

WATER WORKS.

Report of the Committee appointed by the Council of Cleveland on the subject of a supply of pure water.

To the Hon. the Mayor and Common Council of Cleveland.
Gentlemen:—Although at the time of the appointment of your Committee it was intended that ample time should be taken for the examination and investigation of the different Water Works of other cities, as well as the various sources of supply suggested for Cleveland, and that no report would be expected for more than a year; still, advertisements for bids were issued, and the work was commenced. It would have been made last July, but the discovery that we had based our first calculation on erroneous data, in regard to elevations of ground, rendered useless and impracticable the plans we were about to recommend. (Other plans had then to be examined, and new estimates made.)

The expense incurred in the various trials, and the limitation of resources and Fire Engines, has prompted the Committee to continue action, and as early a termination of their investigations as practicable, considering the importance of coming to correct conclusions.

We set out with the idea that there must not only be an abundant supply of pure water, but that it must be placed at such an elevation that any building or buildings in the city could be deluged with it from the hydrants.

It has required much time to venture thoroughly into the works required in other cities, and finally resulted in a report regarding the various kinds of pumping engines, particularly concerning the recently improved "Cornish pumping Engines."

Dispersions in the statements of the height of different points in the town where a reservoir might be placed, required examination, and finally resulted in the selection of a reservoir on the natural surface. There is no point within reasonable distance high enough to flood the upper stories of all the buildings.

The comparative expense of an artificial reservoir near the Lake, and one of low cost, erected at a distance on higher ground, required a good deal of consideration. Also whether such a supply of water might not be made at lower levels than the upper parts of the city.

It was also thought advisable to have the water of the Lake Erie, examined chemically.

These subjects have required more time and attention than the public would readily appreciate.

The free use of water is one of the amiablest of the age. It has come to be not only a luxury that all should enjoy, but a remedy and preventative of disease.

The benefits of the enlarged use of water, both in cleaning private premises and public streets, is apparent, in lessening the epidemics and in improving generally the health and comfort of the cities.

We should be relieved from the constant apprehension of sweeping fires, our townments would become more valuable because they would be more secure; we should be better provided with public and private baths, and enjoy the purity and beauty of public fountains.

It is a great source of gratification, coming from cities well provided with water, are disappointed when they discover our deficiencies in this respect.

Before the recent enlargement and improvement in the water works of American cities, the consumption for private uses, was, on an average, only forty (40) gallons a day for each family. In all Europe, the average consumption for several years has ranged from 100 to 200 gallons, and in Cincinnati in 1844 it rose to 300 gallons per day to each family.

There are in Cleveland about 5000 families, of whom not more than one half would voluntarily use reservoir water. The average consumption for all purposes, public and private, for sprinkling streets, for fire, manufacturing and fountains, varies from 250 to 300 gallons per day to each consumer's family.

At 5000 families, the outside demand for Cleveland would not exceed 1,500,000 gallons per day, and for five years to come would not probably exceed, at any time, 1,000,000.

There are in Cleveland 11,000 families, of whom only 5,228 rent of the water works, and they consume 1,607,000 gallons a day. The works deliver (1851) 2,000,000 gallons, and the excess goes in part to the cleaning of the streets, and the extinguishing of fires. But for the want of stringent rules much of it is stolen from the hydrants by those who do not rent. This defect we shall refer to below.

If at the end of ten (10) years our population should be doubled, and there should be 18,000 families, all of whom should use hydrant water, we shall need a pump that can raise as the extreme duty, 4,000,000 gallons during the working hours.

Your committee do not deem it safe to build a tower of large dimensions to the height that would be necessary, say 90 feet, immediately upon the bank of the Lake.

The nearest available position for a tower is the ridge near Euclid street, distant about 1400 feet from the Lake, which is elevated above the lake about 100 feet, and then it must be some fifty feet high to command a flow of water to the third stories of houses in the city.

Even if it were safe to place the tower on the bank of the Lake, the cost of the additional 60 feet, would very much exceed the cost of 50 feet, and would be gained by shortening the supply pipe which would be mostly lost in a long-timed main delivery pipe. The estimates are therefore for an artificial reservoir, near Euclid street, composed of a tower of masonry, sustaining an iron tank of the capacity of 1,000,000 gallons, which is the largest we can safely adopt.

There are good reasons why this reservoir should not be placed more than three fourths of a mile east of the Court House. The loss of head in the distributing pipes will be less than if the reservoir was farther removed from the centre of the region to be watered, and the cost of the main supply pipe from the Lake would be lessened in proportion to its length. The tower and its tank instead of being an unsightly pile, may be made without additional expense, an object of architectural taste and ornament to the city.

We would strongly recommend the construction of a second reservoir of a capacity of at least 1,000,000 gallons, at some point on the brow of the hill, near the river, which, although only on the same level with the first one, will yet afford an additional supply to the densely populated region of the lower levels and flats near the river. We regard this the more desirable from the necessarily small capacity of the Upper Reservoir.—No estimates for such a reservoir, however, are included in the report,—its cost would be comparatively slight, as it would be only a strong dike in the earth.

THE SOURCE OR SUPPLY OF WATER.

After having paid special attention to the streams in this vicinity—the Sular Run, Mill Creek, Finker's Creek and Chagrin River—it appears to be practicable to bring either of them to the upper plain of the city,—not to a greater extent, as at the outlet, as to the quality of the water which flows in them, whether it was pure and wholesome. A sufficient examination of the qualities of the waters of those streams convinces us that they are entirely unfit for the purpose proposed and also, even if they had afforded pure water, the supply in the two just named creeks would have been extremely liable to failure. The copious springs flowing from the various banks and hill-sides south of the city, have by many been supposed to be adequate to a supply for general use, if properly taken up and concentrated. They are insufficient, and their waters are mostly hard and unfit for the purpose.

Lake Erie is the only source to which we can resort for an unending supply of pure and soft water.

A chemical examination of the waters of the Lake shows it to be possessed of those desirable qualities in an eminent degree, equalling the Cochichewick of Boston, and far exceeding the famouspton of New York. This is extremely fortunate and the effect of its introduction can not but be strongly exhibited upon the future health of the city; for the fact can not be disguised, that the fast increasing impurity of our wells, exercise a very deleterious influence upon those using the water from them.

The result of a chemical examination by Prof. W. W. Mathes of the water of some of our wells, springs, the Cuyahoga River and Lake Erie together with a comparative statement of waters in use at other places is given in appendix 'A.'

MODE OF ACCOMPLISHING THE WORK.

All experience shows that such undertaking can be carried on more economically by individuals or companies than by municipal corporations, and also better managed after construction. In this case there is not sufficient inducement for a company of capitalists to engage in the undertaking, unless the results would be as a first loss of interest. Some gentlemen have proposed to assume a part of the expense on condition that the City could furnish the remainder, say one-third.

But looking into the new charter we see no powers whereby it can be made a mixed affair; it must be wholly a public or private work. (See section 22 and 75 of the General Law, App. "D.")

There is, we are informed a charter existing and a company organized under it, that possibly might be of assistance in accomplishing the desired purpose, if there was a proper and sufficient understanding between it and the City. But there are not sufficient grounds for believing that the vitality of the provisions, since the adoption of the new constitution, to express our opinion of its vitality. (See App. "C.") One thing is clear to us, the City should by no means allow the power to pass from them, of either keeping the control, or assuming it at any time as they might think proper upon certain stipulated terms.

There is no objection to the City taking lands to pay water rents, except as a general tax.

The experience of other places has shown almost without exception the urgent necessity of some power to lay a special water tax upon all tenements, situated in streets through which water pipes are introduced, limiting the interest of water in the tenement, and preventing the great abuse so much complained of, that is a few taking the water and paying for it, but a far greater number stealing it. Such provisions afford to the honest consumer his water at a lower cost, and enable the others to pay its interest when it earns it.

The City might build or streets, fountains, and fountains, need about 100 gallons a day to each family, or about 1/2 the whole consumption.

The large cities where Water Companies have sufficient power to own all the water that is used to be paid for, and when the Corporation pays for that which is used for public purposes, the stock becomes a paying investment. In this case, if the water is not to be prevented from using and wasting the water. In the city of New York last year this waste and loss lessened the amount charged to the paying consumers for private uses from 160 to 138 gallons per family per day.

LOCATION OF THE WORKS.

If we had within a reasonable distance a natural elevation of 100 feet it would be advisable to extend the main supply pipe to reach it, although the expense of doing it is very great, as the original estimates show. In this way the reservoir might be made carrying a supply for any emergency, or for many days continuation. This is an object of importance, because the consumption of water per family is constantly increasing. In some respects Cleveland labors under disadvantages for obtaining and distributing water, which many cities do not in the distance at the water is being secured, and again the distance from the Laketo which it must be thrown to avail ourselves of the highest land which we have.

To obtain the Lake water as free as possible from the impurities brought in by the current of the Cuyahoga River in flood and from the wash of the City and from sewerage, it will be advisable to erect the pumping engine and standing tower, at least as far as one mile east from the foot of Water street, and to extend the suction-pipe some 1,600 feet into the Lake to avoid the impurities near the shore; of course we must resort to steam power to raise the water.

The engine and pump should be powerful enough to afford a supply of 8,000,000 gallons by day-light, which is ample for private, public and manufacturing uses, until our population reaches 75,000.

It should be of the best character in structure and reliable in parts, when we consider that from want of high grounds upon which to construct a reservoir of great capacity, we must rely upon a smaller one being constantly supplied by the faithful working of the engine, assisted by a duplicate reserve when the occasion shall demand.

Being experiments in England, and partial experiments in this country has proved, in our opinion that Cornish Engine, and Pump, and Cornish Rollers are altogether preferable, doing such greater duty, for the same amount of fuel and attendance, than any other, and although the cost is slightly more in original construction—the saving in the long run, many times compensates the increased cost. Some facts showing this will be given below. Your Committee therefore feel bound to recommend decidedly their adoption; indeed your Committee throughout have based their estimates upon the cost of the best and most durable character of Water Works, instead of the cheapest, yet the estimate we compare favorably with the best construction for similar works in other cities, as will be shown by instances cited in other parts of this Report.

As near as we can ascertain the cost of the plan, which, after mature deliberation and comparison with others, we feel inclined to recommend, will be as follows:

One pure Cornish engine and boilers capable of elevating 8,000,000 gallons by daylight 160 feet high.	\$80,000
One reserve duplicate do.	80,000
Stand pipe and tower 160 feet high, 20 inches diameter, 1 1/2 in. thick at 80 per ton.	\$1,200 00
Enclosing same with brick tower.	8,500 00
	4,700 00

Aqueduct or suction pipe to be of boiler iron 3/4 inch thick, 40 inch diameter, to extend 1600 feet into the lake, with cast-iron material and construction, 8 cents.

Drudging, cribbing and laying same, 6,000 00

Rivling mill—3500 feet long, 20 inch diameter, 10 feet thick, weighing about 200 lbs per foot.

Construction, land, and laying same. 5,200 00

Stone tower sustaining iron tank 100 feet diameter, and capable of containing 1,000,000 gallons, in all 50,000 00

This is a rough estimate, for we have not the means of an exact calculation.

DISTRIBUTING PIPES.

We have estimated for about 10 miles of water pipe, including the 16 inch descending main, which will supply the city from the reservoir, giving circulation through all the other pipes gradually diminishing in 10 inch, 8 inch, 6 inch and 4 inch pipes covering the whole extent of the city to be supplied with water, viz:

2000 feet descending main, 10 inch diameter, 3/4 inch thick, weighing about 140 lbs. per foot.	\$4,475 00
labor, lead, and laying same.	2,260 00
	\$6,735 00

One mile 10 inch main 0-10 inch thick weighing 65 lbs. to the foot lineal, at \$45 per ton.

Load and labor laying same.

Two miles 8 inch Main, 9-16 cent weight about 65 lbs. per foot lineal at \$50 per ton.

Load and labor laying same.

Two miles 6 inch Main 3/4 inch thick weighing about 35 lbs. per foot.

Load and labor laying same.

Four miles 4 inch water pipe 3/4 inch thick, 80 lbs. per foot.

Load and labor laying same.

Stop cocks for distribution.

Hydrants, covers, &c.

Bozota, 350 in number.

Handling, draying, distribution delivery and labor not included.

Lot on Lake shore for engine house, &c., lot on Ridge near Euclid street, and land damages for laying rivling mill.

Engine house and buildings.

Contingencies, engineer, &c. say 10 per cent.

Total.

We have stated that the Cornish engine and boiler were in our opinion much the most economical and reliable. This view is derived from the following comparative results of duty performed for fuel consumed by Cornish condensing and high pressure engines in various places named.

If we are correctly informed, at the Cincinnati Water Works a direct action condensing engine, but with Cornish boilers, which also have cost \$7,000 dollars, consumes 3,000,000 gallons of water 175 feet for 90 bushels of coal consumed, the furnace room remaining cool and comfortable. In same building a double or combination high pressure engine which cost 75,000 dollars, elevates, operating under the same circumstances as the condensing engine 3,000,000 galls water 175 feet for 175 bushels coal consumed, requiring three times the labor of attendance, and the furnace room being extremely hot and uncomfortable.

At the Pittsburgh Water Works a high pressure engine elevates 2,600,000 gallons of water 160 feet for 275 bushels coal consumed.

The East London Water Works, England, pure Cornish engines and boilers have raised 1,000,000 gallons a moderate height for 120 bushels coal consumed, while the experience of most of our cities generally high pressure and condensing engines, shows the same duty would have cost from 80 to 90 bushels.

However the performance of the East London Water Works in that case were extraordinary, but it may be estimated that the fuel necessary for raising 3,000,000 galls. of water 160 feet would be as follows:

By the purely Cornish engine and boilers.	45 bush
" condensing "	100 "
" high pressure "	200 "

The general cost for operating, including oil, hands, firewood, &c. for the three different kinds of engines and boilers, may be estimated to compare with each other much the same as the consumption of fuel.

If the plans are matured at an early day and the work vigorously prosecuted, they can probably be completed so far as to become available for a considerable extent within two years from this time. Meanwhile the present system of reservoirs should be largely and promptly increased.

It may not be inappropriate in this connection for your committee to allude to the necessity of the Council making arrangements for an extensive system of sewerage to be prosecuted simultaneously with the progress of water works. The same engineering and superintendence can carry out both the plans without much additional expense, as they have a mutual relation to each other. The system of sewers must necessarily be so calculated as to discharge the drainage of the city as far from the main pipes of the water works as possible.

Our acknowledgments are due to many gentlemen abroad, connected with the water works of other cities, for the pains they have taken to assist in the object of our enquiries. We are indebted to Mr. E. W. Smith, of New York, engineer to the Ocean Steam Navigation Co., and especially to Mr. T. H. Scofield, Engineer of the Cincinnati Water Works for much of the information upon which we have based our calculations and estimates of cost, and the comparative utility of engines; his experience in examining the establishments of England and France, as well as of the American cities, has been very great, and has been freely placed at our service.

To secure at the earliest possible moment, the best and most economical plan for the details of these works, we respectfully suggest the appointment by the Council of a competent Hydraulic Engineer.

The qualifications which such a person should possess, are of a higher order than many persons would suppose at first view. It is a branch of Engineering by itself, in which a critical knowledge of details is indispensable, as an acquaintance at the same time with theoretical mechanics and hydrostatics.

Such a person could, in connection with a committee of the Council, or with a board of water commissioners, have power to adopt a final plan for the whole work, while the requisite financial arrangements were being made.

Mr. Sawden, of the Cincinnati Water Works, to whom we have alluded, is a gentleman whose science and experience entitle him to great confidence in the planning and execution of such works, and we feel no hesitation in suggesting his name to the Council for that purpose.

Mr. Smith also informs us that he has devised a system of Water Works, not yet made public, which he thinks more desirable than any in use. He has not communicated the details, but would desire the privilege of bringing it to the consideration of the Council under stipulated arrangements.

Of course, if his plans should prove the most satisfactory, he alone would be the proper person to superintend their construction.

WILLIAM OASE,
W. J. WARNER,
J. F. KIRKLAND,
CHAS. WHITTLESBY.

APPENDIX "A."

Wm. Case, Esq., Chairman of the Committee on Water Works for the City of Cleveland.

My Dear Sir:—In accordance with your wish, I have made an examination of some of the waters of Cleveland and its vicinity, having reference to the existing and future supply of the city.

The waters of wells and springs now used, and the waters of the Cuyahoga and of Lake Erie have been examined with reference to their purity and adaptation for use.

The following waters have been examined:—

No. 1. Well water, from a well about 50 yards west of the Theatre, between Superior and Centre streets, from the oldest part of the city. This water is used for many purposes, but is not much used for drink. Its taste is unpleasant and color yellowish, the water is hard and contains much organic and mineral matter.

No. 2. Well water, from Prof. Case's well, on the ridge on Euclid street, two miles from the City. This water is colorless and very pure and soft.

These two waters give the extremes, one as nearly pure as the water of the sand and gravel beds can be in that region the other contains filtered impurities so as to be unpotable.

No. 3. Water from the Cuyahoga river, taken at a time of low water in August, at a depth of 10 feet at the Railroad Bridge, so as to avoid the impurities of the surface and the slime of the bottom. This water is clear and soft and almost limpid, and by standing some days becomes entirely limpid, with a scarcely perceptible light flocculent sediment.

No. 4. Water of Lake Erie, taken about one mile eastward of the Light House, about one-half mile from the shore, opposite the east side of the Corporation limits.—This water was entirely limpid, cool and pleasant to the taste when drawn from the lake in a calm sunset evening in August, the hottest season of the year.

This water was taken at various depths from the surface to a depth of twelve feet, mostly from the latter depth.

No. 5. Water of the spring at Jones' Livory Stable, near the Court House, south of the Forest City House.—This water is hard and not pleasant to the taste, though much used.

No. 6. Water from the spring on the bank at the junction of the blue clay and marl with the over-lying sands and gravel. This is hard, but esteemed the best drinking water in the vicinity.

The following shows the solid contents of mineral and organic matters contained in a gallon of 231 cubic inches, solid matter:

No. 1. Well 50 yds west of the Theatre, hard water and bad.	70 23
No. 2. Prof. Case's well, Euclid street, two miles from City, good.	1 60
No. 3. Water of the Cuyahoga river, water.	5 64
No. 4. Water of Lake Erie.	2 54
No. 5. Water of spring at Jones' Livory Stable.	30 08
No. 6. Water of spring under bank of Forest City Hotel, near canal.	25 17

It will be seen from the above that the well water No. 1 is very impure, and from its color and taste it appears unpotable. The soil there, and throughout the higher portion of the city, is composed of sand gravel beds, and all the impurities from drains, sinks, &c., filter through these beds, and are contained in some degree, in most of the wells and springs in the older settled portion of the city. Nos. 5 and 6 show the same effect, but in a less marked degree. No. 2 is remarkable for its purity; few natural waters equaling it.

Nos. 3 and 4 are also purer than is usual for natural waters, as these are the waters in general far the most in the future, for a supply to the city. It is important to examine them more in detail, and to compare them with other waters used in other places.

Grains solid matter per gallon.

Croton water, used in New York.	10 15
Schuykill, used in Philadelphia.	5 65
Cochichewick, used in Boston, (w/urck).	1 86
do (from the Lake, 65 feet below)	3 37
Huagorhill, near Albany.	5 00
Normanskill, " "	0 80
Natron's Creek, near Albany.	0 08
Hudson River, " "	7 24
Mohawk River, near Falls.	7 88
Cuyahoga River, water at R. R. bridge, Cleveland.	5 54
Lake Erie, do.	2 54

It will be seen from the above table that the Cuyahoga water is far purer than the Croton water, and fully an average of the other streams used to supply cities in the east, while the water of Lake Erie is purer far than any of them except Cochichewick, and is more than the average of even that water, so colorated.

The water of Lake Erie is usually clear, and always cool and pleasant to the taste, and if taken from some depth below the surface, to avoid floating objects and sediments, and some height above the bottom to avoid the mud and silt, and at some distance from the shore to avoid the earthy matter in suspension from the action of the surf of the shore, is as good, wholesome and pure water as can be obtained, and as any city need desire.

The following table shows the relative purity of the water used in London, Albany and Cleveland:

LONDON.

Grains of solid matter per gallon.	Analysis.
Long Acre, deep well, brewery.	55 8
Royal Mint.	87 8
Lambeth Brewery.	50 0
do shallow well.	110 0
Old Street Brewery, deep well.	88 0
Well in St. Paul's Church Yard.	10 0
Well in St. Giles' Holborn.	105 0
Trafalgar Square Fountains, deep well.	68 0

ALBANY.

Well in Lydin's street, Albany.	10 24
Well at Old State House.	80 00
Well at Bohango.	64 68
Well at Capital Park.	65 02

LOWELL.

Well 50 yards west of Theatre.	70 23
Spring near Court House.	25 17
Spring under bank S. W. of Court House.	25 17

The well waters of all cities become more or less impure in the course of time, and are low and less suitable for beverage in proportion to the time the earth has been densely peopled, and the soil and subjacent earthy materials permit the rains and other waters, and refuse and fill from houses, stables and manufactories, to filter downwards into the earth. The inhabitants of all cities are obliged, at some time, to discard the water of common wells and have recourse to Artesian wells, or to supplies of water by art, from streams or lakes, brought by aqueducts or pumped up by steam or water power.

The preceding tables show the great disparity in the purity of city and well waters, and the water of streams used to supply the inhabitants of cities; and that the water of Lake Erie, proposed to be used to supply Cleveland is as pure and good as the best of them.

The analyses quantitative of the Cleveland waters are yet incomplete. These waters contain carbonate, sulphate and some muriate of lime and magnesia. The waters No. 1, 5 and 6 abundantly—also, organic matters in solution. The filtering of water through argillaceous materials serves to purify water, in a high degree, from organic impurities. The soils of Cleveland do not produce this effect as much as is the case in most other cities.

Respectfully, your ob't. serv't.,
W. W. MATHER.

The cost of steam water works for neighboring cities have been as nearly as we can ascertain as follows:

BUFFALO.	\$400,000
Detroit—1 1/2 miles pipe; reservoir 250,000 galls.; 27 miles pipe; water pumped 70 feet.	180,000

(The Detroit works have cost more than above stated during the whole time of their use; they have replaced much wooden log pipe by iron pipe.)

Chicago—see listed.	350,000
(Will undoubtedly cost considerably more when completed.)	
Cincinnati—43 miles pipe; res. 600,000.	1,000,000
Milwaukee—contracted at.	825,000
Pittsburgh—23 miles pipe.	128,000
WHEELING.	

Appendix "B" contains tables 22 and 75 of the new municipal law passed last spring.

Appendix "C" contains the several sections of "An act to incorporate the Cleveland Water Company" passed January 25, 1853, also the act amendatory thereto, passed March 10, 1850.

On the 8th of February, 1860, the charter was accepted and carried into effect by the subscription of 27,000 dollars to the capital stock.

Subsequently, viz. May 4, 1860, an organization was effected by the choice of officers.

[Appendix "B" and "C" will appear to-morrow.]

WATER WORKS.

Report of the Committee appointed by the Common Council of Cleveland on the subject of a supply of Pure Water. B

APPENDIX B.

Sec. 22. They shall have the power to provide a supply of water, by the construction, and regulations of wells, pumps, cisterns, reservoirs, or water-works; and for the purpose of establishing or supplying water works, any municipal corporation may go beyond its territorial limits and its jurisdiction, to prevent or punish any pollution or injury to the stream or source of water, or to water-works, shall extend five miles beyond its corporate limits.

Sec. 76. The city council of any city, in which water works are or may be constructed, shall establish a board of three trustees, to be known as the trustees of water works, who shall be elected by the qualified electors of the city, and hold their office for the term of three years, but it shall be so provided that one of said trustees shall be elected annually; the trustees of water works shall manage, conduct, and control the city water works, furnish supplies of water, collect water rents, and appoint all necessary officers and agents, under such rules and regulations as the city council may prescribe; when any city shall have contracted a debt in respect of water works, the rents and income which may arise therefrom, shall be kept a separate and distinct fund, to be applied to the payment of the expenses of constructing and repairing the works, the payment of such debts, or the creation of a sinking fund for its redemption.

APPENDIX "C."

AN ACT to incorporate the "Cleveland Water Company."

Sec. 1. Be it enacted by the General Assembly of the State of Ohio, That Philo Scoville and his associates for the time being, their successors and assigns be, and they are hereby created a body corporate and politic for the purpose of supplying the village of Cleveland, in the county of Cuyahoga, within the present corporate limits thereof, with good and wholesome water, by the name of the "Cleveland Water Company," and by that name shall be, and are hereby made capable in law of suing and being sued, pleading and being impleaded, in Courts of Record, or any other place, whatever may have a common seal, and the same may alter or renew at pleasure, and shall be capable of taking, holding, and acquiring any real, personal, or mixed, provided that all such real estate, shall be necessary for effecting the objects of this incorporation.

Sec. 2. That the capital stock of the company shall be twenty-five thousand dollars with power to the Company to increase the sum at pleasure to fifty thousand the said stock to be divided into shares of fifty dollars each, and it shall be deemed personal property, and may be transferred, in such manner, as the said Company by their laws may direct, provided that nothing herein contained shall be construed as conferring on the said body politic the powers of banking.

Sec. 3. That the control and direction of the operations of said Company shall be in a Board of three Directors to be chosen annually at such time and in such manner as shall be directed by the by-laws of said Company, and the first election shall be holden at some convenient and proper place in such village, at such time as may be designated by any three members of said Company, by giving at least fifteen days notice in some newspaper published in said village. The said Board of directors shall have power to appoint such agents as they may deem necessary, and to make and ordain all necessary by-laws, rules, and regulations for the government and control of said Company, its operations and interests, and to call in the capital stock of said Company in such instalments as they may deem proper.

Sec. 4. That it shall be lawful for said Company to enter into or upon the lands and tenements of any person, and to make and construct, in, over, or through the same, cisterns, reservoirs, aqueducts, pipes, and water courses, as may be necessary to effect the purposes of this incorporation, doing so unnecessary damage to said lands and tenements; provided that said Company shall pay to the proprietors of all such lands and tenements, such compensation for any and all such damages as shall be assessed by three disinterested persons, to be appointed by the Court of Common Pleas of said county of Cuyahoga, on the application of the party injured, or by suit at law by the party injured, as in other cases, for the amount of which damages when assessed or recovered, the individual property of any member of said Company, shall be liable, and may be taken for the same.

Sec. 5. That the said Company shall also have power and are hereby authorized to enter upon, dig, and excavate the streets, alleys, and public square of said county and village in suitable places, for the erection and maintaining such suitable cisterns, reservoirs, aqueducts, pipes, and water courses, as may be necessary for effecting the objects of this incorporation; provided the same be done with as little detriment and obstruction to the public convenience as the nature of said works will admit; and provided also that the said streets, alleys, and squares shall be left in as good condition, as they were before the same were dug or excavated.

Sec. 6. That if any persons shall wilfully and maliciously break down, injure or impair, any of the machinery, engines, works, or devices of said Company whatsoever, the person so offending shall forfeit and pay to the said Company double the amount of damages sustained by such injury to be recovered by action of debt in any court having cognizance thereof.

Sec. 7. That said Company shall have power to lease, sell, contract, and receive pay for all the water to be so as aforesaid, brought into the said village, at such price as may be agreed upon by the parties to such contracts, provided that the cisterns, reservoirs, and outlets of such water shall always be free and open for the purpose of extinguishing fires in said village (without any charge therefor.)

Sec. 8. That this act shall be deemed a public act and shall be bougly construed for the purposes therein expressed in all courts and places whatsoever.

Sec. 9. That any future legislature shall have power to alter or amend this act, provided that the property of said Company shall not be thereby divested, nor directed to any other purpose than the objects herein expressed.

DAVID T. DISNEY, Speaker of H. R.

SAMUEL R. MILLER, Speaker of Senate.

January 26, 1833.

AN ACT. To amend an act entitled an act to incorporate the Cleveland Water Company, passed January 26, 1833:

Sec. 1. Be it enacted by the General Assembly of the State of Ohio, That the several provisions of the act to incorporate the Cleveland Water Company, passed Jan. 26, 1833, be and the same are hereby declared to apply to and embrace the corporate limits of the city of Cleveland, and county of Cuyahoga, as fully and explicitly as the provisions of said act are declared in the same to apply to and embrace the corporate limits of the village of Cleveland, and county of Cuyahoga.

Sec. 2. The capital stock of said company is hereby increased to one hundred thousand dollars, in shares of fifty dollars each, with power to said company to increase said capital in like shares to two hundred thousand dollars, if such increase shall be necessary to carry out the object of said corporation.

March 10, 1850.

BENJAMIN F. LIEFER,

Speaker of the House of Representatives

CHAS. O. CONVERSE,

Speaker of the Senate.

SECRETARY OF STATE'S OFFICE.

Columbus, May 6, 1850.

I hereby certify that the above is a correct copy of the original roll on file in this office.

HENRY W. KING, Secretary of State.

On the 8th of February, 1850, the charter was accepted and carried into effect by the subscription of \$27,000 to the capital stock.

Subsequently, viz: May 4, 1850, an organization was effected by the choice of officers.

The cost of steam water works for neighboring cities have been as nearly as we can ascertain as follows:

BUFFALO..... \$400,000

DETROIT— $4\frac{1}{2}$ miles pipe; reservoir 353,000 galls.; 37 miles logs; water pumped 70 feet high..... 180,000

(The Detroit works have cost more than above stated during the whole time of their use; they have replaced much wooden log pipe by iron pipe.)

CINCINNATI—estimated..... 350,000

(Will undoubtedly cost considerably more when completed.)

CINCINNATI—43 miles pipes; res. 600,000.... 1,000,000

MILWAUKEE—contracted at..... 320,000

PITTSBURGH—23 miles pipe..... 800,000

WHEELING..... 128,000

Appendix "B" contains sections 23 and 75 of the new municipal law passed last spring

Appendix "C" contains the several sections of "An act to incorporate the Cleveland Water Company" passed January 26, 1833, also, the act amendatory thereto, passed March 10, 1850.

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