

DEPARTMENT

FOR

Supplying the City with Water.



ANNUAL REPORT

OF THE

CHIEF ENGINEER OF THE WATER DEPARTMENT

OF THE

CITY OF PHILADELPHIA,

For the Year 1873.

Presented to Councils March 5th,

1874.




PHILADELPHIA : UNIVERSITY OF CALIFORNIA

E. C. MARKLEY & SON, PRINTERS, 422 LIBRARY STREET.

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WITH THE COMPLIMENTS OF

WM. H. McFADDEN,

CHIEF ENGINEER.

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GEORGE W. HUTCHINSON, General Superintendent and in Charge at Fairmount Dam.

DAVID R. GRIFFITH—Superintendent of City Shop.

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Engineers at Works,

Fairmount—William Wright, A. J. Farrell.

Schuylkill—Joshua Bartley, David Pyke.

Delaware—Benj. F. Norman, Joseph Thompson.

Belmont—Abraham Stott, Chris. Betzold.

Roxborough—Johnson Hughes, Wm. H. Saunders.

REPORT.

To the Presidents and Members of the
Select and Common Councils of the City of Philadelphia.

GENTLEMEN:—The duties of the office, to which I had the honor of being elevated by your suffrage, were assumed March 1, 1873.

Within the following pages will be found statements of the operations of the department for the year; the present condition of the different pumping stations, the machinery therein, the buildings and grounds, the different reservoirs, the distribution, the valves or stops, the fire-plugs, together with tables of value for comparison; the prospective and immediate demands of the department, which, with all its immense outlay and increase, fails to keep pace with the rapid growth of the City.

No subject deserves more attention, nor any in which a greater number can be interested than an abundant supply of pure water, and a proper system to that end.

Upon such depends the health, safety and prosperity of any community.

THE FAIRMOUNT WORKS.

At these works, our former boast and present pride, 8,717,538,594 gallons were pumped during the year, being a daily average of 24,077,029 gallons. This is nearly four times the quantity of twenty years ago, when the daily average was, as in 1854, 6,264,115 ale gallons, and an increase over 1872 of nearly 20 per cent., or exactly 1,478,757,293 gallons.

Of all the water distributed this year, the daily average being

40,276,184 gallons, these works furnished nearly 60 per cent., the Schuylkill Works a little over 10 per cent, the Delaware Works a little under 10 per cent., the Belmont Works nearly 15 per cent, and the Roxborough Works 5 per cent.

It will be observed that in the years 1870, 1871, and 1872, the daily average did not reach 38,000,000 gallons.

THE DAM.

The crib work of the dam has been completed. Heavy oak decking was substituted for the temporary white pine planking. Owing to its settling, an oak strip, from 4½ to 15½ inches, was placed along the entire top, thereby making a level overfall of 1112 feet, which, at the eastern end, is 11½ inches higher than the old dam, and 5,511 feet above city datum.

The only change was the substitution of a grouting of cement in place of earth filling, thereby making a compact and solid mass of concrete in the interspace between the old and new dams, thus avoiding the washing out of the earth filling, and forming a hard smooth surface for the overflow. The cribs were constructed and sunk in deep water as a protection to the base of the new structure.

The stone work of the pier at the eastern terminus has been completed, and the coping stone continued around the old guard pier bringing both to the same level. An iron railing is being prepared and will be placed around the top of both piers. Steps will lead to the walk along the base of the mound dam, thereby rendering all easily accessible to the public. An iron railing will be continued along this walk, from the mill house to the pier, making it entirely safe. It is contemplated to raise the mound dam eight inches and pave the top with brick. It is proposed to place a fence along the most dangerous part of the mill race, to prevent accidents, and to render this one of the finest outlooks upon the river. The frequent rains during the summer retarded the progress of the work, but all will be completed during the coming season.

The completion of the dam was under the superintendence of George W. Hutchinson, aided by John Henifer, the intelligent

and energetic foreman of William Taxes, wharf builder, under whose care it was commenced and completed by days' work.

THE RIVER.

The ice gorge of last winter gave occasion for some anxiety about the safety of the dam, then but partially completed, but after a continuance of two months it passed away without doing any injury.

Several freshets occurred during the year, the dates and heights of which were as follows :

January 17th,	81	inches	on	the	dam.
March 10th,	58	"	"	"	
May 23d,	61	"	"	"	
August 15th,	50	"	"	"	
October 21st,	82	"	"	"	
November 24th,	57	"	"	"	

There were but few days during which the water was below the comb of the dam.

MACHINERY AT FAIRMOUNT.

Most of the machinery is in excellent order. The pistons of pumps Nos. 1 and 2 are packed with hemp, and require frequent attention to keep them tight. No. 1 requires re-boring and the introduction of a solid piston. No. 2 will be examined to ascertain if barrel will bear re-boring.

The head gates of Nos. 2 and 6 are rotten above the water line and should be renewed and iron gates and frames substituted. The same pattern will answer for both. Nos. 3, 4, and 5 have required very little attention. In June a lignum vitae step was placed in No. 3 wheel. Several of the pistons were found loose on their rods; these were tightened and are now in good order. These wheels averaged for the year from 7 to 8 revolutions per minute.

Nos. 7, 8, and 9, from constant service, since June, 1862, required re-boring, which was done by L. B. Flander's portable

boring machine, with entire satisfaction, thereby increasing their capacity 4 gallons per stroke, and solid pistons were substituted for the old wooden packing. November 28th the bevel wheel of No. 9 gave out and was recogged. The same will have to be done with the bevel wheels of No. 7 and 8 as they are much worn. These wheels averaged for the year 10.3 revolutions per minute.

No. 6, an old breast wheel and pump, long since useless, is being removed. A turbine, capable of driving an 18 inch pump, should take its place, increasing the capacity of the works 2,500,000 gallons per day.

The small Worthington engine was in service 82 hours, and pumped 9,711,208 gallons.

BUILDINGS AND GROUNDS.

The roof of the North Mill House is in a leaky condition. Sky lights should be placed over each wheel to facilitate the raising and lowering of heavy machinery. It is proposed to continue the fire-proof roof over the room containing wheel No. 1, and to extend the iron railing around the same. The old wooden railing, along the river front, from the Hall to the Wire Bridge, should be replaced with iron.

NEW BRIDGE.

The upper roadway of the new bridge passes around the south side of the reservoir, to accommodate which a vertical cut of at least twenty feet must be made in the embankment, greatly marring its beauty, destroying a grove of fine large trees, and if not carefully done, possibly resulting in injury to the reservoir. Two of the supply mains were uncovered, one of which was not disturbed, and over it an arch was built the width of the roadway; the other comes above the pavement, and may have to be lowered—a difficult operation on account of the rock directly underneath it.

FAIRMOUNT RESERVOIR.

The flag lining of Section No. 4, which was considerably damaged by the ice, has been reset. Excepting some of the stops, which

are useless, the reservoirs are all in good order. Soundings show a slight deposit of mud. The stops and stop-houses on the exterior have been all examined and placed in order for immediate service.

CORINTHIAN AVENUE RESERVOIR.

Parrish Street has been opened along the base of the south embankment, graded and paved. The grounds should be enclosed with a strong iron fence. It was found necessary to put steps at the south-east corner, to prevent destruction of the sodding and wearing of the banks. Soundings show a slight deposit of mud.

SCHUYLKILL RESERVOIR.

Thompson Street has been opened on the south side, graded and paved, which involved the grading and paving of the sidewalk. New fences should be placed around the property. Steps were placed at the two eastern corners, to protect the banks. The leak observed in early summer has disappeared. Soundings indicate a slight deposit.

SCHUYLKILL WORKS.

At these works 1,508,295,800 gallons were pumped during the year, a daily average of 4,190,265 gallons, which was 2,138,500 gallons less per day than these works furnished in 1872. This was due to the Belmont Works supplying the high ground which heretofore received an inadequate supply from the Spring Garden Reservoir.

The roof of main engine-house leaks badly. The cornice and wood-work is in a dilapidated condition. Nothing has been done inside or out, as it is proposed to remove the Sutton engine and put in one of larger capacity and better construction, to accommodate which the building will require remodelling. For the same reason the surrounding grounds do not present a neat and orderly appearance.

The south engine-room and boiler-houses are in their usual

good condition. The roofs have been repaired and painted. The west stack was found cracked and in a dangerous condition; five feet of the top was rebuilt and finished with a heavy cast iron cap. The coal sheds should be extended to protect the coal from exposure. The Engineers' houses have been made comfortable.

NO. 4.—THE OLD CORNISH ENGINE.

This engine pumped 181,762,200 gallons, with a duty of 37,700,000 pounds. A new check valve was furnished, and under the striking beams at the pump end, new columns were placed.

NO. 5—SIDE LEVER CORNISH.

The duty of this engine was 32,200,000 pounds. The cylinder is out of line from the settling of the foundation. The steam valves, air and feed pumps required repairing, which was done at the city shop.

DOUBLE CYLINDER ENGINE.

This engine, though defective in construction, is the most economic in the department. The duty was 60,000,000 pounds. The defects of the valve and valve-gearing are too well known to need specification. It is undergoing such alterations as will increase its reliability, capacity, and duty.

BOILERS.

The Boiler Inspector, after examination, reported eight mud drums in a dangerous condition, and requested their removal, which was done, and new ones put in their place. The steam pipes of the tubular boilers were not properly fastened and leak badly, to remedy which, riveting and caulking are necessary.

THE DELAWARE WORKS.

At these works, 1,364,109.884 gallons were pumped, a daily average of 4,444,619 gallons, which was 219,646 gallons less per day than these works furnished in 1872. Thus, while the Schuylkill and

Delaware Works furnished less water, coal was saved, and the supply was furnished from Fairmount, the cheapest pumping station.

The space in front of engine house, and around the stand pipe, has been paved with brick. The roadways on either side have been drained, graded, and paved, partly with cobble stone and partly with brick on edge. Nearly 2,000 cubic yards of mud were removed from the dock, affording an average depth of 8 feet below low tide, except at upper end, which could not be dredged. It would be advisable to put in a new bulkhead on a line with adjoining dock. This would give more space, where it is greatly needed, in rear of boiler house. The wharf at the outer end should be raised about 18 inches. The spring tides wash over it. The cap logs are nearly all decayed and require renewing. The cost of these improvements would be comparatively small, as the ashes from the works could be used for filling both the wharf and the bulkhead. At the same time the platforms over the sluices, which are scarcely able to sustain the weight of the coal upon them, could be strengthened. Precautions have been taken to prevent chips getting into the forebay, with marked improvement, but not complete success.

ENGINES AT DELAWARE WORKS.

Nearly all the pumping at this station was done by the Worthington engine. It has recently been examined and put in order. Most of the steam joints, of inferior gum, required renewing. The cylinders and steam pipes were newly felted, and most of the valves re-ground.

No. 1—the horizontal high pressure—was run at intervals, while the Worthington was undergoing repairs. It is receiving the usual yearly examination, and is being put in complete order. Both this and the Worthington were run at the same time from same set of boilers, so that it is impossible to get at the separate duty. Jointly they pumped 1,364,109,984 gallons, and show a duty of 29,000,000 pounds.

The beam engine and boilers have not been in service, but are

ready for immediate use. The tubular boilers have been in constant use. Some joints require re-making, when the boilers will be in good order.

The 18-inch forcing main, and the 6-inch supply main, are laid, on a lot belonging either to the Department, or Mr. Stockham. Only a few weeks since a leak occurred which obliged digging on this property. These mains should either be removed or the ownership of said lot definitely determined. To this end I have communicated with the City Solicitor.

DELAWARE RESERVOIR.

Two leaks were observed in this reservoir. One along the line of outlet pipe on the south side, the other on the north bank 6 feet from the top.

In the fall the reservoir was emptied and the clay removed from around the pipe, and the whole carefully repuddled with strong clay.

A portion of the inside slope was removed from the south embankment, and the clay lining renewed under the same. A trench extending below the leak was dug at the north embankment, and the whole repuddled.

Owing to the lateness in the completion of the repairs, the outside slope of the north bank could not be properly sodded. This will have to be renewed in the spring. To the outside slope of the north bank 3 feet were added to the base, tapering to one foot at the top.

The inlet chamber was examined, the walls parged with cement, and two courses of brick, grouted with cement, were placed in the bottom.

STORAGE RESERVOIR.

The altitude of this reservoir is 135 feet above city datum, only 15 feet above the Spring Garden and Corinthian Avenue reservoirs. This is much to be regretted, for had a higher altitude been chosen, the high ground in the Fifteenth, Twentieth, Twenty-eighth, and Twenty-ninth Wards could have secured an adequate supply, and a sufficient pressure for any emergency,

without depending upon Belmont or Roxborough. The storage reservoir can only be considered a part of the first system, embracing the Fairmount, Spring Garden, and Delaware Works, the reservoirs of which range in altitude from 94 to 120 feet.

This structure was in charge of James M. Kramer, the Assistant Engineer, from whose report I am enabled to give the following facts. The embankment at the northeast corner was raised to within 10 feet of the finished level. The banks were raised on the north side an average of 12 feet, on the west 9 feet, on the south $4\frac{1}{2}$ feet, and on the east side 4 feet.

During the coming year the small section of the reservoir can be finished. The completion of the gate house will permit the whole embankment to be carried up at once, and will guard against unequal settling. A portion of the north and east bank has had the clay lining placed on, so that when the work is resumed, the whole can be carried up solid. Much labor was required in preparing the base of the embankment where intersected by old roads, park drives, hedges, &c.

The division embankment, separating the two northern sections, was started in the fall, and much progress made. Three lines of 36-inch pipe, which are in place, pass through this bank, each line controlled by a valve. Three lines of 36-inch pipe will connect the small section with the two larger. The balance of the top soil, remaining over from last year, and a large amount of other material unfit for main embankment, have been removed to spoil banks.

The large gate chamber, at the junction of Thirty-third and Montgomery Avenue, is nearly completed. This structure contains about 5,000 perch of stone. Eight 36-inch pipe lead from the gate chamber, each controlled by a stop, and so arranged that water may be drawn through either one or all. Work has been commenced on the gate-house at Norris Street; all the excavation was finished during the fall and most of the foundation laid. This structure, when finished, will have two 36-inch pipes, and will be used as an outlet chamber exclusively. It will be provided with gates for shutting off the water from the pipes in case of repairs.

The main inlet will be at the junction of the three division embankments, and so arranged that the water can be passed into either one or all the sections. The pumping main will be arranged to introduce the water either through the main gate chamber or the inlet chamber on the division embankments.

BELMONT RESERVOIR.

In the early part of the year the division embankment and top of main embankment of the west division were completed. The ground adjacent was cleared of all debris incident to its construction, and put in good order. Cast iron braces were placed in the gate house to give additional strength to the retaining walls. The western section is in a leaky condition. The water level cannot be carried above nineteen feet, when its maximum height was intended to be twenty-five feet.

BELMONT WORKS.

At these works 1,959,966,670 gallons were pumped during the year, a daily average of 5,360,343 gallons, and an increase over the supply of 1872 of twenty-five per cent., or exactly 1,362,308 gallons per day, and for the month of July an average of 7,658,188 gallons, which is nearly half the maximum capacity of these works. These engines showed a duty of 40,000,000 pounds. A third Worthington pump has been erected, giving a maximum capacity of 18,000,000 gallons per day of twenty-four hours.

During the summer, several nests of boilers were found in a dangerous condition, due to the imperfect manner of setting. It was necessary to strengthen the walls, lengthen the buck stays, and place sole plates under the suspension girders. Heavier suspension rods were substituted and wrought iron necks to steam drums, for cast iron. The boiler fronts were moved out nine inches and an additional lining of fire-brick inserted.

A contract was entered into with Ncafe & Levy for furnishing and setting up a nest of two cylinder boilers, duplicates of those heretofore furnished by this firm. These are now in place and ready for firing. These works have seven nests of boilers, four of

which were furnished by Neafe & Levy, and the balance by Merrick & Sons.

The steam connections require considerable modification. A serious leak in any of them would involve a stoppage of the whole works. Each engine should be provided with a separate steam pipe, having an expansion joint and stop-valve.

A track has been laid from the coal shed to the boiler house, the floor of which has been covered with cast iron plates, the whole drained by terra cotta pipe connecting with sewer outside of the building.

CENTENNIAL.

In this connection it is proper for the department to state, that by the Centennial year, the Belmont Works will be taxed beyond their capacity, before which time provision should be made for their enlargement. If it be the intention of the city to furnish water for the Exposition, immediate steps should be taken for the duplication of the building, pumping machinery, and mains. From information in my possession, the Vienna Exposition required an increase in the water supply of 8,000,000 gallons per day, which was furnished independent of their Water Department. When the manner in which water is used abroad and by us is taken into consideration, less than 25,000,000 gallons daily supply would not be safe.

THE ROXBOROUGH WORKS.

At these works 673,287,495 gallons were pumped during the year, an increase over 1872 of thirty per cent., or exactly 154,476,445 gallons. The daily average for the year was 2,203,928 gallons. There are two engines, a Cornish of 2,500,000 gallons and a Worthington Duplex of double that capacity. The former has been, and the latter needs to be, repaired. The eight cylinder boilers during the summer were taxed to their full capacity, and consequently could not be put in necessary repairs. The new engine house is in good order. The floor and joists of the old engine house are decayed from want of proper

ventilation, which is being provided. The house of the engineer is dilapidated and unhealthy, to improve which would be a waste, therefore the intention is to erect suitable dwellings for those in charge of the works. The grounds should be graded and improved, and that portion along the river front raised five feet, to protect the buildings from freshets. An ice house on adjoining property was recently destroyed by fire, endangering the works, which should be provided with a plug and hose attachment.

ROXBOROUGH RESERVOIR.

Part of the stone lining has been displaced by the ice, and must be relaid, and a portion of the retaining wall on the south side will have to be rebuilt and pointed. The banks are deemed unsafe for want of greater thickness and slope, considering the micaceous earth of which they are composed. The stop houses have never been finished, and there are only temporary bridges leading to them. A leak was detected on the east side early in December.

THE AUXILIARY ENGINE.

This engine, originally intended to afford a better supply to Germantown, is being finished for use, while the reservoir is undergoing the necessary repairs.

BOILER HOUSE.

The extension to the boiler house is near completion, in which has been placed two nests of boilers of improved pattern, occupying but half the space, and a guaranteed capacity equal to the cylinder boilers. These were purchased at a less cost and I feel confident will give a greater duty, and require less repairs, than any other boilers in the department.

AUTOMATIC AIR CHAMBER FEEDER.

The air chamber attached to the Cornish engine, and to which the Worthington engine is connected with advantage, heretofore required charging with air twice a week, involving the stoppage

of the engine, is now kept constantly full and its efficiency increased. The following tests were made with a reservoir indicator attached to the forcing main at the engine house, and a point midway between it and the reservoir. The air chamber filled in the usual manner gave a vibration of $8\frac{1}{2}$ lbs. per square inch at the engine house, and 32 lbs. at the point midway. When filled by the automatic feeder, thus keeping a full air chamber, the vibration at engine house is only two pounds per square inch, and at the point midway only three pounds. These differences of pressures, $6\frac{1}{2}$ pounds at engine house and 29 pounds at midway point, showed a waive shock in the main equal to 4,176 pounds per square foot of internal diameter, and of 2,093 pounds pressure on the plunger. This demonstrates the value of a large and full air chamber.

Immediate action should be taken, estimates for which will be presented as soon as possible, for the laying of a 30-inch pumping main from the Roxborough engine house to the reservoir. The main, originally intended for the Cornish, is twenty inches, and is too small for the Worthington engine, which, when running at full capacity, induces a friction equal to a column of water thirty feet high, forcing extra labor on the engine, rendering the main liable to fracture, and making it impossible to run both engines at the same time.

By the addition of the new main both engines can be run, and it would be capable of accommodating another engine of 5,000,000 gallons capacity.

If anything should happen to the larger engine during the extreme demand of summer, it is very doubtful whether an adequate supply could be furnished. It will thus be seen there is great necessity for another pumping main and engine.

CHESTNUT HILL WORKS.

These works were purchased from the Chestnut Hill Water Company, the department taking possession January 20, 1873.

They contain two independent horizontal engines connected to one pump, which is double acting, of seven inch diameter and four

feet stroke, and is run at forty revolutions per minute, with 2 thirty inch cylinder boilers thirty feet long, connected with a steam drum. These were repaired in 1869 and are in good order. The engine house and water tower needs painting and repairs to roof and walls. The pump receives its supply from a well and spring. The well contains 100,000 gallons, and has a mean overflow in summer of 80,000 gallons. The capacity of the spring is 5,500,000 gallons, with a mean overflow of 350,000 gallons.

The water is pumped a vertical height of 125 feet through a ten inch main into a tank holding 40,000 gallons. These works furnished 22,000,000 gallons during the year, the maximum demand being 153,480, and the minimum 76,740 gallons per day. The grounds should be enclosed and improved. The present service mains laid by the company will soon be inadequate. The stops and fire-plugs were in a bad condition and required renewing, which is now being done. I would recommend the purchase of a lot on the county line, containing a spring, which before many years will be required for this district. This would give a total storage capacity of 6,316,300 gallons, and during the summer a mean overflow of 587,000 gallons per day.

There is ground at Mount Airy higher than the water level in the reservoir, which could get its supply from the tank of the Chestnut Hill Works, and a main should be laid for said purpose.

MOUNT AIRY RESERVOIR.

The small section was repaired and is now filled to its maximum level. The large section, which is leaking, will have a new clay lining placed on the bottom and be paved with brick.

DISTRIBUTION.

One of the present difficulties is in the size of the distributing pipes, which are too small to supply the demands which have been constantly increasing upon them. Communications were presented to your Honorable Bodies, in the months of May and June, calling your attention to this subject, and asking for a loan to connect the Spring Garden and Corinthian Avenue Reser-

voirs; and for laying, through sections of the City inadequately supplied, large supply mains to ultimately connect with the storage reservoir.

There are miles of small pipe in the old city proper which should be removed and replaced by those of a larger size, and the custom of laying small pipe in narrow streets should be abandoned; as these localities are generally selected for manufacturing purposes, increasing the demand for water where the pipes are least capable of giving an adequate supply.

A number of dead ends were connected and a circulation effected. The stop-valves were examined, and a large number found closed, which had been neglected or were out of order; these were repaired and raised, affording relief in sections where these obstructions interfered with the flow. There were 210,736 feet, nearly 40 miles of pipe laid this season, which was 10 miles more than in any year since consolidation. There was included in the above a 20-inch main on Broad Street, south from Washington Avenue to Snyder street, a 16 inch on Washington Avenue east from Fifth Street to Moyamensing Avenue, and south to Snyder Street, a 20-inch main on Twenty second Street north from Jefferson Street to Ridge Avenue, thence along the Ridge Avenue to Thirty-third Street with a 12-inch main. Also along Ridge Avenue, from Schur's Lane to Green Lane, and from Hermit Lane to Schur's Lane a 10-inch main; these amounted to nearly 24,000 feet. The fire-plugs are receiving a thorough examination; many of them were found out of order and have been repaired; at the same time the pressure at each has been taken and recorded.

CITY SHOP.

An accompanying statement will show the work done at this shop, and the amount saved thereby. In emergencies, and under ordinary circumstances, its value must be apparent. It is well managed; its efficiency, however, is limited at its present location, and I would recommend its removal to a larger place, nearer the pumping stations; and the erection of buildings suffi-

cient for storage purposes whence supplies could be distributed, and into which improved tools could be introduced. The nominal valuation of the tools, patterns, and fixtures, is \$20,000, on which, if I am correctly informed, there has never been any insurance.

REGISTRAR.

It affords me pleasure to call special attention to the report of the Registrar, whose department has been managed with marked integrity and in strict conformity with the law.

The receipts from all sources were \$1,078,293.95, an excess over the expenses of maintenance amounting to \$543,943.50.

IMMEDIATE DEMANDS OF THE DEPARTMENT.

The following enlargements are imperatively demanded at an early day, for which means will have to be provided; at the Roxborough Works, a new pumping engine and main; the duplication of the buildings, machinery, and mains at the Belmont Works; a new turbine and pump at Fairmount; and large distributing mains through the City.

In the report will be found a table showing the amount of water pumped, and the daily average supplied, for the past twenty years, in which time the demand has increased almost four-fold. Should the demand continue to increase in the same ratio for the next twenty years, by that time 150,000,000 gallons would be required per day.

With these considerations, the source and means to an abundant supply of pure water becomes a subject worthy your consideration, and to which your attention was directed in my communication of June 24th, 1873.

REPORT ON FRANKFORD WATER SUPPLY.

To the Select and Common Councils
of the City of Philadelphia.

GENTLEMEN:—Quality is the most important element in the consideration of a water supply. Water may be potable, and yet contain mineral salts, such as lime, magnesia, &c., rendering it undesirable for manufacturing purposes. Again, it may be valuable for manufacturing purposes, and contain organic impurities enough to make it objectionable for household uses. Frequent analyses have determined more than three times as much mineral salts in the water of the Schuylkill, as in that of the Delaware. Messrs. Booth and Garrett, in their report upon the water supply of the City in 1862, found a larger amount of organic matter in the water of the Delaware, than in that of the Schuylkill. The character and condition of the organic impurities, is a question of much greater importance than the quantity. The source, therefore, becomes a subject of careful inquiry of which the most objectionable is sewage. When the relative flow of the Delaware and Schuylkill is considered; when a comparison is made of the population in cities and towns along these streams, impurities from sewage cannot be so great in the former as in the latter. Therefore, the water of the Delaware is as desirable for all purposes as that of the Schuylkill, and will compare favorably with it. The principle discharge from sewers is at ebb tide, and is, therefore, carried down the stream. Whether it returns is extremely doubtful. Indeed, it was asserted before the Royal Commission on the metropolitan (London) water supply, that it did not return within (3) three miles of the point at which it was discharged into the Thames. This is certainly the case with the heavier matter held in suspension, and if the above assertion be true, we need only select a point above the city sewage, and we are safe from impurities of this character and source, and water of unquestionable purity can be procured. Frankford creek may be regarded as this sewer. It is, therefore, proposed to locate the works at the foot of Dark Run Lane, half a mile

above this creek. This conclusion has been arrived at after examining various available sites, none of which, all things considered, presents greater advantages. Here is a gravelly beach, with a gentle slope, having 19 feet of water 300 feet from the land, and 22½ feet at 400 feet from the shore at low tide. The accompanying table "A" will give a concise comparison of the various reservoir sites, their altitudes, distances from pumping stations, distances from the centre of Frankford, distances from Kensington reservoir, &c. The only remaining objection to this site as a pumping station, is its location three (3) miles south of the Pennepack creek. Fifty years will not crowd this creek with factories as Manayunk does now the Schuylkill. And surely the water taken from the river three miles south of the Pennepack will be more desirable than that taken from the river at the mouth of Gunner's Run, which has been strongly recommended for the supply of Frankford.

CHARACTER OF WORKS.

It is proposed to construct a subsiding reservoir (immediate or prospective) extending into the river to Port Warden's line, and dredging it to the depth of 15 feet below low tide. This reservoir to have a weir coming within (6) feet of the surface, dividing it into two compartments. The water will be admitted into the outer division, and flow over the weir into the inner one, and thence into the pump-well. By this means matter held in suspension in the water will subside in the outer division. Should any remain, it will deposit in the inner one before reaching the pump-well. Much of the organic impurity dissolved in the water will be dissipated by the action of the sun and light, so that the water taken from the pump-well will be of the most desirable character, and unobjectionable for all purposes, whether drinking, culinary, or manufacturing. The water to be taken from the pump-well by two pumping engines, each having a capacity of raising 5,000,000 gallons per day into a distributing reservoir. The pumps to discharge their water into a stand-pipe located at the works, from which the water is to be conveyed by a 30-inch

main to a store reservoir in the vicinity of the Oxford and Kensington turnpike, a distance of $3\frac{1}{2}$ miles, or 20,000 feet, of ascending main, and within 4 miles, or 21,000 feet, of the Lehigh avenue reservoir. The surface of the water in the basin will be 164 feet above city datum, and 50 feet above the water level in the Kensington basin on Lehigh avenue, and 76 feet above the highest curb in Frankford, thus affording a first class fire protection in addition.

By means of the stand-pipe, the ascending or pumping main can be used also as a distributing main, and branches can be inserted at such points as may be desirable for the supply of Bridesburg, Tacony, Frankford, and Holmesburg, without the necessity for a return or descending main, which could be directed to the supply of the Kensington District, through the Lehigh avenue reservoir. Other advantages are offered by the stand-pipe, such as

First. It acts as an air chamber, in which are lost the waves or pulsations incident upon the operation of all piston or plunger pumps.

Second. The saving of power and risks from breakage of parts of the pumps and mains, incident upon getting rid of these waves.

Third. It increases the capacity of the pumping main. The water flowing from the stand-pipe in a steady stream, will allow a larger flow from a given sized main under the same head or pressure, than when the water oscillates or pulsates.

SIZE OF RESERVOIR.

The reservoir proposed for these works, was to contain but 10,000,000 gallons. This would hardly be sufficient storage to meet the present requirements of Frankford alone. The works described above are intended for a more general service, and as a part of a general system, and not simply local and isolated. The rapid growth of our city northward, and its topography, demand a system intermediate between the first, composed of Fairmount, Corinthian Avenue, Spring Garden, Kensington, and the East Park, at an elevation of 94 to 135 feet above city

datum; and the third, composed of Belmont, at 208 feet, and Roxborough, 365 feet. With this view it would not, I think, be advisable for the city to construct a reservoir with a storage capacity of less than 50,000,000 gallons. These works could be made available to furnish a very large section of the City now unsupplied, or but indifferently so, and at less expense than as now from Belmont and Roxborough.

An additional feature attaches to this reservoir site. In a direct line, at the distance of a mile, is another site 80 feet higher, which would suit admirably for a higher lift, if ever it should be needed.

The changes proposed for your consideration, in the above plan, will render necessary the transfer of certain items.

The sum appropriated, it is believed, from trial estimates made, will be sufficient to carry out the work as designed, in its more complete and enlarged character, and in its more general application.

Every effort will be made to this end, if possible, without asking for additional appropriations.

Yours very truly,

(Signed) WM. H. McFADDEN,
Chief Engineer of Water Department.

"A."

Report of Surveys, Frankford Extension, for Reservoir and Pumping Ground.

Reservoir Sites.	Altitude.	Distance from pumping ground.	Pumping ground.	Distance from centre of Frankford.	Distance from Kensington Reservoir.	REMARKS.
1. Wentz	156	3¼ miles.....	Dk. Run lane.	2½ miles.....	4 miles.....	Gradual ascent over favorable ground for pumping main.
2. Green lane.....	211	4¾ "	" "	3½ "	3¾ "	An extension of same main for one mile crossing Tacony, a depression [of 80 feet.
3. Crowell's.....	232	5 "	" "	3¾ "	4½ "	" " " " "
4. Intersection.....	160	3¾ "	Lardner's.....	3 "	5 "	Pumping main over very favorable ground.
5. Eisenbrey's	161	3¾ "	"	3 "	5½ "	" " " "
6. Snyder's.....	155	4¼ "	11 mile lane....	3½ "	6¾ "	" " over undulating ground.
7. Byberry Point..	165	4¾ "	11 " "	6 "	9 "	" " " very favorable ground.
8. Knightsville ...	165	4½ "	Aurora	6¼ "	9½ "	" " " undulating ground.
9. Smithfield	234	5¼ "	"	8¼ "	11 "	" " " " "

Soundings commencing at Dark Run lane, thence along the Delaware to Fisher's wharf, measured from low water mark.

Dark Run lane..	110 ft.	150 ft.	190 ft.	230 ft.	270 ft.	310 ft.	350 ft.
Sounding.....	3½ ft.	6½ ft.	9 ft.	12½ ft.	16½ ft.	19 ft.	22 ft.
Lardner's	80 ft.	120 ft.	160 ft.	200 ft.	.....	.....	.....
do	7 ft.	15 ft.	20 ft.	25 ft.	.....	.....	.....
Salter's lane.....	40 ft.	80 ft.	120 ft.	160 ft.	200 ft.	.....	.....
do	2 ft.	6 ft.	10 ft.	15 ft.	16 ft.	.....	.....
Pearson's.....	60 ft.	120 ft.	.....	.....	.....	.....	.....
do	10 ft.	19 ft.	.....	.....	.....	.....	.....
Fisher's wharf...	10 ft.	50 ft.	90 ft.	130 ft.	.....	.....	.....
do ...	1 ft.	8 ft.	15 ft.	19 ft.	.....	.....	.....

The soundings at Harrison's the same as at Pearson's.

Operations of the Fairmount Works for the year 1873.

MONTHS.	Running time.	Number of strokes during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Cubic feet of water pumped per month.	Coal consumed in heating mill house.				Tallow consumed.	Oil consumed.	Rain fall during the month.	Average temperature.
	Days.					Tons.	Cwts.	Qrs.	Lbs.					Pounds.	Quarts.	Inches.
January	30	2,007,364	677,068,519	22,568,951	90,517,183	30	.....	.....	.....	24	148	6.05	28.9
February.....	28	1,942,800	652,458,456	23,302,088	87,227,066	25	.....	.....	.....	.....	171	4.07	29.8
March.....	31	1,930,898	684,781,430	22,089,724	91,548,320	25	.....	.....	.....	12	142	2.24	37.1
April.....	30	2,016,529	669,434,158	22,314,472	89,496,545	20	.....	.....	.....	.....	231	4.19	45.3
May.....	31	2,413,877	732,063,996	23,614,967	97,869,518	20	.....	.....	.....	20	284	4.78	59.6
June	30	2,375,838	705,367,462	23,512,249	94,300,462	.....	.....	.....	.....	27	346	.89	70.6
July.....	31	2,240,698	650,248,742	23,572,484	90,942,345	.....	.....	.....	.....	24	227	5.55	76.4
August.....	31	2,608,100	814,700,880	26,260,674	108,917,230	.....	.....	.....	.....	21	225	12.29	72.3
September.....	30	2,617,758	799,306,241	26,643,541	106,859,123	.....	.....	.....	.....	10	183	4.03	66.1
October	31	2,491,900	767,846,304	24,769,236	102,653,249	15	.....	.....	.....	40	210	5.89	54.7
November.....	30	2,394,665	710,206,018	23,673,534	94,947,329	20	.....	.....	.....	12	140	5.	38.3
December	31	2,765,264	824,056,388	26,582,432	110,167,906	20	.....	.....	.....	.....	115	1.05	38.3
Totals.....	364	27,795,586	8,717,538,594	24,077,029	1,165,446,336	175	.....	.....	.....	193	2,422	56.05	*51.4

* Yearly average.

FAIRMOUNT WORKS.

Supplies purchased during 1873.

Gas and oil for lighting works, - - -	\$1,396 43
155 tons of coal for warming works, - -	1,027 50
738½ gallons of lubricating oil, - - -	576 02
Tallow, - - - - -	80 40
Packing and small stores, - - -	1,087 85
Repairs, - - - - -	5,500 00
	<hr/>
	\$9,668 20

Running Expenses for 1873.

Salaries of engineers, &c., - - -	\$7,991 94
Gas and oil for lighting works, - - -	1,303 51
175 tons of coal, for warming works, average price \$6 62½, - - - - -	1,159 37
605½ gallons lubricating oil, average price about 78 cents, - - - - -	472 29
193 lbs. tallow, @ 15 cents, - - -	28 95
Packing and small stores, - - -	1,087 85
Repairs, - - - - -	5,500 00
	<hr/>
	\$17,543 91

Cost of raising water into reservoir, per million gallons, - - - - -	\$2.01 ² / ₁₀
Cost of raising water, per million gallons, one foot high, - - - - -	.02 ²³ / ₁₀₀

Operations of the Schuylkill Works for the year 1873.

MONTHS.	Running time.	Number of strikes du- ring the month.	Total number of gal- lons pumped during the month.	Average gallons per day.	Cubic feet of water pumped per month.	Coal consumed.*				Tallow consumed.	Oil consumed.
	Days.					Tons.	Cwts.	Qrs.	Lbs.			Lbs.	Qts.
January	28	135,866	68,665,960	2,452,356	9,179,941	99	16	.....	.....	90	25
February	23	94,931	48,416,340	2,105,058	6,472,773	78	14	.....	.....	82	30
March	28	156,024	68,563,230	2,448,687	9,166,207	99	02	.....	.....	94	32
April.....	30	273,854	117,100,480	3,903,349	15,655,144	115	15	.....	.....	236	68
May	31	333,698	168,193,470	5,425,596	22,485,758	182	02	.....	.....	271	88
June.....	30	480,685	236,358,140	7,878,605	31,898,682	231	01	.....	.....	344	90
July	31	513,097	250,093,060	8,067,518	33,434,902	263	15	.....	.....	300	64
August	31	805,352	152,464,320	4,918,204	20,382,931	182	05	.....	.....	151	90
September	30	258,324	125,866,010	4,196,200	16,829,680	138	09	.....	.....	100	64
October	31	254,197	129,283,190	4,170,425	17,283,849	155	08	.....	.....	152	80
November.....	30	204,630	88,834,500	2,961,150	11,876,270	123	15	.....	.....	72	30
December	31	118,901	54,437,100	1,756,035	7,277,687	129	17	.....	.....	132	32
Totals	354	3,129,562	1,508,295,800	4,190,265	201,643,824	1,799	18	.....	.....	2,024	702

* The amount of coal given is the total amount consumed for raising steam, banking fires, and without any deduction whatever for ashes or clinker.

SCHUYLKILL WORKS.

Supplies purchased during 1873.

Gas and oil for lighting works, - - -	\$810 88
1,629 $\frac{17}{100}$ tons of coal, - - -	7,692 90
236 gallons of oil, - - -	311 99
Tallow, - - - - -	313 00
Packing and small stores, - - -	548 36
Repairs, - - - - -	6,790 00
	<hr/>
	16,467 13

Running Expenses for 1873.

Salaries of engineers, firemen, &c., - - -	13,049 80
Gas and oil for lighting works, - - -	810 88
1,799 $\frac{18}{100}$ tons of coal, consumed at average price about 4 $\frac{72}{100}$, - - - - -	8,495 53
175 $\frac{1}{2}$ gallons of oil, consumed at average price about 85 cents, - - - - -	149 17
Packing and small stores, - - - - -	548 36
Repairs, - - - - -	6,790 00
2,024 lbs. of tallow, consumed at average price about 13 $\frac{94}{100}$, - - - - -	282 15
	<hr/>
	30,125 89

Cost of raising water into reservoir per million gallons, - - - - -	\$19.97 $\frac{36}{100}$
Cost of raising water per million gallons 1 ft. high,	.17 $\frac{36}{100}$

Operations of the Delaware Works for the year 1873.

MONTHS.	Running time.	Number of strokes during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Cubic feet of water pumped per month.	Coal consumed.*				Tallow consumed.	
	Days.					Tons.	Cwts.	Qrs.	Lbs.	Lbs.	Qts.
January	23	242,417	61,120,352	2,787,841	8,572,238	111	13	.....	29	24	10
February	18	168,230	59,238,080	3,291,004	7,915,529	91	15	3	2	24	8
March	24	262,433	92,376,416	3,849,017	12,349,788	112	1	3	21	22	8
April	25	302,478	106,472,256	4,258,499	14,234,272	128	1	1	14	31	8
May	27	335,205	117,992,160	4,333,043	15,774,353	133	1	3	1	23	14
June	28	582,664	163,700,800	5,846,457	21,885,900	199	13	3	3	24	19
July	29	622,147	170,948,128	5,894,763	22,854,028	197	2	.....	2	24	25
August	26	417,392	135,903,104	5,227,042	17,767,795	157	8	2	14	24	19
September	25	402,104	118,679,836	4,747,193	15,866,285	158	.....	2	26	18	15
October	27	448,901	136,431,392	5,053,015	18,239,491	190	17	3	19	16	16
November	23	397,708	109,460,928	4,759,171	14,633,814	164	5	3	14	18	10
December	27	536,746	83,786,432	3,288,386	11,869,844	117	15	1	27	10	10
Totals	302	4,719,835	1,364,109,854	4,444,619	181,966,446	1,761	18	1	23	271	162

* The amount of coal given is the total amount consumed for raising steam, banking fires, and without any deduction whatever for ashes or clinker.

DELAWARE WORKS.

Supplies purchased during 1873.

Gas for lighting works, - - - -	\$508 50
2,018 tons of coal, - - - -	10,303 94
42 cords of wood, - - - -	360 50
135 gallons of oil (lubricating), - -	148 35
329 pounds of tallow, - - - -	36 40
Packing and small stores, - - - -	464 28
Repairs, - - - -	1,999 41
	<hr/>
	\$13,821 38

Running Expenses for 1873.

Salaries of engineers, firemen, &c., - -	\$8,750 00
Gas for lighting works, - - - -	508 50
1,761 $\frac{18}{100}$ tons of coal, consumed at an average price about 5 $\frac{1}{100}$, - - - -	8,999 63
40 $\frac{1}{2}$ gallons of oil (cylinder), consumed at an average price about 1 $\frac{1}{100}$, - - - -	44 55
271 pounds of tallow, consumed at an average price about 11 $\frac{1}{2}$, - - - -	30 26
Packing and small stores, - - - -	464 28
Repairs, - - - -	1,999 41
Wood, - - - -	360 50
	<hr/>
	\$21,157 13

Cost of raising water into reservoir, per million gallons, - - - -	15.50 $\frac{9}{10}$
Cost of raising water, per million gallons, one foot high, - - - -	.13 $\frac{14}{100}$

Operations of the Belmont Works for the year 1873.

MONTHS.	Running time.	Number of strokes during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Cubic feet of water pumped per month.	Coal consumed.*				Tallow consumed.		Oil consumed.
	Days.					Tons	Cwts.	Qrs.	Lbs.	Lbs.	Qts.	
January.....	31	389,356	124,092,552	4,002,98	16,589,9 3	253	05	.....	20	130	9
February	28	354,629	114,187,640	4,078,130	15,265,727	219	15	2	04	115	8	
March.....	31	372,078	120,098,916	3,874,126	16,056,005	242	.....	.....	20	110	8
April.....	30	401,056	124,989,152	4,166,305	16,709,780	264	08	1	16	115	17	
May.....	31	426,981	134,496,362	4,338,592	17,980,797	293	01	.....	12	136	13
June.....	30	574,939	179,403,350	5,980,112	23,984,405	390	13	1	16	165	14	
July.....	31	758,682	237,403,644	7,658,188	31,738,482	471	08	2	08	245	20	
August.....	31	675,019	212,010,204	6,839,042	28,343,622	441	04	.....	12	210	23
September.....	30	580,043	182,217,606	6,073,920	24,360,642	404	13	3	.....	175	13
October.....	31	500,083	199,288,358	6,428,657	26,642,829	413	19	1	24	.....	108
November.....	30	562,589	165,821,162	5,527,372	22,168,605	351	05	3	16	.....	100
December.....	31	508,824	165,957,434	5,356,691	22,186,823	359	11	1	25	100	34	
Totals.....	365	6,144,170	1,959,960,670	5,360,343	262,027,630	4,105	07	.....	05	1,501	367

*The amount of coal given is the total amount consumed for raising steam, banking fires, and without any deduction whatever for ashes or clinker.

BELMONT WORKS.

Supplies purchased during 1873.

Oil for lighting works,	-	-	-	-	\$258 77
Oil (lubricating),	-	-	-	-	222 48
4,180 $\frac{08}{100}$ tons of coal,	-	-	-	-	20,574 70
1,992 pounds of tallow,	-	-	-	-	326 97
Packing and small stores,	-	-	-	-	439 42
Repairs,	-	-	-	-	3,293 30
					<hr/>
					\$25,115 64

Running Expenses.

Salaries of engineers, fireman, &c.,	-	-	-	-	\$6,500 00
Oil for lighting works,	-	-	-	-	258 77
4,105 $\frac{70}{100}$ tons of coal, consumed at an average of about 4 $\frac{98}{100}$,	-	-	-	-	20,443 25
91 $\frac{1}{2}$ gallons of oil, (45 $\frac{1}{2}$ gallons coal and castor oils, and 46 gallons cylinder oil,) @ average price per gallon \$1 57,	-	-	-	-	144 04
1,501 pounds of tallow @ 16 $\frac{1}{2}$ cents,	-	-	-	-	247 66
Packing and small stores,	-	-	-	-	439 42
Repairs,	-	-	-	-	3,293 30
					<hr/>
					\$31,326 44

Cost of raising water into reservoir per million gals.,	\$15 98 $\frac{3}{10}$
Cost of raising water, per million gallons, 1 foot high,	07 $\frac{68}{100}$

Operations of the Roxborough Works for the year 1873.

MONTH.	Running time.		Number of strokes during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Cubic feet of water pumped per month.	Coal consumed.*				Tallow consumed.		Oil consumed.	
	Days.						Tons.	Cwts.	Qrs.	Lbs.	Lbs.	Qts.		
January	26		157,626	46,499,670	1,788,449	6,216,533	231	16	1		194	38		
February	22		144,601	42,627,795	1,937,627	5,698,903	170	18	1		156	26		
March	26		158,083	46,034,485	1,793,634	6,234,557	197	13			165	16		
April	25		215,134	48,506,230	1,940,249	6,484,790	209	17	1		156	36		
May	27		184,748	51,500,660	2,018,543	7,286,184	246	02	3		169	22		
June	25		221,066	65,220,370	2,608,815	8,719,300	290	12			193	16		
July	27		256,562	67,043,990	2,483,111	8,963,100	275	09	1		189	17		
August	26		224,605	62,065,125	2,421,735	8,417,797	273	06	3		159	19		
September	26		228,069	67,279,355	2,587,667	8,994,566	278		1		155	16		
October	25		220,242	64,971,890	2,598,856	8,686,012	261	04	1		82	17		
November	24		226,699	47,294,455	1,970,602	6,324,125	188	19	1		15	17		
December	26		280,316	59,743,970	2,297,845	7,987,161	239		3		13	21		
Totals	305		2,517,601	673,287,495	2,203,928	90,013,028	2,862	02			1,596	251		

* The amount of coal given is the total amount consumed for raising steam, banking fires, and without any deduction whatever for ashes or clinker.

ROXBOROUGH WORKS.

Supplies purchased during 1873.

Oil for lighting works, - - - -	\$209 00
64½ gallons of oil (castor and cylinder), - -	99 91
1,443 pounds of tallow, - - - -	187 93
2,842 $\frac{7}{100}$ tons coal, - - - -	13,499 78
Packing and small stores, - - - -	257 96
Repairs, - - - -	2,094 83
	<hr/>
	\$16,349 41

Running Expenses for 1873.

Salaries of engineers and firemen, - - -	\$5,850 00
2,862 $\frac{9}{100}$ tons coal consumed at an average price about \$4 $\frac{79}{100}$, - - - -	13,709 45
132½ gallons of oil for lighting works, - -	103 15
65½ gallons of oil, consumed at an average about \$1 $\frac{55}{100}$, - - - -	101 14
1,596 pounds of tallow, consumed at an average of about 13 $\frac{2}{100}$ cents, - - - -	207 80
Packing and small stores, - - - -	257 96
Repairs, - - - -	2,094 83
	<hr/>
	\$22,324 33
Cost of raising water into reservoir, per million gals.,	\$33 15 $\frac{7}{10}$
Cost of raising water, per million gallons, one foot high, - - - -	09 $\frac{92}{100}$

CHESTNUT HILL WORKS.

Wages,	-	-	-	-	-	-	\$1,484	94
Hardware,	-	-	-	-	-	-	151	24
Lumber,	-	-	-	-	-	-	57	09
Coal and wood,	-	-	-	-	-	-	600	95
Repairs,	-	-	-	-	-	-	39	16
Oil,	-	-	-	-	-	-	126	25
Hauling,	-	-	-	-	-	-	200	00
Boat,	-	-	-	-	-	-	35	50
Gauges,	-	-	-	-	-	-	96	75
Steam cocks,	-	-	-	-	-	-	13	50
Cocoa matting,	-	-	-	-	-	-	39	25
Stone,	-	-	-	-	-	-	42	60
Gum-packing, small stores, &c.,	-	-	-	-	-	-	94	01
							<hr/>	
							\$2,981	24

*Amount of Water pumped by all the Works during the year
1873.*

MONTHS.	Gallons of water pumped during the month.	Average number of galls. pumped per day.
January, . . .	980,447,053	33,600,583
February, . . .	916,928,311	34,713,907
March, . . .	1,012,454,477	34,055,188
April, . . .	1,066,502,276	36,582,865
May, . . .	1,207,246,648	39,730,741
June, . . .	1,350,050,122	45,826,238
July, . . .	1,405,737,764	47,676,064
August, . . .	1,378,043,723	45,686,697
September, . . .	1,293,369,048	44,248,521
October, . . .	1,297,820,634	43,020,189
November, . . .	1,121,617,063	38,891,829
December, . . .	1,192,981,324	39,281,389
Totals, . . .	14,223,198,443	40,276,184

Amount of Water pumped by all the Works from 1854 to 1873, inclusive, in U. S. Gallons.

Year.	FAIRMOUNT.		DELAWARE.		SCHUYLKILL.		TWENTY FOURTH WARD ROXBOROUGH AND GER- AND BELMONT.		MANTOWN.		TOTALS.	
	Total water pumped.	Daily average.	Total water pumped.	Daily average.	Total water pumped.	Daily average.	Total water pumped.	Daily average.	Total water pumped.	Daily average.	Total for all the works.	Total daily average.
1854.....	2,286,402,222	6,264,115	618,173,121	1,693,625	1,366,011,659	3,742,497	.....	.....	.....	.....	4,270,786,002	11,700,786
1855.....	2,783,736,830	7,611,756	56,780,060	1,556,197	1,525,987,725	4,178,096	9,538,176	103,606	.....	.....	4,876,528,635	13,344,323
1856.....	2,867,188,965	7,843,849	769,566,040	2,102,439	1,980,657,500	5,500,329	52,577,642	143,654	.....	.....	5,683,361,324	15,528,309
1857.....	3,039,797,730	8,383,067	811,462,085	2,223,183	2,315,832,461	6,344,746	121,948,846	334,654	.....	.....	6,317,963,116	17,369,323
1858.....	3,058,418,667	8,379,229	757,187,690	2,074,486	2,819,641,992	7,725,044	204,177,624	639,390	.....	.....	6,839,425,959	18,738,153
1859.....	3,390,271,757	9,288,415	868,567,100	2,373,633	2,643,756,620	7,243,114	265,456,176	727,277	.....	.....	7,168,031,647	19,638,442
1860.....	3,612,989,017	9,867,378	872,144,980	2,373,727	2,606,900,210	7,390,849	283,646,070	774,112	.....	.....	7,465,740,277	20,382,066
1861.....	3,731,785,628	10,224,070	983,805,740	2,665,358	2,527,182,710	6,928,788	353,313,903	967,956	.....	.....	7,590,679,938	20,728,985
1862.....	3,594,724,753	9,766,369	909,126,440	2,490,757	3,038,527,420	8,324,732	420,507,816	1,132,076	.....	.....	7,932,886,423	21,733,935
1863.....	5,786,712,091	15,306,060	1,182,531,680	3,239,834	2,293,769,280	6,037,724	625,754,090	1,440,422	.....	.....	9,438,775,141	26,024,041
1864.....	5,970,801,329	16,358,360	1,090,884,060	2,988,723	1,725,444,660	4,727,245	519,877,800	1,420,548	.....	.....	9,307,007,849	25,498,651
1865.....	7,082,015,640	19,402,791	1,429,591,700	3,916,689	2,095,038,484	5,493,266	539,923,660	1,468,283	.....	.....	11,050,569,154	30,275,532
1866.....	7,721,817,582	21,155,664	1,271,841,020	4,835,897	947,662,428	3,484,016	636,665,380	1,662,099	106,369,060	537,217	10,614,344,464	29,080,396
1867.....	7,930,416,894	21,951,694	427,933,000	3,926,010	1,590,248,454	5,502,596	677,717,190	1,856,759	177,104,200	562,236	10,863,421,498	29,771,018
1868.....	8,024,539,911	21,929,053	706,442,350	2,475,823	2,337,365,642	6,401,394	727,824,780	1,987,579	190,015,200	684,776	11,983,178,883	33,378,628
1869.....	7,489,611,069	20,519,482	1,042,780,963	2,987,911	2,735,569,020	7,494,710	928,561,494	2,544,004	218,229,800	619,871	12,414,752,336	34,047,409
1870.....	8,134,985,170	22,523,242	1,186,131,144	3,443,932	3,003,737,166	8,484,688	*850,011,192	2,426,246	227,946,600	641,277	13,392,808,272	37,249,385
1871.....	8,821,728,593	24,196,782	1,073,378,521	3,038,640	2,201,294,172	6,117,928	1,054,210,990	2,896,748	+113,787,205	1,379,775	13,498,399,481	37,631,379
1872.....	7,220,091,685	19,898,776	1,474,531,040	4,864,265	2,223,267,070	6,328,765	1,456,756,728	3,998,935	518,811,050	2,025,076	13,160,018,461	37,583,594
1873.....	8,717,638,594	24,077,029	1,364,109,854	4,144,619	1,508,295,800	4,190,265	1,953,966,676	6,360,343	673,287,436	2,263,921	14,223,198,443	40,276,184

*The Works at Belmont were started in October, 1870, at which date the Twenty fourth Ward Works were abandoned.

†The Roxborough Works commenced pumping December 21, 1870.

The Germantown Works were abandoned September 30, 1872. Included in the total amounts for Roxborough for 1871, 128,098,800 gallons, and for 1872, 59,114,200 gallons, were pumped at the Germantown Works.

Amount of water pumped by all the Works during the years 1868, 1869, 1870, 1871, 1872, and 1873.

MONTHS.	1868		1869		1870		1871		1872		1873	
	Gallons of water pumped during the month.	Average number of gallons pumped per day.	Gallons of water pumped during the month.	Average number of gallons pumped per day.	Gallons of water pumped during the month.	Average number of gallons pumped per day.	Gallons of water pumped during the month.	Average number of gallons pumped per day.	Gallons of water pumped during the month.	Average number of gallons pumped per day.	Gallons of water pumped during the month.	Average number of gallons pumped per day.
Jan.....	730,164,667	24,851,784	877,284,223	28,507,994	823,501,020	26,629,192	1,002,008,583	33,421,326	698,095,642	31,789,666	980,447,053	33,000,583
Feb.....	825,584,566	30,914,237	857,235,551	30,850,764	816,804,722	29,377,975	907,177,896	33,644,729	905,458,774	32,428,841	916,928,311	31,713,907
March.....	849,225,424	28,142,180	804,817,745	26,219,793	821,476,247	28,676,516	1,038,157,449	34,298,641	910,517,957	30,313,407	1,012,454,477	34,055,188
April.....	860,197,073	29,632,897	1,044,170,483	35,074,275	1,054,498,246	36,454,860	1,081,525,860	36,496,296	999,791,625	34,103,906	1,066,502,276	36,582,865
May.....	968,861,910	31,719,122	1,120,559,740	36,530,528	1,204,765,895	37,445,308	1,155,557,242	37,706,406	1,230,409,231	40,890,034	1,207,246,618	39,730,741
June.....	1,124,258,325	37,916,924	1,197,573,103	39,935,103	1,220,092,275	40,669,741	1,241,946,831	41,518,289	1,173,692,567	42,680,065	1,350,050,122	45,826,238
July.....	1,225,455,237	39,573,452	1,204,468,903	41,757,063	1,397,614,410	46,008,735	1,266,880,762	41,506,545	1,278,226,163	42,943,079	1,405,737,764	47,676,064
Aug.....	1,257,133,188	40,555,905	1,139,394,772	38,754,670	1,328,758,809	43,663,187	1,307,712,052	42,354,705	1,344,344,562	45,954,377	1,378,043,723	45,686,697
Sept.....	1,113,085,190	37,186,021	1,111,435,089	37,047,826	1,201,946,583	41,105,307	1,226,827,488	41,156,843	1,185,883,592	40,764,905	1,293,360,048	44,248,521
Oct.....	1,169,605,506	37,907,082	1,098,648,339	35,440,337	1,264,416,410	40,845,513	1,210,210,376	40,125,119	1,187,763,266	39,777,853	1,297,820,634	43,020,189
Nov.....	973,100,970	32,833,488	970,776,989	32,359,234	1,186,281,027	39,880,989	1,098,477,072	37,005,607	1,038,793,747	36,214,583	1,121,617,063	38,891,820
Dec.....	888,116,818	29,310,439	898,388,339	29,151,189	1,072,655,628	35,035,201	952,017,870	31,742,506	947,008,335	33,133,416	1,192,981,324	40,261,389
Totals.....	11,985,178,883	33,378,628	12,414,752,336	34,040,409	13,392,808,272	37,249,385	13,498,399,481	37,631,379	13,100,018,461	37,583,594	14,223,198,443	40,276,184

*Statement of the Operations of Shops from January 1, 1873, to
December 31, 1873.*

DR.

To stock on hand January 1, 1873, - - -	\$8,523 34
567,267 lbs. iron castings, - - -	20,883 70
46,848 " wrought iron, - - -	2,212 84
3,138 " steel, - - -	643 04
18,862½ " brass castings, - - -	4,670 20
14,710 " lead, - - -	1,176 80
884 " leather, - - -	478 76
30 " listing, - - -	4 50
300 " gasket, - - -	51 00
20 " tallow, - - -	3 60
44,590 feet lumber, "assorted," - - -	2,211 19
104 tons coal, - - -	707 50
353 galvanized spindles for stops, - - -	122 85
Bolts, nuts, washers, &c., - - -	1,823 06
Hardware for shop, districts, and works, - - -	2,006 26
Wrought-iron tubing, &c., - - -	435 13
Paints, oils, &c., - - -	722 37
Files bought and re cut, - - -	318 01
Wages paid hands and incidentals, - - -	18,143 38
	\$65,137 53

CR.

By	12 stop-cocks, 3 inch, at \$25 00,	300 00
	106 " 4 " at 25 00,	2,650 00
	406 " 6 " at 30 00,	12,180 00
	6 " 10 " at 85 00,	510 00
	29 " 12 " at 120 00,	3,480 00
	8 " 16 " at 200 00,	1,600 00

Amounts carried forward, \$20,720 00 \$65,137 53

Amounts carried forward,	\$20,720 00	\$65,137 53
10 stop cocks, 20 inch at \$225 00,	2,250 00	
7 " 36 " at 750 00,	5,250 00	
920 " boxes, at 4 00,	3,680 00	
333 fire-plugs, at 36 00,	11,988 00	
423 " casings at 18 00,	7,611 00	
692 frames and covers, at 8 00,	5,536 00	
4,400 ½-inch ferrules, at 55,	2,420 00	
170 ½ " " at 55,	93 50	
104 ¼ " " at 55,	57 20	
31 1 " " at 55,	17 05	
Repairs for First District,	2,558 59	
" Second "	3,453 37	
" Third "	3,150 80	
" Fourth "	2,923 11	
" Germantown District,	2,700 43	
" Manayunk "	1,003 12	
" Fairmount Works,	2,241 44	
" Delaware "	529 76	
" Schuylkill "	1,628 94	
" Belmont "	1,353 90	
" Roxborough "	1,255 25	
" Belmont Engine No. 3,	512 64	
" Storage reservoir,	3,282 80	
" Belmont "	615 57	
" Fairmount dam,	5 66	
" Building and Grounds,	653 06	
" Iron railing at Fairmount,	42 07	
" Pattern account,	389 01	
" Fixed stock,	366 67	
" Fifth and Chestnut " office,"	1,927 84	
" Water metres,	24 46	
" Public Building Commission,	142 48	
" Chestnut Hill Works,	240 05	
Amounts carried forward,	\$90,623 77	\$65,137 53

Amounts brought forward,	\$90,623 77	\$65,137 53
Item 9, loan of May 19, 1873, 4th District,	260 64	
“ 10, “ “ First “	32 26	
“ 11, “ “ “ “	22 35	
“ 12, “ “ “ “	148 09	
Repairs for steam pump, Roxborough,	14 14	

Stock on hand, viz :

4 square thread screws, 3-inch at 5 00	20 00
2 “ “ “ 4 “ at 5 00	10 00
11 “ “ “ 6 “ at 5 00	55 00
3 “ “ “ 10 “ at 8 00	24 00
8 “ “ “ 16 “ at 12 00	96 00
7 “ “ “ 20 “ at 14 00	98 00
29 socket screws, 4 “ at 5 00	145 00
19 “ 6 “ at 5 00	95 00
59 “ for repairs, at 5 00	295 00
2 screws, 16 “ at 12 00	24 00
5 “ 30 “ at 20 00	100 00
2 “ 36 “ at 25 00	50 00
137 spindles, 4 “ at 5 00	685 00
51 “ 6 “ at 5 00	255 00
5 “ 8 “ at 5 00	25 00
18 “ 10 “ at 8 00	144 00
14 “ 12 “ at 10 00	140 00
800 lbs. bolts, nuts, &c., at 15½	124 00
1,761 “ wrought iron forgings	335 00
2 sets of 36-inch gear wheels	25 00
55 plug nuts, chains, &c., at 1 25	68 75
22,442 lbs. wrought iron,	06 1,346 52
1,300 “ cast steel,	20 260 00
43,884 “ iron castings,	04 1,755 36
864 “ finished brasses,	353 60
2,976 “ unfinished brasses,	982 08
2,792 feet of lumber, “assorted,”	251 28
Amounts carried forward,	\$98,863 84 \$65,137 53

Amounts brought forward,	\$98,863 84	\$65,137 53
154 wood plugs,	77 00	
2 kegs of nails,	10 00	
108 assorted handles,	27 00	
48 eye bolts,	24 00	
24 steel chisels, "assorted,"	24 00	
175 lbs. leather,	78 75	
Hardware, shovels, &c.,	350 00	
Paints, oils, &c.,	170 00	
To balance, nominal profit of shop,		34,487 06
	<u>\$99,624 59</u>	<u>\$99,624 59</u>

Number of valves raised in the different districts during the year 1873.

	3-inch.	4-inch.	6-inch.	10-inch.	12-inch.	16-inch.	20-inch.	30-inch.	Total.
First District.....		8	16						24
Second do	5	3	19			6	2		35
Third do			4	1					5
Fourth do		5	12	2	1			2	22
Germantown									
Manayunk									
Totals.....	5	16	51	3	1	6	2	.2	86

Stop cocks, Fire-plugs, and Casings, Stop-cock Boxes, Frames, Covers, and Ferrules, made and fitted up at the City shop from the year 1867 to 1873, inclusive.

	3 inch stop cocks.	4 inch stop cocks.	6 inch stop cocks.	8 inch stop cocks.	10-inch stop cocks.	12 inch stop cocks.	16-inch stop cocks.	20-inch stop cocks.	23-inch stop-cocks.	30 inch stop cocks.	36-inch stop-cocks.	Total stop cocks.	New fire plugs.	Fire plugs, cases.	Stop boxes.	Frames and covers.	½ inch ferrules.	¾ inch ferrules.	¾-inch ferrules.	1-inch ferrules.	Total ferrules.
1867.....		34	108	1	4	5	5					157	148	227	433	164	1,770	460	137	117	2,434
1868.....	1	51	04	2	4	5			4	2	1	164	143	222	492	165	2,501	257	84	24	2,866
1869.....	8	71	175	4	6	8	2	4	2	2	4	286	202	291	600	279	3,700	431	50		4,181
1870.....	7	93	208	4	4	10	5			6	6	343	223	307	600	317	4,200	450	100	100	4,850
1871.....		113	218	9	13	17	7	6	2	6	4	395	178	254	641	459	5,025	100	25		5,150
1872.....	15	120	226	8	15	6				4	3	397	226	324	620	409	5,200	100	50	36	5,386
1873.....	12	108	406		7	29	8	10			17	597	333	423	920	692	4,400	170	104	81	4,705
	43	590	1,435	28	53	80	27	20	8	20	35	2,339	1,451	2,048	4,306	2,485	26,796	1,968	550	308	29,622

*Stop-cocks, Stop-cock Boxes, Frames and Covers, Fire-plugs, Cases, Lead, and Gasket delivered from
918 Cherry Street during 1873.*

	3 inch stop cocks.	4-inch stop cocks.	6 inch stop cocks.	8 inch stop cocks.	10 inch stop cocks.	12-inch stop cocks.	16-inch stop cocks.	20-inch stop-cocks.	30 inch stop cocks.	36 inch stop cocks.	Frames and covers.	Fire plugs.	Cases.	Stop boxes.	Pounds lead.	Pounds ga-ket.
First District.....		25	49			1					66	46	60	94	8,368	850
Second ".....	1	15	64	5							111	69	80	166	24,630	830
Third ".....		24	108								160	86	124	244	37,216	1,520
Fourth ".....		20	97								125	53	95	189	28,969	1,795
Germantown District.....	5	9	53								96	69	51	106	22,167	1,060
Manayunk ".....		7	24			3					39	33	27	87	24,989	590
Item 12, Loan of May 19, 1873, First District.....		6	12			1	6	6			31	33	4	31	21,617	100
" 11, " " " " " ".....			11								28			37	21,498	250
" 10, " " " " " ".....								1								
" 9, " " " " Fourth ".....						17					15			15	22,334	1,050
Storage Reservoir.....		7	5			2				16	12	2	2	12	11,815	780
Delaware ".....										2						
Belmont Works.....									1		4					
" new Engine No. 3.....															1,940	
Fairmount Park.....		1	1								2			2		
Fifth and Chestnut.....		2	1	1	4	3	1	1			3	2	2	3		
Schoykill Works.....															65	
Fairmount Dam.....															142	
Totals.....	6	110	429	6	4	27	7	8	1	18	692	346	446	936	222,764	8,825

DISTRIBUTION.

Service and supply mains have been laid in the following streets
in 1873.

FIRST DISTRICT.

*Account of Iron Pipes laid in the First, Second, Third, Fourth,
and Twenty-sixth Wards.*

Street.	Location.	Size.	
		Inches.	Feet.
Bond,	From Morris to Dickinson,	4	759
Griffith,	“ do do	4	909
Twelfth,	“ Passyunk Av. to 220 feet north of Tasker,	6	798
Morris,	“ Twelfth to Thirteenth,	6	450
Gerhard,	“ Mifflin, South,	4	150
Latonia,	“ Nineteenth to Long Lane,	4	729
Nineteenth,	“ Federal to Wharton,	12	637
Kater,	“ Seventeenth to Eighteenth,	4	459
Godfrey,	“ Terminus west of Second to Moyamensing Av.,	4	259
Riggs,	“ Dodier to Verner,	4	359
Catharine,	“ Twenty-second to Twenty- third,	6	470
Long Lane,	“ Federal to Tasker,	6	2,382
Dudley,	“ Seventh to Eighth,	4	459
Sixth,	“ Snyder to 93 feet south of Jackson,	6	607
Emily,	“ Sixth to Seventh,	4	459
Titan,	“ Nineteenth to Twentieth,	4	461
Owen,	“ Sixth to Seventh,	4	459
Auburn,	“ Jackson to Wolf,	4	400
Dickinson,	“ Twelfth to Thirteenth,	6	500

Street.	Location.	Size.	
		Inches.	Feet.
Galloway,	From Twenty-fifth to Twenty-sixth,	4	459
Twenty-sixth,	" Galloway (north),	6	72
Webster,	" Eighteenth to 70 ft. east of Nineteenth,	4	380
Hummell,	" Twenty-ninth (west),	4	330
Scott,	" Eighth to Ninth,	4	459
Wharton,	" Thirty-first to Thirty-fourth,	6	1,043
Mount Holly,	" Reed to Dickinson,	4	450
Napa,	" Reed to Gray's Ferry Road,	4	876
Deshong,	" Twenty-seventh, (west),	4	195
Ellsworth,	" do do	6	92
Eleventh,	" Mifflin to McKean,	6	450
Miller,	" Washington to Barnett,	4	269
Broad,	" do to Snyder,	20	5,094
Washington Av.,	" Fifth to Moy'ng Av.,	16	5,865
Moyamensing Av.,	" Washington to Snyder,		
Twenty-second,	" do to Federal,	20	850
Federal,	" Twenty-second to Twen- ty third,		
Thirty-first,	" Wharton to Gray's Ferry Road,	6	422
Connections,		12	48
do		6	647
do	Penna. Railroad, Swanson bel. Christian,	4	12
Plug connections,		4	508
Total number of feet of pipe laid,			30,227
Number of feet of new pipe laid,		4	9,800
"	"	6	7,933
"	"	12	685
"	"	16	5,865
"	"	20	5,944
Total number of feet,			30,227
Or 5 miles 3,827 feet.			

SECOND DISTRICT.

Account of Iron Pipes laid in the Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Twenty-fourth, and Twenty-seventh Wards.

Street.	Location.	Size.	
		Inches.	Feet.
Walnut,	From east of Forty-third to Forty-fourth,	8	600
Monroe Av.,	" Lancaster Av. to Fifty-second,	6	1,900
Thirty-ninth,	" Locust to Irving,	6	204
Arch,	" Seventeenth east to dead end,	6	180
Markoe,	" Seneca to Lancaster Av.	6	1,160
Elm,	" Thirty-third to Thirty-fourth,	6	382
Forty-sixth,	" Seneca to Westminster,	6	580
"	" " Oregon,	6	393
Hutton,	" Fortieth to Forty-first,	6	630
"	" Forty-second to Lancaster Avenue,	6	738
Fifty-second,	" Lancaster Avenue to North side of Girard Avenue,	6	2,010
Pine,	" Thirty-ninth to Fortieth,	8	660
Robin,	" " "	6	670
Filbert,	" Thirty-eighth to Forty-first,	6	1,928
Darby Road,	" Forty-ninth to Railr'd bridge,	6	663
Forty-ninth,	" Darby Road to Greenway Avenue,	6	473
Thirty-second,	" Chestnut to Spruce,	8	1,309
West side of Broad,	" Brighton to Lardner,	6	400
East side of Broad,	" Budd to 100 ft. South of Pine,	6	450
"	" Lombard to South,	6	434
Baring,	" Fortieth to Lancaster Ave.,	6	1,200
Spruce,	" Thirty fourth to Darby R'd,	8	1,363
Silverton Avenue,	" Haverford Road to Forty-eighth,	6	1,000
Fiftieth,	" Haverford Road to Aspen,	6	300

Street.	Location.	Size.	
		Inches.	Feet.
Thirty-fourth, Story,	From Race to Bridge,	6	1,522
	“ Thirty-fifth to Thirty-sixth,	4	410
Saunders Avenue,	“ Filbert to Lancaster Ave.,	6	1,104
W. s. Thirty-second,	“ Sansom to first street north of Locust,	4	772
Woodward,	“ Darby Road (east),	6	280
Irving,	“ Thirty-seventh to Thirty- eighth,	4	530
Budd,	“ Haverford to Bridge,	4	450
Haverford,	“ Fifty-second to Fifty-fourth,	6	1,200
Vine,	“ Haverford to Fifty-seventh,	6	2,600
Centre,	“ Thirty-seventh to Thirty- eighth,	6	565
Thirty-ninth,	“ Grape to 150 feet north of Sycamore,	6	370
Lex or Mica,	“ Transcript to Eadline,	4	410
Lewis,	“ Thirty-sixth (west),	4	132
Paschall,	“ Fifty-first to Fifty-second,	6	874
Sycamore,	“ Dead end (west) to De Kalb,	8	72
Connecting Forty ninth with Greenway Avenue,		6	150
“ Fifty-second with Monroe Avenue,		6	24
Connection at Asylum for Insane,		6	530
“ Murphy & Allison's Mill,		6	24
“ American Academy of Music,		4	36
“ Cathedral of St. Peter and St. Paul,		4	6
Plug connections,		4	897
Total number of feet of pipe laid,			32,585
Number of feet of new pipe laid,		4	3,643
“ “ “ “		6	24,938
“ “ “ “		8	4,004
Total number of feet,			32,585
Or 6 miles 905 feet.			

THIRD DISTRICT.

Account of Iron pipes laid in the Eleventh, Twelfth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twenty-third, and Twenty-fifth Wards.

Street.	Location.	Size.	
		Inches.	Feet.
Lark,	From Auburn to Wayne,	4	324
Bright,	“ “ “	4	324
Waterloo,	“ Cambria to Lehigh Avenue,	4	1,086
Indiana,	“ Kensington Avenue to Hart Lane,	6	1,512
Belgrade,	“ Lehigh Ave. to Anthracite,	6	300
Third,	“ Cumberland to Lehigh Ave.,	6	1,104
Ormes,	“ Somerset to Cambria,	6	264
William,	“ Thompson to Walker,	6	684
Tioga,	“ Richmond to Almond,	6	1,116
Volkmar,	“ Hanover (east),	4	456
Hewston,	“ Belgrade to Cedar,	4	684
Emma,	“ Otis to Berger,	4	492
Palethorp,	“ Diamond to Susquehanna,	4	600
Clementine,	“ Frankford Road to Emerald,	6	492
Wellington,	“ Thompson to Cedar,	6	1,404
Cumberland,	“ Second to Third,	6	720
Palethorp,	“ York to Huntingdon,	4	1,152
Rorer,	“ Cambria to Indiana,	4	564
Cambria,	“ Rorer to Boudinot,	6	552
Hart Lane,	“ Cambria to Kensington Ave.,	4	360
“ E,”	“ Kensington Ave. to Indiana,	6	528
Edgemont,	“ Allegheny to Wellington,	6	456
Thompson,	“ Clearfield to Wellington,	6	1,260
Tuscullum,	“ Cambria to Front,	6	672
Seventh,	“ York to Huntingdon,	6	1,140
Reese,	“ York to Huntingdon,	6	1,104
Leithgow,	“ Hackley to Berks,	4	252

Street.	Location.	Size.	
		Inches.	Feet.
Cumberland,	From Marshall to Germantown R. R.,	6	1,068
Huntingdon,	" Fifth to Seventh,	6	1,052
Boudinot,	" Somerset to Cambria,	6	420
Melvale,	" Neff to Clearfield,	6	672
Marshal,	" Cumberland to Huntingdon,	6	540
Hope,	" Lehigh Avenue to Somerset,	6	552
Salmon,	" Tioga to Venango,	4	774
Tioga,	" Almond to Belgrade,	6	660
Garnet,	" Hart Lane to Reading R. R.,	6	1,044
Cambria,	" Frankford Road to Trenton Avenue,	6	840
Emlin,	" Gaul to Thompson,	6	678
Hewston,	" Cedar to Memphis,	6	324
Emerald,	" Venango to Harrowgate Lane,	6	408
Madison Avenue,	" Emerald to Hart Creek,	6	324
Cambria,	" Kensington Avenue to Hart Creek,	6	456
Stanton,	" Cambria to Hart Lane,	6	456
Orkney,	" York (south),	6	216
Lambert,	" Venango to Olivia,	6	396
Victoria,	" Richmond to Lambert,	6	384
Neff,	" Edgemont to 50 feet west of Almond,	6	768
Tulip,	" Somerset to Auburn,	6	384
Bright,	" Wayne to Trenton Avenue,	6	264
Tucker,	" Memphis to Sepviva,	4	600
Jackson,	" Memphis to Tulip,	4	300
Sewell,	" Jackson to Tucker,	4	252
Jackson,	" Sepviva to Trenton R. R.,	4	240
Tucker	" Martha to Trenton R. R.,	4	300
Philip,	" York to Cumberland,	4	540
Bodine,	" York to Cumberland,	4	378
Fairhill,	" York to Lehigh Avenue,	6	1,644
Fairhill,	" Lehigh Avenue to Cambria,	6	1,080

Street.	Location.	Size.	
		Inches.	Feet.
Hall,	From Amber to Frankford Road,	6	360
Fourth,	“ York to Lehigh Avenue,	6	1,650
Sixth,	“ Allegheny to Indiana,	4	1,152
	Allegheny Avenue, both sides, from Richmond to Kensington Avenue,	6	3,180
	Connection at Neafie, Levy & Co., Beach and Richmond Streets,	4	144
	“ North Pennsylvania R. R. Co., Front and Berks Streets,	4	20
	Plug connections,	4	905
	Total number of feet of pipe laid,		<u>45,087</u>
	Number of feet of new pipe laid,	4	12,391
	“ “ “ “	6	32,696
	Total number of feet,		<u>45,087</u>
	Or 8 miles 2,787 feet.		

FOURTH DISTRICT.

Account of Iron Pipes laid in the Thirteenth, Fourteenth, Twentieth, Twenty-first, Twenty-eighth, and Twenty-ninth Wards.

Street.	Location.	Size.	
		Inches.	Feet.
Dacota,	From Tenth to Eleventh,	6	456
Eighth,	“ Diamond to Dauphin,	6	1,128
Susquehanna,	“ Marshal to Seventh,	6	240
Susquehanna,	“ Franklin to Germantown R. R.,	6	1,092
Montgomery Ave.,	“ Twenty-second to Ridge Ave.,	6	1,236
Jefferson,	“ Twenty-seventh to Twenty-eighth,	6	420
Cambridge,	“ Twenty-eighth to Twenty-ninth,	6	444

Street.	Location.	Size.	
		Inch ^{s.}	Feet.
Poplar,	From West College Avenue to Twenty-ninth,	6	1,620
Meredith,	“ Twenty-fourth to Twenty- fifth,	4	444
Alder,	“ Cumberland to York,	6	564
Eleventh,	“ Susquehanna to half way be- tween Somerset & Lehigh,	6	2,424
York,	“ Tenth to Alder,	6	312
Fell,	“ Uber to Nineteenth,	6	240
Twentieth,	“ Norris to Diamond,	6	492
Twenty-seventh,	“ Master to 264 feet north of Columbia,	6	1,776
Allegheny Avenue,	“ Seventeenth to half way be- tween Fifteenth and Six- teenth, both sides,	6	1,056
Master,	“ Twenty-fourth to Twenty- fifth,	6	456
A	“ Twenty-fourth to Twenty- fifth,	4	456
Thompson,	“ Twenty-fourth to Twenty- fifth,	6	480
Willington,	“ Jefferson to Oxford,	6	540
Twentieth,	“ Coates to Poplar,	6	1,668
Coates,	“ Twentieth to West,	6	336
Twenty-sixth,	“ Jefferson to Ridge Avenue,	6	1,896
Twenty-fifth,	“ Master to N. College Avenue,	6	1,044
Twenty-fourth,	“ Thompson to N. College Av.,	6	276
Delhi,	“ Tahassa to Cumberland,	6	360
Cumberland,	“ Delhi to Tenth,	6	144
Page,	“ Sixteenth to Seventeenth,	6	468
Norris,	“ Sixteenth to Seventeenth,	6	468
Sixteenth,	“ Norris to Diamond,	6	516
Warnock,	“ Somerset (north),	6	504
Olive,	“ Nineteenth to Shirley,	4	240
Olive,	“ Seventeenth to Eighteenth,	4	456

Street.	Location.	Size.	
		Inches.	Feet.
Ninth,	From Berks to Susquehanna,	6	1,164
Columbia Avenue,	“ Twenty-eighth to Twenty-ninth,	6	504
Summerville,	“ Eleventh (west),	6	156
Norris,	“ Eighteenth to Nineteenth,	6	456
Thirteenth,	“ Norris to Diamond,	6	540
Fountain,	“ Sixteenth to Seventeenth,	6	432
Bouvier,	“ Jefferson to Oxford,	6	540
Norris,	“ Tenth to Eleventh,	6	456
Warnock,	“ Diamond to Norris,	6	576
Park Avenue,	“ Diamond to Susquehanna,	6	564
Twenty-third,	“ Oxford to Norris,	6	2,196
Delhi,	“ Dauphin to Susquehanna,	6	540
Taney,	“ Poplar to Mt. Pleasant,	6	1,080
Bouvier,	“ Columbia to Montgomery,	6	540
Sixteenth,	“ “ “	6	540
Alder,	“ Thompson to Master,	4	480
Twenty-fourth,	“ Columbia to Ridge Avenue,	6	300
Ridge Avenue,	“ Twenty-second to Thirty-third,	12	6,816
Cross connections,	“ “ “	6	1,008
“ “ “	“ “ “	4	216
Connection—Uber and Berks,		6	144
Twenty-second,	From Jefferson to Ridge Avenue,	20	720
Connection, Belmont Works,		12	36
“	Storage Reservoir,	3	594
“	“ “	4	60
“	“ “	6	4,740
“	“ “	12	360
“	“ “	36	888
“	Thirty-second, Thirty-third, and Master,	4	12
“	“ “ “	6	12
“	“ “ “	30	24
“	Fairmount Works,	3	234
“	Dead ends, Twelfth and Division,	4	36
“	Stops,	6	228

Street.	Location.	Size.	
		Inches.	Feet.
Connection, Baldwin's Locomotive Works, Seventeenth and Hamilton,		6	168
" Yewdell's mills, Spring Garden, above Twenty-fourth,		4	36
" Reading R. R., Master below Ninth,		6	24
Plug connections,		4	611
Total number of feet of pipe laid,			52,283
Number of feet of new pipe laid,		3	828
" " " "		4	3,047
" " " "		6	39,564
" " " "		12	7,212
" " " "		20	720
" " " "		30	24
" " " "		36	888
Total number of feet,			52,283
Or 9 miles 4,763 feet.			

FRANKFORD.

Account of Iron Pipes laid in Frankford.

Street.	Location.	Size.	
		Inches.	Feet.
Penn,	From Unity to Pine,	6	624
Adams,	" Leiper to 140 feet north of Sellers,	6	1,584
Oxford,	" Main to Hedge,	6	840
"	" Hedge to Worth,	6	1,536
"	" Worth to Trenton R. R.,	6	180
Worth,	" Oxford to Orthodox,	6	912
Orthodox,	" Melrose to Bridge,	6	1,152
Worth,	" Orthodox to Margaretta,	6	576
Lasher,	" " Meadow,	6	516
Arrot,	" Penn to Franklin,	6	276
Orthodox,	" Richmond to 150 ft. west of West St.,	6	1,632
Total number of feet of pipe laid,			9,828
Total number of feet of new pipe laid,		6	9,828
Or 1 mile 4,548 feet.			

GERMANTOWN.

Account of Iron Pipes laid in Germantown.

Street.	Location.	Size.	
		Inches.	Feet.
E. Walnut Lane,	From Morton (east),	4	170
Mill,	" Hancock (east),	4	1,353
Germantown Av.,	" Cayuga to Rising Sun Lane,	6	7,086
Broad,	" Germantown Av. to Tioga,	6	1,305
Twenty-second,	" Tioga to Westmoreland,	6	1,152
Jefferson,	" Germ. Av. to Wakefield,	6	970
Wakefield,	" Main to Bringhurst,	4	288
Pulaski Av.,	" Manheim to Seymour,	6	498
Sixteenth,	" Tioga to Venango,	6	526
Nineteenth,	" Tioga to Ontario,	6	548
Bethlehem Avenue,	" Summit to Chestnut Av.,	6	1,102
Germantown Av.,	" End of pipe to Abington Av.,	6	760
Ross,	" Penn to Mill,	6	929
Chelton Av.,	" Morris to Bexley,	6	592
Wakefield,	" Penn (south),	4	225
Connections at Dobson's Mills,		4	24
Connections for Plugs,		4	580
Total number of feet of pipe laid,			<u>18,103</u>
Number of feet of new pipe laid,		4	2,640
" " " "		6	15,468
Total number of feet,			<u>18,108</u>
Or 3 miles 2,268 feet.			
Relaid, Duy's lane, from Germantown Avenue to	Germantown Railroad,	6	3,000
" Germantown Avenue, from Stenton Avenue	(south),	6	400
" Ridge Avenue, from Falls Bridge (south),	{	6	454
" Shoemaker's Lane, from Chew to Germantown		4	15
Avenue,		6	3,932
" Tulpehocken to Wayne,		10	340

MANAYUNK.

Account of Iron Pipes laid in Manayunk.

Street.	Location.	Size.	
		Inches.	Feet.
John,	From Cresson to Terrace,	4	392
Davis,	“ Cresson to Ezekiel,	4	481
Warner,	“ “ “	4	495
Cedar,	“ Apple to Tower,	6	276
Belair,	“ Grape to Martin,	4	190
Wood,	“ Centre to Baldwin,	6	168
Centre,	“ Wood to Hamilton,	6	82
Church,	“ do to Chestnut,	6	623
Chestnut,	“ Church to Walnut,	6	114
Wabash Avenue,	“ Green Lane to Centre,	4	342
Ritchie,	“ do do	4	474
Monroe,	“ Washington to Jackson,	4	93
Jackson,	“ Monroe to Jefferson,	4	745
Hermitage,	“ Washington to Smick,	6	328
Smick,	“ Hermitage to Jefferson,	6	147
Jefferson,	“ Smick to Winchester,	6	131
Winchester,	“ Jefferson to Ripka Avenue,	4	425
Jefferson,	“ East from Washington,	6	77
Monastery Avenue,	“ Ridge Avenue to Miskey,	6	300
Péchin,	“ Green Lane to Riley,	6	256
Riley,	“ Pechin to Mitchell,	4	500
Ridge Avenue,	“ Shur's Lane to Green Lane,	12	3,586
“	“ Hermit Lane to Shur's Lane,	10	979
“	“ Wissahickon Ave. to Rox- borough Avenue,	6	5,351
“	“ Leverington Avenue to Paoli Avenue,	6	4,423
“	“ School Lane to Wissahickon Creek or Park,	6	1,250
Plug connections,		4	390
Total number of feet of pipe laid,		-	22,618

Street.	Location.	Size.	
		Inches.	Feet.
Number of feet of new pipe laid,		4	4,527
“ “ “		6	13,526
“ “ “		10	979
“ “ “		12	3,586
Total number of feet,		<hr/>	
Or 4 miles 1,498 feet.		22,618	

Recapitulation of Pipe laid in the several districts during the year 1873.

WARDS.	3-inch.	4 inch.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	30-inch.	36-inch.	Totals.
1st District, 1, 2, 3, 4, 26.....		9,800	7,933			685	5,865	5,914			30,227
2d " 5, 6, 7, 8, 9, 10, 24, 26.....		3,643	24,938	4,004							32,585
3d " 11, 12, 16, 17, 18, 19, 23, 25.....		12,391	32,696								45,087
4th " 13, 14, 15, 20, 21, 28, 29.....	828	3,047	39,564			7,212		720	24	888	52,283
Frankford			9,828								9,828
Germantown		2,640	15,468								18,108
Manayunk		4,527	13,526		979	3,586					22,618
Totals.....	828	36,048	143,953	4,004	979	11,483	5,865	6,664	24	888	210,736

Being a total of 39 miles 4,816 feet.

Total number of feet of pipe, as per last report.....2,884,340

" " " " laid during the year..... 210,736

Feet.....3,095,076

Or 585 miles 2,236 feet.

SERVICE MAINS ORDERED.

Councils have ordered pipes laid in the following streets.

FIRST DISTRICT.

Pipe ordered to be laid in the First District.

Street.	Location.
Otsego,	From Mifflin to McKean.
Mifflin,	“ Eighth to Ninth.
Two certain twelve feet wide streets, north and south of St. Alban's Place, from Twenty-second to Twenty-third.	
Newport,	From Tasker to Mifflin.
Morris,	“ Broad to Fifteenth.
Ellsworth,	“ Twenty-fourth to Twenty-sixth.
Riggs,	“ Verner to Sutherland avenue.
Riggs,	“ Dodier to Muller.
Thirteenth,	“ Jackson to Wolf.
Wharton,	“ Eighteenth to Long Lane.
Nineteenth,	“ Wharton to Reed.
Clarion,	“ Federal to Pritchard.
Oscar,	“ A point 300 feet north of Gray's Ferry Road.
Latona,	“ Thirtieth to Thirty-first.
Ellsworth,	“ Twenty-ninth to Schuylkill Avenue.
Dickinson,	“ Long Lane to Twenty-first.
Coleman,	“ Dickinson to Tasker.
Stretch,	“ “ “
Moyamensing Ave.	“ Fifth to Seventh.
Tasker,	“ Twelfth to Thirteenth.
Wharton,	“ Thirty-fourth to Schuylkill Avenue.
Sixteenth,	“ Dickinson to Passyunk Avenue.
Montrose,	“ Seventeenth to Eighteenth.
Twentieth,	“ Wharton to Reed.
Titan,	“ Twentieth to Long Lane.

SECOND DISTRICT.

Pipe Ordered to be laid in the Second District.

Street.	Location.
Fortieth,	From Lancaster Avenue to Elm.
Aspen,	“ Thirty-sixth to Thirty-seventh.
Lombard,	“ Forty-third to Forty-fifth.
Thirty-eighth,	“ Spruce to Darby Road.
Paschall,	“ Lancaster Avenue to Fifty-first.
“	“ Fifty-second to Fifty-sixth.
Relay Bread Street.	
Spruce,	“ Forty-fifth to Forty-seventh.
Fifty-second,	“ Market to Baltimore Avenue.
Westminster Ave.,	“ Forty-eighth to Fifty-sixth.
Vine,	“ Fifty-seventh to Sixty-eighth.
Forty-second,	“ Haverford to Lancaster Avenue.
Walnut,	“ Forty-fourth to Fifty-seventh.
Chestnut,	“ Forty-second to Fifty-sixth.
Forty-third,	“ Chestnut to Baltimore Avenue.
Baltimore Avenue,	“ Forty-first to Fifty-second.
Grape,	“ Thirty-eighth to Thirty-ninth.

THIRD DISTRICT.

Pipe Ordered to be laid in the Third District.

Street.	Location.
Berks,	From Second to Germantown Avenue.
Ann,	“ Emerald northwest to dead end.
Montgomery,	“ Second to Bodine.
Dauphin,	“ Gaul to Thompson.
Adams,	“ Cedar to Gaul,
Harrowgate,	“ Kensington Avenue to Frankford Road.
Auburn,	“ Trenton Avenue to Frankford Road.
Humboldt,	“ Eleventh to Reading Railroad.

Street.	Location.
Venango,	From Kensington Avenue to Old Harrowgate Lane.
Jasper,	" Cambria to Reading Railroad.
Tulip,	" Montgomery Avenue to Palmer.
Kirkbride,	" Thompson to Guyre.
Clearfield,	" Frankford Road to Jasper.
Wayne,	" Trenton Avenue to Tulip.
Tulip,	" Auburn to Cambria.
Cambria,	" Front to Kensington Avenue
Catham,	" Fremont to William.
Emerald,	" Cemetery Avenue to Allegheny Avenue.
Philip,	" Cumberland to Huntingdon.
Huntingdon,	" Second to Sixth.
Tucker,	" Trenton Railroad to Memphis.
Jackson,	" Tulip to Martha.
Wellington,	" Thompson to Chatham.
Erie Avenue,	" Richmond Street to Frankford Road.
Cumberland,	" Third to Germantown Avenue.
Coleville,	" Front to Cumberland.
Victoria,	" Lambert to Myrtle.
Lambert,	" Venango to Westmoreland.
Hope,	" Somerset to Cambria.
Emerald,	" Madison Avenue to Gunner's Run.
Willard Ave.,	" Emerald to Jasper.
Madison,	" end of pipe west to Jasper.
Emerald,	" Venango to Erie Avenue.
Hope,	" Susquehanna to Dauphin.
Second,	" Lehigh Avenue to Cambria.
Venango,	" Almond to Frankford Road.
Reese,	" Lehigh Avenue to Cambria.
Neff,	" Almond to Belgrade.
Wheat Sheaf Lane,	from Richmond to Frankford Road.
Allegheny Ave.,	" Belgrade to Kensington Avenue.
Kerr,	" Orchard to Apple.
Jasper,	" Huntingdon to Lehigh.
Butler,	" Broad to Germantown Avenue.

Street.	Location.
Summer,	From Somerset to Tremont.
William,	“ Amber to Frankford Road.
Kay,	“ Huntingdon Avenue to old Front Street.

FOURTH DISTRICT.

Pipe ordered to be laid in the Fourth District.

Street.	Location.
Master,	From Twenty-seventh to Twenty-eighth.
Lehigh Ave,	“ Sydenham to Eighteenth.
Thirteenth,	“ Diamond to Susquehanna.
Taney,	“ Brown to Poplar.
Franklin,	“ Berks to Norris.
Stewart,	“ Twenty-first to Twenty-second.
Fifteenth,	“ Monument Cemetery to Susquehanna.
Sixteenth,	“ Diamond to Susquehanna.
Montgomery,	“ Broad to Sixteenth.
Norris,	“ Twentieth to Twenty-first.
Dauphin,	“ Twelfth to Broad.
Brown,	“ Twenty-seventh to Twenty-ninth.
Shamokin,	“ Twenty-first to Twenty-second.
Berks,	“ Sixth to Seventh.
Carlisle,	“ Monument Cemetery to Susquehanna.
Norris,	“ Carlisle to Broad.
Norris,	“ Seventeenth to Eighteenth.
Parrish,	“ Twenty-fourth to Taney.
Ringgold,	“ Parrish to Brown.
Eighteenth,	“ Berks to Susquehanna.
Twentieth,	“ Diamond to Susquehanna.
Norris,	“ Ninth to Tenth.
Ralston,	“ Twenty-third to Twenty-fourth.
Tioga,	“ Twenty-second to Township Line.
Township Line,	“ Twenty-second to Venango.
Taylor,	“ Thompson to North College Avenue.
Ringgold,	“ “ “ “

Street.	Location.
Susquehanna Ave.,	From Tenth to Broad.
Twenty-third,	" Rednor to Islington Lane.
Nevada,	" Tenth to Twelfth.
York,	" Alder to Eleventh.
Warnock,	" York to Cumberland.
Glenwood Ave.,	" Eleventh to Germantown Avenue.
Somerville,	" Germantown Avenue to east of Twelfth.
Perot,	" Twenty fourth to Twenty-fifth.
Marston,	" Jefferson to Columbia.
Cumberland,	" Delhi to Germantown Avenue.
Sixteenth,	" Erie Avenue to Cambria.
Park Avenue,	" Twenty-ninth to Thirtieth.
Twenty-ninth,	" Ridge Avenue to Park Avenue.
Jefferson,	" Washington to Fowler.
Township Line,	" Westmoreland to Municipal Hospital.
Nineteenth,	" Ontario to Westmoreland.

FRANKFORD.

Pipe ordered to be laid in Frankford.

Street.	Location.
Bridge,	From Tacony Road to Bristol Pike.
Tackawanna,	" Church to Harrison.
Orchard,	" Church to Tacony Road.
Mulberry,	" Orthodox to Harrison.

GERMANTOWN.

Pipe ordered to be laid in Germantown.

Street.	Location.
Stenton Avenue,	From terminus of pipe to Germantown Ave.
Eighteenth,	" Cayuga north one square.
Mill,	" Dead end to Chew.
Ontario,	" Seventeenth to Twentieth.
Evergreen Avenue,	" Twenty-fourth to Perkiomen Pike.
Wakefield,	" Bringhurst, north.

MANAYUNK.

Pipe ordered to be laid in Manayunk.

Street.	Location.
Ridge Avenue, Spencer, River Road,	From Bridge to Queen. “ Ridge Avenue. “ Main and Washington streets to American Pulp Works.
Indian Queen, Ezekiel, Ridge Avenue,	“ Ridge Avenue to Norristown R. R. “ Shur's Lane to Markle. “ Thirty-fifth to Reading R. R. Bridge.

Length of pipe laid since Consolidation.

YEARS.	MILES.	FEET.
1855	6	44
1856	10	2,079
1857	12	324
1858	13	3,484
1859	22	784
1860	19	224
1861	11	2,368
1862	9	954
1863	10	4,161
1864	6	4,287
1865	8	4,754
1866	12	2,964
1867	15	4,971
1868	15	148
1869	22	1,884
1870	26	1,953
1871	30	572
1872	27	3,661
1873	39	4,816
Totals - -	320	2,192

Account of the number of holes drilled for making new attachments to public mains during the year 1873.

MONTHS.	$\frac{1}{2}$ -inch diameter.	$\frac{3}{4}$ -inch diameter.	$\frac{1}{2}$ -inch diameter.	1-inch diameter.	Total holes drilled and attachments made.	Shut-offs.
January.....	41	3	2	2	48	32
February.....	36	2	1	2	41	47
March.....	267	4	3	5	279	55
April.....	464	12	5	8	489	66
May.....	465	7	8	2	482	32
June.....	454	29	6	3	492	39
July.....	512	4	5	6	527	36
August.....	444	14	5	1	464	30
September.....	469	13	11	7	500	20
October.....	532	11	4	3	550	35
November.....	668	8	11	5	692	23
December.....	224	3	3	5	235	36
Totals.....	4,576	110	64	49	4,799	451

The following attachments were made in the wards :

WARDS.	$\frac{1}{2}$ -inch diameter.	$\frac{3}{4}$ -inch diameter.	$\frac{1}{2}$ -inch diameter.	1-inch diameter.	Total holes drilled and attachments made.	Shut-offs.
First District, 1, 2, 3, 4, 26.....	1,214	7	.....	5	1,226	39
Second District, 5, 6, 7, 8, 9, 10, 24, 27.....	595	33	23	19	670	141
Third District, 11, 12, 16, 17, 18, 19, 23, 25.....	1,217	16	26	10	1,269	117
Fourth District, 13, 14, 15, 20, 21, 28, 29.....	1,142	51	12	11	1,216	107
Germantown.....	227	3	3	3	236	19
Manayunk.....	181	.....	.....	1	182	23
Totals.....	4,576	110	64	49	4,799	451

The following table exhibits the number of repairs to mains, stops, and plugs, by different districts, during the year 1873:

DISTRICTS.	Repairs to mains.	Repairs to stops.	Repairs to plugs.
First, - - -	35	242	477
Second, - - -	43	489	520
Third, - - -	98	307	589
Fourth, - - -	154	341	917
Germantown, -	46	98	62
Manayunk, - -	15	15	34
Totals, - - -	391	1,492	2,599

Account of new stops and fire-plugs for 1873.

DISTRICTS.	No. of stops.	No. of fire-plugs.
First, - - - -	93	26
Second, - - - -	67	54
Third, - - - -	128	75
Fourth, - - - -	108	41
Germantown, - -	58	47
Manayunk, - - -	36	38
Totals, - - - -	490	281

Statement of the number of Fire Plugs in the different Wards.

FIRST DISTRICT.

Number of plugs, as per last report, -	-	-	-	-	826
First Ward, -	-	-	-	-	6
Second " -	-	-	-	-	1
Twenty-sixth " -	-	-	-	-	19
					<hr/> 26
					852

SECOND DISTRICT.

Number of plugs, as per last report, -	-	-	-	-	1,198
Eighth Ward, -	-	-	-	-	1
Tenth " -	-	-	-	-	1
Twenty-fourth " -	-	-	-	-	38
Twenty-seventh " -	-	-	-	-	14
					<hr/> 54
					1,252

THIRD DISTRICT.

Number of plugs, as per last report, -	-	-	-	-	1,374
Twelfth Ward, -	-	-	-	-	1
Eighteenth " -	-	-	-	-	7
Nineteenth " -	-	-	-	-	19
Twenty-third " -	-	-	-	-	12
Twenty-fifth " -	-	-	-	-	36
					<hr/> 75
					1,449

FOURTH DISTRICT.

Number of plugs, as per last report, -	-	-	-	-	814
Fifteenth Ward, -	-	-	-	-	2
Twentieth " -	-	-	-	-	5
Twenty-eighth " -	-	-	-	-	16
Twenty-ninth " -	-	-	-	-	18
					<hr/> 41
					855

GERMANTOWN.

Number of plugs, as per last report, - - - -	189
Twenty-second Ward, - - - -	26
Twenty-fifth " - - - -	7
Twenty-eighth " - - - -	14
	<hr/>
	236

MANAYUNK.

Number of plugs, as per last report, - - - -	95
Twenty-first Ward, - - - -	33
Twenty-eighth " - - - -	5
	<hr/>
	133
Total fire plugs in all the Wards,	4,777

The following shows the number of attachments made in the different districts during the year 1873, for fire purposes only, in places of public amusement, hotels, manufactories, &c. :

Number, as per last report, - - - -	119
First District, - - - -	1
Second " - - - -	4
Third " - - - -	2
Fourth " - - - -	3
Germantown, - - - -	1
Manayunk, - - - -	0
	<hr/>
	11
Total, - - - -	<hr/>
	130

There are now 54 public drinking fountains supplied by the department, free of charge, as follows :

Erected by the Fountain Society, as per last report, 48	
Added during the year, - - - -	2
	<hr/>
Erected by the Society for Prevention of Cruelty to Animals, as per last report, - - - -	6
	<hr/>
Total, - - - -	56

RECEIPTS AND EXPENDITURES.

RECEIPTS FOR YEAR 1873.

The gross receipts for the year have been \$1,082,985.01. The sources from which this amount has been received will be exhibited by the statement of the Registrar, James Work, Esq.

Of the above sum \$4,691.06 has been received at the Chief Engineer's office, and paid over to the City Treasurer :

For Rents,	\$1,160 00
Old iron, &c.,	465 99
Cement barrels, lumber, and stone,	70 00
Joel Thomas, for removing fire plug,	28 25
Philadelphia and Reading Railroad Company, 4-inch attachment,	143 80
Rinchart & Breyer, 4-inch attachment,	146 49
Commissioners Public Buildings, for labor and material furnished,	222 72
Wm. B. Perkins, Superintendent County Prison, for labor and material furnished,	7 20
Pennsylvania Railroad, for 4-inch attachment,	107 50
Grand Lodge A. Y. M., for removing fire plug,	50 85
Rt. Rev. Bishop Wood, for 4 inch attachment,	75 05
United States Government, for labor and material furnished,	13 60
William Hackett, 4 inch attachment,	198 70
James B. Winpenny, 4-inch attachment,	87 00
R. F. Haus, for 12-inch stop-cock,	140 00
Jacob Fritz, for removing fire plug,	76 50
J. McFetridge, 4-inch attachment,	67 50
Baltz & Co., for material furnished,	2 50
American Academy of Music, for 4-inch attach- ment,	114 70
Pennsylvania Railroad Company, 4-inch attach- ment,	117 95

Baldwin Locomotive Works, for 6-inch attachment,	397 72
Reading Water Company, for two 10-inch stop- cocks,	173 00
Joseph Wilkins, 4-inch attachment,	30 59
Pennsylvania Hospital for the Insane, for 6-inch attachment,	248 30
Francis P. Murray, for proceeds of sale of the old stand pipe at Germantown,	225 00
Wm. Sellers & Co., 4 inch attachment,	48 40
Wm. Yewdell, 4-inch attachment,	131 55
Philadelphia & Reading Railroad Company, for 6-inch attachment,	140 20
	<u>4,691 06</u>

DEPARTMENT FOR SUPPLYING THE CITY WITH WATER,
 Registrar's Office, No. 104 South Fifth Street.

PHILADELPHIA, *January, 1874.*

DR. W. H. MCFADDEN,

Chief Engineer Water Department.

DEAR SIR:—I have the honor to submit the following statements, detailing the business of this office for the year 1873.

The receipts were estimated at \$1,060,000, but by reference to the annexed statement you will find they amounted to \$1,078,293 95, an excess over the estimate of \$18,293 95, and an increase over the year 1872, of \$34,680 84.

The amount collected for iron pipe was \$116,997 17, showing a decrease in that item, compared with the year previous, of \$14,825 79, but had the late financial panic not occurred, the collections, I feel assured, would have been much greater, and have shown a satisfactory increase. The amount returned uncollected, for lien, was \$75,882 09. The City Solicitor kindly furnished me a statement of the amount received for iron pipe in his office during the year, which was \$26,601 71.

Yours, very respectfully,

JAMES WORK,

Registrar.

Statement of receipts at Registrar's Office, from January 1 to December 31, 1873.

MONTHS—1873.	Delinquent Rents.	Penalties.	Rents of 1873.	Penalties.	Fractional Rents.	Water pipe.	Totals.
January.....	\$5,887 75	\$674 32	\$24,168 00	.....	\$1,326 25	\$7,660 31	\$39,616 03
February.....	2,482 50	275 09	61,696 50	.....	1,724 00	17,428 89	73,600 98
March.....	2,940 75	228 52	164,904 75	.....	4,092 82	11,621 60	173,788 44
April.....	1,929 75	288 22	455,443 75	.....	5,665 75	6,652 33	469,979 80
May.....	2,376 75	312 57	38,810 25	\$1,902 70	5,767 75	4,593 68	53,793 60
June.....	1,033 75	137 53	45,881 50	2,266 78	6,069 25	5,029 77	60,418 68
July.....	647 25	75 05	11,417 00	1,591 05	5,648 80	12,561 02	31,840 17
August.....	390 00	57 03	15,105 00	2,249 80	5,135 35	6,097 45	29,034 63
September.....	1,595 50	232 84	35,235 75	5,226 02	4,541 60	9,289 66	56,121 37
October.....	1,277 75	186 41	18,809 50	2,751 03	4,468 05	10,980 72	38,473 46
November.....	1,304 25	186 42	8,243 25	1,217 73	4,402 50	7,883 82	23,237 97
December.....	939 50	140 93	5,981 25	890 62	3,132 00	17,298 02	28,382 32
Totals.....	\$22,705 50	\$2,824 93	\$865,696 50	\$18,095 73	\$61,974 12	\$116,937 17	\$1,078,293 98

Amount of water duplicates for the years 1873 and 1874.

WARDS.	1873.	1874.	INCREASE.
First, - - -	\$42,738 25	\$45,794 75	\$3,056 50
Second, - - -	32,498 25	33,570 50	1,072 25
Third, - - -	19,863 25	20,008 50	145 25
Fourth, - - -	18,962 00	19,226 25	264 25
Fifth, - - -	35,132 25	35,202 75	70 50
Sixth, - - -	36,058 00	36,424 50	366 50
Seventh, - - -	39,568 50	39,787 50	219 00
Eighth, - - -	38,561 75	39,104 75	543 00
Ninth, - - -	34,515 25	34,718 25	203 00
Tenth, - - -	34,568 75	35,213 25	644 50
Eleventh, - - -	18,017 50	18,281 75	264 25
Twelfth, - - -	19,965 25	20,757 00	791 75
Thirteenth, - - -	29,235 25	29,453 00	217 75
Fourteenth, - - -	33,156 50	33,469 00	312 50
Fifteenth, - - -	70,533 25	71,898 50	1,365 25
Sixteenth, - - -	23,484 75	23,937 00	452 25
Seventeenth, - - -	22,679 50	22,937 00	257 50
Eighteenth, - - -	32,105 00	33,024 25	919 25
Nineteenth, - - -	86,520 00	95,161 75	8,641 75
Twentieth, - - -	67,431 00	69,584 25	2,153 25
Twenty-first, - - -	15,620 75	20,862 25	5,241 50
Twenty-eighth, } - - -			
Twenty-second, - - -	16,540 00	20,712 50	4,172 50
Twenty-third, - - -	6,112 50	6,657 00	544 50
Twenty-fourth, - - -	25,003 25	28,530 25	3,527 00
Twenty-fifth, - - -	12,183 25	14,130 50	1,947 25
Twenty-sixth, - - -	57,322 75	64,706 00	7,383 25
Twenty-seventh, - - -	19,376 25	20,471 25	1,095 00
Twenty-ninth, - - -	42,158 25	48,103 00	5,944 75
Totals, - - -	\$929,911 25	\$981,727 25	\$51,816 00

PERMITS ISSUED DURING THE YEAR 1873.

WARDS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 & 28	22	23	24	25	26	27	29	Total.	
Dwellings.....	326	59	13	11	3	1	15	16	9	16	3	20	6	6	111	8	13	82	786	167	389	295	76	353	323	707	83	501	4,408	
" ½ and ¾.....																					7	1							2	34
Baths.....	208	63	8	19	6	2	25	26	5	26	6	30	9	8	95	17	17	50	531	134	199	235	20	181	49	331	68	357	2,735	
Wash presses and screw nozzles.....	120	42	18	10	11	4	12	22	14	20	7	32	10	11	50	9	14	21	233	111	195	86	29	126	36	136	49	266	1,686	
Water closets, urinals, and biddets.....	13	7	4	6	35	53	40	60	81	40	16	43	29	30	94	23	7	1	30	93	102	189	5	72		63	49	152	1,326	
Basins, sinks, and wash tubs.....	5	8	1	4	27	28	58	78	67	37	5	44	5	10	90	31		1	25	71	138	184	2	37		7	41	164	1,158	
Stores, shops, and offices.....	1	14	1	1	11	8	1	2	3	8	2	4	2	1	3	4	1	1	9	6	1	1	2	6		3	4	3	103	
Bars.....	5	8	1	2	6	3	1	2	5	3	6	2	4	4	1	6	4	10	26	7	23	4			8	7	14	9	179	
Engines and boilers.....	3	2	3		7	12		1	5	3	5	2	1		6	1	4	1	15	4	3	3	2	1	5	3	2	1	95	
Horse powers.....	7	34	31		80	106		8	47	34	44	12	3		107	75	50	6	211	60	23	29	12	4	41	95	10	6	1,135	
Stables.....	8	4	1	2			2	5		1	1	1		2	12	2	2	6	13	11	3	38	2	4	1	10	2	10	143	
Slaughter-houses.....																						3							1	16
Watering horses.....	2	1								1					1	2	1	2	5	4					1	1	6	5	32	
Bakeries.....	2		2																		1				1	1	1		4	
Watering streets.....					8	9	1		9	8	2		8	8	6	4	4				4		2		2			1		76
" ships.....	1	7		8							2																			18
Building purposes.....	14	1	1	1	4	1	1		4	2	4	1		1	9	1	1	6	52	29	39	33	10	23	23	24	7	23	315	
Fountains.....								3	1	1	1	2	2	1					1		6	2								20
Market houses.....				1					1	1	1														1				4	
Factories and dye-houses.....					1	1			2	1	2				2	3	4		11	3	2	1	2		5	5	3		44	
Sugar houses.....						1																							1	
Photograph galleries.....							1						1																4	
Masonic temple.....									1																				1	
Laundries.....									1						2														3	
Breweries and bottling establishments.....													2						1				1						5	
Marble and stone yards.....																			1	1									4	
Churches.....																					3		1						4	
Hot houses.....																					2								6	
Cleansing carpets.....																						1								1
Railroad depots.....																						2								2
Hospitals and Universities.....																							1							2
Totals.....	728	250	85	65	199	229	157	213	244	202	106	197	79	83	500	188	130	191	1957	705	1138	1109	164	824	492	1405	322	1528	13,583	

List of Dwellings, Factories, Horse power, &c., as charged on Registers of 1873.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 & 29	21 & 28	22	23	24 & 27	25	26	Total.	
Dwellings	6875	3850	2025	1875	2761	2775	3691	2785	2479	2890	2365	1920	2180	3130	5994	2940	2150	3705	9596	10,375	1901	1615	613	3768	1685	7365	92,748	
" ½ and ¾	484	1578	1396	1576	543	325	1325	175	513	1064	967	753	619	809	1381	1479	641	1092	1117	786	21	7	7	133	312	560	20,015	
Baths	1909	1002	670	432	822	512	2010	2092	1226	1774	428	836	1687	1612	3564	461	318	727	2686	7,49	1112	1214	160	1922	376	2410	39,038	
Wash-pans	636	408	314	135	564	328	1040	1158	930	1148	196	487	948	1105	2563	322	246	468	1420	5,109	1072	491	247	1106	224	1102	23,770	
Water-closets, urinals, and boudets	78	52	66	73	1375	1697	1116	2203	1535	1133	165	189	408	447	1742	104	33	29	203	1,876	506	873	27	1070	22	747	17,794	
Basins, sinks, wash tubs	60	62	62	72	1360	1645	1172	2302	1498	1159	153	179	378	216	1748	112	25	21	194	1,898	558	854	24	989	24	1917	146	
Horse-power	634	632	129	211	782	1394	352	286	943	330	506	298	258	185	2113	1250	487	646	1862	714	111	515	184	605	86	134	1,607	
Hor-castles	494	871	307	247	521	400	653	1524	1355	1725	1701	1647	615	690	189	667	210	502	1109	1,909	99	67	110	1079	156	728	21,272	
Bars	165	158	115	209	291	175	91	114	153	103	281	116	89	54	210	136	168	97	272	252	43	20	16	128	77	294	3,567	
Watering horses	26	9	9	9	19	2	11	.....	29	5	4	1	1	5	13	4	11	69	15	1	3	9	87	11	54	368	
Factories	11	8	1	2	5	31	22	.....	30	10	4	13	11	29	5	34	40	6	113	19	6	9	2	40	5	7	472
Fountain's	6	1	1	24
Bakeries	29	38	31	21	14	19	10	9	26	9	13	16	12	16	42	13	17	14	89	61	5	6	27	20	16	571		
Dye-tubs	19	7	.....	.....	9	39	1	.....	5	16	7	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	499
Meat packers	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
Breweries	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87
Sugar houses	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Hot and Green houses	26
Fountain's	3	1	3	1	15	15	2	26	29	20	2	8	8	14	31	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	307
Distilleries .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Slaughter houses	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	113
Malt houses .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18
Brick yards	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
Barber shops	21	29	16	15	32	29	11	11	37	13	13	13	17	25	28	17	24	10	67	17	0	5	4	19	4	12	494	
Photographs .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90
Miscellaneous	7	6	7	4	2	5	3	2	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100

Receipts and Expenditures since Consolidation.

YEARS.	Received by Register for water-rents and percentage.	Received by Chief Engineer for rents, old loans, scraps and private fire-plug attachments.	Total receipts from all sources.	Yearly increase.	Total expenditures.
1855.....	\$381,410 17	\$626 55	\$382,036 72		\$250,896 37
1856.....	351,936 49	960 11	352,896 60	Decrease	160,388 02
1857.....	425,661 94	302 20	425,964 14	\$73,067 54	200,605 82
1858.....	457,518 48	129 75	457,648 23	31,684 06	187,978 09
1859.....	548,128 19	3,051 89	551,180 08	93,531 85	411,737 09
1860.....	557,121 76	1,409 77	558,531 53	7,351 45	252,506 23
1861.....	533,094 76	885 30	533,980 06	Decrease	238,089 54
1862.....	544,767 25	1,125 82	545,793 07	11,813 01	177,271 69
1863.....	568,740 66	937 69	569,678 29	23,885 22	213,750 20
1864.....	609,257 28	855 29	610,112 57	40,434 28	253,968 75
1865.....	629,887 47	6,500 95	636,388 42	26,275 85	422,337 58
1866.....	666,294 95	3,927 18	670,222 13	33,833 71	616,712 92
1867.....	761,559 45	5,891 44	767,450 89	96,229 76	575,844 49
1868.....	772,695 76	4,404 83	777,099 59	9,556 70	802,217 46
1869.....	808,508 23	4,962 60	813,470 83	36,461 24	909,768 28
1870.....	928,935 95	7,335 01	935,370 96	121,900 13	1,144,073 51
1871.....	956,050 04	7,154 04	963,234 08	27,863 12	1,069,193 43
1872.....	1,043,613 11	10,688 46	1,054,281 51	91,047 43	1,063,576 28
1873.....	1,078,293 95	4,691 06	1,082,985 01	28,703 50	1,564,418 48

**EXPENDITURES OF THE DEPARTMENT FOR THE
YEAR 1873.**

Salaries of Chief Engineer, Registrar, Clerks, &c.,	\$32,550 00
Office expenses, - - - - -	5,496 75
Salaries of engineers, firemen, &c, at works, -	42,141 94
Supplies to works, viz.:	
Coal and wood, - - - - -	53,459 32
Tallow, oil, and gas, - - - - -	5,677 53
Small stores, packing, &c., - - - - -	2,797 87
Repairs to works, viz.:	
Fairmount Works, - - - - -	\$5,500 00
Delaware " - - - - -	2,000 00
Schuylkill " - - - - -	6,790 00
Belmont " - - - - -	3,293 30
Roxborough " - - - - -	2,094 83
	19,678 13
Keeping buildings, grounds, and reservoirs in good order:	
Wages, - - - - -	\$8,786 64
Brickwork, - - - - -	1,351 00
Hardware, - - - - -	196 26
Lumber, - - - - -	978 42
Paving, - - - - -	1,005 01
Plumbing, - - - - -	143 90
Plastering, - - - - -	83 00
Painting, - - - - -	256 01
Bricks, - - - - -	213 75
Iron vases, - - - - -	425 00
Lime, - - - - -	51 35
Matting and oil cloth, - - - - -	186 34
Mill work, - - - - -	3 52
Salt hay, - - - - -	20 63
	\$13,700 83
Amounts carried forward,	\$161,801 54

Amounts brought forward,	\$13,700 83	\$161,801 54
Siding, - - -	257 16	
Lead and oil, - - -	475 88	
Hand rails, - - -	13 50	
Hose and rubber goods, -	192 00	
Clocks, - - -	29 00	
Paper hanging, - - -	67 84	
Stoves, - - -	50 90	
Tin work, - - -	32 72	
Hauling, - - -	199 50	
Repairs to track, - - -	126 75	
Regulating scales, - - -	10 00	
Furniture, - - -	71 25	
Grading, - - -	306 25	
Plants, - - -	68 50	
Mouldings, - - -	80 23	
Uniforms, - - -	6 00	
Slate, tin, and gravel roofing,	518 93	
Inspecting boilers, - - -	297 16	
Mason work, - - -	76 55	
Iron rails, - - -	179 66	
Sundry bills, - - -	239 39	
		17,000 00

Keeping pipes, plugs, stops, and fixtures
in good order:

Wages, First District, -	4,754 06	
“ Second “ -	6,765 00	
“ Third “ -	7,776 87	
“ Fourth “ -	8,348 50	
“ Germantown, -	2,046 65	
“ Manayunk, -	456 00	
Repaving around fire plugs, -	926 33	
Plumbing, - - -	470 55	
Shop, - - -	115 50	
Amount carried forward,	\$31,659 46	\$178,801 54

Amounts brought forward,	\$31,659 46	\$178,801 54
Bolts and nuts, - - -	13 37	
Sundry bills, - - -	255 02	
Oil, - - -	72 15	
	<hr/>	\$32,000 00

For the purchase of iron pipes, fire plugs,
stop cocks, lead, brass, and iron cast-
ings, &c.:

Iron pipes, - - -	\$154,279 35	
“ castings, - - -	21,019 50	
Brass “ - - -	5,467 97	
Lead, - - -	15,751 83	
Lumber, - - -	3,347 28	
Hardware, - - -	2,238 90	
Wrought iron and steel, - - -	2,921 82	
Bolts, nuts, &c., - - -	1,506 63	
Coal, - - -	786 75	
Varnish, paint, &c., - - -	299 67	
Coke, - - -	140 70	
Leather, - - -	398 03	
Sponge cloths, - - -	889 50	
Water meters, - - -	151 00	
Gasket, - - -	825 23	
Tubing, - - -	215 98	
Rent of yards, - - -	175 00	
Belting, - - -	34 11	
Galvanizing spindles, - - -	122 85	
Valves, cocks, &c., - - -	1,000 32	
Rubber valves, gum, gasket, hose,	838 26	
Packing, - - -	415 80	
Oil, - - -	497 88	
Wood, - - -	256 00	
Rope, &c, - - -	185 38	
Powder, fuse, &c., - - -	242 45	
Tallow and oil cups, - - -	227 96	
	<hr/>	
Amounts carried forward,	\$214,236 15	\$210,801 54

Amounts brought forward,	\$214,236 15	\$201,810 54
Machine work, - - -	354 50	
Lamps and lanterns, - - -	51 80	
Soap, - - - - -	30 00	
Grindstone, - - - - -	13 35	
Drawing paper and instruments,	63 80	
Tool house, - - - - -	85 80	
Push carts and wheel-barrows,	134 41	
Felting, - - - - -	88 00	
Roofing materials, - - -	11 00	
Glass, - - - - -	5 60	
Damages, - - - - -	476 42	
Sundry bills, - - - - -	441 61	
	<hr/>	\$215,992 44
For labor in laying pipes and fitting fire-plugs, &c. :		
Wages, First District, - - -	\$3,405 44	
“ Second “ - - -	7,428 29	
“ Third “ - - -	14,172 28	
“ Fourth “ - - -	12,653 01	
“ Germantown, - - -	10,515 75	
“ Manayunk, - - -	8,464 50	
“ Shop, - - - - -	18,227 26	
Surveyors, for measuring pipe,	2,892 73	
Hauling pipe, - - - - -	4,142 31	
Repaving, - - - - -	3,561 18	
Pipe plans, - - - - -	2,445 50	
Covering and encasing pipe, -	762 53	
Inspecting pipe, - - - - -	725 85	
Blasting rock and dressing tools,	128 45	
Repairing tool-houses, - - -	94 05	
Plumbing, - - - - -	10 30	
Sundries, - - - - -	150 45	
Rent of cellar and lot, - - -	185 00	
	<hr/>	\$89,964 88
Amount carried forward, - - -	- - -	\$516,758 86

Amount brought forward,	-	-	-	\$516,758 86
For drilling and making new attachments:				
Wages, First District,	-	-	\$2,058 00	
“ Second “	-	-	2,180 25	
“ Third “	-	-	2,359 50	
“ Fourth “	-	-	2,120 75	
Germantown,	-	-	530 92	
Manayunk,	-	-	747 37	
			<hr/>	\$9,996 79
Iron railing, Fairmount,	-	-	-	1,300 00
Carriage hire and keep of horse for use of Chief Engineer,	-	-	-	650 00
For care and maintenance of Chestnut Hill Water Works,	-	-	-	2,981 24
For expenses of public fountains of the Philadelphia Fountain Society,	-	-	-	1,000 00
			<hr/>	\$532,686 89

SPECIAL APPROPRIATIONS.

(Appropriation approved June 24, 1873.)

To refund certain twice paid and over-paid water rents and pipe laying bills,	-	-	-	\$225 20
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(Appropriation approved Nov. 4, 1873.)

For dredging dock at foot of Otis street,	-	-	-	488 15
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(Appropriation approved June 20, 1870.)

Assisting to keep up the supply of water. Machine work,	-	-	\$561 16	
Amounts carried forward,	-	-	\$561 61	\$533,400 24

Amounts brought forward,	-	\$561 16	\$533,400 24
Suction pipe, &c.,	-	113 29	
Hardware,	-	78 44	
Lumber, -	-	28 05	
Tube brushes,	-	7 50	
Wages, -	-	6 82	
			<u>795 26</u>

(Appropriation approved October 23, 1871.)

For making surveys for an additional supply of water to Frankford:

Wages, -	-	\$131 20	
Repairs to level,	-	13 00	
			<u>144 20</u>

(Appropriation approved June 25, 1872.)

To refund certain twice paid and over-paid water rents, and pipe laying bills,	-	-	10 75
			<u>\$534,350 45</u>

EXTENSIONS OF WORKS.

AMOUNTS PAID FROM WATER LOANS.

(Appropriation approved April 3, 1868.)

Item 2.

For purchase and laying a 20 inch main to connect the Roxborough Water Works with the Germantown Works:

Bolts and nuts,-	-	\$42 63	
Clay, -	-	237 50	
			<u>280 13</u>
Amount carried forward,	-	-	\$280 13

Amount brought forward, - - - \$280 13

(Appropriation approved February 13, 1869.)

Item 2.

For boilers and connections at Belmont Works :

Blow-off pipe, - - -	\$2 50	
Steam cocks, - - -	2 72	
	<u> </u>	5 22

Item 10.

Incidentals :

Stone cutting, - - - -		34 65
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(Appropriation approved April 7, 1870.)

Item 1.

Engines and foundations at Schuylkill Water

Works in place of old engine No. 3 :

Repairs to engine, - - -	\$2,042 97	
Name plate, - - - -	100 00	
Wages, - - - -	640 62	
	<u> </u>	2,783 59

Item 2.

Boilers and fittings, - - -	\$6,776 92	
Iron castings, - - - -	2,103 43	
Wages, - - - -	5,681 29	
Clay, - - - -	1,583 35	
Ground fire brick, - - -	173 00	
Lime, - - - -	157 75	
Hauling, - - - -	196 00	
Sundry bills, - - - -	9 00	
Check valves, - - - -	700 00	
Felting, - - - -	30 24	
	<u> </u>	17,410 98

Amount carried forward, - - -		\$20,514 57
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Amount brought forward, - - - \$20,514 57

Item 4.

For descending main from the Belmont Reservoir
and for crossing the Schuylkill River :

Brickwork, - - -	402 50	
Hauling, - - -	63 00	
Packing, - - -	199 50	
Man-hole plates, - - -	40 00	
Wages, - - -	1,728 72	
	<hr/>	2,433 72

Item 5.

For pumping main from the Delaware Works to
the reservoir :

Nuts and bolts, - - -		1 92
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Item 8.

For reservoir adjoining present reservoir of the
Delaware Works :

Wages, - - -	12 00	
Lumber, - - -	12 99	
	<hr/>	24 99

Item 9.

For enlarging the reservoir now building at Bel-
mont Water Works :

Cement, - - -		18 00
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Item 10.

For incidentals :

Gravel, - - -	96 00	
Repairs to track, - - -	118 00	
Grading, - - -	313 25	
Packing and hose, - - -	22 75	
Hardware, - - -	10 00	
Sundries, - - -	9 75	
	<hr/>	569 75

Amount carried forward, - - - \$23,562 95

Amount brought forward, - - - \$23,562 95

(Appropriation approved July 7, 1870.)

Item 1.

For new engine and pump with foundations and inlet thereto :

Lot of ground, - - -	800 00
Wages, - - -	104 00

904 00

Item 2.

For new engine and boiler house, Roxborough :

Wages, - - -	\$7,836 84
Lumber, - - -	1,711 93
Boilers (on account), - - -	6,500 00
Hardware, - - -	173 32
Stone, - - -	335 00
Lime, - - -	146 20
Grate bars, - - -	293 03
Roofing, - - -	759 05
Brick, - - -	505 41
Air chamber feeders, - - -	135 00
Sand, - - -	91 05
Bolts and nuts, - - -	89 95
Paints and oil, - - -	65 08
Tubing, - - -	86 35
Stoves, - - -	67 40
Machine Work, - - -	52 00
Cement, - - -	12 60
Coal, - - -	16 25
Sash, - - -	42 00
Fire brick, - - -	438 56
Sundry bills, - - -	64 88

19,421 90

Amount carried forward, - - - \$43,888 85

Amount brought forward, - - \$43,888 85

Item 5.

Incidentals:

Plastering, - - -	\$57 00
Hardware, - - -	7 95
Lumber, - - -	69 36
Steel tape, - - -	20 58
Survey of lot, - - -	25 00
Sundry bills, - - -	15 00
	<hr/>
	\$194 89

(Appropriation approved November 6, 1871.)

Item 2.

New Engine, No. 3, at Belmont Works:

Engines, - - -	\$43,200 00
Wages, - - -	173 45
Bolts and nuts, - - -	31 60
Iron and steel, - - -	76 64
Brick, - - -	28 00
Tubing, - - -	55 74
Steam cocks, - - -	35 75
Hardware, - - -	35 98
Lumber, - - -	121 32
Steam gauge, - - -	147 60
Cement, - - -	37 80
Iron beams, - - -	12 00
Sundry bills, - - -	15 99
	<hr/>
	\$43,971 87

Item 3.

Rebuilding Fairmount Dam:

Wharf builders, - - -	\$12,882 75
	<hr/>
Amounts carried forward, -	\$12,882 75
	<hr/>
	\$88,055 61

Amounts brought forward, -	\$12,882 75	\$88,055 61
Hardware, - - -	607 04	
Lumber, - - -	10,880 35	
Towing, - - -	586 00	
Stone for filling crib, - -	10,085 25	
Stone dressed for piers, -	2,354 41	
Coal, - - -	204 75	
Cement, - - -	5,469 85	
Wharf spikes, - - -	307 96	
Hire of scow, - - -	2,496 00	
Repairs to dredge, - - -	1,573 67	
Iron and steel, - - -	740 00	
Rope and oakum, - - -	77 85	
Tubing, - - -	18 01	
Gum hose, packing, and boots, -	202 43	
Bricks, - - -	39 12	
Diving, - - -	601 60	
Hemp packing, - - -	69 00	
Lime and sand, - - -	184 20	
Sharpening tools, - - -	91 36	
Iron castings, - - -	1,649 99	
Sundry bills, - - -	76 05	
Wages, - - -	35,435 48	
	<hr/>	\$86,633 12

Item 5.

Completion of Belmont Reservoir:

Hardware, - - -	\$107 32
Lumber, - - -	16 26
Gravel, - - -	1,682 40
Bricks, - - -	584 30
Boat, - - -	31 95
Rope, - - -	4 00
Drain pipe, - - -	238 30

Amounts carried forward,	\$2,664 53	\$174,688 73
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Amounts brought forward,	\$2,664 53	\$174,688 73
Grass seed, - - -	23 85	
Iron castings, - - -	1,144 00	
Lime, - - -	113 59	
Sundries, - - -	40 13	
Wages, - - -	11,702 34	
	<hr/>	\$15,688 44

Item 6.

Completion of Delaware Water Works

Reservoir:

Hauling, - - -	\$110 00	
Hire of boat, - - -	52 50	
Brick, - - -	46 80	
Hardware, - - -	27 75	
Lime, - - -	15 50	
Clay, - - -	529 55	
Land damages, - - -	25 00	
Lumber, - - -	131 86	
Wages, - - -	3,228 31	
	<hr/>	\$4,167 27

Item 7.

Construction of large Storage Reservoir in East Fairmount Park:

Wages, - - -	\$557,199 73	
Cement, - - -	10,938 02	
Bricks, - - -	11,602 25	
Iron castings, - - -	27,959 10	
Hardware and tools, - - -	3,188 02	
Lumber, - - -	4,038 29	
Tubing, - - -	1,685 70	
Stone, - - -	13,129 08	
	<hr/>	
Amounts carried forward,	\$629,740 19	\$194,544 44

Amounts brought forward,	\$629,740 19	\$194,544 44
Granite, - - -	2,197 02	
Clay, - - -	1,684 15	
Lead, - - -	393 94	
Bolts and nuts, - .	226 17	
Hauling, - - -	1,187 00	
Sprinkling wagons, - -	1,950 00	
Iron and steel, - - -	107 48	
Blacksmithing, - - -	30 90	
Drain pipe, - - -	1,071 29	
Oil, &c., - - -	176 48	
Gum hose and packing, -	141 63	
Cordage, - - -	128 25	
Roofing, - - -	122 92	
Gravel and sand, - - -	285 00	
Paints, &c., - - -	23 12	
Hire of derrick, - - -	55 50	
Tolls, Belmont Bridge, -	52 76	
Steam hammer, - - -	995 00	
Pumps, - - -	49 60	
Wheelbarrows, - - -	426 00	
Counsel fees, - - -	150 00	
Lime, - - -	8 00	
Coal, - - -	85 25	
Gravel screens, - - -	20 25	
Stove pipe, - - -	6 00	
Ice, - - -	23 21	
Time books and pay rolls, -	191 00	
Drawing paper and instruments,	71 55	
Sundry bills, - - -	326 98	
	<hr/>	\$641,926 64
Amount carried forward,		\$836,471 08

Amount brought forward, \$836,471 08

Item 9.

Incidentals :

Purchase and repairs to Surveyor's instruments,	\$162 85	
Paving,	266 21	
Carriage hire,	102 00	
Time-books,	70 25	
Car fares and freights,	73 42	
Furniture,	4 00	
Tolls,	51 80	
Oil,	39 13	
Water-coolers,	23 55	
Clock,	20 00	
Advertising,	11 25	
Sundries,	43 21	
		\$867 67

(Appropriation approved December 6, 1872.)

For the purchase of the Chesnut Hill Water Works, \$65,000 00

(Appropriation approved May 19, 1873.)

Item 4.

For reservoir (Frankford) :

Wages of Surveyors, 964 57

Item 6.

For 30-inch ascending main, &c. :

Lead, 23 82

Item 7.

For 20-inch descending main, &c.,

Lead, 9 60

Amount carried forward, \$906,645 32

Amount brought forward, . . . \$906,645 32

Item 8.

For 10 and 12-inch mains, with stop-cocks,
&c., on Ridge Avenue :

Pipe,	\$8,818 79	
Lead,	1,200 00	
Hardware and tools,	59 50	
Wages,	4,475 66	
	<hr/>	14,553 95

Item 9.

For 20-inch main on Twenty-second
Street, from Jefferson to Ridge Ave-
nue, and 12-inch main on Ridge Ave-
nue, from Twenty-second Street to
Thirty-third Street, with stop-cocks,
branches, plugs, &c. :

Pipe,	\$14,911 37	
Lead,	2,350 00	
Lumber,	86 11	
Hardware (picks and shovels),	160 85	
Rope,	27 60	
Hauling,	227 50	
Pump for ditch,	34 03	
Paving,	522 85	
Wages,	12,612 27	
	<hr/>	30,932 58

Item 10.

For twenty-inch main on Washington
Avenue, from Twenty-first to Twenty-
second Street, and on Twenty-second,
from Washington Avenue to Federal
Street, &c. :

Lead,	\$1,509 44	
Pipe,	15,246 17	
Wages,	870 79	
Shovels,	16 00	17,642 40
	<hr/>	<hr/>

Amount carried forward, . . . \$969,774 25

Amount brought forward, - - \$969,774 25

Item 11.

For 20-inch main on Broad Street, from
Washington Avenue to Snyder Avenue,
with stop cocks, &c.

Pipe, - - - -	\$20,183 97
Lead, - - - -	2,012 64
Lumber, - - - -	170 83
Paving, - - - -	289 29
Tools, - - - -	58 00
Rope, - - - -	47 60
Rubber boot, - - - -	7 00
Tooth brushes - - - -	6 20
Wages, - - - -	5,473 13
	<hr/>
	28,248 66

Item 12.

For 16-inch main on Washington Avenue,
from Fifth Street to Moyamensing Ave-
nue, and on Moyamensing Avenue from
Washington Avenue to Snyder Avenue,
with stops, &c.

Pipe, - - - -	\$15,956 71
Lead, - - - -	5,191 25
Hardware and tools, - - - -	247 45
Packing, - - - -	14 40
Pump, - - - -	10 00
Lumber, - - - -	132 58
Paving, - - - -	935 84
Wages, - - - -	7,251 09
	<hr/>
	29,739 32
Amount carried forward, - - - -	<hr/>
	\$1,027,762 23

Amount brought forward, - - \$1,027,762 23

Item 13.

Incidentals :

Wages and expenses of Surveyors,	\$1,308 52	
Printing and advertising, -	264 70	
Surveyors' books and instruments,	78 12	
Carriage hire and car fares for engineers, - - -	215 00	
Inspecting mains, - - -	194 35	
Castings, - - -	204 66	
Sundry bills, - - -	40 45	
	<hr/>	2,305 80

1,030,068 03

Amount expended from general appropriation, 534,350 45

Amount expended from loans - - 1,030,068 03

Total expenditures for 1873, - \$1,564,418 48