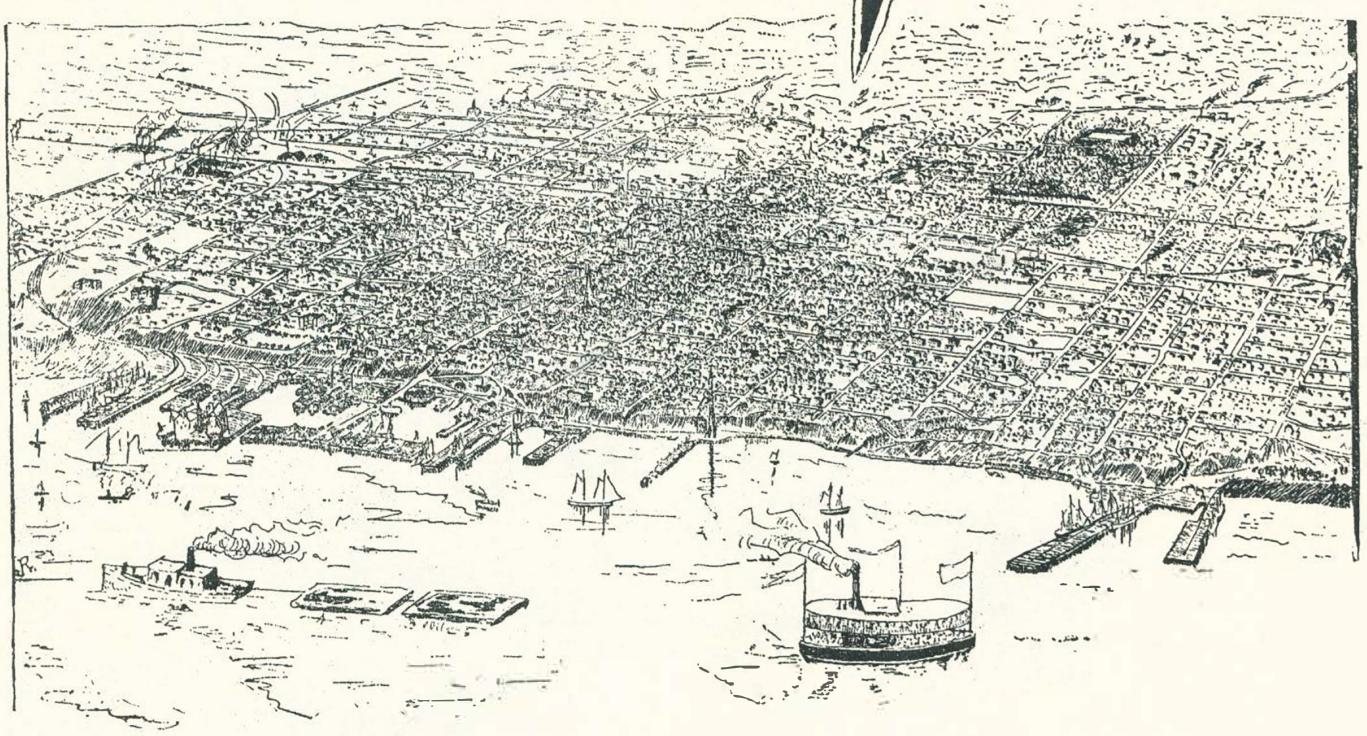
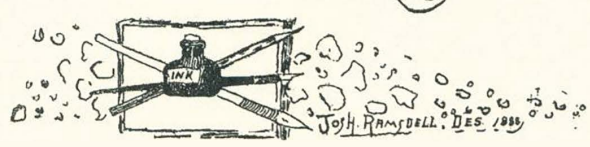
The City of Erie, Pa.

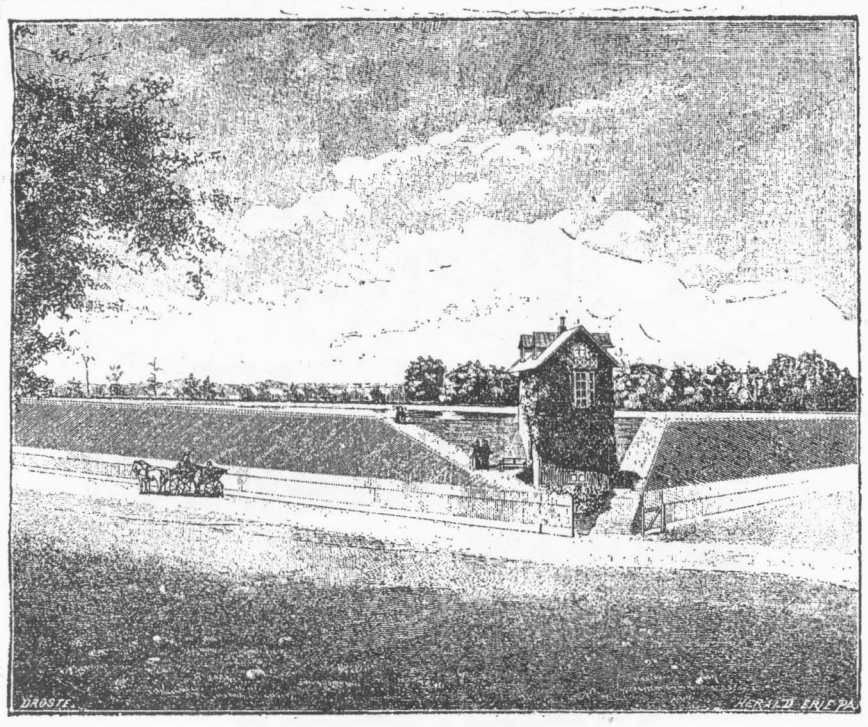


With Illustrations of its Public Buildings, Churches, Schools, Summer Resorts and some of its Residences, Business Blocks, Manufactories and Citizens.



ENG. BY HERALD PRINTING & PUBLISHING CO.

ERIE, PENN'A:
HERALD PRINTING & PUBLISHING CO., L'T'd.
1888.



ERIE WATER WORKS RESERVOIR.

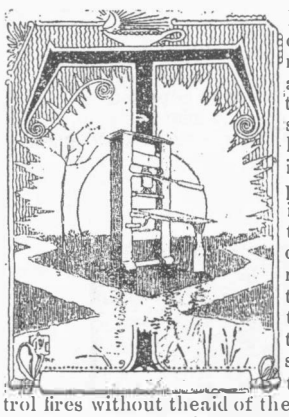
ERIE'S PRIDE.

Her Water Works System—Its Cheapness and Efficiency—Historical Review of the Early Source of Supply.

Wells and Pump Logs—Early Movements for the Present Works—Division of Opinion. The Improvement Party in the Election of 1867.

The Original Plant—Subsequent Improvements—Financial Success &c-

BY B. F. SLOAN.



THE water system of Erie is the most complete and perfect in the State. Besides being inexhaustable, its purity is beyond the pale of just criticism. In more than one-half the city in area, and more than two-thirds in population and business, the pressure is sufficient to extinguish or control fires without the aid of the fire department. Almost every manufactory and large business block, as well as all the railroad depots, and round-houses, are provided with private fire protection. These facts give Erie the reputation among underwriters of being one of the safest cities in the country. While this is true, a just comparison of the cost of water for domestic and manufacturing purposes betwen this and other cities shows that for cheapness Erie stands unrivaled. A table in the last annual report of the Board of Water Commisssioners giving the cost of water to the average householder in 25 cities, compiled from official reports, shows that Erie is the lowest. A similar table of meter rates for 1,000 gallons metered in 163 cities and towns shows that nine only of the whole number charge less than Erie. In one of these, where the charge is but 11-100 of a cent less, there is no expense for pumping machinery nor for lifting the water, as it is furnished by gravity; and in the remaining eight, the loss in the meter rate is made up by heavier rates for domestic use, and by payment for fire hydrants, or by a constant yearly appropriation, by the city to the department, or by both, showing that the sums lost by decreased meter rates are more than made good by a general tax on the people, not all of whom are water takers, for the benefit of railroads and manufacturers. In other words, the many in the cities referred to are made to bear additional burthens for the benefit of the few. That is not the case in Erie. Equity and justice is the rule in Erie's water rates, and not the exception.

HISTORICAL.

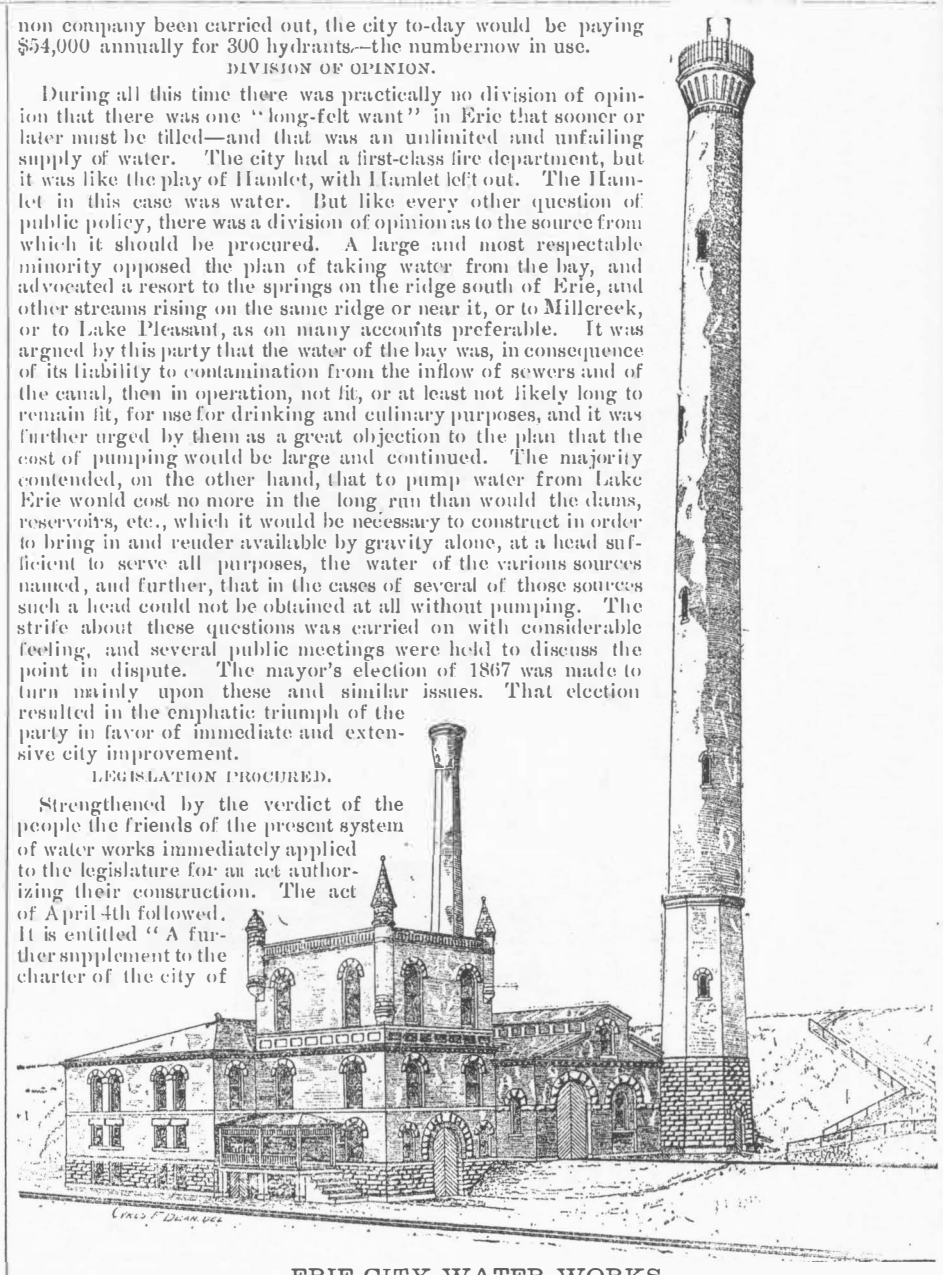
Up to 1840 Erie depended for its water supply upon wells and cisterns, and an occasional visit in the heat of summer, when these necessary adjuncts to every household were dry, of the "water-man" with a cart filled with water from the bay. In that year the borough—it was not a city then—built its first works. They were a small and primitive affair—consisting of lines of pump-logs laid in some of the most thickly built-up streets. The supply was taken from a large spring on the Reed farm, south of Eighteenth street, and west of Parade. Though comparatively insignificant, these simple gravity works were very useful in their day. They gradually ceased to be used, and were totally discontinued when the supply of the Reed House was taken from the present works. In 1853 a movement was made in councils to supersede the pump-log system with something more in accordance with the demands of the people, but after making some preliminary surveys the matter was allowed to rest until 1865, when by an act of the legislature John W. Shannon, Esq., and certain other citizens, were incorporated under the name and style of the "Erie Water and Gas Company." This company shortly afterward organized in accordance with the provisions of the general law of the State relative to the formation and organization of gas and water companies, approved March 11, 1857. By its charter the Erie Water and Gas Company was privileged to have a capital of $100,000, to build and maintain gas and water works, to increase its capital to an amount sufficient to cover the cost of erecting its works, and to furnish and contract to furnish water and gas to individual persons and to corporations, etc., etc. The same act authorized the mayor and councils of the city of Erie and the commissioners of Erie county to contract with the said company for supplies of water and gas. On the 16th of July, 1866, the councils passed a resolution appointing a committee to procure the services of a competent hydraulic engineer "to examine and report to the councils plans for both sewerage and water" at the earliest moment practicable. The committee thus appointed applied, among others, to H. P. M. Birkinbine, Esq., of Philadelphia, a hydraulic engineer of known reputation for both scientific and practical ability in his profession, and were fortunate enough to engage him to make the desired examination and report. On the 23d of February, 1867, Mr. Birkinbine's report was prepared and submitted to the councils. This report reviewed the various sources of water supply open to the choice of the city, and recommended that the water of Lake Erie be taken from the bay. It put the cost of works at $350,000. At the same session of the councils a bill providing for the election of three water commissioners was read, and it was resolved that our senator and representatives be urged to insist on the passage of it. About the same time the Erie Gas Company procured the passage of an act supplementary to their charter, authorizing them in conformity with the provisions of the general law of March 11, 1857, to introduce water wherever they were authorized to introduce gas. This act was approved March 9, 1867. Two days afterwards, viz.: March 11, 1867, the city councils passed a resolution directing the mayor to enter into a contract with the Erie Water and Gas Company to supply the city with water for fire purposes for twenty years, from July 1, 1868, or as soon thereafter as the works could be completed, provided it should be not later than two years from the date of said contract; if not completed within two years the contract to be null and void. By this contract it was agreed that the city should pay a yearly rent of $9,000 for 50 fire plugs, and the contract was to be further subject to the following conditions, viz.: that the said water and gas company commence building within one year from the date of contract, and that if within one year from the date thereof the city should begin the construction of water works of sufficient capacity to supply the wants of the community the said contract be null and void. The city was further to have the right at any time within five years to purchase the works of the company on certain specified terms. The contract thus proposed was duly entered into; but was never carried out in any of its particulars, except those which provided for its nullification by act of the city. It may be well to note here that had this contract with the Shannon company been carried out, the city to-day would be paying $54,000 annually for 300 hydrants—the number now in use.

DIVISION OF OPINION.

During all this time there was practically no division of opinion that there was one "long-felt want" in Erie that sooner or later must be filled—and that was an unlimited and unfailing supply of water. The city had a first-class fire department, but it was like the play of Hamlet, with Hamlet left out. The Hamlet in this case was water. But like every other question of public policy, there was a division of opinion as to the source from which it should be procured. A large and most respectable minority opposed the plan of taking water from the bay, and advocated a resort to the springs on the ridge south of Erie, and other streams rising on the same ridge or near it, or to Millcreek, or to Lake Pleasant, as on many accounts preferable. It was argued by this party that the water of the bay was, in consequence of its liability to contamination from the inflow of sewers and of the canal, then in operation, not fit, or at least not likely long to remain fit, for use for drinking and culinary purposes, and it was further urged by them as a great objection to the plan that the cost of pumping would be large and continued. The majority contended, on the other hand, that to pump water from Lake Erie would cost no more in the long run than would the dams, reservoirs, etc., which it would be necessary to construct in order to bring in and render available by gravity alone, at a head sufficient to serve all purposes, the water of the various sources named, and further, that in the cases of several of those sources such a head could not be obtained at all without pumping. The strife about these questions was carried on with considerable feeling, and several public meetings were held to discuss the point in dispute. The mayor's election of 1867 was made to turn mainly upon these and similar issues. That election resulted in the emphatic triumph of the party in favor of immediate and extensive city improvement.

LEGISLATION PROCURED.

Strengthened by the verdict of the people the friends of the present system of water works immediately applied to the legislature for an act authorizing their construction. The act of April 4th followed. It is entitled "A further supplement to the charter of the city of Erie, to provide for the appointment of Water Commissioners, and to define their powers and duties." This act made it the duty of the Judge of the Court of Common Pleas to appoint three persons to serve as Commissioners of Water Works—one of whom to serve one year, one two years, and one three years—and one annually thereafter at the May term of court. The first appointments were William L. Scott, Henry Rawle and William W. Reed. After several preliminary meetings, on June 29, 1867, the board was permanently organized by the election of William W. Reed, president, and the appointment of William Brewster, secretary. The first step was to make a personal examination of various plans of water works—in the meantime inviting suggestions of any feasible plan to take water from inland sources southward of the city. No such plan having been suggested, negotiations were opened with Mr. Birkinbine, mentioned above, and in November a permanent engagement was made with him to take charge of the construction of the works. At the same time the plan devised by him was adopted.



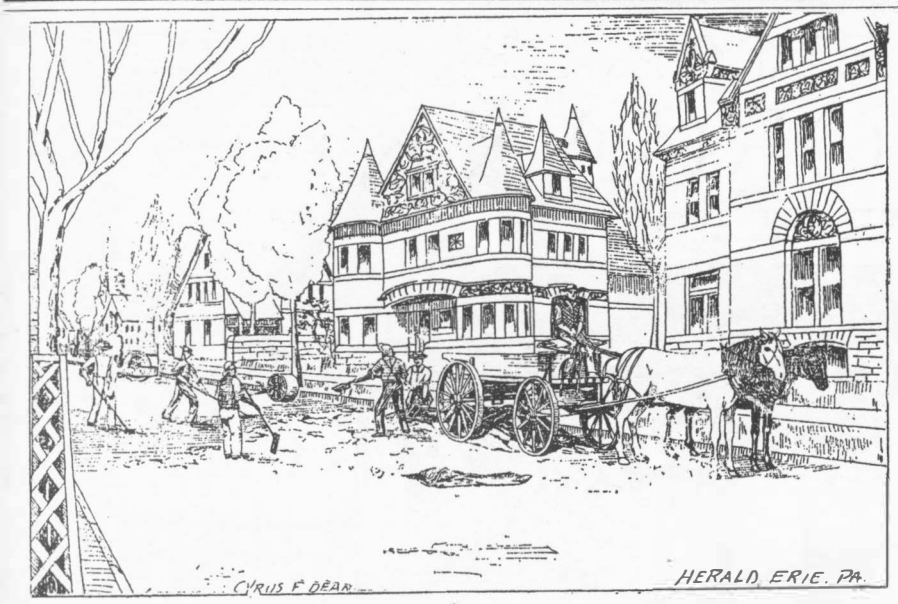
ERIE CITY WATER WORKS.

LOCATION OF WORKS AND RESERVOIR.

The location of the works at the foot of Chestnut street was agreed upon in November, and in the same month a contract for the engines was made with the West Engine Company, of Norristown, Penn'a. In December a contract for the stand-pipe was awarded to the Erie City Iron Works, and early in 1868 contracts were let for the buildings, including the stand-pipe tower, to John M. Kuhn, Esq., and for the crib work of the inlet or conduit from the lake, to Captain James Dunlap. The excavation for the foundation was commenced April 7, 1868, and from that time the work of construction made steady and rapid progress. The raising of the iron stand-pipe, which is a straight wrought-iron tube five feet in diameter, and 217 (now 233) feet high, was a feat worthy of special record. It was accomplished in a way suggested by George Selden, Esq., of the Erie City Iron Works, contractors, by the use of heavy blocks and tackle rigged on a derrick. The top of the pipe was first raised a short distance and stayed. The next lower section was then put on, and so, section by section, until the full height of the pipe was reached. Around this pipe the brick tower was afterwards built. It rests on a very heavy foundation of stone, is octagonal in shape, and extends with tapering sides to a height of 31 feet above the level of the lake. Its base area is a circle of 24 feet. Forty-five feet above the top of this foundation—the intervening distance being built of brick—is a belt course of stone five feet high—and from thence the stand-pipe is a circle, inside of which is a spiral staircase to to the top (251 feet above the surface of the lake), of the platform, which is 14 feet in diameter, enclosed in a substantial iron railing for the safety of visitors. The tower is lighted by nine windows. It is claimed (and we think the claim is correct) to be the highest water works stand-pipe in the world. In 1870 the commissioners called councils' attention to the immediate necessity of purchasing a site for a reservoir. This recommendation resulted the next year in the purchase of about seven acres of land from the Cochran estate, on the south side of Twenty-sixth street, between Chestnut and Cherry. The work was completed in 1874. The depth of the reservoir is 28 feet; it holds about 34,000,000 gallons, a sufficient supply for about eight days, at the present rate of consumption. Its original cost was $217,000, which has been increased by repairs and alterations to $223,500. In the construction of this great and necessary work, but few of those who are enjoying its benefits realize the embarrassments the commissioners—Messrs. Reed, Barr, Gensheimer and Liebel—encountered. On this point we quote from a committee appointed by Mayor Reed, February 24, 1874, to audit the accounts of the city. This committee was composed of Hon. William A. Galbraith, J. C. Spencer, and G. T. Churchill, Esqrs. On page 61 of their report to councils, they say: "During that period—the time the reservoir was being constructed—the commissioners have borrowed, on their own notes, of banks and of private parties, the sum of $176,632.18, of which $126,932.48 has been paid, leaving $46,699.70 yet due. The pressing need of an early completion of the reservoir, and the difficulty of selling bonds, has led the commissioners to shoulder a responsibility which could not have been demanded of them, *and for which they certainly deserve great credit.*" The last dollar of this $49,699.70 was liquidated by the writer of this in March, 1879, from the earnings of the works.

THE OLD ENGINES AND THE NEW.

The first engines purchased—two in number—were of the kind known as the "Cornish Bull Engines"—originally invented and designed by the celebrated inventor, James Watt. For their kind, and before more modern inventions and improvements superseded them, they were considered very fine and economical machines. Their pumping capacity is, single, 2,500,000 gallons per day; double, 4,000,000. In 1885, after a careful computation of the amount of water pumped by the old engines during the preceding year, the Board of Water Commissioners were convinced that the limit of supply had been nearly reached, and that an additional pump must be provided. The following year a contract was made with the Holly Manufacturing Company, of Lockport, N. Y., for a 5,000,000 gallon per day Gaskill Engine. The contract price was $24,850 for engine and foundation. The work of building a new engine house and placing in position the new pumping engine



was completed early in 1887, and the new machine accepted June 11th of the same year. A description of this machine is not compatible with the length of this article. Suffice it to say that it is claimed by its inventor and generally acknowledged to be the most economical in the use of fuel of any machine in existence. This is borne out by the fact developed on its trial test before acceptance—that with $1 worth of coal it raised to the reservoir 515,673 gallons of wateragainst a head of 237 feet,increased by friction to 244 feet. This test is equivalent to the power of one pound of coal required to raise its own weight to a height of 1,220,000 feet, or 231 miles. It is a safe assertion to make that no pumping engine has ever made an equal record.

STATISTICAL AND FINANCIAL.

The construction account of the works to date foots up about $1,000,000. There are 60 miles of 4, 6, 12, 20 and 30 inch distributing mains; from 5,000 to 6,000 private street connections—all put in by the department at an expense of over $60,000 (no other city does this)—300 fire hydrants and 550 stop valves, or water gates, varying in size from 4 to 30 inches. It should be noted in this connection, that this 60 miles of pipe gives to Erie one and one-half miles to each 1,000 inhabitants—an amount of pipe to population larger than any other city in the country. All this vast work—(we include the entire plant)—has been accomplished by an outlay, on the part of the city, of $675,000 in bonds, discounted at 80 cents on the dollar, and the earnings of the works, as shown by the following table:

From	To	W. R. Rec'd.	Incr'ase	Decr'ase
Jan. 1, 1869	Dec. 31, 1869	$4,264 47		
" 1870	" 1870	9,237 30	$4,972 83	
" 1871	" 1871	18,138 08	8,900 78	
" 1872	" 1872	21,652 68	3,514 60	
" 1873	" 1873	25,560 40	3,907 72	
" 1874	" 1874	27,938 90	2.378 50	
" 1875	" 1875	29,639 38	1,700 48	
" 1876	" 1876	31,048 76	1,409 38	
" 1877	" 1877	32,276 57	1,227 81	
" 1878	" 1878	29,636 01		$2,640 56
" 1879	" 1879	33,343 20	3,707 19	
" 1880	" 1880	37,385 00	4,041 80	
" 1881	" 1881	40,385 87	3.000 87	
" 1882	" 1882	43,818 73	3,432 86	
" 1883	" 1883	48.269 89	4,451 16	
" 1884	" 1884	51,852 78	3,582 89	
" 1885	" 1885	53,550 35	1,697 57	
" 1886	" 1886	58,725 00	5,174 65	
" 1887	" 1887	67,121 92	8,396 92	
Estim. 1888	" 1888	72,700 00	5,678 08	
Total		736,545 29		

Of the earnings of the current year, $23,000 have been paid the city in aid of its water bond interest account.

PAST AND PRESENT MEMBERS OF THE BOARD.

The ex-members of the board are William L. Scott, from 1867 to 1868; Henry Rawle, from 1867 to 1872; William W. Reed, from 1867 to 1879; John C. Selden, from 1868 to 1872; M. R. Barr, from 1872 to 1877; John Gensheimer, from 1872 to 1878; M. Liebel, from 1877 to 1881; J. M. Bryant, from 1878 to 1881; G. W. F. Sherwin, from 1879 to 1885, and Benjamin Whitman, from 1881 to 1887.

The present board is George W. Starr, C. Kessler and C. J. Brown.

The officers are, president, George W. Starr; secretary and treasurer, B. F. Sloan; assistant secretary, George C. Gensheimer; clerk, Will W. Reed; superintendent of street work, William O'Lone; inspectors, A. F. Crane, F. W. Koehler, John D. Spafford; mechanical engineer, F. A. Roth; assistant mechanical engineers, George R. Miller, John Kelly; firemen, R. W. Simons, Joseph Burns, Jacob Mullen; watchman at pumping works, Thomas Tidman; keeper of reservoir and grounds, Samuel Pfister.

The senior in the service of the department is Mr. Gensheimer, appointed clerk in April 1877, and promoted to assistant secretary in 1883. Inspector Crane is next, having been appointed in July, 1877. The present secretary and treasurer was appointed on the resignation of John C. Perkins in 1878, and consequently has been in service 10 years.

B. F. Sloan

THE Barber Asphalt Paving Company.

THE attention of municipal bodies, city engineers and the public is respectfully invited to the merits of the Trinidad Asphalt Pavement, as now laid by the Barber Asphalt Paving Company. This pavement is composed of an indestructible foundation of hydraulic cement concrete, and a wearing surface composed of refined Trinidad Asphaltum, sand and powdered limestone mixed together in suitable proportions and by suitable machinery. The pavement has been in use in various cities of this country for a period of thirteen years, and its durability and desirability as a road covering are now established beyond doubt or discussion. The extent of pavements laid by this Company, prior to January 1st, 1889, is as follows:

Buffalo,	946,746	square yards.
Washington,	717,089	" "
Omaha,	272,793	" "
Topeka, Kans.,	184,457	" "
Philadelphia,	158,519	" "
New Orleans,	151,147	" "
St. Joseph,	133,363	" "
St. Louis,	86,251	" "
Louisville,	82,204	" "
Chicago,	77,137	" "
Erie,	63,400	" "
Kansas City,	59,123	" "
Scranton,	48,038	" "
Wilkes Barre,	45,566	" "
Boston,	42,121	" "
New York City,	39,686	" "
Baltimore,	31,188	" "
Youngstown,	23,177	" "
Harrisburg,	11,493	" "
Dunkirk,	909	" "
Total,	3,174,407	yards.

or the equivalent of about 208 miles of 26 ft. roadway.

Among the advantages of this pavement, special attention is invited to the following:

1st, DURABILITY. Many Thousands of yards of Trinidad Ashphalt Pavement have been laid in Washington, and subjected to the ordinary traffic of a residence street—say 1000 vehicles a day; which, during the five years guarantee period, have required no repairs whatever and at its conclusion were in perfect order. On some of the Washington streets, now nine and ten years old, no repairs have ever been made and the pavements are as good as the day they were laid Similarly in Erie; 9th Street laid in 1882, 6th Street laid in 1883, 8th Street laid in 1886, 5th and Sassafras Streets laid in 1887, and 11th Street laid in 1888, are all in perfect order. The repairs upon them have been insignificant, and no part of the cost of these slight repairs has fallen on the city or the property owners. On Linwood Avenue in Buffalo, paved with asphalt in 1882, the repairs during six years have been less than one fourth of one per cent. of the original cost. The street has always been in the same perfect order as on the day it was opened to travel. An excavation recently made for sewer repairs showed that the thickness of the asphalt wearing surface was 2½ inches. The contract only called for 2½ inches when laid, and it is evident that during six years of constant use the wear has been practically nothing.

On streets of very heavy traffic, asphalt pavements, as well as all other pavements, require repairs of a greater or less extent. This Company guarantees its pavements for five years, during which time it maintains the pavement, and if any repairs are necessary, it makes them free of cost The Company is also prepared to make contracts for maintenance, subsequent to the five years' period, at reasonable rates, depending on the recorded traffic on the street.

2d, SMOOTHNESS. The smooth and uniform surface of the asphalt reduces the force of traction to ⅓ or ¼, as compared with various stone pavements, and ½ as compared with gravel roads; it increases the carrying power of horses by corresponding amounts, from three to twelve fold; it saves from ⅛ to ½ of the repairs of vehicles due to the wear and tear resulting from the incessant blows of stone pavements, and the mud of macadam and gravel roads; it adds to the comfort of every person who rides in a carriage.

3d, HEALTH. The joints of Belgian and cobble pavements are the receptacles for the manure and urine which are dropped on the street, and which putrify under the combined effect of moisture and heat, giving forth unhealthy vapors. The cleaning of the street does not remove these offensive matters, as the brooms pass over the surface and not into the joints. The upper layer of macadam and gravel roads is thoroughly impregnated with the same kind of filth. The vegetable fibre of wood pavements also absorbs the street filth in the same manner, and, in addition, gives out the foul odors arising from its own decay. On asphalt pavements there are no joints; the pavements areeasily cleaned, and when cleaned every particle of foreign matter is removed from them. The materials of which they are composed are all of mineral origin, and are not subject to decay.

4th, SAFETY. The result of a long series of recorded observations in ten different cities during 192 days in which over 800,000 horses were observed, showed that on an average a horse traveled 583 miles before falling on asphalt, and only 413 miles before falling on stone; or in other words, that for the same distance traveled there were 41 per cent. more accidents on stone than on asphalt The gritty surface of the Trinidad asphalt pavement due to the combination of sand and bitumen, is incapable of taking the polish which makes stone pavements so slippery. It dries quickly after a rain, and thus escapes the damp, greasy condition which renders wood so slippery.

5th, NOISELESSNESS. The Trinidad Asphalt Pavement is almost noiseless; the horses' hoofs make a slight click as they touch the surface, but the wheels of vehicles make no perceptible sound. The intolerable noise of stone pavements is known to every one. It is declared by leading physicians to be the principal cause of the nervous diseases so prevalent among residents of large cities.

6th, POPULARITY. The final test of the relative merits of different classes of *durable* pavements is the relative amount of traffic which they attract under similar circumstances. In St. Louis two streets, parallel, adjacent, and similar in every respect, were paved in 1883, one with Trinidad asphalt and the other with the best quality of granite blocks with tar cement in the joints. In 1885, the *recorded traffic on the granite street was* 308 *vehicles per diem, and on the asphalt* 3247 *vehicles.* Similar results have followed in Washington, Buffalo, Louisville, Omaha, Erie, and every city where the Trinidad asphalt has been placed in direct competition with stone pavements.

7th, COST. The Trinidad Asphalt is laid at less cost than the best quality of granite or Belgian pavements, or of wood on concrete; and, although its first cost is greater than that of the cheap varieties of wood laid on sand, yet the rapid decay and frequent renewals of wood make the wood pavement much more expensive in the end.

Considering all the elements that enter into the construction and use of a pavement—its cost, durability, smoothness, cleanliness, and safety—the Trinidad Asphalt Pavement is the best and cheapest pavement that has ever been laid. It is the only pavement which in this country can to-day show 200 miles of surface in first class order. It is the standard pavement of America.

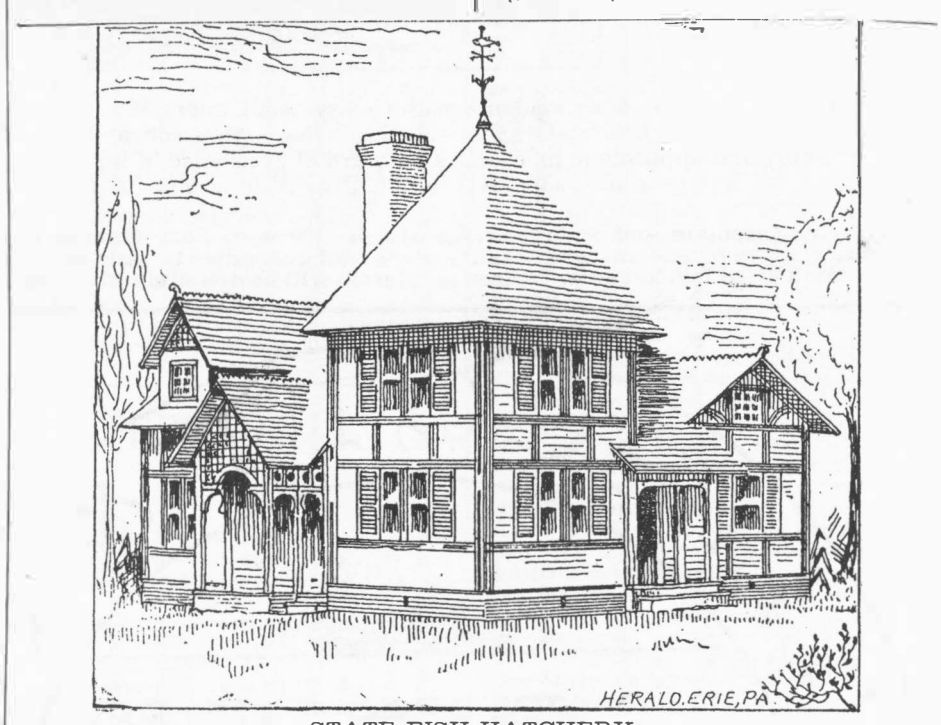
For plans and estimates apply to the general offices of the Barber Asphalt Paving Company.

A. L. BARBER, *President,*
Le Droit Building,
Washington, D. C.

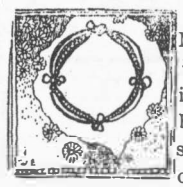
F. V. GREENE, *Vice-President,*
Washington Building,
1 *Broadway, New York.*

or to J. M. WRIGHT, *Superintendent,*
7th and German Streets,
Erie, Penn'a.

Attention is also directed to the advertisement of this company, to be found on the last page of this publication.



STATE FISH HATCHERY.



IN the northwest corner of Second and Sassafras streets is located the State Fish Hatchery, a commodious story and a half structure of attractive architectural design, which is visited annually by large delegations of interested sight-seers.

The hatchery is supported by State funds, and was first opened Dec. 12, 1885. The object of the hatchery is to propagate white-fish in Erie waters, which otherwise would in time become depleted.

The Lake Erie fishing business is of great magnitude and rapidly enlarging. Hundreds of thousands of dollars are invested in the enterprise, which gives employment to a small army of men.

Added to this constant and increasing drain on the natural supply, is the wholesale destruction of spawn by sturgeon and other species of the sucker family. It is estimated that one large sturgeon will consume more than a million fish eggs in a day, which if undisturbed would be comparatively safe after hatching. It is claimed that a dozen artificial hatcheries of the capacity of the one at Erie would in five years double the supply of white-fish in the lake if none were propagated by natural means.

The spawn is obtained in December, and as the hatching process requires about 4½ months, the hatchery is kept open during the winter.

The spawn is obtained from the vicinity of the islands near Sandusky, O., the "run" of white-fish leaving Erie left before spawning-time.

Aside from a comfortably furnished reception room, the entire ground floor is used for propagating purposes. There are several long tables, on which are placed rows of oblong glass jars holding one gallon each. About one quart of spawn is put into each jar, which is then filled with water and sealed air-tight, with the exception of two rubber tubes with glass nozzles, which run a supply of fresh water through the jars and keep the spawn in constant motion.

By an ingenious contrivance all the "dead" spawn is removed from the jar by the discharge tube. A tank on the second floor, containing 1,000 gallons of water, gives the required pressure.

After hatching the small fry are kept in the jars for about a week, then taken out on the lake ten or a dozen miles and liberated.

As near as can be learned a white-fish will increase about one pound a year for the first four or five years. One quart of white-fish spawn contains about 36,000 eggs. In the winter of 1885-6 16,000,000 small fry were placed in the lake; in 1886-7, 10,000,000; in 1887-8, 16,000,000; and it is expected that 20,000.000 will be hatched this winter.

When running to its full capacity the Erie hatchery can bring out 30,000,000 small fry in a season.

A four or five-pound white-fish will deposit from 15,000 to 20,000 eggs at spawning-time.

Last year 1,500 rock bass caught in nets were sent out to stock the waters of the State, and next spring a lot of catfish will be sent out as an experiment.

When the season for hatching whitefish closes, a quantity of wall-eyed pike (better known as blue pike) spawn will be placed in the hatching-jars for experimenting purposes.

The hatchery is under the supervision of the State Fish Commission, one or more members of which visit the hatchery monthly, while the entire board makes an annual inspection.

The Erie hatchery is in charge of Mr. John Maher, of this city, an enthusiast in fish culture. Mr. Maher takes pleasure in explaining the process of artificial propagation.