

DEPARTMENT  
FOR  
Supplying the City with Water.

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ANNUAL REPORT

OF THE

Chief Engineer of the Water Department

OF THE

CITY OF PHILADELPHIA,

*Presented to Councils, Feb. 8.*

1872.

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PHILADELPHIA:

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1872.

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*Fourth District*—Jacob C. Apple, Office, Corinthian Ave. and Brown Street.

### ENGINEERS AT WORKS.

*Fairmount Works*—William Osborne, Joseph Moyer.  
*Schuylkill Works*—William Hodges, Joshua Bartley.  
*Delaware Works*—Benjamin F. Norman, Jos. Thompson.  
*Twenty-fourth Ward Works*—Abraham Stott, Christian Betzold.  
*Germantown Works*—William Wright, James Drinkwater.  
*Roxborough Works*—Johnson Hughes, W. H. Saunders.

James M. Kreamer—In charge of Belmont Reservoir and Engine House, and Delaware Reservoir.

John L. Ogden—In charge at Schuylkill Works Extensions, Engine, Boilers, &c.

J. Harry Stewart—In charge of Roxborough Reservoir, and Engine House.

Robert N. Bowers—In charge of Fairmount Extensions, and General Superintendent.

David R. Griffith—Superintendent of City Shop.

# REPORT.

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

GENTLEMEN:—In this, the seventieth annual report which has been made to Councils upon the water supply of the city, will be found a brief record of the business transactions of the water department during the year 1871, and the condition of the several works under its charge.

It is very much to be regretted that a great deal of valuable time has been lost in not prosecuting some of the essential additions required to be made to the works.

As early as November 30, 1869, a report was made to councils by the chief engineer, detailing certain required renewals and additions to the works, and an appropriation asked for the purpose of effecting the objects named.

On the 15th of March, 1870, about one-third only of the sum asked was granted. As this was insufficient to accomplish all the improvements required, it was decided to divide the amount between several of the most urgent of the objects for which the loan was asked, although it was evident that even these could only be partly done with the limited sum granted.

It was confidently hoped that the balance necessary to complete the works commenced and others proposed, would be promptly appropriated, but owing to the unavoidable delay in the passage of the required loan, the veto of the mayor of the city upon its appropriation bill, and the injunction placed upon the city treasurer and this department by the Supreme Court, the loan was not, finally, put at our disposal until November 6, 1871, almost two years after the first application had been made.

Thus all the best part of two summer seasons, fit for out-door work, was entirely lost.

The work suspended was the completion of the Delaware reservoir, the commencement of the large storage reservoir on East Park, the ascending main from the Delaware engine-house to the reservoir, the finishing of the Belmont reservoir, and the rebuilding of the dam.

It has been considered necessary to advert to this matter in order that it may be seen that the unfortunate delay in commencing and finishing work of vital importance to the city, cannot be chargeable to any failure of duty on the part of the chief engineer of the department.

At Fairmount, the last of the large turbines and pumps has been finished, and was ready to start on the 14th of December, 1871. Like those previously erected by the same parties, it is an excellent piece of work, and reflects great credit upon the contractors, Messrs. E. Geyelin and I. P. Morris & Co., for the faithful and skilful manner in which they have performed the requirements of their contracts.

The mill building is now completed, with the exception of the railing upon the top, the plastering of the inside walls, the stone floors, the platforms and staircases, and the north sky-light; work upon them will go on during the winter and will be finished early in the spring.

There are still two breast wheels in either end of the house; one of these is now useless and should be taken out and replaced by a turbine as early as possible; the other is in fair condition, and with repairs may yet be usefully employed.

The buildings, grounds, and reservoirs (including that at Corinthian Avenue) are in excellent order, requiring only the ordinary repairs incident to such work.

At the Schuylkill engine-house a compound double cylinder rotative engine has been completed and will be ready to commence duty in a few days. An engraving, showing the elevation of this engine, was given in the annual report for the year 1870.

Its principal dimensions are as follows :

High pressure cylinder, 36 in. diameter, 5 ft. 1 in. stroke.

Low " " 57 " " 8 ft. stroke.

There is one bucket and plunger pump immediately under the low pressure cylinder, of 28½ inches diameter and 8 feet stroke, and a similar pump, of 28½ inches diameter and 7 feet 2 inches stroke, at the opposite side of the beam, just inside of the crank connecting rod. The lever beams are two, connected together, 30 feet long between end centres, and weighing 39,885 pounds ; these are supported upon a large doric column 6 feet diameter at the base, which forms an air chamber of about 744 cubic feet capacity, into which both pumps discharge their water. When in action the steam is admitted to the high pressure cylinder ; when at half stroke, it is cut off, and acts by expansion through the other half of the high pressure cylinder and the whole of the low pressure cylinder, from which it is exhausted into the condenser.

The engine has been erected from the general designs of the chief engineer and was executed in a very creditable manner by Henry G. Morris, of the Southwark Foundry, Philadelphia.

To amply supply it with steam, a gang of five tubular boilers, each 15 feet long, 6 feet diameter of shell, with seventy-five 4-inch tubes, have been erected from the designs of the chief engineer, by I. P. Morris & Co., of the Port Richmond Iron Works, Philadelphia ; they replace four old boilers which were worn out, and unsafe to be run.

An arched inlet of large size has been built from the forebay into the engine-house for the supply of the engine just erected, and the one proposed to be built in place of the old bell-crank engine, now inadequate in size, defective in plan, and much worn. Gates are provided by which either engine may be shut off from the inlet for repairs.

A main of 36 inches diameter, and 3,468 feet long, has been laid from the new engine up Thirty-third Street to Master, and thence to the Schuylkill reservoir, at Thirty-third and Master Streets. This has been provided with a branch and the necessary

stop-cocks, so that the engine may hereafter pump into the Schuylkill reservoir or the new storage reservoir on East Park, as may be necessary.

A brick aqueduct of 10 feet inside diameter, and 210 feet long, has been completed from the river to the forebay of the works; it proved to be a slow, troublesome, expensive work, as it had to be carried through the old wharf below water level, and therefore by the aid of coffer dams.

The old inlet, which was made of wood, and much dilapidated, is abandoned.

Both Cornish engines at the works have done good service and have required but little repairs.

The roof of the main building over the new and the side lever Cornish engines has been raised about 5 feet, adding much to the appearance and usefulness of the building, which is now being rough cast inside.

The reservoir supplied from these works is in good order.

At the Delaware engine-house a Worthington duplex engine of a pumping capacity of 6,000,000 gallons per day has been erected, and was started successfully on the 25th of October, but is laboring under the disadvantage of pumping through the old inadequate ascending main.

The engine is an excellent piece of work, reflecting much credit upon the contractor; additional power has long been wanted at these works, but for the very great assistance they receive by a partial supply from Corinthian Avenue reservoir and the Schuylkill Works, the district could not have been provided with its proper quantity of water. This draught upon Corinthian Avenue was very serious, and could not have been maintained much longer. The floor which formed a second story to the engine house, as it was useless for the purposes of the work, has been taken out and the whole room rough-cast and painted, adding much to the appearance of the house and the comfort of visitors as well as to those employed there.

The boiler house was extended, upon piles driven for the purpose, a distance of 12 feet towards the river, and five tubular

boilers, of the same size and character as those last erected at the Schuylkill Works, have been put up in a workmanlike manner, by Henry G. Morris, of the Southwark Foundry.

The 36-inch ascending main has been laid from the stand-pipe for a distance of 9,990 feet, leaving 1,868 feet to complete it; this would have been finished some time since but for the necessary suspension of the work during the pending of the loan.

The same may be said of the new reservoir, which could readily have been finished and filled with water in the latter part of August last had the means to complete it been provided. The inside is finished, and the filling of it with water from the old reservoir was commenced on the 20th of December, 1871; the outside is sodded, and nothing remains to be done except the formation of a roadway to the top of the embankment and to put a fence around the whole.

The reservoir at the foot of the embankment covers an area of  $4\frac{83}{100}$  acres; the area of water surface when full will be  $3\frac{29}{100}$  acres; and its contents, with 17 feet 9 inches depth of water, will be 16,373,718 United States standard gallons.

The work was carried on with great care, and it is believed to be a substantial, reliable structure. It is of the embankment character, with inside slopes of one and one-half horizontal to one perpendicular; lined on the side with straight hard bricks, laid on edge upon mortar, and flat on the bottom, also on mortar; the whole having been previously lined with clay, put up in a nearly dry condition, and rolled, first with grooved, and then with plain rollers. The embankment was made up in 6-inch layers, each layer watered and rolled with heavy grooved and flat rollers.

The old reservoir is in good condition.

At the Belmont Works the second Worthington engine was started to regular work July 18, 1871.

Engine No. 1 has run almost daily since September 19, 1870, giving entire satisfaction; it has not cost one dollar in repairs or additions.

On the 19th of August, 1871, the supply of parts of the high ground of the Twentieth and Twenty-ninth Wards was added to

the duty of these works, much increasing the time necessary to run the engines.

The want of a third engine (for which a sum was included in the delayed loan) makes it impossible safely to supply as much of the high ground on the east side of the river as we desire; and it will not be proper to increase the area of ground fed from Belmont until the third engine is in place. It is, therefore, important that the engine placed here should not be experimental, as thereby much valuable time may be lost, and the high ground to which allusion is made above be left without relief. The dry wells, inlets, and other parts of the engine house, are built for the introduction of three engines of the same class. The two already erected have proven so eminently satisfactory that I can see no reason for adopting any other form.

The submerged main laid across the Schuylkill for the supply of the high ground upon the east side of the river has been very successful, and has not given any trouble.

The inability to finish Belmont reservoir, for the reason previously given, is a serious disadvantage, now that the demand upon it is increased by the amount of water drawn from it for the supply of this side of the river.

The old works have been entirely disused since September, 1870. As the engines and boilers had been much over-worked and greatly worn, it has been decided to offer them for sale at public auction, together with the buildings and stack.

The stand-pipe, as it is an ornamental structure, will be retained, although not required for the purposes of the works.

The Roxborough Works have been in successful operation during the year; the engine has worked remarkably well, and is an excellent example of the Cornish type.

Owing to unavoidable delays in signing the contract for the duplex engine intended for this place, the period for its commencement was retarded, and it is not yet finished; the machine is, however, all fitted together in the shop of the contractor, and its erection will soon be commenced.

During the summer an additional stone engine-house has been



erected, 54 by 57 feet inside, capable of amply accommodating two engines of the same size as the one now building.

The reservoir, since the last repair given it, has been much improved, and is now useful; it has been filled to the depth of 18½ feet without exhibiting any appreciable leakage.

A fence has been placed around the top of the embankment.

The engine and boiler house for the auxiliary engine for the future supply of Germantown is completed, with the exception of rough casting the outside. It has not yet been used, for the reason that the old works at Germantown could not be abandoned on account of the want of a descending main from the Mount Airy reservoir; therefore the demand upon the Roxborough line was not as great as it will be hereafter.

The pipe aqueduct bridge across the Wissahickon Creek has been in use since March, 1871; it answers fully the purpose of its erection, and has not given any trouble.

At Germantown the principal work has been the repair of the Mount Airy reservoir; it is improved, but, I regret to say, is not yet tight.

An appropriation was made rather late in the season for laying a main on the Main Street, Germantown, of 16 inches diameter, from the reservoir to Tulpehocken Street, and of 10 inches diameter from that street to Wister Street; but owing to the delay in getting the pipes only 7,640 feet of the 16-inch main has been completed; the remainder will be finished as early in the spring as the weather will permit.

The 30-inch main from the eastern terminus of the submerged pipe along the railroad to Thirty-third Street, thence to Master, thence to Twenty-sixth Street, thence to Jefferson Street, terminating at Ridge Avenue, has been in use since August last.

A main, 24 inches in diameter, has been laid on Poplar Street, from the terminus of the 30-inch main on that street, west of Seventeenth Street, to Sixteenth Street, where it is reduced to 20 inches diameter, and carried along Sixteenth Street, of that size, from Poplar Street to Spring Garden Street. This will improve the supply of water in that immediate neighborhood.

The quantity of distributing pipe laid has been very large, amounting to 30 miles and 572 feet; and making the total amount of pipe now in use 518 miles and 3,069 feet.

The number of new permits issued is 13,648, being 1,218 more than in the previous year.

The total receipts of the department from all sources have reached the sum of \$963,234.08; the expenses for the maintenance of the works have been \$445,264.23; showing a surplus of receipts over expenses of \$517,969.85.

Owing, perhaps, to the coolness of the summer, the increase of the water supply over that of the previous year has not been as great as usual.

Diagrams showing graphically the water supply for the past year from all the works, and the annual average supply for each year since the consolidation of the city, will be found with the usual statistical tables.

The operations of the machine shop continue to be very satisfactory. A new lathe has been added to its tools; so that, besides fitting up all the stop-cocks, fire hydrants, ferrules, and other fixtures required for the distributing pipes, and making the picks, bars, and tools required for all the works, much new work, with a large amount of repairs to the steam and water-power machinery, is now done, which would otherwise have to be given out to private establishments at higher rates than it is now done by our own men and with our own tools. The profit thus derived is, at fair rates, \$28,619 51.

In the statistical tables of the operations of the several works, the comparative economy of the cost of running is shown by the statement of the cost of raising one million gallons one foot high, and may be recapitulated as follows, in the order of their greatest economy.

		Per million gallons.
Fairmount Works,	water power. - - - - -	.01 $\frac{3}{100}$
Belmont	do Worthington's duplex steam engines,	.08 $\frac{1}{10}$
Schuylkill	do two full Cornish, one low pressure rotative engine. - - - - -	.10 $\frac{9}{10}$
Roxborough	do one full Cornish steam engine, -	.12 $\frac{7}{10}$
Delaware	do one high and one low pressure rota- tive engine, - - - - -	.19 $\frac{9}{10}$
Germantown	do two high pressure rotative engines,	.26 $\frac{3}{10}$

Very respectfully,

FRED GRAFF,

*Chief Engineer Water Department.*

*Operations of Fairmount Works for the year 1871.*

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-hk use.				Tallow consumed.	Oil consumed.	Rain-fall during the month.	Average temperature.
	Days.					Tons.	Cwts.	Qrs.	Lbs.				
January.....	31	2,450,975	761,340,521	24,559,372	101,783,492	.....	.....	.....	.....	42	108	3.47	31.29
February.....	28	2,379,420	669,851,376	23,923,263	89,552,323	.....	.....	.....	.....	.....	165	3.09	33.93
March.....	31	2,223,234	749,162,594	24,166,535	100,155,427	.....	.....	.....	.....	18	219	5.91	48.70
April.....	30	2,004,094	735,425,180	24,514,173	98,318,874	.....	.....	.....	.....	.....	250	1.83	58.15
May.....	31	2,786,396	757,374,133	24,431,424	101,253,227	.....	.....	.....	.....	30	230	3.38	66.26
June.....	30	2,850,165	838,708,054	26,956,935	108,116,050	.....	.....	.....	.....	21	225	3.77	74.51
July.....	31	2,830,480	812,322,141	26,300,724	108,599,257	.....	.....	.....	.....	26	245	6.81	76.68
August.....	31	2,127,643	651,798,328	21,025,752	87,138,814	.....	.....	.....	.....	10	200	5.97	78.50
September.....	30	2,530,406	727,939,725	24,366,324	97,324,529	.....	.....	.....	.....	35	183	1.77	63.80
October.....	31	2,316,825	687,051,404	22,162,949	91,851,792	.....	.....	.....	.....	22	152	4.86	57.87
November.....	30	2,546,720	764,853,907	25,403,130	102,253,196	.....	.....	.....	.....	20	150	4.29	41.
December.....	31	2,535,030	635,850,925	23,446,804	93,028,198	103	.....	.....	.....	25	167	2.26	30.85
<b>Totals.....</b>	<b>363</b>	<b>30,200,138</b>	<b>8,821,728,593</b>	<b>24,195,782</b>	<b>1,179,375,479</b>	<b>103</b>	.....	.....	.....	<b>249</b>	<b>2,294</b>	<b>47.41</b>	<b>56.14</b>

## FAIRMOUNT WORKS.

*Supplies purchased during 1871.*

Gas and oil for lighting,	-	-	-	-	\$1,061	42
81 tons of coal for warming works,	-	-	-	-	566	00
705 gallons of oil (lubricating),	-	-	-	-	641	63
665 pounds of tallow,	-	-	-	-	119	70
Packing and small stores,	-	-	-	-	900	25
Repairs,	-	-	-	-	3,991	36
					\$7,280	36

*Running Expenses, 1871.*

Salaries of engineers and labor,	-	-	-	-	\$4,990	25
Gas and oil for lighting works,	-	-	-	-	1,061	42
102 tons coal for warming works, at average price above	-	-	-	-	\$6.99	719 97
573½ gallons oil lub., at average price above	.91				521	89
249 pounds tallow,	"	"	.18		44	82
Packing and small stores,	-	-	-	-	900	25
Repairs,	-	-	-	-	3,991	36
					\$12,229	96

Cost of raising water into reservoir, per million gallons,	-	-	-	-	\$1.38	<sup>9</sup> / <sub>100</sub>
Cost of raising water, per million gallons, one foot high,	-	-	-	-	01.	<sup>28</sup> / <sub>1000</sub>

Operations of the Schuylkill Works for the year 1871.

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.	Qrs.	
January.....	31	278,852	100,386,720	3,238,281	13,420,684	90	.....	.....	.....	84	21	
February.....	29	303,687	111,770,370	3,991,799	14,942,563	110	01	.....	.....	120	45	
March.....	31	309,628	143,291,680	4,622,300	19,143,958	145	09	.....	.....	140	41	
April.....	30	455,352	184,466,430	6,148,881	24,661,287	186	19	.....	.....	211	171	
May.....	31	537,774	219,761,334	6,766,676	28,042,959	197	09	.....	.....	224	126	
June.....	30	562,074	236,566,972	7,885,566	31,026,601	236	10	.....	.....	264	211	
July.....	31	607,879	239,059,516	7,711,597	30,622,930	235	11	.....	.....	292	104	
August.....	31	683,202	344,781,354	11,121,979	46,093,764	326	.....	.....	.....	377	143	
September.....	30	593,959	230,040,786	7,668,026	30,754,116	204	06	.....	.....	260	62	
October.....	31	659,017	238,536,380	8,662,464	35,900,586	245	17	.....	.....	270	92	
November.....	24	238,113	93,335,130	3,888,964	12,477,989	73	13	.....	.....	92	23	
December.....	23	109,160	39,237,600	1,708,591	5,253,689	82	02	.....	.....	56	12	
<b>Totals.....</b>	<b>361</b>	<b>5,641,107</b>	<b>2,201,234,172</b>	<b>6,117,925</b>	<b>292,940,396</b>	<b>2,103</b>	<b>17</b>	<b>.....</b>	<b>.....</b>	<b>2,390</b>	<b>1,053</b>	

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

## SCHUYLKILL WORKS.

*Supplies purchased during 1871.*

Gas for lighting works,	-	-	-	\$944 55
3,712 $\frac{1}{8}$ tons of coal,	-	-	-	19,192 03
177 $\frac{1}{2}$ gallons of oil,	-	-	-	135 62
2,736 pounds of tallow,	-	-	-	473 96
Packing and small stores,	-	-	-	575 00
Repairs,	-	-	-	4,984 33
				<hr/>
				\$26,305 49

*Running Expenses, 1871.*

Salaries of engineers, firemen, &c.,	-	-	-	\$9,600 00
Gas for lighting works,	-	-	-	944 55
2,103 $\frac{1}{8}$ tons of coal consumed at average price above 5 $\frac{1}{16}$ ,	-	-	-	10,876 90
263 $\frac{1}{4}$ gallons of oil consumed at average price above 76 $\frac{1}{16}$ ,	-	-	-	201 12
2,390 pounds of tallow consumed at average price above 17 $\frac{2}{16}$ ,	-	-	-	413 47
Packing and small stores,	-	-	-	575 00
Repairs,	-	-	-	4,984 33
				<hr/>
				\$27,595 37

Cost of raising water into reservoir, per million gallons,	-	-	-	\$12 53 $\frac{7}{8}$
Cost of raising water, per million gallons, one foot high,	-	-	-	10 $\frac{2}{8}$
2				

*Operations of the Delaware Works for the year 1871.*

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.....	22	359,087	61,403,877	2,791,085	8,209,075	144	.....	.....	.....	42	16
February.....	20	340,853	54,536,480	2,726,824	7,290,973	104	.....	.....	.....	18	15
March.....	25	424,980	67,996,800	2,719,872	9,090,481	124	10	.....	.....	24	16
April.....	27	463,518	78,962,880	2,924,551	10,556,584	143	10	.....	.....	28	18
May.....	29	555,632	88,901,120	3,065,728	11,885,176	165	.....	.....	.....	28	17
June.....	30	572,550	91,608,000	3,053,600	12,247,059	169	.....	.....	.....	32	21
July.....	31	597,800	95,568,000	3,082,839	12,776,471	171	10	.....	.....	42	26
August.....	31	728,281	118,407,005	3,819,581	15,829,813	256	8	.....	24	88	23
September.....	30	608,377	100,057,782	3,335,259	13,376,709	215	.....	.....	.....	30	19
October.....	26	506,558	84,961,697	3,267,758	11,368,516	202	.....	.....	.....	26	17
November.....	30	565,160	90,425,600	3,014,187	12,089,984	179	10	.....	.....	28	18
December.....	28	465,983	74,549,280	2,662,474	9,966,481	154	6	3	04	30	16
<b>Totals.....</b>	<b>829</b>	<b>6,218,224</b>	<b>1,007,378,521</b>	<b>3,038,646</b>	<b>184,677,272</b>	<b>2,028</b>	<b>15</b>	.....	.....	<b>366</b>	<b>224</b>

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



## DELAWARE WORKS.

*Supplies purchased during 1871.*

Gas for lighting works,	-	-	-	\$377 07
2,488 $\frac{1}{2}$ tons of coal,	-	-	-	15,498 32
180 gallons of oil,	-	-	-	135 00
650 pounds of tallow,	-	-	-	111 42
Packing and small stores,	-	-	-	425 00
Repairs,	-	-	-	1,500 00
				<hr/>
				\$18,046 81

*Running Expenses, 1871.*

Salaries of engineers, firemen, &c.,	-	-	-	\$7,400 00
Gas for lighting works,	-	-	-	377 07
2,028 $\frac{1}{2}$ tons of coal at average price above \$6 $\frac{23}{100}$ ,				12,639 12
56 gallons of oil	"	"	" 75 cts.,	42 00
366 pounds of tallow	"	"	" 17 $\frac{1}{10}$ ,	62 59
Packing and small stores,	-	-	-	425 00
Repairs,	-	-	-	1,500 00
				<hr/>
				\$22,445 78

Cost of raising water into reservoir, per million gallons,	-	-	-	22 29
Cost of raising water, per million gallons, one foot high,	-	-	-	19 $\frac{9}{10}$

Operations of the Belmont Works for the year 1871.

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	161,314	50,007,340	1,613,140	6,685,478	105	10	2	24	55	7	
February.....	26	141,367	43,823,770	1,685,529	5,858,793	95	.....	3	16	75	8	
March.....	31	166,582	51,610,420	1,665,820	6,903,799	110	11	2	12	65	6	
April.....	30	155,274	57,434,910	1,914,498	7,678,468	114	.....	1	12	75	8	
May.....	31	211,750	67,642,500	2,182,016	9,043,115	134	9	1	4	95	6	
June.....	30	234,756	72,774,360	2,425,512	9,729,192	141	.....	2	4	90	8	
July.....	31	258,975	80,282,250	2,676,075	10,782,921	174	11	3	4	115	9	
August.....	31	497,521	154,233,060	4,975,280	20,010,393	306	5	.....	.....	155	12	
September.....	30	416,813	129,212,030	4,307,068	17,274,335	269	4	3	8	115	9	
October.....	31	433,428	135,912,680	4,384,280	18,170,131	262	17	.....	16	135	11	
November.....	30	351,108	108,843,450	3,628,116	14,551,267	226	4	.....	1	125	10	
December.....	31	330,336	102,404,160	3,303,360	13,690,396	209	6	2	12	100	9	
<b>Totals.....</b>	<b>863</b>	<b>3,404,224</b>	<b>1,054,210,990</b>	<b>2,890,748</b>	<b>140,937,283</b>	<b>2150</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1200</b>	<b>103</b>	

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

## BELMONT WORKS.

*Supplies purchased during 1871.*

Coal oil for lighting works, - - -	\$103 07
1,802 $\frac{8}{10}$ tons of coal, - - -	9,884 72
47 $\frac{1}{2}$ gallons of oil, - - -	73 63
1,339 pounds of tallow, - - -	239 51
Packing and small store, - - -	346 13
Repairs to boilers, steam heater, &c., - -	1,194 78
	<hr/>
	\$11,841 84

*Running Expenses, 1871.*

Salaries of engineers, firemen, &c., - -	\$5,000 00
Coal oil for lighting works, - - -	103 07
2,150 $\frac{1}{10}$ tons of coal at average price above \$5 $\frac{49}{100}$ ,	11,804 05
25 $\frac{3}{4}$ gallons of oil " " " 1 $\frac{55}{100}$ ,	39 91
1,200 pounds of tallow " " " 17 $\frac{9}{10}$ ,	214 80
Packing and small stores, - - -	346 13
Repairs, - - - - -	1,194 78
	<hr/>
	\$18,702 74

Cost of raising water into reservoir, per million gallons, - - - - - 17 74

Cost of raising water, per million gallons, one foot high, - - - - - 08 $\frac{5}{10}$

No part of the repairs named above were put upon the engines, but were made to the boilers and their steam and feed pipes and other fixtures.

Operations of the Germantown Works for the year 1871.

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 .....	29	2,008,000	18,243,800	629,097	2,439,011	76				31	13	
February .....	28	2,021,000	18,359,800	655,700	2,454,491	78				32	13	
March .....	25	1,237,000	11,131,200	445,248	1,488,128	40				23	10	
April .....	27	568,000	5,154,800	190,918	689,144	20				10	5	
May .....	31	768,000	7,194,800	232,090	961,871	27				22	8	
June .....	30	986,000	8,877,600	295,920	1,186,845	35				20	8	
July .....	30	1,103,000	9,941,800	320,703	1,329,118	36				20	8	
August .....	31	1,249,000	11,016,400	355,368	1,472,780	44				18	8	
September .....	29	1,120,000	10,081,000	347,621	1,347,727	40				20	8	
October .....	30	1,037,000	9,339,200	311,307	1,248,556	40				20	8	
November .....	30	1,027,000	9,232,200	307,740	1,234,251	42				21	8	
December .....	30	1,054,000	9,526,400	317,547	1,273,584	33				24	8	
Totals .....	350	14,178,000	128,098,800	307,438	17,125,506	510				261	106	

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

## GERMANTOWN WORKS.

*Supplies purchased during 1871.*

Coal oil for lighting works, - - -	\$5 00
599 tons of coal, - - -	3,931 75
46 gallons of oil (lubricating), - - -	35 50
338 pounds of tallow, - - -	52 45
Packing and small stores, - - -	44 00
Repairs, - - -	229 11
	<hr/>
	\$4,297 81

*Running Expenses, 1871.*

Salaries of engineers, firemen, &c., - - -	\$4,050 00
Coal oil for lighting works, - - -	5 00
510 tons of coal at average price above \$6.57,	3,350 70
26½ gallons of oil " " " .77,	20 21
26½ pounds of tallow " " " .15½,	40 46
Packing and small stores, - - -	44 00
Repairs, - - -	229 11
	<hr/>
	\$7,739 48

Cost of raising water into reservoir, per million gallons, - - -	\$60 46
Cost of raising water, per million gallons, one foot high, - - -	26 <sup>3</sup> / <sub>10</sub>

*Operations of the Roxborough Works for the year 1871.*

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 .....	18	73,285	10,626,325	590,351	1,420,631	83	10	1	25	58	10	
February .....	14	60,940	8,836,300	631,164	1,181,823	83	3	3	03	43	5	
March.....	22	102,999	14,934,855	678,857	1,996,637	47	17	8	10	83	8	
April.....	25	138,494	20,081,630	803,265	2,684,709	65	11	1	08	126	12	
May.....	24	170,230	24,683,350	1,028,473	3,299,918	70	16	1	04	145	14	
June.....	26	161,461	23,411,845	900,456	3,129,926	70	08	2	06	125	12	
July.....	21	135,219	29,706,755	1,414,607	3,971,491	63	10	1	22	105	12	
August.....	26	189,489	27,475,905	1,056,765	3,673,236	84	.....	.....	07	143	18	
September.....	26	203,077	29,446,165	1,132,545	3,936,653	94	.....	.....	.....	131	20	
October.....	25	230,407	33,409,015	1,336,361	4,466,446	111	12	2	.....	143	24	
November.....	25	219,219	31,786,755	1,271,470	4,236,197	103	13	.....	.....	136	23	
December.....	24	215,789	31,289,505	1,303,729	4,183,089	110	13	1	.....	143	20	
<b>Totals.....</b>	<b>276</b>	<b>1,900,609</b>	<b>285,688,405</b>	<b>1,012,337</b>	<b>38,180,251</b>	<b>888</b>	<b>17</b>	<b>2</b>	<b>01</b>	<b>1,381</b>	<b>180</b>	

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

## ROXBOROUGH WORKS.

*Supplies purchased during 1871.*

Oil for lighting works,	-	-	-	\$35 34
579 $\frac{1}{8}$ tons of coal,	-	-	-	3,335 00
93 $\frac{1}{2}$ gallons of oil,	-	-	-	63 91
1,367 pounds of tallow,	-	-	-	228 65
Packing and small stores,	-	-	-	200 45
Repairs,	-	-	-	2,318 46
				<hr/>
				\$6,181 81

*Running Expenses, 1871.*

Salaries of engineers and firemen,	-	-	\$4,200 00
Oil for lighting works,	-	-	35 34
888 $\frac{1}{8}$ tons of coal at average price above \$5.75,	5,110 88		
45 gallons of oil " " " 68 $\frac{3}{10}$ ,	30 74		
1,381 pounds of tallow " " " 16 $\frac{7}{10}$ ,	230 63		
Packing and small stores,	-	-	200 45
Repairs,	-	-	2,318 46
			<hr/>
			\$12,126 50

Cost of raising water into reservoir, per million gallons,	-	-	-	\$42 40
Cost of raising water, per million gallons, one foot high,	-	-	-	12 $\frac{7}{10}$

*Amount of Water Pumped by all the Works during the year 1871.*

MONTHS.	Gallons of water pumped during the month.	Average number of gallons pumped per day.
January, . .	1,002,008,583	33,421,326
February, . .	907,177,896	33,644,279
March, . .	1,038,157,449	34,298,641
April, . .	1,081,525,860	36,496,286
May, . .	1,155,557,242	37,706,406
June, . .	1,241,946,831	41,518,289
July, . .	1,266,880,762	41,506,545
August, . .	1,307,712,052	42,354,705
September, .	1,226,827,488	41,156,843
October, . .	1,219,210,376	40,125,119
November, .	1,098,477,072	37,605,607
December, .	952,917,870	31,742,505
Totals, . .	13,498,399,481	37,631,379



*Amount of Water pumped by all the Works during the years 1867, 1868, 1869, 1870, and 1871.*

MONTHS.	1867.		1868.		1869.		1870.		1871.	
	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.
January....	618,287,074	20,005,379	730,464,667	24,851,786	877,284,223	28,507,994	823,501,020	26,629,192	1,002,008,588	33,421,326
February...	711,152,228	28,187,718	825,584,566	30,914,237	857,235,551	30,850,764	816,808,722	29,377,975	907,177,806	33,644,279
March.....	716,604,210	24,058,725	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
April.....	875,050,766	29,259,539	880,197,073	29,632,897	1,044,170,483	35,074,275	1,054,488,246	36,454,860	1,081,525,860	36,496,286
May.....	886,321,354	29,384,172	968,861,910	31,719,122	1,120,568,740	36,530,528	1,204,765,895	37,445,368	1,165,657,242	37,706,406
June.....	1,023,294,108	34,706,857	1,124,258,325	37,916,924	1,197,673,103	39,935,103	1,220,092,276	40,669,741	1,241,946,831	41,518,289
July.....	1,115,559,299	37,639,532	1,225,465,237	39,573,452	1,294,468,963	41,757,063	1,397,614,410	46,008,735	1,266,880,762	41,506,545
August.....	1,065,853,766	36,446,543	1,257,133,188	40,555,908	1,139,394,772	36,754,670	1,328,758,809	43,663,187	1,307,712,052	42,354,705
September..	1,043,957,549	39,041,156	1,113,085,190	37,186,021	1,111,435,089	37,047,836	1,201,946,583	41,105,307	1,226,827,488	41,156,843
October.....	1,071,726,037	35,396,907	1,169,605,506	37,907,082	1,098,648,339	35,440,337	1,264,416,410	40,845,543	1,219,210,376	40,125,119
November..	880,945,353	30,976,368	973,190,979	32,833,468	970,776,989	32,350,234	1,186,284,027	39,880,989	1,098,477,072	37,605,607
December...	854,579,754	28,615,319	888,116,818	29,310,439	898,388,339	29,151,189	1,072,655,628	35,035,201	952,917,870	31,742,505
<b>Totals...</b>	<b>10,863,421,498</b>	<b>29,771,018</b>	<b>11,985,178,883</b>	<b>33,378,628</b>	<b>12,414,752,336</b>	<b>34,040,409</b>	<b>13,392,808,272</b>	<b>37,249,385</b>	<b>13,498,399,481</b>	<b>37,631,879</b>

## CHIEF ENGINEER'S OFFICE,

No. 104 South Fifth Street.

Table No. 1 shows the average quantity of water pumped each month by all the works together; also the total by water power, by steam power, and each of the works separate.

Table No. 2 shows the monthly average by all the works, by water power and by steam power, for the years 1867, 1868, 1869, 1870.

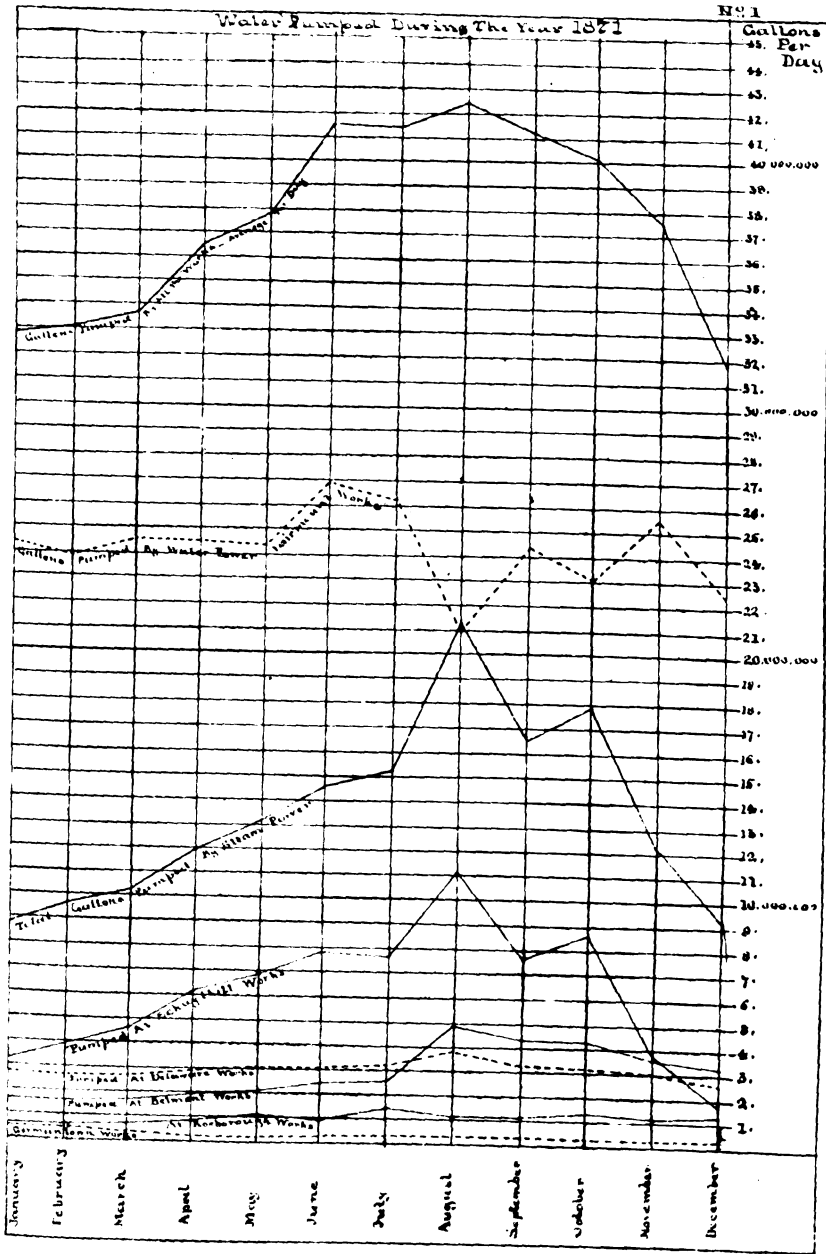
Table No. 3 shows the average of the whole year for each year since consolidation.

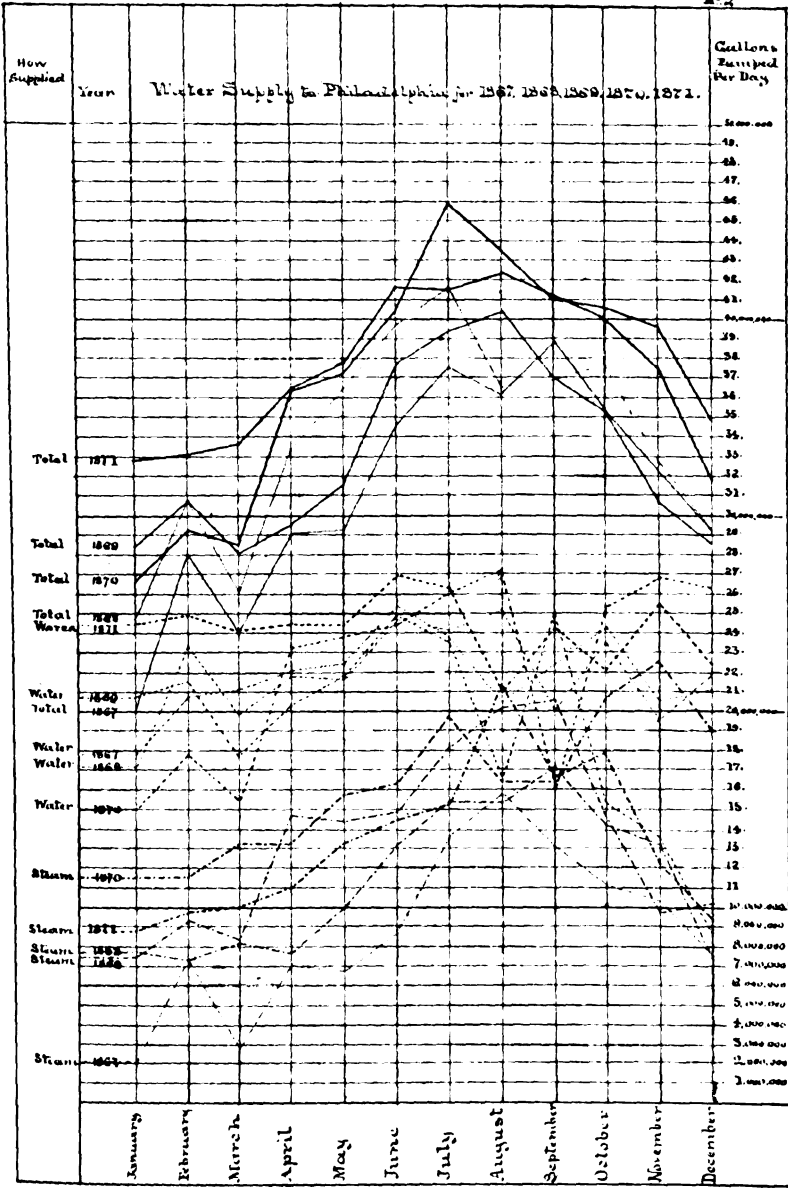
In tables Nos. 1 and 2 the horizontal lines show million of gallons raised per day—the perpendicular lines show the months.

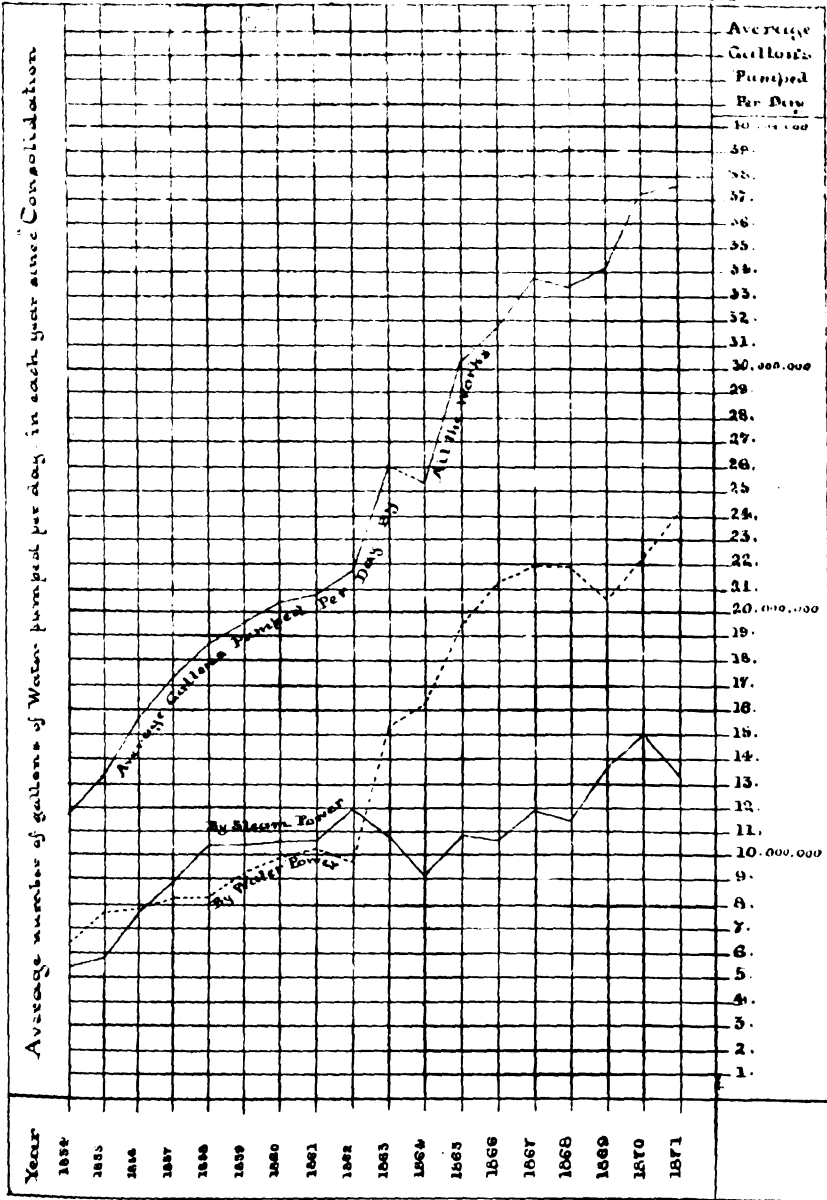
In table No. 3 the perpendicular lines show the year.

Water Pumped During The Year 1871

No 1







*Statement of the Operations of Shop from January 1, 1871, to  
December 31, 1871.*

DR.

To stock on hand January 1, 1871,	-	-	\$4,234 91
396,882 lbs. cast-iron castings,	-	-	12,981 07
42,098 " wrought-iron,	-	-	1,752 21
2,157 " steel,	-	-	420 54
14,537 " brass castings,	-	-	3,096 88
14,393 " lead,	-	-	1,007 51
9,640 " bolts, washers, nuts, &c.,	-	-	1,492 37
330 " leather,	-	-	145 53
410 " gasket,	-	-	69 70
18 " listing	-	-	3 60
25 " tallow,	-	-	4 50
32,603 feet lumber (assorted),	-	-	1,386 09
102 tons coal,	-	-	701 00
528 galvanizing spindles for stops,	-	-	158 40
Machine work,	-	-	154 52
Hardware,	-	-	1,634 67
Wrought-iron tubings, &c.,	-	-	480 51
Paints, oils, &c.,	-	-	604 58
Files bought and re-cut,	-	-	220 04
Wages paid hands, and incidentals,	-	-	15,718 35
			\$46,266 98

CR.

By 113 stop-cocks, 4-inch, at \$40,	\$4,520 00	
218 " 6 " at 42,	9,156 00	
9 " 8 " at 80,	720 00	
13 " 10 " at 95,	1,235 00	
17 " 12 " at 120,	2,040 00	
7 " 16 " at 175,	1,225 00	
	\$18,896 00	\$46,266 98

	Amounts brought forward,	\$18,896 00	\$46,266 98
By	6 stop-cocks, 20-inch, at \$220,	1,320 00	
	2 " 23 " at 380,	760 00	
	6 " 30 " at 520,	3,120 00	
	4 " 36 " at 750,	3,000 00	
	641 stop-cock boxes, at 3 50	2,243 50	
	176 fire plugs, at 36 00	6,336 00	
	254 plug casings, at 18 00	4,572 00	
	459 frames and covers, at 7 00	3,213 00	
	5025 ½-inch ferrules, at 50,	2,512 50	
	100 § " " at 50,	50 00	
	25 † " " at 50,	12 50	
	Repairs for First District,	1,097 15	
	" Second "	2,360 93	
	" Third "	1,647 32	
	" Fourth "	1,459 15	
	" " " 30-in. main,	803 35	
	" Germantown District,	1,416 80	
	" " engine-house,	33 31	
	" Manayunk,	900 45	
	" Belmont reservoir,	171 27	
	" Belmont Works,	1,155 89	
	" Schuylkill Works,	2,282 11	
	" New inlet, Schuylkill Works,	1,650 00	
	" Delaware Works,	487 07	
	" Fairmount Works,	1,203 11	
	" " " exten- sion,	1,466 99	
	" Roxboro' Works,	246 94	
	" " "	209 41	
	" " "	229 89	
	" Buildings and grounds,	708 25	
	Amounts carried forward,	\$65,564 89	\$46,266 98

Amounts brought forward,	\$65,564 89	\$46,266 98
Repairs for Iron railing, Fairmount,	393 35	
“ Schuylkill Works,	257 02	
“ Delaware Works,	483 02	
“ 36-inch main, Belmont,	213 34	
“ 36-inch main, Delaware,	485 29	
“ Mount Airy reservoir,	54 72	
“ 36-inch main, Schuylkill,	577 41	
“ Delaware reservoir,	96 41	
“ Storage reservoir,	549 52	
“ Twenty-fourth Ward Works (old),	74 25	
“ Steam pumps, Fairmount,	530 78	
Fixtures, stock (shops account),	513 68	
New patterns made and repaired,	308 03	
Repairs for Fifth and Chestnut Streets, (office),	136 62	
Water meters (filling and setting),	95 00	
Two pivot tables, complete (Delaware and Belmont Works),	344 12	
Stock on hand, viz.:		
50 sharp thread screws, at \$2 50,	125 00	
5 square “ 3-inch, at \$5 00,	25 00	
2 “ “ 4 “ at 5 00,	10 00	
4 “ “ 6 “ at 5 00,	20 00	
2 “ “ 8 “ at 6 00,	12 00	
5 “ “ 10 “ at 8 00,	40 00	
1 “ “ 12 “ at 10 00,	10 00	
3 “ “ 16 “ at 12 00,	36 00	
5 “ “ 20 “ at 14 00,	70 00	
2 “ “ 30 “ at 20 00,	40 00	
1 “ “ 36 “ at 25 00,	25 00	
Amounts carried forward,	\$71,090 45	\$46,266 98



Amounts brought forward,		\$71,090 45	\$46,266 98
25 socket screws, 6-inch	at 5 00,	125 00	
5 " "	16 " at 12 00,	60 00	
17 spindles,	3 " at 5 00,	85 00	
50 "	4 " at 5 00,	250 00	
160 "	6 " at 5 00,	800 00	
10 "	8 " at 6 00,	60 00	
7 "	10 " at 8 00,	56 00	
8 "	12 " at 10 00,	80 00	
850 lbs. bolts, nuts, and washers,	at 15,	127 50	
16,778 lbs. wrought-iron,	at 4½,	755 01	
605 " " forgings,	at 13,	78 65	
925 " cast steel,	at 21,	194 25	
12,124 " iron castings,	at 4,	484 96	
1,187 " finished brasses,	at 30,	356 10	
300 feet assorted lumber,	at 8,	24 00	
154 wooden plugs,	at 50,	77 00	
Keg of nails,		5 25	
25 quires emery, flint paper, &c.,		5 00	
28 lbs. leather,	at 44,	12 32	
Hardware, shovels, &c.,		85 00	
Paints, oils, &c.,		75 00	
To balance, nominal profit of shop,			28,619 51
		<hr/>	<hr/>
		\$74,886 49	\$74,886 49

## DISTRIBUTION.

Service mains have been laid in the following streets in 1871.

## FIRST DISTRICT.

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

Street.	Location.	Size.	
		Inches.	Feet.
Titan,	From Seventeenth to Eighteenth,	4	450
Latona,	" Seventeenth to Eighteenth,	4	450
Hummell,	" Gray's Ferry Road to Twen- ty-ninth,	4	416
Fitzwater,	" Twenty-third (east),	6	386
Dickerson,	" Passyunk Road (west),	6	475
Watt,	" Wharton to Reed,	4	450
Kimball,	" Terminus to 21st (west),	4	148
Twentieth,	" Federal to Wharton,	6	700
Wharton,	" Terminus to Eighteenth (west),	6	220
Reed,	" Mount Holly to Twentieth,	6	1,162
Nineteenth,	" Washington Avenue to Ells- worth,	12	400
Alter,	" Seventeenth to Eighteenth,	4	450
Alter,	" Nineteenth to Twentieth,	4	450
Ellsworth,	" Nineteenth to Twentieth,	6	450
McCurdy,	" Twenty-sixth to Twenty-sev- enth,	4	450
Celeste,	" Seventh to Eighth,	4	450
Amelia,	" Terminus west of Sixth to Eighth,	4	625
Miffin,	" Sixth to Eighth,	6	900
June,	" Seventh to Eighth,	4	450
Hoffman,	" Sixth to Seventh,	4	450

Street,	Location.	Size.	
		Inches.	Feet.
Dudley,	From Sixth to Seventh,	4	450
Ninth,	" Reed to Dickerson,	4	450
Guirey,	" Passyunk Road to Twelfth,	4	600
Twenty-second,	" Catharine to Pemberton,	6	560
Fitzwater,	" Terminus to Twenty-second (east),	6	190
Fitzwater,	" Terminus to Twenty-second (west),	6	64
Montrose,	" Twenty-second to west Twen- ty-third,	4	800
Y. P. M.,	" Jarvis (south),	4	133
Moore,	" Terminus west of Seventh to Ninth,	6	750
Birch,	" Fitzwater to Catharine,	4	450
Alexander Ave.,	" Wharton (north),	4	350
Eighteenth,	" Terminus south to Wharton,	6	206
Manton,	" Nineteenth to Twentieth,	4	450
Fernon,	" Ninth to Tenth,	4	450
Mountain,	" Eighth to Beulah,	4	300
Hoffinan,	" Fourth to Fifth,	4	450
Carpenter,	" Terminus west of Twentieth to Twenty-second,	6	613
Twenty-first,	" Montrose to Mifflin,	6	359
Dudley,	" Eighth to Ninth,	4	450
McKean,	" Ninth (east),	6	350
May,	" Seventh to Eighth,	4	450
Oakford,	" Thirty-first (east),	4	350
Thirty-first,	" Gray's Ferry Rd., to Oakford,	6	150
Twenty-seventh,	" Park to Oakford,	6	300
Fourth,	" Mifflin to McKean,	6	450
Eighth,	" Morris to Mifflin,	6	900
League,	" Terminus to W. of Nineteenth,	4	150
Sixth,	" Terminus to McKean,	6	296
Seventh,	" Moore to McKean,	6	900

Location.	Size.	
	Inches.	Feet.
Connecting Seventeenth Street with 20-inch main, Washington Avenue,	6	75
" Eighteenth Street with 20-inch main, Washington Avenue,	6	75
" Eighteenth Street with Titan Street,	4	14
" Pierce with Eighth Street,	4	27
" Kimball with Twenty-first Street,	4	26
Connection for mill, Twenty-first Street and Wash- ington Avenue,	4	21
Connection for mill, Eighth and Mountain,	4	22
" " " Holly and Fitzwater,	4	13
" " " fire-plugs,	4	475
Total number of feet of pipe laid,		<hr/> 23,051
Number of feet of new pipe laid,	4	12,120
" " " "	6	10,531
" " " "	12	400
Total number of feet, Or 4 miles 1,931 feet.		<hr/> 23,051
Relaid, Essex, from Christian (north),	3	75
" Christian, between Third and Fourth,	10	84

## 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.
Sycamore,	From Thirty-fifth to 102 feet west of Thirty-seventh,	8	974
Westminster Ave.,	" Lancaster Ave. to Forty- Eighth,	12	1,259

Street.	Location.	Size.	
		Inches.	Feet.
Westminster Ave., From	Lancaster Ave. to Forty-		
	Eighth,	6	36
Westminster Ave., “	Lancaster Ave. to Forty-		
	Eighth,	4	48
Fortieth,	“ Elm to Westminster Ave.,	6	2,667
Rockland,	“ Thirty-third to Thirty-fifth,	4	842
Elm,	“ Thirty-seventh to 282 feet		
	west of Thirty-eighth,	6	704
Warren,	“ Thirty-eighth to Thirty-		
	ninth,	4	465
Haverford Ave., “	Forty-fourth to Fiftieth,	6	2,730
Irving,	“ Fortieth to Forty-first,	6	720
Thirty-ninth,	“ Spruce to Woodland,	6	620
Grape,	“ Thirty-Sixth to Thirty-		
	seventh,	4	414
Union,	“ Haverford to Sycamore,	6	860
Aspen,	“ Thirty-Fifth to Thirty-		
	sixth,	6	440
Forty-fifth,	“ Lancaster Ave. to Haver-		
	ford,	6	2,420
Forty-fifth,	“ Spruce to Baltimore Ave.,	6	1,370
Woodland,	“ Forty-sixth to Railroad		
	Bridge,	6	755
Thirty-eighth,	“ Spruce to Irving,	6	230
Transcript,	“ Forty-fourth to Forty-		
	fifth,	6	400
Powelton Avenue,	“ Thirty-eighth to Thirty-		
	ninth,	6	585
Elm,	“ Union to Fortieth,	6	317
Kershaw Avenue,	“ Fiftieth Street to Lancas-		
	ter Avenue,	4	689
Main from Fairmount	Engine-house to reservoir,	12	585
Connecting Story Street	with Union Street,	6	24
“ Elm	“ “ “	6	12

Street.	Location.	Size.	
		Inches.	Feet.
Connecting Fortieth Street with Aspen Street, Plug connections,		6	36
		4	604
Total number of feet of pipe laid,		<hr/> 20,806	
Number of feet of new pipe laid,		<hr/>	
"	"	4	3,062
"	"	6	14,926
"	"	8	974
"	"	12	1,844
Total number of feet, Or 3 miles 4,966 feet.		<hr/> 20,806	
Lowered pipe on Preston, from Myrtle to Huron,		6	450

## 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.
Toronto,	From Melvale (south),	4	576
Wellington,	" Richmond to Thompson,	6	804
Germantown Ave.,	" Lehigh Ave. to Old York Road, and along Old York Road to Tioga,	6	4,776
	" Old York Road to Eleventh,	6	960
Tioga,	" Tioga to Ontario,	6	576
Tenth,	" Tioga to Ontario,	6	624
Eleventh,	" Tenth to Eleventh,	6	480
Ontario,	" Lehigh Avenue to Reading Railroad,	6	443
Thompson	" Wellington to Westmore- land,	6	408
Edgemont,			

Street.	Location.	Size.	
		Inches.	Feet.
Thompson,	From William to Clearfield,	6	1,786
Edgemont,	“ York to Cumberland,	6	444
Bodine,	“ Dauphin to Susquehanna,	6	639
Lawrence,	“ Norris to Hackley,	6	360
Almendo,	“ Somerset to Ann,	6	1,272
Mutter,	“ Lehigh Ave. to Cumber- land,	6	1,128
Bath,	“ Sorrell to Ann,	4	288
Orianna,	“ Susquehanna to Dauphin,	4	612
Cambria,	“ Fifth to Sixth,	6	600
Fairhill,	“ Cambria to Indiana,	4	567
Neff,	“ Richmond to Bath,	4	513
Hart Lane,	“ Frankford Ave. to Ken- sington Avenue,	6	1,260
Hazzard,	“ Emerald to Kensington Avenue,	4	945
Seltzer,	“ Front to Fillmore,	4	567
Sturner,	“ Front to Fillmore,	4	567
Albert,	“ Emerald to Kensington Avenue,	6	936
Sargeant,	“ Emerald to Kensington Avenue,	6	864
McClellan,	“ Montgomery Avenue to Vienna,	4	387
Warder,	“ Montgomery Avenue to Vienna,	4	387
Taggart,	“ Dauphin to Norris,	4	414
Hope,	“ Norris to Berks,	4	585
Leithgow,	“ York (south),	4	297
Rainbow,	“ Blair to Trenton Avenue,	4	297
Wreekin,	“ Memphis to Cedar,	4	450
Adams,	“ Gaul to Almond,	6	348
Cook,	“ Gaul to Memphis,	4	486
Emerald,	“ Washington Ave. to Clear- field,	6	660

Street.	Location.	Size.	
		Inches.	Feet.
America,	From Diamond (south), east side,	6	168
Letterly,	" Emerald to Jasper,	4	450
Firth,	" Emerald to Jasper,	4	477
Venango,	" Kensington Avenue to Frankford Road,	6	1,500
Beach,	" Vienna to Otis,	6	348
Hancock,	" Columbia Ave. (north),	6	504
Davis,	" Hancock to Howard,	4	576
Thompson,	" Wellington to Westmore- land,	6	420
Ash,	" Girard Avenue to Moyer,	4	333
Moyer,	" Otis to Vienna,	4	369
Fifth,	" Cambria (north),	6	120
D,	" Kensington Ave. to Old Front Street,	6	1,488
Hope,	" Huntington to Lehigh,	4	594
Lucy,	" Belgrade to Almond,	4	333
Firth,	" Emerald to Coral,	4	459
Leithgow,	" Dauphin (north),	4	279
Fifth,	" Germantown Road to Hackley,	6	540
Germantown Road,	" Huntingdon to Lehigh Av.,	6	600
Connections,		4	416
"		6	21
Pumping main, Delaware Works (including suction main),		36	4,032
Pumping main, connected with stand-pipe,		30	19
Total number of feet of pipe laid,			41,352
Number of feet of new pipe laid,		4	12,224
" " "		6	25,077
" " "		30	19
" " "		36	4,032
Total number of feet of new pipe laid,			41,352
Or 7 miles 4,392 feet.			



Street.	Location.	Size.	
		Inches.	Feet.
Relaid—Amber, from Ann (north),		6	468
“ drain at Delaware Works,		4	36
“ bridge, Delaware Avenue and Poplar,		4	45
“ Pegg Run and Willow Street,		6	39

## FOURTH DISTRICT.

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

Street.	Location.	Size.	
		Inches.	Feet.
Twenty-fifth,	From Brown to Hare,	6	444
Tioga,	“ Seventeenth to Broad,	6	1,416
Berks,	“ Twenty-first to Twenty-second,	6	480
Tahassa,	“ Ninth to Tenth,	4	636
Franklin,	“ Norris to Diamond,	6	516
Eighth,	“ Berks to Norris,	6	600
Seventeenth,	“ Columbia to Montgomery,	6	552
Nassau,	“ Twenty-second to Twenty-third,	6	480
Seventeenth,	“ Alleghany to Tioga,	6	1,692
Stewart,	“ Twenty-second to Twenty-third,	6	480
Diamond,	“ Broad to Tenth,	6	2,052
Jefferson,	“ Eighteenth to Twentieth,	6	936
Institute,	“ Columbia to Montgomery,	6	576
Dakota,	“ Ninth to Tenth,	4	636
Montgomery,	“ Sixteenth to Eighteenth,	6	960
Twenty-first,	“ Columbia to Norris,	6	1,740
Uber,	“ Montgomery Avenue to Berks,	6	468
Poplar,	“ Twenty-second to Twenty-fourth,	6	780
Berks,	“ Seventh to Ninth,	6	696
York,	“ Germantown Avenue to Tenth,	6	696
Marshall,	“ Berks (north),	6	336
A,	“ Twenty-third to Twenty-fourth,	6	456
Broad,	“ Alleghany to Tioga,	6	2,172
Harvard,	“ Oxford to Bolton,	4	372

Street.	Location.	Size.	
		Inches.	Feet.
Twenty-eighth,	From North of Girard Avenue to Goldbeck,	6	252
Twenty-ninth,	“ North of Girard Avenue to Goldbeck,	6	360
Goldbeck,	“ Twenty-eighth to Twenty-ninth,	6	444
Twenty-sixth,	“ Girard Avenue to Thompson,	6	612
Wood,	“ Twenty-third to Twenty-fourth,	6	456
Harland,	“ Nineteenth to Twentieth,	4	588
Berks,	“ Nineteenth to Twentieth,	6	468
Eighth,	“ Norris to Diamond,	6	540
Twenty-first,	“ Norris to Susquehanna,	6	948
Mervine,	“ Diamond (south),	6	180
Sharswood,	“ Eighteenth to Nineteenth,	6	456
Norris,	“ Broad to Mervine,	12	1,164
Thirty-third,	“ Thompson (north),	6	72
Pumping main from Spring Garden Works to basin,		36	3,456
“	“ at forebay, Fairmount,	36	252
“	“ at Columbia Bridge (east),	30	7,932
“	“ Poplar, from Seventeenth to Sixteenth,	24	564
“	“ Twenty-first and Jefferson Streets to College Avenue,	20	1,164
“	“ Sixteenth, from Poplar Street to Spring Garden,	20	2,916
“	“ (Spring Garden Reservoir),	16	1,212
Connection with mains,		10	120
“	“ “	12	504
“	“ “	20	216
“	“ “	30	66
“	“ “	36	12
Plug connections,		3	18
“	“	4	811
“	“	6	264
Total number of feet of pipe laid,			46,219

			Size.	
			Inchs.	Feet.
Number of feet of new pipe laid			3	18
"	"	"	4	3,043
"	"	"	6	23,580
"	"	"	10	120
"	"	"	12	1,668
"	"	"	16	1,212
"	"	"	20	4,296
"	"	"	24	564
"	"	"	30	7,998
"	"	"	36	3,720
Total number of feet,			<hr/> 46,219	
Or 8 miles 3,979 feet.				

## FRANKFORD.

*Account of Iron Pipes laid in Frankford.*

Street.	Location.	Size.	
		Inches.	Feet.
Waln,	From Unity to Oxford,	6	384
Penn,	" Sellers to Unity,	6	600
Leiper,	" Church to Allen,	6	2,052
Foulkrod,	" Penn to Franklin,	6	300
Franklin,	" Oxford to Wakeling,	6	1,296
Plug connections,		4	93
Total number of feet of pipe laid,		<hr/> 4,725	
Number of feet of new pipe laid,		4	93
"	" " " "	6	4,632
Total number of feet of new pipe laid,		<hr/> 4,725	

## GERMANTOWN.

*Account of Iron Pipes laid in Germantown.*

Street.	Location.	Size.	
		Inches.	Feet.
School Lane,	From end of pipe to Ridge Avenue,	6	691
Ridge Avenue,	" School Avenue to Falls Bridge,	6	2,500
Rittenhouse,	" Main to Greene,	6	1,055
Pastorius,	" Main to Hancock,	6	833
Adams,	" Rittenhouse to Harvey,	4	584
Price,	" Terminus (east),	4	140
Queen,	" Main to Greene,	6	813
Chelton Avenue,	" Hancock west to Germantown Railroad,	6	450
Chelton Avenue,	" Hancock east to Willow Avenue,	6	407
Main,	" Reservoir to Main Street and Johnson Street,	16	7,614
Waste on Mount Airy Avenue,	east from Sixteenth Street main,	4	250
Waste on Franklin (west),		4	275
" at Wissahickon pipe bridge,		4	159
" " "		6	92
Reservoir connection, Allen's Lane,		20	141
Connections,		10	40
Plug connections,		4	191
Total number of feet of pipe laid,			16,235
Number of feet of new pipe laid,		4	1,599
" " "		6	6,841
" " "		10	40
" " "		16	7,614
" " "		20	141
Total number of feet of pipe laid,			16,235
Or 3 miles 395 feet.			

	Size.	
	Inches.	Feet.
Relaid, Wayne Street from School Street to Chelton Avenue,	6	777
“ Wayne Street and Chelton Avenue Intersection,	6	24
“ School Street, from Main to Greene,	8	758
“ School Street, from Greene to near Norristown Railroad,	6	10,187
“ Intersection, School and Greene Streets,	6	77
“ “ Main, N. E. of School,	6	50
“ “ Main, S. W. of School,	6	50
“ Plug connections,	4	302
Total number of feet of pipe relaid,		12,225
Or 2 miles 1,665 feet.		

### MANAYUNK.

#### *Account of Iron Pipes laid in Manayunk.*

Street.	Location.	Size.	
		Inches.	Feet.
Wood,	From Green Lane to Levering,	6	914
Church,	“ Chestnut (east),	6	425
Grape,	“ Tower to Brown,	6	190
Belair,	“ Grape to Cotton,	4	225
Terrace,	“ Grape to Mechanic,	4	396
Baker,	“ Green Lane to Gay,	4	657
Fleming,	“ Grape to Cotton,	4	162
Chestnut,	“ Church to Centre,	6	213
Levering Avenue,	“ Ridge Ave. to line of Joshua Garsed's property,	6	824
Centre,	“ Hamilton to Wood,	6	444
Cresson,	“ Levering to Grape,	6	262
Green Lane,	“ Spring (west),	6	720

Street.	Location.	Size.	
		Inches.	Feet.
Grape,	From Brown to Belair,	6	864
	Connecting stand-pipe with Germantown Avenue,	20	288
Total number of feet of pipe laid,		<hr/> 6,584	
Number of feet of new pipe laid,		4	1,440
"	"	6	4,856
"	"	20	288
Total number of feet of new pipe laid,		<hr/> 6,584	
Or 1 mile 1,304 feet.			

*Recapitulation of Pipe laid in the several districts during the year 1871.*

WARDS.	3-inch.	4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	24-inch.	30-inch.	36-inch.	TOTAL.
1st District, 1, 2, 3, 4, 26.....		12,120	10,531			400						23,051
2d " 5, 6, 7, 8, 9, 10, 24, 27.....		3,062	14,926	974		1,844						20,806
3d " 11, 12, 16, 17, 18, 19, 23, 25.....		12,224	25,077							19	4,032	41,352
4th " 13, 14, 15, 20, 21, 28, 29.....	18	3,043	23,580		120	1,068	1,212	4,296	564	7,998	3,720	46,219
Frankford.....		93	4,632									4,725
Germantown.....		1,599	6,841		40		7,614	141				16,235
Manayunk.....		1,440	4,856									6,584
Total.....	18	33,581	90,443	974	160	3,912	8,826	4,725	564	8,017	7,752	158,972

Being a total of 30 miles 572 feet.

Total number of feet of pipe, as per last report..... 2,579,147  
 " " " " laid during the year..... 158,972

Feet..... 2,738,119  
 Or 518 miles 3,069 feet.

## SERVICE MAINS ORDERED.

Councils have ordered pipe laid in the following streets.

### FIRST DISTRICT.

*Pipe ordered to be laid in the First District.*

Street	Location.
Tenth,	From Winton to Jackson.
Moore,	" Tenth to Broad.
Dickinson,	" Bancroft to Seventeenth.
Twenty-fourth,	" Alter to Federal.
Otsego,	" Mifflin to McKean.
Mifflin,	" Eighth to Ninth.
Chadwick,	" Reed to Dickinson.
Seventeenth,	" Reed to Dickinson.
Twelfth,	" Wharton to 300 feet South of Reed.
Twenty-fourth,	" Catharine to Christian.
Catharine,	" Twenty-second to Twenty-third.
Catharine,	" Twenty-fourth to Gray's Ferry Road.
Two certain twelve feet wide streets, north and south of St. Albans Place, from Twenty-second to Twenty-third.	
Two certain twelve feet wide streets, north and south of Madison Square, from Twenty-second to Twenty-fourth.	
Eighteenth,	From Wharton to Reed.
Herman,	" Wharton south 290 feet.
Kater,	" Seventeenth to Eighteenth.
Salter,	" Seventh to Eighth.
Twenty-sixth,	" Federal to Galloway.
Bancroft,	" Mifflin to McKean.
Twelfth,	" Mifflin to McKean.
Bond,	" Mifflin to McKean.
Dean,	" Mifflin to McKean.
McKean,	" Twelfth to Thirtieth.
Lancaster,	" Marion to Keefe.
Godfrey,	" Second to Moyamensing Avenue.
Thirty-first,	" Gray's Ferry Road north 180 feet.



## SECOND DISTRICT.

*Pipe ordered to be laid in the Second District.*

Street.	Location.
Lex,	From Huron to Transcript.
Rockland,	" Thirty-sixth to Thirty-ninth.
Haverford Ave.,	" Fiftieth to Sixty-eighth.
Aspen,	" Thirty-sixth to Thirty-seventh.
Fortieth,	" Westminster Ave. to Penn. R. R. bridge.
Atlantic,	" Thirty-fifth to Thirth-sixth.
Walnut,	" Forty-third to Forty-seventh.
Atlanta,	" Thirty-sixth to Thirty seventh.
Ashburton,	" Twenty-fifth to Twenty-sixth.
Woodland,	" Railroad bridge to Forty-ninth.
State,	" Filbert to Baring.
Preston,	" Aspen to Story.
Story,	" Preston to Forty-first.
Silverton Ave.,	" Forty-eighth to Fiftieth.
Sloan,	" Lancaster Avenue to Filbert.
Thirty-first,	" Bridge to Hamilton.
Antoinette,	" Market to Haverford.
Powelton Ave.,	" Thirty-ninth to Fortieth.
Thirty-ninth,	" Chestnut to Sansom.

## THIRD DISTRICT.

*Pipe ordered to be laid in the Third District.*

Street.	Location.
Berks,	From Front to Germantown Avenue.
Ann,	" Emerald to Kensington Avenue.
Wellington,	" Thompson to Cedar.
Ormes,	" Somerset to Cambria.
Montgomery Ave.,	" Second to Bodine.

Street.	Location.
Indiana,	From Fifth to Sixth.
Venango,	“ Third to Ninth.
Sixth,	“ Reading Railroad to Rising Sun Lane.
Dauphin,	“ Gaul to Thompson.
Adams,	“ Cedar to Gaul.
Tusculum,	“ Front to Kensington Avenue.
Harrowgate Lane,	“ Kensington Ave. to Frankford Road.
Fourth,	“ Oxford to Columbia Avenue.
Cabot,	“ Reading Railroad to 246 feet south of Lehigh Avenue.
Palethorp,	“ Berks to Norris.
Fifth,	“ York to Clearfield.
Chatham,	“ William to Somerset.
E,	“ Kensington Avenue to Indiana.

#### FRANKFORD.

*Pipe ordered to be laid in Frankford.*

Street.	Location.
Adams,	from Kensington Avenue to Sellers.
Elizabeth,	from Pine to 405 feet N. E. of Unity.

#### FOURTH DISTRICT.

*Pipe ordered to be laid in the Fourth District.*

Street.	Location.
Master,	From Twenty-seventh to Twenty-eighth.
Lehigh Avenue,	“ Sydenham to Eighteenth.
Thirteenth,	“ Berks to Susquehanna Avenue.
Berks,	“ Twenty-second to Ridge Avenue.
Taney,	“ Brown to Poplar.
Franklin,	“ Berks to Norris.

Street.	Location.
Eighth,	From Diamond to Dauphin.
Stewart,	“ Twenty-first to Twenty-second.
Jefferson,	“ Twentieth to Twenty-sixth.
Institute,	“ Montgomery Avenue to Berks.
Fifteenth,	“ Monument Cemetery to Susquehanna.
Carlisle,	“ Monument Cemetery to Susquehanna.
Sixteenth,	“ Norris to Susquehanna.
Seventeenth,	“ Columbia Ave. to Lamb Tavern Road.
Montgomery,	“ Broad to Sixteenth.
Norris,	“ Twentieth to Twenty-first.
Dauphin,	“ Tenth to Broad.
Brown,	“ Twenty-seventh to Twenty-ninth.
Shamokin,	“ Twenty-first to Twenty-second.
Berks,	“ Sixth to Seventh.
Berks,	“ Ninth to Tenth.
Marshall,	“ Terminus north to Germantown Avenue.
Norris,	“ Sixteenth to Nineteenth.
Norris,	“ Carlisle to Broad.
Parrish,	“ Twenty-fourth to Taney.
Columbia Avenue,	“ Twenty-fourth to Twenty-eighth.
Brandywine,	“ Broad to Fifteenth.
West College Ave.,	“ Poplar to Girard Avenue.

### MANAYUNK.

#### *Pipe ordered to be laid in Manayunk.*

Street.	Location.
Ridge Avenue,	From Bridge to Queen.
Spencer,	“ Ridge Avenue.
Washington,	“ Main to Fountain.
Ridge Avenue,	“ Green Lane to Lyceum Avenue.
Lyceum Avenue,	“ Ridge Avenue to Manayunk Avenue.
Oak,	“ Baker to Wood.
River Road,	“ Main and Washington Streets to American Pulp Works.

Street.	Location.
Ridge Avenue,	From Green Lane to Kram's Avenue.
Cotton,	" End of pipe to Tower Street.
Tower,	" Cotton to Mechanic.
Mechanic,	" Tower to Leibert.
Chestnut,	" Church to Walnut.
Green Lane,	" Ridge Avenue to Manayunk Avenue.

## GERMANTOWN.

*Pipe ordered to be laid in Germantown.*

Street.	Location.
Township Line Road, to connect with pipe now laid in the Twenty-eighth Ward.	From Terminus of pipe to Germantown Ave.
Stenton Ave.,	" Westmoreland to Cayuga.
Germantown Ave.,	" Green Street to Wayne Avenue.
Maplewood Ave.,	" Germantown Avenue to Wissahickon Avenue, relay.
Manheim,	" Wyoming to Stenton Avenue.
Germantown Ave,	" Wyoming to Stenton Avenue.
Connect dead ends on Wister or Stenton Avenue, near Germantown Railroad.	

*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
Total, - -	252	4,275

*Account of the number of holes drilled for making new attachments to public mains during the year 1871.*

WARDS.	$\frac{1}{2}$ -inch diameter.	$\frac{3}{8}$ -inch diameter.	$\frac{3}{4}$ -inch diameter.	1-inch diameter.	Total holes drilled and attachments made.	Shut-offs.
January .....	93	5	1	3	102	14
February .....	81	1	1	2	85	20
March .....	388	13	5	2	408	53
April .....	430	15	7	5	457	35
May .....	489	3	9	1	502	46
June .....	447	15	1	4	467	23
July .....	426	14	4	2	446	23
August .....	497	13	9	5	524	31
September .....	534	15	6	3	558	28
October .....	601	18	11	3	633	27
November .....	604	14	6	5	629	37
December .....	340	7	4	2	353	37
Total .....	4,930	133	64	37	5,164	374

*The following attachments were made in the wards :*

WARDS.	$\frac{1}{2}$ -inch diameter.	$\frac{3}{8}$ -inch diameter.	$\frac{3}{4}$ -inch diameter.	1-inch diameter.	Total holes drilled and attachments made.	Shut-offs.
First District, 1, 2, 3, 4, 26...	1,411	5	2	2	1,420	45
Second District, 5, 6, 7, 8, 9, 10, 24, 27.....	648	61	36	10	755	122
Third District, 11, 12, 16, 17, 18, 19, 23, 25.....	1,571	13	10	12	1,606	111
Fourth District, 13, 14, 15, 20, 21, 28, 29.....	1,048	46	11	5	1,110	86
Germantown .....	138	8	5	4	155	.....
Manayunk .....	114	.....	.....	4	118	10
Total .....	4,930	133	64	37	5,164	374

*The following Table exhibits the number of repairs to mains, stops, and plugs, by different districts, during the year 1871.*

DISTRICTS.	Repairs to mains.	Repairs to stops.	Repairs to plugs.
First, - - -	52	218	265
Second, - - -	19	197	161
Third, - - -	161	406	434
Fourth, - - -	96	285	426
Germantown, -	81	45	34
Manayunk, -	63	4	37
Total, - - -	472	1,155	1,357

*Account of new stops and fire-plugs for 1871.*

DISTRICTS.	No. of stops.	No. of fire-plugs.
First, - - - -	39	38
Second, - - - -	48	45
Third, - - - -	101	61
Fourth, - - - -	63	16
Germantown, - - -	45	14
Manayunk, - - - -	14	17
Total, - - - -	310	191

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

## FIRST DISTRICT.

Number of plugs, as per last report,	-	-	-	742
First Ward,	-	-	-	14
Second	"	-	-	—
Third	"	-	-	—
Fourth	"	-	-	1
Twenty-sixth	"	-	-	23
				—
				38
				<hr/>
				780

## SECOND DISTRICT.

Number of plugs, as per last report,	-	-	-	1,119
Fifth Ward,	-	-	-	—
Sixth	"	-	-	—
Seventh	"	-	-	—
Eighth	"	-	-	2
Ninth	"	-	-	1
Tenth	"	-	-	—
Twenty-fourth	"	-	-	36
Twenty-seventh	"	-	-	6
				—
				45
				<hr/>
				1,164

## THIRD DISTRICT.

Number of plugs, as per last report,	-	-	-	1,249
Eleventh Ward,	-	-	-	—
Twelfth	"	-	-	—
Sixteenth	"	-	-	—
Seventeenth	"	-	-	—
				—
Amounts carried forward,	-	-	00	1,249



Amounts brought forward,	-	-	00	1,249
Eighteenth Ward,	-	-	3	
Nineteenth "	-	-	22	
Twenty-third " (Frankford),	-	-	8	
Twenty-fifth - - - - -	-	-	28	
			—	61
				—
				1,310

## FOURTH DISTRICT.

Number of plugs, as per last report,	-	-	-	770
Thirteenth Ward,	-	-	—	
Fourteenth "	-	-	—	
Fifteenth "	-	-	—	
Twentieth "	-	-	1	
Twenty-eighth "	-	-	21	
Twenty-ninth "	-	-	2	
			—	23
				—
				793

## MANAYUNK.

Number of plugs, as per last report,	-	-	-	54
" " during year,	-	-	-	26
				—
				80

## GERMANTOWN.

Number of plugs, as per last report,	-	-	-	149
" " during year,	-	-	-	14
				—
				163

Total fire plugs in all the wards, 4,290

The following shows the number of attachments made in the different Districts during the year 1871, for fire purposes only, in places of public amusement, hotels, manufactories, &c. :

Total, as per last report,	-	-	-	-	98
First District,	-	-	-	-	3
Second “	-	-	-	-	3
Third “	-	-	-	-	4
Fourth “	-	-	-	-	5
				—	15
Total,	-	-	-	-	<u>113</u>

There are now 49 public drinking fountains supplied by the department free of charge, as follows :

Erected by the Fountain Society, as per last report,	32
Added during the year,	11
	—
	43
Erected by the Society for Prevention of Cruelty to Animals, as per last report,	6
	—
Total,	<u>49</u>

## RECEIPTS AND EXPENDITURES.

### RECEIPTS.

The gross receipts for the year have been \$963,234 08. The sources from which this amount has been received will be exhibited by the statement of the Register, George F. Keyser, Esq.

Of the above sum, \$7,184 04 has been received at the Engineer's office.

The following amounts have been received at the Chief Engineer's office, and paid to the City Treasurer :

For Rents,	\$1,460 00
Old iron, &c.,	702 95
	—
Amount carried forward,	<u>\$2,162 95</u>

Amount brought forward,	\$2,162 95
Cement and oil barrels,	66 00
Repairs to plugs,	5 00
Gravel and stone,	168 75
From Lamb & Kelly, for removing fire plug,	24 25
G. Bergner, for removing fire plug,	208 10
I. P. Morris & Co., for scrap iron, brass, &c.,	1,920 54
Commissioners Fairmount Park, for labor and materials,	65 58
Frederick Zaiss, for 4-inch attachment,	151 15
J. Crump, " "	193 28
Bromley & Brother, for 4-inch attachment,	173 97
Zimmerlung & Sons, for 4-inch attachment,	127 45
Keely & Brownbeck, for 4-inch attachment,	201 81
Morris, Tasker & Co., for 3-inch attachment,	109 00
Brown & Sons, for 4-inch attachment,	118 75
J. T. Bradshaw, for 4-inch attachment,	162 15
Whitaker & Palmer, for 4-inch attachment,	162 66
Gillingham & Garrison, for 4-inch attachment,	200 52
H. J. Fox, for relaying pipe,	184 50
Philadelphia and Reading Railroad Company, for labor and materials,	549 28
J. Stead, for stop-cock key,	9 50
Cutting ice,	50 00
American Button Hole and Sewing Machine Company, for 4-inch attachment,	168 85
	<u>\$7,184 04</u>

DEPARTMENT FOR SUPPLYING THE CITY WITH WATER,  
 Register's Office, No. 104 South Fifth Street,  
 PHILADELPHIA, *January, 1872.*

FREDERICK GRAFF, Esq.,

*Chief Engineer Water Department.*

DEAR SIR:—In compliance with the requirements of this office, I herewith submit to you the annual statement for the fiscal year 1871. Annexed you will find the schedule of the duplicates for the years 1871 and 1872, showing the amounts of water-rents charged on each, together with other statements of the business operations of this office. By reference to the statement of the receipts for the year, it will be seen that they amounted to \$956,050 04; and the estimated receipts from all sources were \$911,000 00, an excess of \$45,050 04.

The total amount returned to the Survey Department for lien of iron pipe, during the year 1871, was \$62,341 24.

I am compelled, by a sense of justice to the clerical force at present employed in this office, to ask that authority be given to employ additional clerks, and as a proof of the necessity thereof would respectfully call your attention to the fact that in 1862 the amount collected was but a trifle in excess of five hundred thousand dollars, while in 1871 it was nearly one million dollars, without any additional help to transact the duties entailed, which, together with the increased number of water-tenants and demand for permits, prove the inadequate clerical force to meet the growing business of this branch of the department.

Yours, very respectfully,

GEORGE F. KEYSER,

*Register.*

*List of Dwellings, Factories, Horse-power, &c., c's charged on Registers of 1871.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total.
Dwellings .....	6992	3716	2901	1846	2755	2771	3539	2738	2463	2831	2357	1011	2566	3108	5818	2010	2125	3479	7707	9023	1103	1117	412	2812	1088	6160	83,488
" $\frac{1}{2}$ and $\frac{3}{4}$ .....	484	1575	1396	1576	543	325	1325	575	513	1065	967	753	619	809	1377	1375	679	1080	1111	784	14	7	6	129	312	550	19,049
Baths .....	1404	894	628	397	808	507	1930	2000	1265	1682	410	704	1855	1584	3390	423	290	605	1404	5358	698	862	120	1362	213	1776	32,489
Wash-paves .....	412	346	286	118	546	322	1011	1100	596	1086	181	435	920	1062	2463	291	222	405	882	4291	660	349	194	794	161	806	20,242
Water closets, bidkets, & urinals .....	50	44	61	66	1318	1545	1034	2902	1413	997	141	128	349	71	1536	54	22	15	153	1423	348	580	18	785	19	176	14,548
Basins, sinks, & wash tubs .....	19	41	64	70	1270	1382	1262	2317	1880	1126	150	241	444	312	3329	114	31	41	153	2608	203	498	50	636	15	123	17,723
Horse-power .....	570	578	87	211	617	1135	324	228	879	281	460	240	239	93	1966	1141	428	570	1633	629	67	443	156	560	37	129	13,701
Bars .....	89	140	76	187	251	162	84	102	159	60	263	162	76	46	200	124	154	76	217	294	11	13	12	99	61	157	3,125
Watering horses .....	22	8	9	9	19	2	11	.....	19	3	3	.....	1	5	10	1	10	67	12	3	1	.....	9	28	6	47	305
Factories .....	7	8	.....	2	2	30	21	.....	36	9	.....	13	11	28	3	31	34	2	101	15	1	5	1	34	.....	7	394
Fountains .....	1	1	2	1	11	15	2	19	26	19	.....	6	6	11	28	4	.....	4	2	20	2	14	2	47	1	7	251
Horse stalls .....	419	844	299	238	617	400	640	1489	1718	1692	164	612	682	1812	656	102	454	1020	1752	73	45	116	1068	134	673	20,540	
Bakeries .....	26	37	29	21	14	19	10	9	25	9	15	16	12	15	42	13	17	14	86	45	4	8	4	26	6	26	545
Dye-tubs .....	.....	7	.....	.....	6	35	1	.....	14	.....	.....	3	.....	61	41	42	24	64	5	5	20	.....	.....	16	16	359	
Meat packers .....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
Foundries .....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16
Breweries .....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	4	6	18	.....	.....	.....	.....	.....	.....	.....	.....	76
Sugar-houses .....	.....	2	.....	1	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Hot houses .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
Distilleries .....	.....	.....	.....	1	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Slaughter houses .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
Malt-houses .....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
Brick yards .....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Barber shops .....	18	26	13	12	30	28	8	7	38	10	12	12	11	21	23	15	23	9	53	12	5	5	3	18	4	7	427
Drug stores and offices .....	16	17	13	11	18	15	8	9	32	15	7	11	7	14	32	11	12	9	51	28	7	6	20	7	15	10	400
Photographers .....	.....	.....	.....	1	.....	6	11	1	8	21	2	5	2	6	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93

### PERMITS ISSUED FOR THE YEAR 1871.

WARDS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	Total.
Dwellings.....	492	2118	22	6	4	53	36	4	59	1	5	2	17	128	22	17	170	969	216	120	107	82	293	259	732	63	166	409	4,624	
"    ½ and ¾.....	3	1	4											4			7	12	3		1		1						34	
Baths.....	189	20	49	9	2		46	87	7	71	3	13	14	23	131	22	11	78	596	146	41	56	23	142	99	305	58	78	275	2,596
Wash-paves.....	70	17	24	5	12	27	27	45	10	66	8	13	18	30	101	14	10	60	206	143	68	19	39	75	56	93	46	71	241	1,591
Water-closets, urinals, and biddets..	8	3	4	4	48	50	36	178	62	121	8	11	25	41	100	6	3	2	19	84	15	44	6	73	8	19	47	60	149	1,233
Basins, sinks, & wash-tubs.....	4		2	3	24	33	75	258	60	121	7	17	16	28	122	5	8	4	16	6	15	40	7	66	3	4	69	51	152	1,290
Building permits.....	40	10	3	7	8	4		13	7	6	1	1	1	1	31	4	3	19	128	44	28	53	24	62	32	29	23	31	59	672
Bakeries.....	1														1						3	2		2	1				1	11
Steam engines.....	2			3	3	12		3	4	2	7	2	2	3	3		3	4	4	2	1	6	3	2	2	1	1	2	3	90
Horse-power.....	17			21	24	102		95	37	14	52	26	12	42	39		34	50	42	80	20	110	17	18	35	10	40	20	13	970
Fountains.....	1		1	1	1	1		2	1	1				1	1					2		2							1	18
Public fountains.....				1	1			1	3											2		2							1	11
Stables.....	7	6					3	6	1	1	3	1	3	2	10	3	5	3	10	11	3	5		4	2	7	1	4	6	106
Drug stores.....	1		2	1	1				1					1						3		1				1			1	13
Hotels and bars.....	3	2	1	2	2	6	2	6	3	2	10	1	4		7	2		7	12	20	4	1	6	4	7	4	1	3	6	128
Stores, shops, and offices.....	1		2	1	13	6		1	5	6	1		2	1	6	1	1	1	2	4		4	1	1		2	1	2	2	66
Watering horses.....	3			1	3	1					3				2				1	6	2		3	1		1	1	1	1	30
"    streets.....					2	2	1		2	1	2		1	1	3						2		1					2	1	22
"    ships.....		11		3																										14
Slaughter-houses.....	2													2	1				4				2		2				1	6
Factories.....	2							1	1	1	1	1			1	1		2	3	2		5	2	1	1	3	1	1		30
Foundries.....									1					2	1					1										6
Skating-parks.....	1														1														1	3
Laundries.....				1								1																		2
Barber shops.....						2		1	1	2					3					3	1		3		1	1			2	20
Photograph galleries.....								1									1													2
Marble yards.....								1									1		1	1										6
Market-houses.....									1											2	1									4
Bottling establishments.....											1																			2
Vinegar.....											1										1									2
Carpenter shops.....											2				2															2
Blacksmiths.....												2			1					1	2		1							7
Breweries.....															1														1	4
Hot and green houses.....																				1		2	4					1		8
Asylum and poor houses.....																					1			1						2
Public halls.....																							1			1				2
Miscellaneous.....				1		1		1		1		2		1		1			2	1	2		1		1	1				16
Total.....	847	102	210	84	150	231	244	733	213	475	107	94	100	202	694	60	91	413	2046	862	317	464	219	745	509	1218	376	494	1828	13,644

*Amount of duplicates for the years 1871 and 1872.*

WARDS.	1871.	1872.
First, - - -	\$33,281 25	\$36,849 25
Second, - - -	31,860 50	32,311 25
Third, - - -	18,231 25	18,819 75
Fourth, - - -	18,576 50	18,843 25
Fifth, - - -	31,942 50	34,244 75
Sixth, - - -	33,677 75	34,875 00
Seventh, - - -	38,414 25	38,879 75
Eighth, - - -	36,447 50	37,668 50
Ninth, - - -	33,961 25	34,478 00
Tenth, - - -	32,434 25	33,710 25
Eleventh, - - -	17,942 25	18,123 00
Twelfth, - - -	19,777 75	19,849 75
Thirteenth, - - -	28,585 50	29,257 50
Fourteenth, - - -	31,780 75	32,480 50
Fifteenth, - - -	66,978 00	68,137 75
Sixteenth, - - -	22,746 75	23,085 00
Seventeenth, - - -	22,007 00	22,741 25
Eighteenth, - - -	29,294 25	31,025 75
Nineteenth, - - -	59,652 25	67,642 00
Twentieth, - - -	88,318 75	64,720 00
Twenty-first, } -	9,007 50	11,831 00
Twenty-eighth, } -		
Twenty-second, - - -	13,293 00	14,944 00
Twenty-third, - - -	3,855 00	5,240 00
Twenty-fourth, - - -	17,755 75	20,109 75
Twenty-fifth, - - -	7,064 50	9,204 50
Twenty-sixth, - - -	44,619 25	50,806 50
Twenty-seventh, - - -	16,589 25	17,721 75
Twenty-ninth, - - -	. . . .	36,660 75
Totals, - - -	\$808,094 50	\$864,260 50

*Statement of Receipts at Register's Office, from January 1 to December 31, 1871.*

MONTHS.	Delinquent, 1870.	Penalties.	Rents.	Penalties.	Fractional.	Water-pipes.	Totals.
January.....	\$6,754 00	\$842 88	\$28,455 50		\$1,937 25	\$8,214 86	\$46,204 49
February.....	3,257 50	427 15	57,317 75		1,342 00	8,556 82	70,931 22
March.....	2,628 75	345 88	154,198 50		5,405 00	6,552 33	169,130 46
April.....	1,921 25	230 73	358,459 75		5,493 75	4,886 59	370,992 07
May.....	830 50	93 83	34,138 25	1,617 12	5,789 00	6,658 69	49,127 30
June.....	803 50	70 22	37,784 00	1,790 86	5,651 95	12,876 05	58,976 58
July.....	421 00	46 50	9,335 75	1,250 19	4,130 25	7,792 35	22,976 04
August.....	1,040 75	47 26	14,661 50	2,012 01	4,404 00	11,513 05	33,678 57
September.....	596 75	63 09	34,716 75	4,387 11	4,889 50	13,200 03	57,853 23
October.....	901 75	105 69	18,635 75	2,257 40	4,169 25	8,308 30	34,378 14
November.....	1,057 00	120 12	12,499 25	1,539 63	4,377 50	3,464 20	23,057 70
December.....	1,063 50	74 02	8,973 25	1,063 67	3,482 00	4,087 80	18,714 24
<b>Totals.....</b>	<b>\$21,276 25</b>	<b>\$1,467 37</b>	<b>\$760,296 00</b>	<b>\$15,917 99</b>	<b>\$51,071 45</b>	<b>\$96,110 98</b>	<b>\$1,566,050 04</b>



RECEIPTS AND EXPENDITURES SINCE  
CONSOLIDATION.

YEARS.	Received by Register for water-rents and per- centage.	Received by Chief Engi- neer for rents, old iron, scraps, and private fire- plug attachments.	Total receipts from all sources.	Yearly Increase.	Total expenditures.
1855.....	\$381,410 17	\$626 55	\$382,036 72	.....	\$250,895 37
1856.....	351,936 49	960 11	352,896 60	Decrease.	160,368 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 09	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.	238,969 54
1862.....	544,767 25	1,025 82	545,793 07	11,813 01	177,271 69
1863.....	568,740 60	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.....	629,837 47	6,500 95	636,338 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	96,228 76	575,844 49
1868.....	772,605 76	4,404 83	777,009 59	9,558 70	802,217 46
1869.....	808,508 23	4,962 60	813,470 83	36,461 24	909,768 28
1870.....	928,035 95	7,335 01	935,370 96	121,900 13	1,144,073 51
1871.....	956,050 04	7,184 04	963,234 08	27,863 12	1,069,193 43

*Expenditures of the Department for the year 1871.*

Salaries of chief engineers, register, clerks, &c.,	-	\$29,700	00
Office expenses,	-	4,288	86
Salaries of engineers, firemen, &c., at works,	-	35,240	25
Supplies to works, viz.:			
Coal and wood,	-	52,407	81
Tallow, oil and gas,	-	4,837	43
Small stores, packing, &c.,	-	2,490	83
Repairs to works, viz.:			
Fairmount Works,	-	\$3,991	36
Delaware "	-	1,500	00
Schuylkill "	-	4,984	33
Belmont "	-	1,194	78
Germantown "	-	229	11
Roxborough "	-	2,318	46
			<hr/>
			14,218 04
Keeping buildings, grounds, and reservoirs			
in good order:			
Lumber,	-	\$665	13
Slating,	-	388	30
Tin roofing, &c.,	-	287	75
Plumbing,	-	278	32
Bricks,	-	120	01
Brickwork,	-	392	50
Lime,	-	34	20
Slag roofing,	-	36	40
Painting, &c.,	-	116	26
Sodding banks, Belmont Reservoir,	-	6,198	75
Hardware,	-	147	19
Drain pipe,	-	64	65
Paper hanging,	-	13	90
Uniforms for guards,	-	50	00
White lead,	-	126	84
T rails,	-	75	29
Lanterns,	-	30	00
			<hr/>
Amounts carried forward,	-	\$9,025 49	\$143,183 22

Amounts brought forward,	-	\$9,025 49	\$143,183 22
Linseed oil, &c.,	- - -	41 62	
Granite,	- - -	133 93	
Curb stone at Delaware Works,	-	300 00	
Sundry bills,	- - -	106 68	
Wages,	- - -	8,379 06	
		<u>          </u>	17,986 78

Iron pipes, fire plugs, and other fixtures,  
and materials for laying pipes, &c.:

Iron pipes,	- - -	\$123,757 50	
Iron castings,	- - -	11,960 35	
Brass castings,	- - -	3,343 26	
Lead,	- - -	5,441 94	
Wrought iron and steel,	- - -	2,162 46	
Hardware,	- - -	1,312 73	
Bolts, nuts, and washers,	-	1,281 34	
Lumber	- - -	1,651 45	
Tubing,	- - -	421 82	
Coal,	- - -	771 00	
Paints, oils, &c.,	- - -	540 58	
Belting,	- - -	98 91	
Rents of yards, &c.,	- - -	289 50	
Lathe and face plates,	- - -	783 08	
Galvanizing spindles,	- - -	158 40	
Water meters,	- - -	1,058 87	
Machine work,	- - -	80 71	
Leather,	- - -	145 53	
Drill,	- - -	47 35	
Cordage,	- - -	11 00	
Wharfage,	- - -	11 00	
Coke,	- - -	18 00	
Hose,	- - -	25 00	
Sundry bills,	- - -	218 82	
		<u>          </u>	155,590 60
Amount carried forward,	- - -	\$316,760 60	

Amount brought forward,	-	-	\$316,760 60
Labor laying pipe, setting plugs, &c., and for fitting up stop cocks, &c., viz.:			
First District,	-	-	\$5,303 65
Second "	-	-	7,866 46
Third "	-	-	15,039 33
Fourth "	-	-	5,069 75
Germantown,	-	-	6,828 36
Manayunk,	-	-	4,530 87
Shop,	-	-	16,259 11
Surveyors, for measuring pipe, &c.,	-	-	4,271 94
Pipe plans,	-	-	1,295 81
Rebuilding culverts,	-	-	280 00
Hauling pipes,	-	-	1,841 25
Lumber,	-	-	144 03
Powder and fuse,	-	-	50 80
Dressing tools,	-	-	39 76
Sundry bills,	-	-	419 60
			<hr/>
Keeping pipes, plugs, stops, and fixtures in good order:			69,240 72
Wages, First District,	-	-	\$4,274 25
" Second "	-	-	5,737 00
" Third "	-	-	8,349 75
" Fourth "	-	-	4,758 12
" Germantown,	-	-	992 21
" Manayunk,	-	-	1,916 85
Plumbing,	-	-	153 92
Repaving around fire plugs,	-	-	1,703 35
Sundry bills,	-	-	66 42
			<hr/>
Drilling and making new attachments:			27,951 87
Wages, First District,	-	-	\$1,404 00
" Second "	-	-	1,602 24
" Third "	-	-	2,574 00
" Fourth "	-	-	2,301 00
Amounts carried forward,	-	-	<hr/>
			\$7,881 24 \$413,953 19

Amounts brought forward,	-	\$7,881 24	\$413,953 19
Wages, Germantown,	-	232 62	
"    Manayunk,	-	382 50	
		<hr/>	8,496 36
Iron railing, Fairmount,	-	-	271 36
Carriage hire and keep of horse for use of Chief Engineer,	-	-	573 25
Rent of engines, &c., Germantown Water Company,	-	-	3,750 00
Repairing inlet to forebay at Schuylkill Water Works :			
Lumber,	-	\$1,769 40	
Dredging,	-	1,152 51	
Pile driving, &c.,	-	2,536 75	
Services of tug boat,	-	450 00	
Brickwork,	-	624 30	
Bricks,	-	971 25	
Lime,	-	66 50	
Gravel,	-	21 90	
Granite,	-	290 00	
Flag stone,	-	52 50	
Hardware,	-	61 50	
Dressing tools,	-	12 89	
Sundry bills,	-	74 56	
Towing,	-	94 00	
Wages,	-	4,184 16	
		<hr/>	12,362 22
Substituting turbine wheel at Fairmount in place of old breast wheels Nos. 2 and 3, viz. :			
Wages,	-	-	36 63
Assisting to keep up the supply of water :			
Lumber,	-	\$1,786 67	
Brickwork,	-	260 91	
		<hr/>	
Amounts carried forward,		\$2,047 58	\$439,443 01

Amounts brought forward,	\$2,047 58	\$439,443 01
Bricks, - - - -	248 50	
Pumps—feed - - - -	355 87	
Slating, - - - -	351 54	
Machine work, - - - -	269 50	
Hauling pumps, - - - -	120 00	
Packing, - - - -	57 19	
Hardware, - - - -	42 24	
Lime, - - - -	24 32	
Frames, - - - -	31 85	
Sundry bills, - - - -	45 18	
Wages, - - - -	2,015 68	
	<hr/>	5,609 45
Bills of twice paid and overpaid water rents, 1870,		145 37
To pay expert or experts, &c, in suit of Schuylkill Navigation Company vs. City:		
Witness fees, - - - -		31 65
Surveys for a better supply of water to Frankford:		
Wages, - - - -		34 75
		<hr/>
		<u>\$445,264 23</u>

## EXTENSIONS OF WORKS.

## AMOUNTS PAID FROM WATER LOANS.

(Appropriation April 3, 1868.)

*Item 1.*

For the purpose of laying a 16-inch, 12-inch,  
and 10-inch main for Manayunk, viz.:

Branches and curves, - - - -	\$73 00
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*Item 2.*

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

Lumber, - - - -	\$142 25	
Iron castings, - - - -	413 39	
Hardware, - - - -	12 50	
Powder, - - - -	36 20	
Wages, - - - -	616 86	
	<hr/>	1,221 18

*Item 4.*

For the purchase and laying a 30-inch  
ascending and a 20-inch descending  
main for the Twenty-fourth Ward  
Water Works:

Wages, - - - -	41 65
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(Appropriation December 18, 1868.)

For the purchase and erection of two  
pumping engines for the Twenty-fourth  
Ward Water Works (now Belmont  
Water Works):

Engine No. 2, balance on contract, -	37,300 00
Amount carried forward, - -	<hr/> \$38,635 83

Amount brought forward, - - \$38,635 83

(Appropriation February 13, 1869.)

*Item 2.*

For boilers and connections at Belmont

Water Works, viz.:

Felting, - - - - - 41 40

*Item 6.*

For the completion of engine houses,  
grading, fences, coal sheds, &c., &c.,

Roxborough Water Works, viz.:

Stone, - - - - - 52 00

*Item 7.*

For repairs at Mount Airy Reservoir:

Cement, - - - - \$1,345 00

Freights on cement, &c., - - 339 14

Stone, - - - - 223 35

Sand, - - - - 169 95

Lumber, - - - - 85 69

Bricks, - - - - 30 00

Powder and fuse, - - - 7 85

Wages, - - - - 2,277 94

4,478 92

*Item 9.*

For substituting turbine wheel in place  
of old breast wheels Nos. 4 and 5, at

Fairmount Water Works:

Wages, - - - - - 189 00

Amount carried forward, - - \$43,397 15



*Item 10.*

Amount brought forward,	-	-	\$43,397 15
For incidentals :			
Ballusters, &c.,	-	-	28 12

(Appropriation April 7, 1870.)

*Item 1.*

For engine and foundations at the Schuyl-kill Water Works, in place of old engine No. 3 :

Bricks,	-	-	-	\$885 00
Stone,	-	-	-	581 29
Brickwork,	-	-	-	1,087 86
Lime,	-	-	-	579 20
Cement,	-	-	-	940 57
Granite,	-	-	-	283 00
Lumber,	-	-	-	1,630 20
Machine work,	-	-	-	1,104 65
Fire brick,	-	-	-	108 50
Iron castings,	-	-	-	165 02
Drain pipe,	-	-	-	81 25
Cordage,	-	-	-	68 33
Frames,	-	-	-	131 92
Slating,	-	-	-	218 20
Pile driving,	-	-	-	397 00
Hardware,	-	-	-	102 29
Powder and fuse,	-	-	-	33 25
Tubing,	-	-	-	389 64
Painting,	-	-	-	143 70
Packing,	-	-	-	78 75
Engine (account of contract),	-	33,150	00	
Sundry bills,	-	-	118 02	
Tin work,	-	-	782 90	
Wages,	-	-	9,820 95	
				<u>52,881 49</u>
Amount carried forward,	-	-		\$96,306 76

Amount brought forward, - - \$96,306 76

*Item 2.*

For additional duplex engine at Delaware Water Works:

Engine (account of contract),	-	\$23,400 00	
Boilers, - - -	-	12,588 00	
Lumber, - - -	-	1,470 75	
Brickwork, setting boilers, &c., &c.,	-	4,969 80	
Pile driving, - - -	-	508 55	
Iron castings, - - -	-	251 44	
Wrought iron, - - -	-	37 50	
Flue doors, - - -	-	19 25	
Machine work, - - -	-	1,183 65	
Plastering, - - -	-	536 75	
Felting, - - -	-	393 05	
Hardware, - - -	-	64 87	
Steam pipe, &c., - - -	-	79 34	
Packing, - - -	-	60 81	
Brass castings, - - -	-	111 41	
Sundry bills, - - -	-	95 63	
Wages, - - -	-	6,597 05	
			52,367 85

*Item 3.*

For ascending main, Belmont Water Works, viz.:

Mains, &c, - - -	-	\$13,459 36	
Lead, - - -	-	663 95	
Resodding embankment over main works, - - -	-	382 50	
Hauling mains, - - -	-	189 50	
Machine work, - - -	-	6 60	
Lumber, - - -	-	44 51	
Amounts carried forward, -		\$14,746 42	\$148,674 61

Amounts brought forward,	- \$14,746 42	\$148,674 61
Drain pipe, - - -	- 75 75	
Sundry bills, - - -	- 269 74	
Wages, - - -	- 4,692 25	
	<hr/>	19,784 16

*Item 4.*

For (on account) descending main from  
the Belmont Reservoir and for cross-  
ing the Schuylkill River :

Mains, - - -	- \$45,594 89	
Submerged main, - - -	- 28,453 47	
Lead, - - -	- 1,842 88	
Hauling mains, - - -	- 1,760 50	
Grading Masters Street, - - -	- 546 25	
Relaying railroad track, - - -	- 820 00	
Filling pipe trench along railroad,	115 00	
Repaving over main, - - -	- 220 00	
Lumber, - - -	- 168 10	
Powder and fuse, - - -	- 112 00	
Cordage, - - -	- 57 78	
Iron castings, - - -	- 263 30	
Sundry bills, - - -	- 94 50	
Wages, - - -	- 22,677 95	
	<hr/>	102,726 62

*Item 5.*

For (on account) pumping main from the  
Delaware Works to the reservoir

Mains, &c., - - -	- \$29,196 65	
Lumber, - - -	- 827 99	
Repairs to wharf at works, - - -	- 1,874 90	
Hauling mains, - - -	- 1,541 00	
Wharfage on mains, - - -	- 1,548 00	
	<hr/>	
Amounts carried forward, -	\$34,988 54	\$271,175 39

Amounts brought forward,	-	\$34,988 54	\$271,175 39
Brickwork, - - -	-	367 30	
Bricks, - - -	-	49 00	
Plumbing, - - -	-	60 75	
Sundry bills, - - -	-	51 65	
Wages, - - -	-	7,166 20	
		<hr/>	42,683 44

*Item 6.*

For pumping main from the Schuylkill

Works to the reservoir :

Mains, &c., - - -	-	\$31,618 25	
Lead, - - -	-	7,259 24	
Lumber, - - -	-	268 41	
Brickwork, - - -	-	168 50	
Bricks, - - -	-	28 00	
Hauling mains, - - -	-	1,328 00	
Machine work, - - -	-	411 13	
Repairs to railroad track, -	-	115 00	
Cordage, - - -	-	30 12	
Sundry bills, - - -	-	30 89	
Wages, - - -	-	15,184 20	
		<hr/>	56,441 74

*Item 7.*For substituting turbine wheel in place  
of old breast wheels Nos. 6 and 7, at

Fairmount Water Works :

Turbine wheel (on account),	-	\$15,335 47	
“ “ small, - - -	-	506 00	
Lumber, - - -	-	2,938 08	
White lead, &c., - - -	-	220 71	
Coal, - - -	-	445 45	
Painting, - - -	-	74 10	
Amounts carried forward, -		<hr/>	\$19,519 81 \$370,300 57

Amounts brought forward,	\$19,519 81	\$370,300 57
Plastering, - - -	215 16	
Flume (wrought iron), - -	2,553 47	
Sand, - - -	133 50	
Bricks, - - -	965 50	
Cement, - - -	823 93	
Lime, &c., - - -	115 14	
Powder and fuse, - - -	70 18	
Mains and branches, - -	3,948 75	
Sash and frames, - - -	185 98	
Hardware, - - -	343 83	
Iron castings, - - -	70 90	
Machine work, - - -	1,134 01	
Wrought iron beams, - -	3,331 60	
Brickwork, - - -	1,618 05	
Vault light, - - -	971 90	
Balustrade iron railing, -	900 16	
Caps and bases (colonnade),	1,426 50	
Roofing felt, - - -	60 00	
Pump (Andrews), - - -	251 00	
Tin work, - - -	103 42	
Plumbing, - - -	278 51	
Brass valves, &c., - - -	80 08	
Belting, - - -	21 40	
Galvanizing, - - -	46 10	
Wages, - - -	17,044 22	
Sundry bills, - - -	174 23	
	<hr/>	56,387 33

*Item 8.*

For (on account) reservoir adjoining present reservoir of the Delaware Work

Lumber, - - -	238 93	
Cement, - - -	195 00	
Amounts carried forward, -	\$433 93	\$426,687 90

Amounts brought forward,	-	\$433 93	\$426,687 90
Bricks, - - -	-	5,180 10	
Stone, - - -	-	313 75	
Sodding banks, - - -	-	1,130 22	
Tubing, - - -	-	19 95	
Hardware, - - -	-	51 50	
Lime, - - -	-	439 25	
Hauling stop-cock, - - -	-	20 00	
Belting, - - -	-	15 00	
Sundry bills, - - -	-	21 80	
Wages, - - -	-	34,167 74	
			<u>42,093 24</u>

*Item 9.*

For enlarging the reservoir now building  
at Belmont Water Works:

Wages, - - -	-		1,476 13
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*Item 10.*

For incidentals:

Hydraulic jack, - - -	-	\$180 00	
Hardware, - - -	-	1 75	
Repairing surveying instruments, -	-	3 50	
Stove, - - -	-	8 50	
Sundry bills, - - -	-	97 45	
			<u>291 20</u>

(Appropriation July 7, 1870.)

*Item 1.*

For new engine and pumps, with founda-  
tion and inlet thereto, Roxborough  
Works:

Engine (on account), - - -	-	\$18,000 00	
Mains, - - -	-	750 00	
Powder and fuse, - - -	-	76 04	
			<u>18,826 04</u>

Amount carried forward, - - -	-		<u>\$489,374 51</u>
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Amount brought forward, - - - \$489,374 51

*Item 2.*

For new engine and boiler house, Rox-  
borough :

Mason work, - - -	\$2,446 24
Lumber, - - -	1,831 96
Cement, - - -	79 72
Iron castings, - - -	15 08
Slating, - - -	282 13
Stone, - - -	119 00
Painting, - - -	433 23
Brickwork, - - -	115 00
Doors, &c., - - -	155 00
Tin work, - - -	543 77
Cordage, - - -	63 30
Wood mouldings, &c., - - -	63 40
Towing, - - -	25 00
Wages, - - -	5,553 60
Hardware, - - -	112 11
	<hr/>
	11,838 54

*Item 3.*

For necessary repairs to reservoir, Rox-  
borough :

Lime, - - -	\$307 50
Sand, - - -	66 00
Bricks, - - -	40 00
Stone, - - -	12 00
Clay, - - -	5 00
Lumber, - - -	294 07
Wages, - - -	1,645 71
	<hr/>
	2,370 28
Amount carried forward, - - -	<hr/>
	\$503,583 33

Amount brought forward, - - - \$503,583 33

*Item 4.*

For small engine and stand-pipe, to supply

Germantown :

Bricks, - - -	\$132 00
Lumber, - - -	375 29
Brickwork, - - -	1,167 25
Frames, sash, &c., - - -	260 35
Hardware, - - -	97 08
Slate roofing, - - -	438 30
Painting, - - -	340 50
Lime, - - -	231 00
Iron castings, - - -	155 92
Mason work, - - -	225 00
Tin work, - - -	80 70
Wages, - - -	2,189 84
	<hr/>
	5,692 60

*Item 5.*

For incidentals, freights, &c., - - - 50 36

(Appropriation December 5, 1870.)

For a 16-inch and a 12-inch main, from  
Mount Airy Reservoir to Wister Street.

(To be reimbursed out of a water loan  
hereafter to be created).

Mains, &c., - - -	\$39,101 91
Lumber, - - -	138 17
Dressing tools, - - -	181 78
Inspecting mains, - - -	553 00
Powder and fuse, - - -	224 41
Sundry bills, - - -	92 55
Wages, - - -	12,852 15
	<hr/>
	53,143 97
Amount carried forward, - - -	\$562,470 26



Amount brought forward, - - \$562,470 26

(Appropriation November 6, 1871.)

*Item 4.*

For the completion of the 36-inch ascending main from the Delaware Works to the reservoir:

Mains, &c.,	-	-	-	\$14,760 04	
Lead,	-	-	-	3,939 32	
Lumber,	-	-	-	233 59	
Bricklaying,	-	-	-	340 82	
Hardware,	-	-	-	169 64	
Piling,	-	-	-	578 50	
Hauling mains,	-	-	-	592 50	
Blasting,	-	-	-	48 00	
Sundry bills,	-	-	-	44 20	
Wages,	-	-	-	10,303 17	
					31,009 78

*Item 5.*

For completion of Belmont Reservoir:

Stone,	-	-	-	\$536 25	
Lumber,	-	-	-	190 72	
Hardware,	-	-	-	113 90	
Powder,	-	-	-	187 00	
Repairs,	-	-	-	95 21	
Wages,	-	-	-	5,115 42	
					6,238 50

*Item 6.*

For the completion of the Delaware Water Works Reservoir:

Bricks,	-	-	-	\$5,731 50	
Gravel,	-	-	-	622 00	
Amount carried forward, -	-	-	-	\$6,353 50	\$599,718 54

Amounts brought forward,	-	\$6,353 50	\$599,718 54
Clay puddle,	-	120 00	
Lumber,	-	38 16	
Lime,	-	546 00	
Coke,	-	20 00	
Sundry bills,	-	131 18	
Wages,	-	8,779 03	
			<u>15,987 87</u>

*Item 7.*

For large storage reservoir, East Fairmount Park:

Mains, &c.,	-	\$603 62	
Lumber,	-	321 07	
Iron castings,	-	594 91	
Hardware,	-	490 80	
Roofing,	-	16 64	
Plow, &c.,	-	34 00	
Sundry bills,	-	95 60	
Wages,	-	5,978 40	
			<u>8,135 04</u>

*Item 9.*

For incidentals:

Stoves, &c.,	.	.	.	.	-	77 75
						<u>\$623,929 20</u>