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ANNUAL REPORT

OF THE

BUREAU OF SURVEYS,

FOR THE YEAR 1889.

BUREAU OF SURVEYS,

DEPARTMENT OF PUBLIC WORKS.

OFFICERS, 1889.

Chief Engineer and Surveyor,
SAMUEL L. SMEDLEY.

Principal Assistant—J. MILTON TITLOW.

Assistant—Gustavus K. Morehead.

Recording Clerk—Edward H. Thompson.

Sewer Registrar—William Calvert.

Sewer Clerk—William T. McPhail.

Draughtsmen:

George S. Connor,
Neville B. Craig,

Carl A. Trik,
Otto Reizler.

Stenographer and Type-Writer,
Joseph R. Scott,

Rodman,
Robert McFadden.

Janitor—Isaac Holland.

REGISTRY BUREAU.

Registrar,
JOHN W. FRAZIER.

Registry Clerk—James H. Roberts.

Draughtsmen:

Isaac E. Shallcross,
Charles H. Ott,
J. G. D. Craig,

William H. Wester,
S. Crawford Smith,
Hugo Trik,

O. S. Stallman,
Robert P. Green,
H. J. Humphrey.

Inspectors of Sewer Connections:

William S. Molineaux,

James H. Hendrickson.

Inspectors of Sewer Construction:

John Able, Jr.,
Newton B. Beam,
William Penn Brown,
Conrad F. Brown,
Theo. A. Brackney,
Joel P. Colebaugh,
James Duffy,
David J. Davis,
August Durr,
Geo. L. Deitz,
Samuel R. Franklin,
John P. Flood,
Joseph P. Hunter,
Thomas Hooper,
William L. Holbrook,

Alexander F. Harkness,
Titus Huber,
John Hare,
Edward C. Hill,
John Lindsay,
Chas. Y. Lauderbach,
William J. Little,
Chas. P. McCalley,
William May,
John G. Moore,
James McGill,
John McCormick,
George Moore,
F. D. Morris,
Henry Miller,

Chas. E. Preston,
Jas. V. Quigley,
Abraham Ruth,
David S. Roth,
Jonathan G. Slater,
Henry M. Smith,
Emerick H. Sickels,
Champney R. Van Horn,
John Vicary,
George Willingmyre,
Joseph W. Williams,
Findley J. Watt,
Elmer E. Whiting,
John Wallace,
William Yetter.

Supervisor of Intercepting Sewer—Hiram L. Wynn.

ANNUAL REPORT

OF THE

BUREAU OF SURVEYS,

DEPARTMENT OF PUBLIC WORKS,

For the year 1889.

Philadelphia, January 1, 1890.

LOUIS WAGNER, ESQ.

Director of Department of Public Works.

DEAR SIR:—I have the honor of submitting herewith the Annual Report of work performed by the Bureau of Surveys during the year 1889, with accounts of receipts and expenditures, the construction of bridges and sewers, the plotting of streets, and other work done by the District Surveyors and Regulators, and the operations of the Registry Bureau and Sewer Permit Registrar.

The appropriations, expenses, transfers, balances, and receipts for the year, were as follows:

Appropriation for 1889.....		\$774,332 00
Balance available from previous years.....		353,240 87
Additional appropriations and transfers.....		309,377 87
Amount of warrants drawn during 1889:		
Current expenses.....	\$132,289 61	
For extensions.....	560,649 36	
Transfers from.....	70,686 08	
Balance available in 1890.....	664,583 67	
Amount merging.....	8,742 02	
	\$1,436,950 74	\$1,436,950 74
Number of warrants drawn, 1,920.		
Total receipts, Bureau of Surveys and Registry Bureau.....		\$29,914 32
Total receipts, District Surveyors.....		42,060 44
Total.....		\$71,974 76

Engineering Bureau.

The Engineering Bureau has been busily engaged in the design and construction of 20 main sewers and 10 bridges, together with the usual routine work of estimates and sketches for preliminary estimates for Committees of Councils, and the preparation of contracts for all work done under the supervision of the Bureau, estimates for payments thereon, and for inspection. Extensive studies have been made for the revision of street grades in portions of the city but little above tide, and portions in the Twenty-fifth Ward confirmed, and will be continued the coming year in the First and Twenty-sixth Wards. Testimony has been furnished before the courts and examiners in a number of cases.

Walnut Street Bridge.

This bridge, which has been under discussion for many years, was authorized to be commenced by a partial appropriation of \$200,000 made by Councils, December 24, 1888, and the design approved, except in elevation, through the property of the Allison Manufacturing Company, and the work directed to be commenced by Ordinance of March 22, 1889.

A contract was made June 7, 1889, with I. H. Hathaway & Co. for the four main river piers at a cost of \$120,000. On account of the frequent mid-summer rain storms, preparatory work on the dams for river piers was not commenced until September 20 for the east river pier, and upon November 9 this work was carried away by a freshet in the Schuylkill river. Work was then begun for the dam of the west river pier on December 10. The dams are to be constructed under the direction and patents of J. E. Robinson, which have been successful in other places, but at this site there are greater difficulties to be overcome on account of the greater depth of water, it being 38 feet to rock, and overlaid with very little mud and cobble stones. Another contract was made June 19, 1889, with R. C. Ballinger & Company for all the trestle piers required between Twenty-fourth and Thirty-second

streets, at a cost not to exceed \$55,000. On account of the great difficulties of obtaining stone from the quarries, work was not commenced until July 17, and it has been continually delayed for the same reason since. \$14,842.93 has been paid on account of work done this year. The work has been under Inspectors L. M. Winston, George H. Paddock, and James Duffy.

All the foundations for trestle piers are upon piles between the Baltimore and Ohio Railroad tracks to near Thirty-first street, the original bed of the river having been, at some former time, that far west, and consequently filled with river mud to 45 feet below the surface.

The design shows three quadrangular truss spans over the river, 123 feet between centres of piers, the latter placed parallel with the river, two in the water, and two on either shore, giving a clear passage for navigation in the middle, at a mean high tide, 21 feet in height and 100 feet in width, with a similar opening on each side adjoining the wharves of somewhat less dimensions.

The approaches at either end of river spans between Twenty-fourth and Thirty-second streets will be wrought iron girder spans of 29 to 70 feet in length, supported by wrought iron columns, passing over Twenty-fourth street, Schuylkill River East Side Railroad, the Schuylkill Front and West Chester branches of the Pennsylvania Railroad, and the Junction Railroad. At the ends of the iron work approaches the present surface of Walnut street will be raised by earth embankments to the required grades.

From 60 feet east of Twenty-third street, the ascending grade to the east shore pier will be two feet per hundred, raising the present surface at the east curb of Twenty-third street two and seven-tenths feet, and lowering the present surface of Twenty-fourth street one and one-half feet, to give a clearance under the structure 12 feet in height. The new grade at this point will be fifteen and eight-tenths feet above the present

surface, giving ample head-room over the Schuylkill River East Side Railroad. From the east shore pier, the grade ascends sixty-five hundredths of a foot per hundred to half way between Thirty-first and Thirty-second streets, giving sufficient head-room for the two railroads crossed, by lowering part of those of the West Chester Railroad about two feet.

From this point the grade descends two feet per hundred to 140 feet east of Thirty-third street, giving ample head-room over the Junction Railroad, and not interfering with the head-way over the tracks of the Allison Manufacturing Company, and without materially changing the present surface in front of the buildings east of Thirty-third street.

Walnut street, which has heretofore been only 50 feet in width, was placed on the city plan 60 feet wide from the Delaware to the Schuylkill rivers, and confirmed May 6, 1889, which will require the property owners when rebuilding in the future to set back to that width.

The ordinance of March 12, 1889, requires that between Twenty-second and Twenty-fourth streets, on the bridge approaches, there shall be no projection of steps, etc., beyond the 60 feet line.

The fronts of the present houses, except the few near Twenty-fourth street, are now generally set back to that width.

On the iron structure, the roadway will be 38 feet in width, allowing of four lines of rapid travel, with footways of 10 feet on each side; a total width of 58 feet. From Thirty-second to Thirty-third streets, the street would remain the present width of 80 feet.

Because of the numerous railroad tracks on each side of the river, extending west to Thirty-second street, the bridge must not only be one of unusual length, but also, one difficult of construction, compelling the use of iron, where a stone bridge, because of its permanency, would be more desirable, and increasing the cost generally beyond that of a bridge which would span the river only.

The approximate estimate of the cost is \$900,000, exclusive of land damages.

Photographs have been taken, and plans and elevations made of all the buildings upon the bridge site, previous to commencing work, which will be of great value for evidence in court, in cases of suits for damages.

Bridges on the line of the Connecting Railway.

By authority of Ordinances of Councils of July 2, 1885, and March 22, 1887, contracts were made on April 27, with Crofode and Saylor, for building bridges at Kensington avenue, K street and Frankford avenue, and including the re-formation of those streets to pass them under the railway, and a sewer for drainage. One-half of the cost of these bridges is to be paid by the Pennsylvania Railroad Company, and the balance of the total cost by the city not exceeding \$85,750. About three-fourths of the work has been done and \$45,276 paid on account. The bridges are of wrought iron built through girders of the Pennsylvania Railroad standard for five tracks each, upon abutments of rock range ashlar masonry.

By authority of Ordinance of Councils of March 20, 1888, a contract was made August 8, 1888, with the Pennsylvania Railroad Company for building a bridge at Sixth street, for \$12,500, one-half the estimated cost of the bridge proper. The lowering of the street grade to pass under the bridge and the building of a deep sewer to drain the depression were done under other contracts, and entirely paid for by the city. The greater part of the work was done last year and completed August 8, 1889. The bridge is similar to those above described, being also for five tracks.

By authority of Ordinance of Councils of March 30, a bridge was authorized at Twenty-second street to pass that street, now being graded, under the railway. On account of urgent necessities, subsequently arising, the appropriation therefor was transferred before the contract was entered into. It will be similar to the other bridges described above.

Thirty-fourth Street Bridge.

✓ By authority of Ordinance of Councils of March 27, 1887, a contract was entered into with the Pennsylvania Railroad Company for a bridge at Thirty-fourth street over the main line of the said company, the total cost to the city being \$40,000. Work has not been commenced by reason of legal difficulties, causing some delay in carrying out one of the conditions upon which the work is authorized, that is, that Thirty-fifth street shall be vacated under the Pennsylvania Railroad, and the new Thirty-fourth street used instead.

Bridge on Lansdowne Avenue.

✓ By Ordinance of Councils of November 6, 1888, a contract was entered into with I. H. Hathaway on December 28, 1888, for a stone bridge on Lansdowne avenue over Cobb's creek. The work was completed June 15, at a total cost of \$6,835, one-half of same being paid by the city, and the other by Delaware county. The bridge consists of a brick arch of 30 feet span over Cobb's creek, with rubble masonry abutments and parapets. It is 48 feet in width, giving a roadway of 34 feet, and two footways of 7 feet each.

Bridge on Chester avenue, over West Chester Branch of the Pennsylvania Railroad.

X
By Ordinance of Councils of December 5, 1888, the extension of the present iron bridge was authorized, and a contract for the work made with I. H. Hathaway, December 28, 1888. The work was completed April 23, at a cost of \$1,533.45. The extension consists of an additional 25 feet deck span, 21 feet wide, adjoining the north abutment of the old bridge, with iron floor beams. It was constructed to give additional facilities for access to Forty-ninth street station, by passing under Chester avenue.

Willow Avenue Bridge.

X Councils, by Ordinance of March 22, 1889, authorized the construction of a bridge on the Chestnut Hill Branch of the

Philadelphia and Reading Railroad over Willow avenue. A contract was made with the Philadelphia and Reading Railroad Company April 26, 1889, and the work completed December 4, at a cost of \$14,500. The bridge consists of a double track built wrought iron girder through bridge of 54 feet span over Willow avenue, resting upon abutments of rock range ashlar masonry. When the avenue is graded it will give an undergrade crossing very much desired for reaching the mills, churches, and railroad station in that vicinity.

Second Street Bridge.

Councils, by Ordinance of June 17, 1889, authorized the construction of a bridge at Second street over the Richmond Branch of the Philadelphia and Reading Railroad Company, making an appropriation of \$22,500 therefor, one-half the estimated cost. On account of the increased cost of foundations, the railroad company refused to enter into a contract until the cost of the superstructure was reduced to make the total cost about \$45,000. The appropriation was transferred for emergency purposes the latter part of the year, and the contract has not yet been entered into.

Poplar Street Bridge.

Councils, by Ordinance of December 31, 1888, authorized the Union Passenger Railway Company to build a bridge on the line of Poplar street, over the main line of the Philadelphia and Reading Railroad on Pennsylvania avenue, to give the former an entrance into Fairmount Park. The work is being done upon designs prepared by this Bureau, and when completed will in every way be a desirable and satisfactory improvement. The west abutment has been built, and contracts made for the iron work of superstructure.

In consequence of several severe accidents having occurred at Broad street, where it passes under the low iron bridge of the Connecting Railway, the Bureau has prepared plans for a stone arch bridge which will deaden the sound and contribute

greatly to the safety of this very important crossing. It consists of four spans of brick arches, designed to keep two spacious openings for the central drive.

In order to accomplish this improvement, the street grades will have to be lowered 3.5 feet, to give a clearance of 14.75 feet, and the street increased ten feet in width for one block.

A design was also prepared for passing the cable cars on Columbia avenue over the tracks of the P. G. and N. R. R. Branch of the Philadelphia and Reading Railroad, but no definite conclusion has yet been reached to effect a change in the street grade.

Main Sewers.

By reason of the distribution of the appropriation for main sewers being made in March, all of them were completed by the end of the year, except the large sewer of Somerset street; the contract amounting to \$178,000. The works themselves show the advantage in better construction gained by the city, in being executed in the favorable working months, notwithstanding the extraordinary unfavorable weather of this year. It would be better that the main sewer appropriations were specifically made in the annual appropriation bill each year. Designs and proposals were received for constructing an outlet for the Cohocksink sewer, on Germantown avenue and Shackamaxon street. By reason of the proposed abandonment in the following year of the Kensington Pumping Station by the Bureau of Water, the subject was reconsidered and contracts awarded for an outlet on the more direct and less expensive line on Norris street and Susquehanna avenue, objected to in the past on account of part of the water supply being taken at this point.

Manayunk Intercepting Sewer.

During the year, branches of the intercepting sewer were constructed along the Wissahickon and Monoshone creeks, and on Ridge avenue and Scott's lane, at Falls Village. The ordinary flow of the stream from Laurel Hill Cemetery, and

entering the Schuylkill river at Nicetown lane, was connected with the sewer. The extension of the Monoshone branch to Germantown is very much desired.

All of the mills and private houses on the main line of the sewer and its branches, from which objectionable drainage passed into the river, have been connected, with very few exceptions, and those are in process of being made. 614 original notices have been served on all property owners on the line of the sewer and its branches, as far as constructed. All parties refusing to comply are referred to the City Solicitor for legal action.

All the drainage from 29 mills, employing at least 10,000 operatives, and from 327 houses, now passes into the Intercepting sewer, and is emptied below the water supply at Fairmount. On the night of February 28, 1889, the Supervisor arrested two men for emptying refuse from water-closets at Schofield's Mill. The men and their foreman were each placed under \$600 bail for appearance at Court. The cases have been held over by reason of proper connections being in progress. The owner of 27 houses at Wissahickon not having complied with the notices to connect the same with the sewer, a warrant was issued for a hearing at the Central Police Station, when the owner agreed to comply, and the houses were soon after connected.

Aramingo Canal Drainage.

While the appropriation next year for the extension of the Somerset street sewer will be sufficient to reach the Aramingo Canal, the full size of the water way below this point must remain open until the branch above at Westmoreland street is extended into the river, because the former is only designed to take a part of the drainage from the total area. It is important that the Westmoreland street sewer be continued at the earliest date.

During the year the street grades have been revised over that portion of the drainage area lying between the Philadel-

phia and Trenton Railroad, the Delaware river and Somerset street, and Frankford creek, by taking out the depression along the line of the proposed Aramingo Canal, and raising the grades to about 10 feet above the surface, with a regular decline to the river. This important work has been suggested many times in reports of past years, and was imperatively demanded by reason of the rapid improvements being made in that section. While it will probably cost the city a large sum for damages, it will be of immense value to the City Government and property owners in the future, and prevent the territory from being built up in such a way as to make the proper drainage almost impracticable.

Frankford Drainage Area.

By reason of the valuable preliminary plans prepared for this territory last year, the Bureau was able to quickly and intelligently locate the proposed Belt Line Railroad along Frankford creek, so that the main sewers proposed by the city will not be obstructed should the railroad be constructed. This reverses many former practices, where railroads have been located and constructed without reference to the future drainage of the city, forcing the city to get rid of the great difficulties and bear the expense, in consequence of injudicious location of the railroads, without reference to the growth or necessities of the municipality.

Inspection of Cements.

In past years the greater part of the cements used by this Bureau have been made by two manufactories only, and by a general understanding that the cement furnished the city contractors was to be of a higher grade and standard than the common cements in the market, the "improved" cements were produced, costing 16 $\frac{2}{3}$ per cent. more. The manufactories of American cements have lately so increased in numbers, and the constant demand on this Bureau for inspection of cements delivered on the works while under construction, in addition to

the large amount of work done every year, make it absolutely necessary that systematic and constant examination and tests be made, and for this purpose I recommend that an additional draughtsman be appointed in the Engineering Bureau, who can be detailed for this purpose during the busy construction season.

The specifications for cement are as follows: "The Portland cement shall be of the best quality, weighing not less than 112 pounds per imperial bushel, and 98 per cent. by weight shall pass a wire cloth sieve of 2,500 meshes per square inch. Briquettes of neat cement, one square inch in section, seven days in water after setting, shall bear a tensile strain of two hundred and seventy-five pounds, and not exceed an average of four hundred pounds."

The natural cement shall be of the best quality, 98 per cent. by weight, shall pass a wire cloth sieve of 2,500 meshes per square inch. Briquettes of neat cement, one square inch in section, one day in water after setting, shall bear a tensile strain of fifty pounds, and after seven days in water, one hundred and twenty pounds."

Blue-Printing and Photographing.

As recommended in my report of 1887, I desire to again call your attention to the necessity of suitable rooms and appliances in the City Hall for blue-printing and photographing, and ask that the Commissioners be requested to furnish rooms for the purpose. They should be of sufficient capacity to do the work of all the Bureaus.

Registry Bureau.

The following exhibit shows the operations of the Registry Division of the Bureau of Surveys, during the year 1889:

Number of certificates of registered owners issued.....	8,158
Number of certificates for use of Law Department.....	337
Total	8,495

Receipts from certificates of registered owners.....	\$2,039 50
Receipts from miscellaneous sources.....	102 00
	<hr/>
Total receipts.....	\$2,141 50
Number of original lots plotted.....	11,868
Number of transfers registered.....	21,370
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Total plotted and registered.....	33,238
Total plotted and registered in 1888.....	28,065
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Increase	5,173
Number of plans made for the use of City Departments, Bureaus, and individuals.....	157
Number made during 1888.....	52
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Increase	105
Number of examinations of registry plan books made.....	19,547
Number made during 1888.....	18,717
	<hr/>
Increase.....	830
Number of descriptions of property filed for registry.....	22,034
Filed during 1888.....	18,717
	<hr/>
Increase	3,317
Number of titles perfected.....	2,091
Number of titles perfected in 1888.....	1,665
	<hr/>
Increase	426
Number of certificates of legal opening of streets, issued to De- partments, Bureaus, etc.	3,465
Issued during 1888	2,739
	<hr/>
Increase	726
Number of certificates of registered owners in municipal lien cases for Law Department.....	1,383
Number during 1888.....	412
	<hr/>
Increase	971

Perhaps the most important work of the year was in making a complete record of the legal opening of streets of the city, as contemplated by the Act of Assembly of March 8, 1862, which provides that the Chief Engineer and Surveyor shall cause to be copied the records filed in the Court of Quarter Sessions, which show when the streets and the roads of the City of Philadelphia were opened, and the courses and widths thereof. This labor involved the critical examination of each and every report made by road juries, and the action of the Court thereon since the year 1695, embracing 33 large volumes, of what are technically termed "Road Dockets;" the final action of the Supreme Court in each case appealed to that tribunal, the re-examination of all the deeds of dedication of streets to public use, affidavits of adverse usage of streets, opinions of the City Solicitor, and the special acts of the Legislature in opening up streets and avenues to public use.

The result of this examination was the compilation of two volumes, embracing 6,218 entries of streets legally opened, vacated, etc., an invaluable record, and which would have been completed years ago had an appropriation been made for that purpose, as repeatedly asked for by the Chief Engineer and Surveyor.

The renewal of worn-out registry plan books and street plans is progressing favorably, and an index of all the streets opened to public use has been completed.

The decrease in the number of certificates of registered owners, which has caused a falling off of cash receipts of nearly \$600, is owing to the fact that some of the Land Title Companies now issue these certificates, based upon the information acquired, without cost, from this Bureau and from the Recorder of Deeds office.

The decrease of about \$700 in miscellaneous receipts is because this character of work is now being done by the draughtsmen attached to the Board of Highway Supervisors, instead of in this Bureau, otherwise the work of the office shows a gratifying increase over all preceding years.

Sewer Connections and Records.

Sewer connections of 5,075 buildings were authorized during the year, which involved the issuing of 2,755 permits, with the usual inspection, draughting, and return of the reports (ordinance April 3, 1883).

The permits issued in each month were as follows :

January	54	July.....	283
February.....	20	August.....	319
March.....	221	September.....	279
April.....	249	October.....	312
May.....	325	November.....	363
June.....	266	December.....	64

The numbers in each ward :

First.....	79	Eighteenth.....	40
Second.....	29	Nineteenth.....	160
Third.....	29	Twentieth.....	156
Fourth.....	32	Twenty-first.....	128
Fifth.....	51	Twenty-second.....	174
Sixth.....	46	Twenty-third.....	14
Seventh.....	59	Twenty-fourth.....	314
Eighth.....	81	Twenty-fifth.....	28
Ninth.....	29	Twenty-sixth.....	83
Tenth.....	60	Twenty-seventh.....	96
Eleventh.....	22	Twenty-eighth.....	252
Twelfth.....	22	Twenty-ninth.....	243
Thirteenth.....	35	Thirtieth.....	33
Fourteenth.....	78	Thirty-first.....	26
Fifteenth.....	108	Thirty-second.....	102
Sixteenth.....	41	Thirty-third.....	78
Seventeenth.....	27		

The character of the drainage was :

Water closets.....	3,825	Slaughter Houses.....	15
Surface.....	2,209	Ice Houses.....	5
Sinks.....	782	Markets.....	3
Cellars.....	506	Breweries.....	3
Stables.....	48	For future use.....	450
Factories.....	18	Miscellaneous.....	20

One hundred and ninety eight drains were connected with the Intercepting sewer and its various branches, all of which

were supervised by Hiram L. Wynn, who was appointed Supervisor of the Intercepting sewer in January last.

The Bureaus of Water and Highways and the Board of Health have been furnished with the usual daily list of permits issued. The Ordinance of March 30, 1889, requires the Bureau of Highways to "cause the repaving to be done over all trenches." Complaints have been numerous that this important section is not strictly carried out.

Fifty-one (51) sewers have been built at private cost.

Three hundred and ten plans of main and branch sewers constructed were received from the District Surveyors, and duly entered in the sewer reference book.

The indexing of the inspectors' books has been continued; the number received during the year was 287, making the total number now in constant use 1,199, accumulated in five years.

The inspectors of drain connections occasionally have had their vigilance severely taxed to reach all points at which work was going on.

George W. Fox resigned on July 5, and William B. Dixey was appointed and assigned to duty on July 25 to fill his place. Mr. Dixey also sent in his resignation, which was accepted on November 30, when James H. Hendrickson was appointed, and assigned to duty on December 1.

The custom of locating the slants in sewers opposite the party wall, governed by the flow, very frequently causes the sewer to be broken when connections are made. The Board of Health approves all plans of plumbing, and the pipes are often run along the wall of the house, contrary to which the slants are placed.

The returns of sewer connections have been received monthly, but remain as turned in by the inspectors.

All moneys for permits, searches, balances, etc., were paid at the office of the Receiver of Taxes, taking his receipt therefor.

The receipts of the Bureau from all sources (except Dis-

strict Surveyors) during the year, were \$29,914.32, an increase of \$3,677.67 over 1888, as follows :

January	\$964 80	July.....	\$2,850 50
February	535 05	August.....	2,544 03
March.....	2,440 87	September.....	3,014 89
April.....	1,947 19	October.....	2,682 77
May.....	2,662 34	November.....	3,362 98
June.....	2,917 89	December.....	3,991 01

RECAPITULATION.

For sewer permits.....	\$18,074 50
For searches in Registry Bureau.....	2,039 00
For sewer bills.....	7,947 00
For sewer balances.....	1,711 32
For miscellaneous receipts.....	142 50
	\$29,914 32

Board of Surveyors and Regulators.

Twenty-seven meetings of the Board of Surveyors were held during the year, on six of which one hundred and thirty-one plans of streets and revisions of lines and grades were considered, and parties interested were heard under oath or affirmation.

The Board sustained a severe loss in the death of Edward Darlington Roberts, of the Fourth District.

Mr. Roberts was engaged in surveying in the District of Spring Garden in 1848, and in 1860 became a member of the Board, serving continuously to the time of his decease, on September 12, 1889.

His professional experience, punctuality and fidelity, gained for him the confidence and esteem of his fellow members, and of the public.

The Fourth District thus passed under the provisions of the Act of June, 1885; Mr. Francis Lightfoot being appointed to temporarily take charge of the office of Surveyor and Regulator. He discharged the duties acceptably until October 31, when failing health compelled him to resign the office. The

present incumbent, Mr. William W. Thayer, was appointed December 15, 1889.

The Surveyors now serving under salary are :

Thomas Daly, First District.

William W. Thayer, Fourth District.

Carl A. Sundstrom, Eighth District.

Joseph Johnson, Eleventh District.

Herbert M. Fuller, Thirteenth District.

On the expiration of the term of the present elected Surveyors, on April 7, 1890, the Second, Third, and Sixth Districts will come under the provisions of the Act of 1885.

A statement of the monthly receipts and expenditures in the several districts is appended.

Gutter Complaints.

Two hundred and ninety-seven notices have been issued, under the provisions of the ordinance to under-drain objectionable footway gutters.

One hundred and three have been complied with, and twenty-four have been sent to the City Solicitor for legal proceedings.

Eleven cases have been dismissed as not objectionable, and two have been held under consideration.

One hundred and fifty-seven cases are pending.

Main Sewers.

The following main sewers were completed in December, 1888, but final estimates were not made until 1889.

Fifty-second street sewer, Monroe street to Lancaster avenue. Contractor, H. F. Sullivan; final estimate, February 13, 1889, \$8,224.80; amount paid in assessment bills \$3,167.95.

Lombard street sewer, from Eighth street westward. Contractor, James Deehan; final estimate, January 21, 1889, \$2,055.60; amount paid in assessment bills \$679.86.

Powelton avenue sewer, between Twenty-fourth street and Schuylkill river. Contractor, R. A. Malone; final estimate, March 22, 1889, \$6,280.

Snyder avenue sewer, between Commercial avenue and Delaware river. Contractor, John S. Dutton; final estimate, February 19, 1889, \$4,200.82

The sewer on Allegheny avenue, west of Nineteenth street to Twenty-third street, Thirty-second Ward, was built a distance of 1,763 feet 5 inches. It is an egg-shaped sewer of the following sizes :

3 feet 9 inches by 5 feet, costing \$6 per foot.

3 feet 4 inches by 5 feet, costing \$6 per foot.

2 feet 4 inches by 3 feet 6 inches costing \$5 per foot.

Total cost \$10,125.15. Contractor, R. A. Malone; Inspector, F. D. Morris.

Bainbridge street sewer, from Sutherland avenue westward to Port Warden's line of the Schuylkill river, Thirtieth Ward, is a circular sewer, 3 feet 6 inches in diameter; total length of sewer built, 215.75 feet; cost \$4,530.75. Contractor, Daniel A. Kennedy; Inspector, John Vicary.

Bridge street sewer, between Thomas street and Torresdale avenue, Twenty-third Ward, was built for a distance of 1,057 feet 10 inches. It is a circular sewer of the following sizes :

4 feet diameter, costing \$9 per foot.

3 feet diameter, costing \$8 per foot.

Total cost will be \$9,048.80. Assessment bills amounting to \$2,378.79 were paid to Contractors, R. A. Malone & Co., and payments amounting to \$6,480 were made in 1889. Inspector of work, N. B. Beam. Final estimate not made.

Clearfield street sewer, from Ninth street to the Connecting Railway, Thirty-third Ward, is a circular sewer of the following sizes: 8 feet 6 inches, 8 feet 3 inches, and 8 feet diameters. Total length built 1,154.25 feet, at a cost of \$17.75 per foot, amounting to \$20,487.93. Assessment bills amounting to \$1,161.56 were paid to the Contractor, W. H. H. Achuff. Inspector, C. R. Van Horn.

Gunner's run sewer has been extended northwest of Indiana avenue and Rosehill street, Thirty-third Ward. This sewer is circular, 11 feet in diameter, costing \$24 per foot; 10 feet 9 inches diameter, costing \$23 per foot. Total length of sewer built, 450 feet 6 inches, costing \$20,000. Contractor, James Deehan; Inspector, C. F. Brown. Final estimate not yet made.

Lombard street sewer was extended from 247 feet west of Ninth street to Thirteenth and South streets, a total distance of 1,914 feet 5 inches, costing \$26,455.48. Assessment bills amounting to \$2,968.95 were paid to the contractor. It is an egg-shaped sewer of the following sizes: 4 feet 6 inches by 6 feet, 4 feet by 6 feet, 3 feet by 4 feet 6 inches, and 3 feet 4 by 5 feet. Contractor, James Deehan; Inspector, E. H. Sickels.

Reed street sewer, from Schuylkill River East Side Railroad eastward to Patton street, is circular, with diameter of 4 feet by 4 feet 6 inches. It extends a total distance of 1,333 feet 4 inches, costing \$12,000. Contractor, R. A. Malone; Inspector, A. F. Harkness.

Somerset street sewer, from William street and Delaware river, through Richmond coal wharves to Somerset street and westward. During the year 1889 the sewer was built 1,323 feet. It is a twin sewer, circular, 12 feet in diameter, costing \$55 per foot. That portion which is 10 feet by 10 feet 4 inches diameter, 70 feet long, with iron cover, cost \$89 per foot. Payments amounting to \$65,504 have been made during the year 1889. Contractor, R. A. Malone; Inspectors, H. M. Smith and D. S. Rorer.

Seventeenth street and Allegheny avenue sewer, connecting with sewer at Clearfield street and Woodpecker lane. This is an egg-shaped sewer of the following sizes: 3 feet 4 inches by 5 feet, and 4 feet by 5 feet. Total distance built 1,725 feet to Allegheny avenue, costing \$13,204.85. Assessment bills amounting to \$1,580.37 were paid to the Contractor, R. A. Malone. Inspector, F. D. Morris.

Tasker street sewer, from Delaware river to Meadow street,

First Ward, is circular, 7 feet in diameter. The sewer was built a distance of 965 feet, costing \$20,988.75. Assessment bills amounting to \$2,325.75 were paid to the Contractor, H. F. Sullivan. Inspector, H. M. Smith.

Tasker street sewer, from Meadow street westward, is approaching completion. It is circular, with diameters of 7 feet 3 inches and 7 feet; 2,182 feet were built during 1889. Payments amounting to \$28,576.80 have been made during 1889. Contractor, H. C. Eyre; Inspector, W. P. Brown.

Twenty-fifth street sewer is circular, with a diameter of 5 feet. It connects with main sewer on Pennsylvania avenue, and will extend to Parrish street, under J. F. Kennedy's contract. It is intended to relieve the sewer on Brown street. The work is being pushed with great energy. 470 feet were built during 1889, and 785 feet of tunneling. Payments made during 1889 were \$9,424. Contractor, James F. Kennedy; Inspectors, E. H. Sickels and F. D. Morris.

Twenty-fourth street sewer, from near Clarence street to north of Lehigh avenue, is a 7 feet circular sewer. It was built a distance of 1,000 feet, and completed 1889. Final estimate not yet made. Contractor, George W. Ruch; Inspector, C. R. Van Horn.

Wingohocking sewer, on the line of Heiskell street and Willow avenue, Twenty-second Ward, is circular, with a diameter of 8 feet 6 inches; total length built, 708 feet, 6 inches; cost \$12,600. Contractor, D. McMahon; Inspector, W. L. Holbrook.

Washington street sewer, from Delaware river to Spring street (Tacony), is a 5 feet circular sewer. Total length of sewer built, 928 feet 8 inches, costing \$11,854.95. Assessment bills amounting to \$1,141.74 were collected. Contractor, H. F. Sullivan; Inspector, H. M. Smith.

Wissahickon Valley Sewer.

This is one of the branches of the Intercepting sewer, projected for the drainage of the western portion of Germantown and vicinity.

SECTION 3. This section was awarded to H. C. Eyre. Work begun in November, 1888; final estimate made June 3, 1889; 377.61 feet of 2 feet 4 inches by 3 feet 6 inches, egg-shape, and 776.68 feet of circular sewer, 5 feet in diameter, were built, costing \$17,999.99. Contractor, H. C. Eyre; Inspector, F. J. Watt.

SECTION 4. This section was awarded to H. F. Sullivan. It is circular, 5 feet in diameter. Total length built, 1,164.24 feet costing \$13,970.88. Inspector, F. J. Watt.

Monoshone branch sewer is a continuation of Wissahickon Valley system, eastward of the Wissahickon sewer. At Ritzenhouse lane it is circular, 3 feet 6 inches diameter. Total length of sewer built, 1,012.65 feet, costing \$7,999.93. Contractor, H. C. Eyre; Inspector, F. J. Watt.

Connections with Intercepting Sewer.

Connections on Main street, from near Levering street to Centre street (vacated), Manayunk, with Intercepting sewer, are terra-cotta pipe, of the following lengths and sizes:

86 feet of 10-inch pipe.

801 feet of 12-inch pipe.

496.13 feet of 8-inch pipe, and

28.5 feet of 12-inch pipe,

costing altogether \$4,207.35. Contractor D. A. Kennedy; Inspector, C. Y. Lauderbach.

Main, Washington, High, Hamilton, and Church streets, Manayunk, are terra cotta pipe sewers, connecting with the Intercepting sewer, of the following lengths and sizes: 114 feet of 8-inch pipe; 940 feet, composed of the following sizes: 15-inch, 12-inch, 8-inch, 833.2 feet of 10-inch pipe, 491.1 feet, composed of the following sizes: 10-inch and 8-inch pipes, costing altogether \$10,365.60. Contractor, W. H. H. Achuff; Inspector, C. Y. Lauderbach.

Nicotown lane sewer, connecting with Intercepting sewer, is "D" shaped, 4 feet 6 inches by 5 feet, and was built to carry storm-water into Schuylkill river. Total length 91 feet,

and 93 feet of 12-inch terra cotta pipe; sewer costing \$1,510.20. To make the work complete \$600 was paid by the Laurel Hill Cemetery Company for the portion on its property. Contractor, James Deehan; Inspector, C. Y. Lauderbach.

Ridge avenue and Scott's lane sewer is a pipe sewer, connecting with the Intercepting sewer. Total length 743 feet of 12-inch terra cotta pipe; costing \$7,580.30. Contractor, Daniel A. Kennedy; Inspector, C. Y. Lauderbach.

Cohocksink Sewer.

The work of repairing Cohocksink sewer, at Germantown avenue above Second street, was continued by Contractor H. S. Hong, the amount expended being \$7,843.26.

A contract, limited to \$7,000, was made June 4, 1889, with John McParland. Serious breaks, occurring at Germantown avenue below Second street, and on Thompson and Third streets, were, after a series of difficulties, repaired at a cost of \$27,000, of which amount \$20,000 was from appropriations to the Bureau of Highways.

A further inspection of the sewer showed that additional repairs were necessary, and a dangerous break occurring at Van Horn street and Germantown avenue, was repaired by Contractor John McParland, at a cost of \$5,928.46.

Another break occurring on Thompson street, west of Third street, required the sewer to be repaired as far west as Charlotte street, at a cost of \$12,000. Work was done, under emergency, without appropriation, and was completed before the end of the year. The condition of Cohocksink sewer is very bad, and will still require a large expenditure of money to put it in anything like a safe condition.

Willow Street Sewer Repairs.

The work of repairing Willow street sewer was done by Charles A. Porter. The repairs at Eighth and Willow streets cost \$6,052.70.

The repairs at St. John and Willow streets, on Willow street from St. John to Second street, was done by Charles A. Porter, under emergency, without an appropriation, and completed before the end of the year.

The total length of sewers built and inspected during the year 1889 was 35.54 miles, divided as follows: main sewers, 3.33 miles; Branches of Intercepting sewer and connections, 1.52 miles; Branch sewers, 28.75 miles; Branch sewers at private expense, 1.94 miles.

DESCRIPTION.	FEET.	MILES.
Main sewers.....	17,592.40	3.33
Branches of Intercepting sewer and connections.....	8,048.13	1.52
Branch sewers.....	151,752.50	28.75
Branch sewers (at private cost).....	10,285.00	1.94
Total.....	187,678.03	35.54

The total length of branch sewers now constructed is 301.31 miles.

Total length of main sewers constructed..... 66.59 "

Total length of sewers..... 367.90 "

Mr. John Kay Little, who has faithfully served the city as draughtsman and assistant engineer for seventeen years, resigned on September 30, and Mr. Gustavus K. Moorehead was appointed in his place.

The usual tables are appended, which show that more work has been done by the Bureau than in former years, although the work in 1888 exceeded by 50 per cent. any previous year.

Respectfully submitted,

SAMUEL L. SMEDLEY,

Chief Engineer and Surveyor.