Hydraulic Company are disposed to part with any supposed interest they may have in the Hydraulic Works, with power to purchase the same.”

Aldermen Julius Eldred and Thomas Palmer were appointed the committee ; and on the eighteenth of May, 1836, they reported that they had purchased the entire interest of the Hydraulic Company for the sum of twenty thousand and five hundred dollars, possession to be given the June following, and payment to be made in stock, bearing interest at six per cent. per annum, redeemable at the pleasure of the city, the interest to be paid semi-annually, at the Bank of Michigan. A statement was also presented, showing that the Company had expended, for the construction and management of their works, \$23,608 over and above all receipts for water.

Their report was finally accepted, and the works purchased on the 4th of June, 1836 ; and it was decided to keep up the

old works as thoroughly as possible, and to proceed at once with the construction of others.

The bonds above mentioned were afterwards (December 30th, 1837), on the application of the Company, reduced to twenty thousand dollars, and made payable June 1st, 1856, at the Bank of America, in the city of New York, bearing six per cent. annual interest.

On the ninth of June, 1836, Noah Sutton was appointed an agent of the city to visit Pittsburgh, Philadelphia, and New York, for the purpose of examining the Water Works in those cities, and obtaining information as to their construction and management. Mr. Sutton was also authorized, subject to the approval of the Common Council, to contract in behalf of the city for cast and wrought iron for the reservoir, and for cast iron pipes. Shortly after this, the site now occupied by the works at the foot of Orleans street was purchased, and a contract made for constructing the dock.

David French was appointed Superintendent on the twenty-fourth of June, 1836, and, in conjunction with H. Wilmarth, was directed to examine the several springs in the towns of Northfield and Southfield, and report whether, in their opinion, a sufficient quantity of pure water could be obtained for the supply of the city, and to report, if so, the probable cost of accomplishing it.

They reported, August 3rd, the result of an examination in the town of Farmington, from which it was ascertained "that, by the concentration of several springs, an abundant supply of pure water could be obtained."

The report was accepted, and laid on the table, and nothing further was done in the matter.

Noah Sutton, having returned from his tour of examination of the Water Works in other cities, submitted to the Council August 11th, 1836, a detailed report of his observations, together with contracts for castings, and the transportation of them; and on the fifteenth they were accepted, and confirmed.

On the twenty-fifth, Mr. Sutton was appointed to superintend the construction of the works, and on the thirtieth of November his services were dispensed with.

On the eleventh of April, 1837, Sanford Brittain was appointed Superintendent of the old works, in place of David French.

During the season of 1837, in accordance with the plans and specifications furnished by Noah Sutton, the foundation was laid of the present reservoir building, by himself as the contractor, and the brickwork well carried forward, under contract by William Burnell, under the superintendence of Alderman John Scott, as Committee of the Council. The general plan of the building and tank is nearly a duplicate of the Old Manhattan Works of New York ; in fact, the castings of the tank were made from the same patterns.

The dock was also further extended, and partially filled in. A portion of the pipes contracted for by Noah Sutton the year previous was also received.

April 7th, 1838, Edward M. McGraw was appointed Superintendent of the "Old Hydraulic Works," in place of Sanford Brittain. Subsequently Aldermen P. E. De Mill and Henry B. Lathrop were appointed Committee on Water Works.

In the season of 1838, the brickwork of the reservoir building was completed ; and the manner in which it has stood the test of time and use shows it to have been a most complete and faithful piece of work.

The unprecedented rise of water in the lakes during that season rendered it necessary to increase the height of the dock. The filling in of the dock was also completed. A further quantity of pipes and castings was received, and the pipes in Jefferson avenue, from Randolph street to Woodward avenue, were laid.

May 7th, 1839, Aldermen Henry H. Le Roy, Charles Moran, and William F. Chittenden, were appointed Committee on Water Works.

During the season of 1839, nothing was accomplished in the construction of the new works. The materials, of which the brick reservoir on Fort street, built in 1830, was composed were sold, and the reservoir taken down.

March 9th, 1840, William Barclay was appointed Superintendent of the "Old Hydraulic Works," in place of Edward M. McGraw; and on the thirteenth Aldermen Henry H. Le Roy and Chauncey Hurlbut were appointed a Committee on the "New Hydraulic Works;" and Aldermen W.F. Chittenden and Alvah Ewers were appointed Committee on "Old Hydraulic Works."

On the thirty-first of March, proposals having been previously advertised and received, and their proposition being declared the most favorable, a contract was made with Charles Jackson and Noah Sutton to complete the entire works. for the sum of forty-nine thousand one hundred and ninety-five dollars. This contract embraced the following specified works :

The building of an engine house.

The laying of nine miles of tamarack logs.

The erecting of the iron reservoir.

The construction of the enclosure of the iron reservoir.

The building and erecting in complete running order of a steam engine and pump (being the forty-five horse-power engine and pump still in use), and—

The furnishing a portion, and laying all the iron pipes (four and a half miles), and setting the fire hydrants and the stop-cocks.

The contractors were to complete the works by the first of October, 1841, and were to have them so far advanced by the first of November, 1840, that, by connecting the new pipes with the old reservoir on Fort street, the water could be supplied to it from the iron tank, and the old engine and pump on Woodbridge street could be dispensed with. This, however,

they failed to accomplish. But, from Decémber 10th, 1840, to January 19th, 1841, several trials were made of the engine and pump, and also a test of the reservoir.

The committee who superintended these trials, finding that the pumps were defective, and the tank leaking badly, reported the facts to the Common Council, and that body refused to accept the works.

March 12th, 1841, Aldermen W. F. Chittenden and Peter J. Desnoyers were appointed Committee on "Old Hydraulic Works;" and Aldermen Matthew Gooding and Chauncey Hurlbut were appointed Committee on "New Hydraulic Works."

On the third of June, 1841, the above Committee on "New Hydraulic Works" were authorized to put the works into operation for the purpose of testing them, and to report the result to the Council.

These instructions were at once carried into effect by the Committee. The water was pumped into the iron reservoir, and from thence was taken, by gravitation, through the ten-inch iron main, through Orleans street and Jefferson avenue, to Wayne street; through Wayne street, in a four-inch pipe, to the alley between Congress and Fort streets; and from thence, through a three-inch iron pipe, to the old reservoir on Fort street. From thence it was distributed through the old system of logs. The Committee submitted the following interesting report on the 22nd of June, 1841 :

"That they had, in accordance with a resolution of the Board, employed Benjamin Keeney to run the engine and pump from the fifth day of June up to the present time; and so far, as the Committee are informed, the city has been as well supplied with water during the time as heretofore; and would have been abundantly supplied but for the numerous leaks in the old works. The Committee find that about eight feet of water passes off daily from the new reservoir, equal to 170,000 gal-



lons, and at the rate of about 7,083 gallons per hour. Allowing six hours in each night that no water was drawn from the hydrants, would give an increase of 42,498 gallons; but, instead of this quantity, the Committee only find a gain of 13,000 gallons, leaving over 29,000 gallons to pass off by leaks in logs connected with the old reservoir during this six hours, which would make over 116,000 gallons in twenty-four hours. The water pumped up while the Committee have been running the works, would average over fourteen barrels per day for each individual assessed for water tax, or about nineteen gallons for each inhabitant.

“ Eighteen and a half cords of wood, purchased by the Committee at one dollar per cord, run the engine to furnish a supply of water for fourteen days, which would be \$1 32 per day. The old works have cost the city for the year past about \$4 23 per day for wood, and \$2 48 for labor and superintendence, being about \$6 71 per day, besides five per cent. for collecting, and an expense of some two dollars per day for repairs, &c. The Committee are of opinion that running the engine three hours per day would supply the city with water, if the logs and pipes were in good repair; and, as that part of the contract with Messrs. Jackson and Sutton, which should have been done on the first of November last, is now nearly complete, or in such condition that the works could be used by the city to much better advantage than to continue the old works, the Committee would recommend their acceptance, so far as completed, *with the exception of time*, and the appointment of a Superintendent to take charge of them, whose duty it shall be to keep a regular map of all the individual connections, with such notes or memoranda as may be necessary for a full explanation thereof, and superintend the laying of the pipes and logs, and the putting up of hydrants, &c. The confusion and derangement in the old works, and the spending of money in digging at random, for the want of a correct map, ought to be sufficient to prevent the Board from creating a similar evil. The unnecessary expenses

incurred in the old works, in consequence of the Superintendent, Engineer, &c., receiving their appointments on party grounds, is, in the opinion of the Committee, a sufficient reason to induce the Council to abandon the practice, and appoint some person that will spend his time *exclusively* for the *interests* of the city.

“ The new works, when completed, will cost the city (including interest on the money invested) more than one hundred and twenty thousand dollars ; and, aside from the interest individuals that expect to be supplied with water may have in these works, it is a matter of deep interest to the tax payers of this city who has the management of these works, and how they are managed. The Committee would, therefore, recommend, as a measure best calculated to promote the interests of the city, the appointment of George Gibson as Superintendent, with power to employ an Engineer. Mr. Gibson has long been known to most of our citizens as a man of strict integrity, an able and industrious mechanic, a man whose acts have invariably been marked by prudence and economy, and, during a residence of several years in this place, has not been particularly identified with either ‘ political party,’ and probably will not be, as he wishes it distinctly understood that he will not accept the office if any party pledge or preference is required. The Committee are aware that the above recommendation is not in strict accordance with party usages at the present day, but they believe that they have asked for nothing more than the tax payers have a right to expect.

“ The Committee would recommend the following as exceptions to the works included in that part of the contract with Messrs. Jackson and Sutton, which should have been done the first of November last, and reserve them for the future action of the Board : *the whole as to time*: four hydrants on the main pipe ; the apparatus for raising the valve in the tank, and the leaks in the bottom of the tank. The leaks in the bottom of the tank are not, as the Committee believe, sufficient to injure,

or in any way endanger, at present, the tower; and the contractors are of opinion that a few weeks warm weather will remedy any defect that may now exist.

“If the Board should accept the works, and go on to use them, it would, doubtless, be advisable to increase the rate of assessment, so as to make them pay the running expenses, and a reasonable portion of the money invested. The Committee find, by reference to the assessments, that, in 1838, six hundred and thirteen persons were assessed for water; in 1840, six hundred and eleven were assessed, at \$6,865, equal to \$11 24 each. The present year only three hundred and thirty-five are assessed, amounting, in all, to \$3,726, or, at that rate per year, equal to \$11 12. The deficiency for the present year is, probably, occasioned more by the defects in the old works, than the absence of persons wishing a supply of water.

“If assessments were to be made, so as to pay the interest on the whole capital invested, including the running expenses, it would make them average something like \$23 00 each, allowing five hundred a reasonable number to assess. An assessment of \$15 each, for five hundred persons, would give \$7,500, which would, in the opinion of the Committee, pay all necessary expenses, and  $3\frac{1}{2}$  per cent. on the capital invested, and allow the other  $3\frac{1}{2}$  per cent. to be saved, by the reduction on insurance, and the amount of property to be saved from destruction at fires, by the addition of fifty fire hydrants to the present facilities for extinguishing fires.”

Soon after the date of this report, the engine and pump on Woodbridge street were abandoned, and the “New Works” were so far brought into use as to supply water to the Fort street reservoir, from whence it was distributed.

July 30th, 1841, William Barclay, Superintendent of {the “Old Hydraulic Works,” was also appointed Superintendent of the “New Hydraulic Works.” At the same time, the Committee on “New Hydraulic Works” resigned; and on the third

of August following, Chauncey Hurlbut resigned his seat as Alderman, and Aldermen W.F. Chittenden and Morgan L. Gage were appointed Committee.

August 31st, Alderman Gage resigned as one of the Committee, and Alderman J. V. Reuhle was appointed in his place.

December 14th, 1841, the works were accepted by the Council. The contractors, Messrs. Jackson and Sutton, brought in a bill for extra work, amounting to \$3,181 96, which was referred to Levi Cook, Reynold Gillet, and Thomas Palmer, as arbitrators, who awarded the contractors the sum of \$2,129. This award the city contested, and endeavored to have set aside, and carried the matter into the Supreme Court, where the judgment was sustained, and the city compelled to pay it; together with all the costs of arbitration, and of the Circuit and Supreme Courts.

January 25th, 1842, Aldermen Chittenden and Reuhle resigned as Committee on "New Hydraulics."

March 29th, 1842, Aldermen John Scott and Jeremiah Moors were appointed Committee on Hydraulic Works.

During the process of connecting with the new works, and disconnecting from the old, both reservoirs were kept in use; but, early in the fall of 1842, the work being completed, the Fort street reservoir was abandoned.

March 21st, 1843, Aldermen Charles Moran and John Scott were appointed Committee on Hydraulic Works.

April 4th, 1843, Benjamin B. Moore was appointed Superintendent, in place of William Barclay, resigned.

March 26th, 1844, Aldermen Charles Moran and James A. Van Dyke were appointed Committee on Hydraulic Works; and on the following day David Thompson was appointed Superintendent, in place of Benjamin B. Moore. Mr. Thompson also acted as City Marshal.

March 18th, 1845, Aldermen William Barclay and Buck-

minster Wight were appointed Committee on "Hydraulic Works."

March 10th, 1846, James Stewart was appointed Superintendent, in place of David Thompson. The Committee of the previous year were subsequently re-appointed.

March 10th, 1847, Aldermen Theodore Williams and Nicholas Greusel, Jr., were appointed Committee. During this season a new boiler for the engine, in place of the one constructed by Jackson and Sutton, was put up, under contract, by James Brennan.

March 14th, 1848, Aldermen James Stewart and Francis E. Eldred were appointed Committee; and, March 28th, Washington Burley was appointed Superintendent, in place of James Stewart, his appointment to take effect the first of July following.

August 29th, 1848, Nicholas Greusel, Jr., was appointed Superintendent, in place of Washington Burley, resigned.

During the winter of 1848 and 1849, the Legislature passed an act, amending the Charter of the City, and providing for the election by the people of nearly all the officers; and March 5th, 1849, David Esdell, Jr., was elected Superintendent; and on the fourteenth following, Aldermen Buckminster Wight and John Patton were appointed Committee. Subsequently, Alderman Wight resigned, and Alderman Francis E. Eldred was appointed in his place, May 1st.]

The Committee of this year found the works in a bad state for furnishing a constant supply of water to the inhabitants. They had been originally constructed for the then existing population, seemingly without any estimate or calculation for an increase. When the plans were decided upon, in 1836, the city contained about eight thousand inhabitants. In 1849, they numbered upwards of twenty thousand. To supply this increased number, nearly twice the contents of the reservoir were required each twenty-four hours, and it was necessary to run the engine

from sixteen to twenty-four hours each day. It was difficult to find time to make even the necessary and usual repairs to the engine; and, in case of any extensive repairs being required, the supply would be stopped, and an unforeseen accident could for weeks deprive the citizens of all the benefits intended to be conferred. From a clear understanding of these facts, the Committee became convinced of the want of an additional engine of greater power. They recommended to the Council the purchase and putting up of a new engine; and, in accordance with their recommendation, early in the fall of 1849, a contract was made with De Graff and Kendrick, of this city, for constructing and erecting, in complete running order, the large horizontal engine (150 horse power) and pump now in use, the plans of which were furnished by Van Schoick, Kellogg, and Co.

Contracts were also made with Joseph Granger for building a new engine house, and with Walcott and Hammond for furnishing the inlet and pumping pipes.

Under the above Committee, the engine house was completed, with the exception of the paving, which was delayed until the engine was set up. The new engine house entirely enclosed the old one, which was not taken down until the former was completed.

March 12th, 1850, Aldermen John Patton, Nelson Tomlinson, and Rollin C. Smith, were appointed Committee. The engine contracted for by De Graff and Kendrick the year previous was completed this season, and was first run October 28th; but, owing to a failure of the valves, was not brought into use until the nineteenth of November.

The inlet pipe, from the river to the engine, and the pumping pipe, from the engine to the reservoir, were laid, under the superintendence of Benjamin B. Moore. Several difficulties were encountered in this work, which were successfully overcome by Mr. Moore. Among these were, the raising from the ground and lowering into the tank of the valve-seat (weighing nearly a

ton) and valve, and the setting of them, and the sinking of the river part of the inlet pipe.

March 3rd, 1851, Ezekiel McDonald was elected Superintendent; and March 18th, Aldermen Rollin C. Smith, James A. Slaymaker, and Edward Shepard, were appointed Committee.

Early in this season, four acres of land, upon the Mullett farm, between Russell and Prospect streets, and opposite the city cemetery, were purchased by the Council, as a site for a new reservoir.

The old direct-action inclined engine, which had originally been placed upon an uncertain foundation, was this season taken up, and an excavation to the old river bed made, upon which a permanent stonework was laid.

The cylinder was also bored, and a new frame for the portions of the machine above the pavement was erected.

For several years there had been many complaints, in different parts of the city, of an irregular and insufficient supply of water. These complaints became more frequent as the population increased, and greater demands were made upon the works. Persons who had previously been well supplied found themselves obliged to draw at night the water for the following day; and there were large districts where a supply could not be obtained before midnight, and then it was small in quantity, and of poor quality.

The new engine was somewhat of a relief, but had not accomplished as much as had been anticipated. What had been done it was well to do. Relief for the duty of the engine-men and a reserve engine, in case of accident, had been provided, and but little else.

That which was outside, and could be seen, was taken care of, and the *subterranean* was for once neglected. ¶

There was plenty of power for raising the water to the reservoir, but no means of distributing it. Joined to the four

and a half miles of iron pipes, the largest having an interior diameter of ten inches, were some thirty-five miles of wooden logs, principally of two inches bore, and those frequently connected with a five-eighths-of-an-inch lead pipe.

These were laid regardless of any system; and, anticipating the future progress of the city, they had actually passed the lines, and lost their way in the township of Hamtramck on the east, and Springwells on the west. They had, in fact, become indefinite in extension, and still people wondered why there was not a full supply of water. The Common Council was besieged with petitions for relief, and for reduction of rates, and they found themselves in nearly the same situation that their predecessors, the "Old Hydraulic Company," had been only fifteen years previous.

Chargeable directly to construction, \$181,015 93 had been expended upon the works; and, in addition to this, there had been an average annual deficit in the expense and repairs account of \$5,675 over and above all receipts, amounting, for the fifteen years, to the sum of \$85,125 09.

Many discussions and debates were had as to the policy to be pursued, all concurring in the immediate necessity of an enlargement and improvement of the works. Many were in favor of a sale to a company, while others were strongly opposed to such a course; and finally, after much agitation, the Council united in the project of placing the works under the management of a separate organization, to be selected and appointed by them.

Accordingly, on the twenty-fourth of February, 1852, the Council passed an ordinance, by which the control and management of the Water Works were vested in a Board of Trustees, consisting of five members; and Shubael Conant, Henry Ledyard, Edmund A. Brush, James A. Van Dyke, and William R. Noyes, were appointed Trustees.

Subsequently, several amendments were made to the ordinance, on the application of the Trustees; and on the thirteenth



of April following, Jacob Houghton, Jr., was appointed Commissioner under the ordinance.

During that season, iron pipes were extended into several parts of the city, where the complaints were loudest, and a temporary relief was at once given, by an increased supply of water. The surplus revenue of the works was entirely expended in their improvement.

On the fourteenth of February, 1853, the State Legislature, on the application of the Common Council, passed an amendment to the City Charter, whereby the Trustees were created a Board of Water Commissioners, and special powers and authority were given to them, the better to enable them to accomplish the object sought.

Under the authority of this Act, the Board of Water Commissioners was organized on the sixteenth of May, 1853, when Shubael Conant was appointed President, R. E. Roberts Secretary, Jacob Houghton, Jr., Superintendent and Engineer; and F. M. Wing, who has held the position, and faithfully executed the duties for the last ten years, was appointed Engineer at the engine house.

Subsequently, Mr. Conant tendered his resignation as President, and Edmund A. Brush was appointed in his place.

In reviewing this brief sketch, many who have seen it all and been part of it, will be momentarily surprised at the recalling of incidents almost forgotten and lost in the thoughts of their different schemes and projects during the last twenty-six years, while the population of their city has grown to upwards of thirty-five thousand, from a germ of fifteen hundred; and in the history of these works can be traced results exceeding the most sanguine predictions.

As each of the works mentioned were constructed, they were supposed to make ample provision for years; and much caution was exercised, lest the works should be constructed upon a scale larger than the demand would ever warrant. Especially was this the case with the present works, planned in 1836, and

constructed and carried through against the bitter opposition that such projects always entail ; and, though then supposed to be sufficient for many years to come, have thus quickly undeceived their own founders, and left them nearly as badly off as they were at their commencement.

However, we have the satisfaction of not being alone in this experience, for every city in this country, where water works are established, has learned the same. Men of strong foresight have failed to estimate their progress, and, while visiting the most important works of the country during the past season, the lesson was fully taught. The advice constantly given by persons who have grown up with these different projects was, to " be sure and build large enough ; you will find it difficult to over-estimate."

Nor is this experience confined to our own cities. London, the capital of Great Britain, that the Englishman always boasts of " as having the best water supply in the world," has learned it. When the Dutchman, Peter Morrys, in 1581, erected the tide wheel under the first arch of " Old London bridge," (thus founding the first water works of the metropolis,) he pumped the water of the Thames through wooden logs, to supply the inhabitants. From that time until 1746, London was supplied by means of wooden logs and pottery pipes. In that year the first iron main was laid ; and it was not until 1810 that the logs were finally abandoned, and iron pipes brought into general use. London and its suburbs are now supplied by nine different companies, employing, in the aggregate, upwards of sixty steam engines ; and yet, for the last six years, Committoes in Parliament and Boards of Commissioners have been discussing " how a better supply of water can be furnished to the metropolis."

Respectfully submitted,

JACOB HOUGHTON, JR.,

Superintendent and Engineer.