



ONE HUNDRED AND FIFTH ANNUAL REPORT

OF THE

BUREAU OF WATER

FOR THE YEAR ENDING DECEMBER 31, 1906

AND

FOURTH ANNUAL MESSAGE

OF

JOHN WEAVER

MAYOR OF THE CITY OF PHILADELPHIA

WITH THE

ANNUAL REPORT

OF

JOHN R. HATHAWAY

Director of the Department of Public Works

ISSUED BY THE CITY OF PHILADELPHIA, 1907

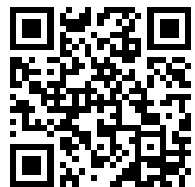
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OFFICE OF THE MAYOR
PHILADELPHIA



Mayor

JOHN WEAVER

Secretary

MARGARET FORDERER

Chief Clerk

HERBERT M. ORAM

Contract and License Clerk

JOSEPH F. JONES

Clerk

WILLIAM F. GLEASON

Ass't Stenographer and Typewriter

CHARLES H. DALRYMPLE

Messenger

WALKER B. WEBB

FOURTH ANNUAL MESSAGE

OFFICE OF THE MAYOR, CITY HALL

Philadelphia, April 1, 1907.

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

GENTLEMEN:—In accordance with the provisions of the Act of Assembly of June 1, 1885, I transmit to your Honorable Bodies my fourth annual message, with a statement of the finances and general condition of the affairs of the City.

I might say that the close of my administration winds up a period of twenty years of the City's administration under the Act of June 1, 1885, known as the "Bullitt Bill," the several Mayors under the Bullitt Bill being as follows:

- Hon. EDWIN H. FITLER,
sworn in first Monday of April, 1887.
- " EDWIN S. STUART,
sworn in first Monday of April, 1891.
- " CHARLES F. WARWICK,
sworn in first Monday of April, 1895.
- " SAMUEL H. ASHBRIDGE,
sworn in first Monday of April, 1899.
- JOHN WEAVER,
sworn in first Monday of April, 1903.

It is not my purpose now to make a comparison of the administration of the affairs of the City under the Bullitt Bill with the administration of its affairs under the laws as they existed prior to the Act of 1885, but I should say in passing that there is no doubt that the wisdom of the passage of the Bullitt Bill has been thoroughly demonstrated.

FINANCES.

The financial condition of the City, as shown by the City Controller's Report, is splendid. After the payment of all the current obligations of the City for 1906 there was shown a surplus of upwards of one million six hundred thousand (1,600,000) dollars and when you take into consideration the fact that under the Act of 1905 the Board of Education now gets one-third of all the taxes collected from the real estate assessed at City rates; one-half of all the taxes assessed upon suburban real estate, and two-thirds of all the taxes assessed upon farm property, which gives them upwards of a million and a half dollars more than they had received before the passage of the Act and which decreases the amount available to the other departments by that much, it must convince you that it could only have been brought about by a careful and economical administration of the executive departments.

When I went into office on the first Monday of April, 1903, the tax rate of the City was one dollar and eighty-five cents (1.85) on the hundred dollars. This was reduced by your Honorable Bodies, at my recommendation, to one dollar and fifty cents (1.50) on the hundred in an effort that was made to equalize the assessment of real estate. This was carrying out what I had said to your Honorable Bodies in my inaugural address on April 6, 1903, as follows:

“There has been for years much criticism in this City relative to the method of assessing real estate. I might report an instance that was brought at the time to my attention where a house that was bought for \$8,000 was assessed at \$4,000, and within a square of that house another house which was bought for \$7,000 was assessed at \$5,600. Such examples could be multiplied, not only in the case of small properties, but also in the case of large ones. The proper method and the only way to carry out the intent of the law would be to assess all property at its full market value.

“This would remove the great multitude of inaccuracies that exist under the present method, and would insure that no owner of property would be required to pay more than his just proportion of the burden of taxation. If the amount of taxes that this method would produce would amount to more than sufficient for the running expenses of the City government the tax rate could be reduced so as to bring down the gross amount of taxes to about the amount that is being paid. The system which I mention has been in use in the New England cities, and, I am informed, has lately been introduced in the City of New York.”

A few “croaking ravens” prophesied at that time that the dollar-and-fifty-cent tax rate would not be sufficient for the expenses of the City, so that it is a cause for particular congratulation that notwithstanding the fact that your Honorable Bodies very properly increased the pay of the teachers in the public schools by a sum aggregating six or seven hundred thousand dollars a year in 1904, and then subsequently there was upwards of a million and a half dollars given to the Board of Education for general purposes by the Board of Education Act of 1905, we have still been

able to carry on the great works of the City and have a handsome surplus at the end of four years trial of a tax rate of one dollar and fifty cents (1.50). And from my experience, I should say that there was absolutely no necessity for ever increasing the tax rate above that amount. I call your attention to the City Controller's Report of 1904, in which he says:

"The tax levy for 1904 was computed at \$16,872,055.67. This was based on an estimated assessed valuation of \$1,162,074,023 at a rate of \$1.50 per hundred, and was the lowest tax rate adopted in thirty-six years. Of the amount collected there remained on December 31, allowing for discounts of \$58,012.32 and penalties of \$57,351.93, about three and one-eighth per cent. of the tax levy uncollected, a smaller sum outstanding than has hitherto been shown."

The total amount expended by the various City departments during the year, outside of mandamus items, was.....	\$46,372,135.35
The mandamus payments amounted to....	1,238,777.38
a very marked falling off from previous years.	
The amount paid out in mandamuses for 1903 was	1,891,403.47
In 1904 the amount paid out for this purpose was	2,524,018.42
The amount paid in 1905 was	1,635,645.47

so that you will see that the efforts of the administration during the last four years did not become effective until 1905, but, as you are aware, we have insisted that whatever streets were to be opened for the benefit of the property owner, and which would result in very

largely increased value of his property, that he should dedicate the bed of the street to the City, and not collect damages from the City in addition to having a largely increased value in real estate, and, I am happy to say, this has been done very generally, and instead of keeping back the building operations in the City, appears to have increased them; at least the fact remains that the building operations in the City have very materially increased, whatever the cause.

LOANS.

On the first of January, 1903, three months before I went into office, the borrowing capacity of the City was about \$9,000,000.

The borrowing capacity, of course, was increased from time to time by the increase in the assessed value of real estate in the City, and also by the payment, through the Sinking Fund Commissioners, of a number of loans maturing, and also by the purchase by the Sinking Fund Commissioners of various City loans with money paid to them in the annual appropriations by your Honorable Bodies for the purpose of paying loans as they matured.

In 1904 we borrowed sixteen million (16,000,000) dollars that was authorized by your Honorable Bodies by ordinance of December 17, 1903.

On January 1, 1907, the borrowing capacity of the City was \$27,736,959.50, but there has been authorized by your Honorable Bodies and ratified by vote of the people, loans of seventeen million five hundred thousand (17,500,000) dollars, viz., four million (4,000,000) dollars for the abolition of grade crossings, ratified by the people at the election of November, 1905, which has not yet been borrowed, and thirteen million five hundred thousand (13,500,000) dollars for filtration and other purposes, ratified by the peo-

ple at the election in November, 1906. None of these sums have yet been borrowed, but we have advertised for five million dollars of the thirteen million five hundred thousand dollars so that we can proceed with the great public improvements authorized by your Honorable Bodies, but we feel it unwise to advertise for more than five million dollars of the thirteen million five hundred thousand dollars because of the stringency of the money market, and this five million dollars will enable the work to go on without any delay.

FIRE INSURANCE FUNDS.

Prior to the year 1904 the City insured nearly all of its buildings in various insurance companies, and paid out between twenty and thirty thousand dollars a year in insurance premiums. For the previous ten years there had been no loss of any account, and the City had not collected more than one thousand dollars in the whole of the ten years. It occurred to me that it would be a wise thing for the City to cancel all insurance policies, and pay the return premiums into the hands of the Sinking Fund Commissioners, and all of the insurance premiums should be paid to them and the fund permitted to accumulate until it reached two hundred and fifty thousand (250,000) dollars, and that after that the increase of the fund could be used by the Sinking Fund Commissioners to help to retire the debt of the City. I sent a message to your Honorable Bodies on the subject, and you passed an ordinance authorizing this to be done.

We had accumulated money in this fund to upwards of two hundred thousand (200,000) dollars, but immediately afterwards we had a fire in the Boys' High School, and another one in the Girls' High School, and there has been a

still later one in one of the other schools. All the losses that have been sustained by fire have been in the Board of Education, with the exception of eighteen hundred (1,800) dollars that was paid to repair Belmont Mansion that was injured by fire. We have still on hand in this fund nearly one hundred and fifty thousand (150,000) dollars, although there will be some further small amounts to pay out for fire losses, but I still believe that notwithstanding these fires, and our disastrous experience since we started this fund, that it is the very best system the City could have, and, as I suggested in my last annual message, I think it would be wise to allow the fund to accumulate to five hundred thousand (500,000) dollars and not leave it at two hundred and fifty thousand (250,000) dollars.

DEPARTMENT OF PUBLIC SAFETY.

It was necessary for me to make another change in the Directorship of the Department of Public Safety during the year 1906, and on the twenty-second day of September, 1906, I appointed Robert J. McKenty, who was at that time the Superintendent of the House of Correction, Director of the Department of Public Safety, in place of Colonel Sheldon Potter resigned.

Mr. McKenty's long experience in the Department has made him, in my judgment, one of the best Directors of Public Safety the City has ever had. He is thoroughly familiar with every bureau in the Department, and the workings of each bureau, and is in entire sympathy with the large number of employees in the various bureaus under him. I refer you especially to his report and the report of the bureau chiefs under him. You will notice in his report of the Bureau of Police that there were eighty-three thou-

sand arrests during the year, an increase of twenty-five hundred over 1905.

I also call your attention to the Director's report of the installation of a complete electrical photographing plant, and the adoption of the finger-print system of identification of prisoners in the detective division; also the good work that has been accomplished with the mounted police in the Summer School.

I also call your attention to his report on the introduction of motor cycles, which has greatly added to the efficiency of the police service, and also to his reference to the valuable work performed by instructor Rodman in the gymnasium.

The Director also calls attention to the work of the Fire Marshal, whose Bureau has made during the year forty-nine hundred and sixty-three inspections of fire escapes, buildings, exits, etc., besides the investigations of places where dynamite was stored, and where petroleum, gasoline, benzine and other high explosives and combustibles were kept.

The Director calls attention to the death of William M. Angney, who, for a number of years, had been Chief Surgeon of the Bureau of Police, and whose place has been filled by the appointment of Dr. Francis S. Patterson. I desire at this time to pay a tribute to the memory of Dr. Angney. He was a very efficient surgeon, doing his work in a quiet manner, without ostentation, but doing it very effectively. He had that delicate touch that is so essential to the successful operating surgeon, and never tired of working for others. In addition to the very arduous duties of the Department I know that he was engaged in a great many charities, and that all his spare time was devoted to this work. He was a martyr to duty, for there is no doubt that his strenuous work in the Department, his long hours, and the fact that he was always on hand when duty called

him, probably brought on the disease that finally terminated in his death. It can certainly be said of Dr. Angney that "he served his City well."

I also call attention to the Director's reference to the work of the meat detective, showing an inspection of upwards of one hundred and seventy-eight thousand head of cattle on the hoof; upwards of twenty-eight thousand slaughtered cattle; forty-six thousand calves, etc., besides visiting slaughter houses.

I call your special attention to the Director's suggestion of a material increase in the force of patrolmen. The Director says there should be at least two hundred men added to the force to properly cover the one hundred and twenty-nine square miles of territory for which the Bureau is responsible. I entirely agree with the Director's suggestion that one hundred men should be immediately added to the force, one-half of whom could be mounted men, in order to provide for the rapidly growing suburban districts.

Bureau of Fire.

This Bureau has kept up with its usual splendid work during the year under its very capable head, Chief Baxter. There appears to have been thirty-six hundred and fifty-one alarms of fire during the year, an increase of forty-two over 1905. The fire losses during the year amounted to

On Buildings.....	\$ 789,680.00
On Contents.....	1,605,636.00

The Director calls attention to Chief Baxter's recommendation that a new station shall be built for No. 6 Company, the present one being in bad condition, and also for No. 5, which occupies rented quarters.

Beginning with October 9th a series of tests were made of the engines of the entire fire service by a Committee consisting of Mr. John M. Lukens, Chief of Bureau of

Boiler Inspection, Chief Baxter of the Bureau of Fire, and experts employed by the Trades' League. Each engine was given a thorough trial with not more than two hours' notice, in order that each engine could be tested under actual fire fighting conditions. The tests were thorough and elaborate, each engine being run to its maximum capacity for one hour. The result of the test showed that the engines were able to maintain a much higher pumping capacity and a much less slippage than that which was shown by the report of the National Board of Fire Underwriters.

Chief Baxter, however, recommends that twenty thousand (20,000) dollars be expended in re-building ten of the oldest engines in the service, and in order to meet the demands incident to the development of the City, that fifty thousand (50,000) dollars be expended in creating a reserve service of ten new engines to take the place of engines laid up for ordinary repairs or those disabled at fires.

The high pressure service has been very effective, and it is recommended that it should be extended. Your Honorable Bodies have provided for a loan of one hundred and fifty thousand (150,000) dollars for extension of the present system, but new stations should be established, and the system extended first into the mill district, and then all over the City, not only for more effective fire service, but for the further reason that when the filtration system is completed it will not be necessary to use filtered water for fire purposes. The Superintendent of the high pressure service recommends the placing of an additional hydrant in the centre of each block, thus increasing the efficiency of the service. It is important to note that not a single defect has developed in the plant during its three years of operation.

Electrical Bureau.

This constantly growing Bureau has been continuing its splendid work, and I call your special attention to Chief Sager's recommendation for the elimination of overhead wires. This has been recommended for several years in succession, and it is becoming more and more serious every year and must be attended to. He also recommends that an ordinance be passed giving authority to his Bureau to remove all overhead wires and poles erected without the authority of your Honorable Bodies. I would suggest that both these matters be taken up by your Honorable Bodies as quickly as possible.

Chief Sager also recommends a legislative enactment giving the City the power to make rules and regulations governing the introduction of electricity into private plants. If this was done the number of fires caused by defective electric light wiring would decrease.

The report of the Bureau shows that there has been an increase of 579 miles of overhead wire since 1905.

Chief Sager reports the number of arc lamps in the City of Philadelphia for the purpose of street lighting, and I take this opportunity of calling your Honorable Bodies' attention to the fact that two years ago we started an agitation for competition in the matter of electric lighting, and the agitation resulted in the reduction by the Philadelphia Electric Company, from one hundred and ten (110) dollars per arc lamp per year to about ninety-nine (99) dollars.

Two propositions that have been submitted to your Honorable Bodies during the past year, one by the Commonwealth Electric Company and one by the Citizens' Electric Company, very materially decreased the cost to the City of street lighting, and I earnestly recommend the passage of the ordinance proposed by the Commonwealth

Electric Company because it seems to be the most feasible one, and would not only have decreased the cost to the City, probably bringing it down to between sixty (60) and seventy (70) dollars per lamp per annum, but would also very materially decrease the cost of electric lighting to the private consumer and the cost of electric energy to the factories. We have been very much handicapped in this City by the fact that there is no competition and that we do not get either the electric lighting or the electric energy supplied at such a figure as to induce the people to use it to a very large extent. I am positive that the passage of the Commonwealth ordinance would be a great saving to the City and also to the citizen.

Bureau of City Property.

The report of Chief Eisenhower, of the Bureau of City Property, is very gratifying. It shows that although the properties owned by the City of Philadelphia have very materially decreased by the destruction of all the houses and factories on the triangle between Pennsylvania avenue, Twenty-fifth street and Spring Garden street, yet the receipts from rentals have increased by twenty-one thousand (21,000) dollars. My message of last year called your attention to the fact that there had been a great improvement in the system of bookkeeping in this Bureau during the year. The public baths seem to have been well patronized, a total of 5,709,190 persons using them in the course of the year.

Bureau of Building Inspection.

In order to compare the work done in the last few years in Philadelphia in building, I quote from my Third Annual Message of April 2, 1905, as follows:

“There was an increase in the value of building operations of 20% over 1904, and of 67% over 1900.

During 1905 there were 16,958 building operations, with an estimated value of over \$34,000,000. Included in this amount were permits for 9,420 dwellings, and I call your attention to the details of this report which you will find in the Director's report to me."

The report for 1906 is still more favorable than that of 1905. It shows that permits were issued to 17,872 building operations, and that the total value of the operations for 1906 amounted to \$40,711,510, and that permits were issued for 10,145 dwellings at an estimated value of \$22,863,630, an increase over 1905 of 725 dwellings, and an increase over 1904 of 3,447 dwellings. Of the number of dwellings erected, 8,940 were two-story dwellings, valued at over seventeen million dollars. I call your attention to this to show that we are still keeping up our record of being a "City of homes." I cannot do better, however, than refer you to the splendid report of Chief Clark, of this Bureau, for the work of the Bureau during the past year, and to especially call your attention to the fact that the Chief recommends an increase in the force of building inspectors in order to accomplish the rapidly increasing work of the Bureau.

It is also gratifying to know that last year, namely, 1906, was the first year that the Bureau of Building Inspection was self-supporting, the receipts showing a net profit over all expenses, including salaries, of over \$6,000.

Bureau of Boiler Inspection.

In the Bureau of Boiler Inspection such work was done as was possible under the existing ordinance to abate the smoke nuisance, and some 1,945 investigations of complaints were made, and 62 firms abated the nuisance, the complaints having been well founded. I would call your at-

tion, however, to the fact that it will be necessary to have some uniform legislation covering not only the factories, but the railroads, because our citizens will not be very much better off if we succeed in having every factory abate the smoke nuisance, if we are still to have all the smoke from the railroads. This will not be a hardship upon the railroad companies, and I understand that they have adopted a system in most of the other large cities in the East, and if they can do it in other cities, they ought to be willing to do it here.

Bureau of Correction.

I call your special attention to the report of this Bureau, the very marked improvement there during the past three years being due, I think, entirely to the splendid work that the present Director of Public Safety did while he was Superintendent of the Bureau of Correction, before he became Director of Public Safety.

It is very gratifying to me to be able to surrender the duties of the office of Chief Executive of the City with the Department of Public Safety in such splendid shape as it is to-day. It was never better administered.

DEPARTMENT OF SUPPLIES.

In this Department, Mr. Frederick J. Shoyer, who had held the position of the Director of Supplies from the time of the creation of the Department, resigned the beginning of April, 1906, as he was about to become a candidate for the nomination for an important County office, and he did not desire to even have the appearance of violating the

laws of the State by holding public office while he was asking from his fellow-citizens the nomination for another office. I desire at this time to pay a tribute to Mr. Shoyer's never-failing zeal in behalf of the City. During the whole time that he was in office he had no thought except to serve the City of Philadelphia to the best of his ability.

After Mr. Shoyer's resignation on April 4, 1906, I appointed Director of Supplies, to succeed Mr. Shoyer, Mr. Robert Grier, who up to that time had been my Secretary. He has had charge of the Department since that time, and I especially invite your attention to his very exhaustive report.

The Director calls attention to the fact that the Department might become more efficient by the establishing of a storehouse for the distribution of the supplies to the various bureaus.

I also call your attention to the fact stated in the report that the sale of old material which I directed should be turned over to the Department of Supplies for sale realized the sum of \$24,679.58.

The Director's report contains a detailed statement of the funds appropriated to the Department, and its expenditures, to which I call your attention.

DEPARTMENT OF PUBLIC HEALTH AND CHARITIES.

This Department has been very ably administered by Dr. W. M. L. Coplin, the Director, who was appointed on the 27th day of November, 1905, to succeed Dr. Edward Martin who had resigned.

I call your special attention to Dr. Coplin's report on the mentally defective children. He says in part:

“In the central office, Councils provide an appropriation for the care of 160 mentally defective children, in the Pennsylvania Training School for Feeble-Minded Children, at Elwyn, Pa. ; the amount of money expended in 1906 was \$30,747.31. The fund available falls far short of that adequate for the needs of the unfortunates of this class and leaves hundreds who cannot be removed from their homes where the environment is often such as may intensify any existing mental defect and preclude that training of the faculties necessary for making the individual, when grown, self-supporting and safe to society in general. Practically all the mentally defective sooner or later become charges of the Municipality and, in the meantime, during the more plastic period of youth, the City fails to take official cognizance of their existence and leaves them helpless charges with parents and remoter kindred, or even strangers, none of whom is prepared by training or means to improve the deplorable mental condition of the dependent child. Among the medium or higher grades of feeble-minded girls no moral training is given even when possible, no adequate safeguards taken so that coincident with maturity the child—for she is as yet no more—is morally degraded and becomes the helpless mother whose offspring is probably of lower mentality than the parent. *One mentally defective of this type has been admitted to the Philadelphia Hospital for five confinements; four of the offspring were clearly subnormal and three became immediate public charges.* Others of the women become prostitutes, contract venereal disease, infect boys, often mere children, and in other ways endanger society. Medical men do not regard sufferers of this type suitable individuals for commitment as insane, and, until they become criminals, no adequate pro-

vision for their custodial care or training is made. What Elwyn does for a small number should be done for all. I believe the Commonwealth should assume the responsibility and make the necessary provisions for their care; if the State will not, then the City must; it is a crime to allow the present deplorable conditions to persist."

The Director's report about the decrease in the number of deaths from diphtheria is very encouraging, and perhaps more encouraging is the report of the great decrease in deaths from scarlet fever, inasmuch as the medical profession have as yet not discovered any antidote for this dread scourge of childhood; the Director attributing this falling off of cases of diphtheria and scarlet fever to the good work of the medical inspectors is certainly correct.

I call your special attention to what the Director says about tuberculosis, and I quote from his report as follows:

"In my Annual Report for 1905, I attempted to make clear how inadequately the City was doing its duty toward the great army of sufferers from tuberculosis. During 1906, 5,388 cases of pulmonary tuberculosis were reported and in some form or another the malady accounted for 3,627 deaths—about 13 per cent. of all deaths; approximately 1 in 7 of those dying succumb to this captain of the men of death. The City very properly provides an institution for the care of scarlet fever and diphtheria patients; in the entire City the total number of deaths from the two diseases was 548. In the meantime we are doing little to alleviate the tuberculosis situation, although for every death due to diphtheria over seven fell before the Great White Plague. With distinguished wisdom we are spending millions toward the filtration of the water supply, among the greatest possible ad-

vantages from which will be the prevention of about 10,000 cases and 1,000 deaths due to typhoid; why not make some special effort to lessen the ten or fifteen thousand cases and 3,627 deaths, the result of infection by the tubercle bacillus. Additional data might be given, but as I have considered the matter in the Annual Report for 1905, I can do no better than to urge the recommendations then made, namely, that the Department should be given funds sufficient to provide for (1) the education of the public along certain preventive lines; (2) cleansing and disinfecting houses in which deaths have occurred from tuberculosis; (3) the establishment of dispensaries for the treatment and prophylactic education of the poor; (5) the employment of district nurses for the care and education in a preventive way of patients that cannot be removed from their homes; (6) hospital treatment for advanced cases; (7) sanitary supervision of industries, the improper operation of which increases the number of cases of tuberculosis in the community."

There is no doubt that the Municipality must give more and more care and consideration to this dreadful disease which is more fatal than any other disease that we have to contend with, and the unfortunate part of it is that it is peculiarly fatal amongst the poor.

The Director's statistics in regard to the medical inspection of the school is very interesting, and a large amount of work of the medical inspectors is shown when we consider that there were over sixty-four thousand school visits made by the inspectors during 1906, and the necessity for medical attention discovered in over thirty-one thousand children, and it is interesting to note the Director's remarks in regard to the children of defective vision, and the sugges-

tion that the Board of Education or the City in some way should look after those children with defective vision, whose parents are not in a condition financially to look after them, and he calls attention to the fact that 11,765 instances of defective vision were encountered in 1906.

The Director's report on the abatement of nuisances, milk inspection, division of meat and cattle inspection and the new Municipal Hospital is well worth consideration.

I also call your special attention to the Director's report on the Antitoxin Laboratory, and the growth of the use of antitoxin from the production of it by the Municipality between 1896 and 1906, viz., ten years. In 1896 the Municipality only manufactured 900,000 units; in 1906 they manufactured 34,000,000 units, and it is the increased use of this to which we owe the decrease in the death rate of diphtheria.

The Director calls attention to the fact that we should have a modern Biological Laboratory, properly equipped, and located outside of the City Hall. Some years ago a building was partially erected at Torresdale, which was intended to become the Administration Building of a new Insane Department, but attention was called to the fact that the ground that we could use was entirely inadequate, and during the past year we have succeeded in purchasing a tract of nearly nine hundred acres in Byberry. The Director's suggestion that this Administration Building, with the twenty acres of land adjoining it, should be used for a Biological Laboratory and the ground as a paddock for horses, which the Bureau of Health now has under treatment for the purpose of producing antitoxin it occurs to me that it would be economical to have the laboratories of all the City Departments united in that one building. It seems to me also that the Bureau of Health could not only prepare its own antitoxin, which they are now

preparing, but could also prepare the vaccination virus, and I earnestly call this matter to your attention.

The Director's report on the Philadelphia General Hospital is very interesting, and I quote from his report, as follows:

“Almshouse—Philadelphia General Hospital—Department for the Insane.

“The three Institutions, grouped and administered as three Divisions of the Bureau of Charities, constitute the largest organization of its kind in America, and in magnitude is exceeded by but few in the world. During the year just closed, 15,573 individuals entered its portals; 8,949 of these were discharged or eloped, and 4,623 were in the Institution at the close of the year; 213 were born within the walls, and 2,001 died. The per capita cost of the entire Institution was 44 11-100 cents per day. By the most careful supervision it has been possible to keep down the census in the Indigent Department so that, at the close of 1906, the number of inmates was 72 less than at the corresponding period of 1905. All other Departments of the Institution show an increased number of inmates amounting in all to 391. This calculated at the average per capita rate for the Institution would demand an increase of expenditure of \$62,951.58—a total which would be somewhat reduced by the fact that the out-wards (Almshouse Proper) showed a slight but not material reduction. This indicated necessity for appropriation has not been met by the funds rendered available by Councils.

“Early in 1906 an appropriation was made for fitting up a pavilion and juxtaposed hall of the Philadelphia Museums to receive the male indigent. This work was pushed as rapidly as possible but as a

result of unforeseen difficulties—principally inadequate sewage facilities—the project was delayed much longer than was at first anticipated. Finally, on September 15, 1906, the work was finished and the inmates removed to the commodious, well-ventilated, well-lighted, satisfactorily-heated quarters, prepared for them, and in which they have passed a healthful and pleasant winter. The new quarters consist of two dormitories, first and second floors, a large recreation room, a dining room, and a kitchen. Adequate but not fortunately located toilet facilities are also available. Immediately after removal of the indigent to their new accommodations restoration of the quarters they had vacated was begun; when the alterations are completed it is the intention that one-half of the newly acquired space shall be devoted to relieving the great overcrowding in the hospital, and the remainder for a like relief to the Insane Department. The renovation includes a new equipment of old toilet towers, the building of an additional toilet tower, reflooring, repainting, and the installation of an elevator, and fully equipped hydrotherapeutic plant. This work is now well advanced and it is our hope that by the first of March the long-sought relief along the lines indicated may be at hand. It is well to state, however, that while this offers an accommodation for about 350 insane the population in this Department has, in the meantime, increased over 175, and by the end of the present year the temporary relief will be no longer adequate.”

I have only quoted some parts of the Director's report, but the whole report is well worth not only reading but a careful study as the Director has given very careful attention to the matter, and has compared the work of his Department with similar departments in other cities.

I cannot praise too highly the work of this Department, and the industry and ability of the Director, and the great comprehensive grasp he has of all matters affecting the health of the City, and the suggestion that he makes for the improvement of the Department is well worth your consideration. I quote the concluding paragraphs of his report:

Remarks:—During the year just closed many important improvements and additions have been made. Councils have dealt fairly with the Department and I think to a large degree have realized the enormous difficulties under which the work is being done. All those who have been in contact with the problem have given the Director hearty and cordial support and have worked indefatigably for the many improvements that have been inaugurated. In spite of all this I can but submit that we have scarcely more than touched the border of an enormous field so long neglected that the consummation of the movements necessary for modernizing conditions in the Bureau of Charities may constitute a herculean task. New buildings for the indigent, a new hospital system for the insane, the organization and equipment of both, modernizing the Philadelphia General Hospital—were themselves tasks of the first magnitude, and when it is recalled that with these gigantic problems to be solved there remains the question of operation, maintenance, organization and the thousand and one subsidiary matters that must in the meantime be carried out, it will be seen that the duty is at no time a light one.

“It must always be with sincere regret that one repeats year after year urgent recommendations that remain unfulfilled. It is not probable that the cries of the needy fall on heedless ears or sink into soulless hearts. Here in Philadelphia was first inaugurated

anything like a proper humane treatment of the insane and within the call of that venerable Institution the City's charges now lie huddled as in the mad-house of days that were. An official document is no place for sentiment, but the thoughtful must wonder why, in this great Christian community in which dozens of splendid private charities thrive to do noble work, the hospitals owned and operated by the City, ministering to the suffering of our fellow-men, can awaken no sense of pride, no irresistible determination on the part of our citizens to make them the splendidly, fully equipped Institutions that they should be.

"In conclusion I wish to express my appreciation of your co-operation and through you to thank Councils for their efforts toward improving the Department and especially do I feel grateful for the warm-hearted support of a large number of medical men who have given freely of their time and skill."

DEPARTMENT OF PUBLIC WORKS.

We have been rather unfortunate in this Department during the past two years in that we have had so many changes in the Head of the Department. Mr. A. Lincoln Acker, finding that his private business demanded his attention, resigned on March 5, 1906, and I was exceedingly reluctant to be compelled to accept his resignation. Mr. Acker, however, insisted that his own business required his attention, and that he could not afford to remain any longer in the Department of Public Works. Upon his resignation I appointed the then Assistant Director of Public Works, Mr. Thomas L. Hicks, to be the Director. He resigned on October 11, 1906, and I appointed Mr. John R. Hathaway, the present Director, in his place.

Bureau of City Ice Boats.

In my Annual Message of 1905, I called your attention to the fact that we had lost one of the old ice boats by wreck in Delaware Bay, and had been compelled to build a new one of the most modern type and very powerful. Last winter we had no ice in the Delaware river, and therefore we had no opportunity of showing the efficiency of this boat. This winter, however, we have had very severe weather, and there has been enough ice to enable us to demonstrate the full power of this boat. There remains no doubt at all about her ability to cope with any ice conditions. It certainly is not possible for the channel of our river to become closed to navigation with this ice boat at work. Ice boats Nos. 1 and 2 are still at work, but the new boat can do more work than the other two, and eventually it will become necessary to build another new and powerful ice breaker to take the place of the two old ones. I believe that two boats of the type of the new one will be able under all conditions to keep open our channel. I heartily approve of the suggestion of the Superintendent for the dredging of the dock at the House of Correction, where all these boats can be laid up during the summer, and that funds should be provided for this at once.

Bureau of Gas.

Our Gas Works are still operated under the lease to the United Gas Improvement Company, but the time has arrived when the City must determine whether or not she will take back the Gas Works under the option in the lease at the end of the ten-year term, which expires at the end of 1907, or shall permit the lease to go on for the balance of the thirty years. Notice of the exercise of the option must be given before July 1, 1907.

A commission of three men—Mr. Wm. G. Huey, Mr.

Wm. S. Kimball and Mr. Thomas M. Eynon—two business men and an engineer, was appointed under the authority of your Honorable Bodies some weeks ago, for the purpose of ascertaining what amount of money would be payable to the United Gas Improvement Company in case the City should determine to cancel the lease at the end of the ten-year period. This was made necessary because the only examination that had been made of the accounts of the United Gas Improvement Company by the City Controller's office was a mere vouching of the account, that is, a comparing of the bills (which were generally bills made out by the United Gas Improvement Company themselves) with the accounts of the United Gas Improvement Company, and the only thing that such a vouching determined was that the amounts set forth in the statements were the same as those set forth in the bills, and that the extension of amounts and adding up of figures were correct. I have already had the honor to transmit to your Honorable Bodies two reports made by this Commission, but we have not yet been able to get the information from the United Gas Improvement Company that will enable the Commission to say whether the amounts charged by the United Gas Improvement Company are correct. The Commission has said that from all they have been able to ascertain, the United Gas Improvement Company kept no account for repairs and that repairs appear to have been charged against the City under the items of "Improvements," "Extensions" or some other names which could properly be charged against the City, but which item should not have been included under that head. The following is a copy of a report made by the Commission to me, which includes some of the correspondence had between them:

“To the HONORABLE JOHN WEAVER,
Mayor of Philadelphia.

DEAR SIR:—The Commission appointed by you on February 1st, to examine into and verify the reports and condition of the Philadelphia Gas Works, as now operated by the United Gas Improvement Company, beg to submit the following, as a preliminary report.

The Commission, as far as the time has permitted, have examined two (2) years of the annual reports rendered to the City Controller, by the U. G. I. Co., and have based the following figures on the average of the two years examined.

We find that a very large proportion of the vouchers are bills from the U. G. I. Co.’s Storage Warehouses, and that the examination of the accounts by the Controller’s assistants has *never* reached the vouchers from the parties who furnished the material.

The Commissioners, therefore, feel that the vouchers for the supplies delivered from the Storage Warehouses, belonging to the U. G. I. Co., were *not* sufficient proof that the supplies were actually delivered, and used in the Gas Works of the City.

As to the item of repairs, etc., the Commissioners communicated with the President of the U. G. I. Co., as follows:”

MR. THOMAS DOLAN,
President of the U. G. I. Co.,
Philadelphia, Pa.

DEAR SIR:—Will you kindly furnish the following information: How much has your Company expended on *total repairs* during the time of the present lease, viz., nine years.

1. Total amount of repairs expended on buildings?
2. Total amount of repairs expended on gas apparatus and on machinery used in and for the manufacture of gas?
3. Total amount of repairs expended on streets?

Please keep these items separate and as much in detail as you can possibly give us.

It is also the Commissioners' wish that you would supply them with the names of the large manufacturers and contractors from whom you ordinarily purchase your material or who do your work.

Yours very truly,

(Signed) THOMAS M. EYNON,
Secretary,

THE UNITED GAS IMPROVEMENT CO.

Office of the President.

Philadelphia, February 7, 1907.

MR. THOMAS M. EYNON, Secretary,
Room 504, City Hall, Philadelphia.

DEAR SIR:—I beg to acknowledge receipt of yours of the 6th inst.

The items concerning which you ask for a statement in detail, and the totals expended, have been treated as part of our operating expenses, and have been so intermingled with them that it would involve a very considerable amount of time and labor to separate and classify them.

No portion of any of these amounts, however, ever entered into the annual statements furnished to the Comptroller.

It would also involve a considerable amount of time

and labor to state the names of the large manufacturers and contractors from whom, from time to time, we purchased our material and who did our work.

The names of the persons and firms with whom we have dealt both in a large and in a small way, who have done work in connection with the items in the annual statements, appear on the vouchers submitted to the Comptroller when the annual statements were audited, examined and verified, which vouchers are at your service for the fullest examination.

Yours very truly,

(Signed) THOMAS DOLAN,
President.

MR. THOMAS DOLAN,

President of the U. G. I. Co., Philadelphia, Pa.

DEAR SIR:—Will you please furnish the Commission the following information:

1. Are your storage warehouses built on the real estate owned by the City of Philadelphia or on real estate purchased by your Company?
2. Have the warehouses been built at the expense of your Company or of the City of Philadelphia?
3. What is the value of the horses, wagons, carts and harness used in and about the streets and gas works?
4. Do they belong to the City of Philadelphia or to your Company?

Awaiting your reply, we remain,

Yours respectfully,

(Signed) THOMAS M. EYNON,
Secretary.

THE UNITED GAS IMPROVEMENT CO.

Office of the President.

Philadelphia, February 12, 1907.

MR. THOMAS M. EYNON, Secretary,
Commissioners of Philadelphia,
Room 504, City Hall, Philadelphia.

DEAR SIR:—I beg to acknowledge receipt of yours of the 11th instant.

I answer your questions in the order you put them:

1. There is but one storage warehouse. It is located at 19th and Allegheny avenue. The United Gas Improvement Company is the lessee thereof. It is not located on the real estate belonging to the City of Philadelphia and does not belong to it. There are some small supply shops which could not be characterized as storage warehouses. Some of these are on the property of the City. Some belong to the United Gas Improvement Company as lessee of third parties.

2. Of course no expense connected with the storage warehouse and with supply shops not belonging to the City has been charged to it. Such small supply shops as belong to the City, and as have been from time to time improved, have been improved at its expense. The aggregate of cost of such improvements has been very trifling. The detail thereof appears in our annual statements and is explained by the vouchers, which are at your service.

3 and 4. The value of the horses, wagons, carts and harness used in and about the streets and Gas Works, belonging to the City of Philadelphia, is \$11,456.00. The rest of the horses, wagons, carts and harness so used belong to The United Gas Improvement Com-

pany, and no charges concerning any of these articles have appeared in the annual statements.

Yours respectfully,

(Signed) THOMAS DOLAN,
President.

“You can readily understand from the above that the U. G. I. Co. have practically *admitted* that they have no repair account.

Again, the U. G. I. Co. have made charges for hauling material to the Warehouses, and from the Warehouses to the Works, the charges amounting to \$468,000 in ten (10) years, with interest at 6%, amounting to \$156,000, making a total cost to the City for this work, during the past ten (10) years, of \$624,000.

Again, the U. G. I. Co. have made charges for Warehouse account of \$260,000 in ten (10) years, with interest at 6%, amounting to \$86,000, making a total cost to the City for this work during the past ten (10) years of \$346,000.

The Commissioners are of one opinion that the above amount should be charged to operating expenses, and *not* to be paid for by the City under any conditions.

The amount of money alleged to be expended by the U. G. I. Co., as per statement (the last year being estimated) is about \$13,500,000 and the interest charges on same, about \$4,500,000. The amount of the appraisal of the Philadelphia Gas Improvement Co.'s Plant, about \$1,000,000, together with the supplies on hand, which the City under the contract would be forced to purchase at the expiration of the ten (10) years, will amount to about \$2,000,000,

making a total of \$21,000,000, as per the U. G. I. reports, required by the City to take back its works.

There is one other large item which the U. G. I. Co. have been charging against the City as Betterments, which clearly comes under the head of Repairs, namely: The replacing of the Gas Mains all over the City. The Commissioners have decided that the above replacements, unless the pipes are replaced, are of larger capacity, and in this case the charge against Betterments would only be for the exact cost for the difference in size of pipes, *and not for the digging, filling in of the ditch, and the repaving of the streets.*

The Commission has not yet had an opportunity of visiting the different Gas Works of the City, but are of one mind that most of the Betterments and Extensions, as charged on the reports, should clearly come under the head of Repairs.

One feature has impressed itself upon the Commissioners above all others, i. e., the great amount of money expended the first ten (10) years of the lease. It would seem from this that the U. G. I. Co. have far exceeded the ordinary business prudence and demands in looking into the future, and have made such improvements that may not be needed for some years.

The City will have received from the U. G. I. Co. during the past ten (10) years (estimating the last year's account) about \$5,200,000. The U. G. I. Co. have received \$46,800,000 from the sale of gas.

Manufacturing companies of all kinds assume that it requires at least 10% of the money invested to maintain their plants in good working condition, and an extremely low estimate of the value of the plant of the Philadelphia Gas Works is \$20,000,000. In order to be conservative, we will assume that it will require from one to five per cent. of the value of the

plant, or \$200,000 to \$1,000,000 per year to maintain the same in good working condition, which makes the necessary repairs of the Gas Works for ten (10) years vary at least from \$2,000,000 to \$10,000,000.

In reviewing the above items, the Commissioners firmly believe that further and more extensive investigation will bear out the fact that the U. G. I. Co. have charged to Improvements, Betterments and Extensions the above large amounts that should have been charged to Repairs.

NOTE.—Clause 6, Page 13 of the Contract specifies the items of Repairs and are Not Chargeable to the City.”

I am very sorry that the United Gas Improvement Company did not give the Commission appointed by the authority of your Honorable Bodies the information that would have enabled them to have reported immediately the amount due, because the spirit of hostility that they have manifested, and their reluctance and refusal to give the Commissioners the information they desired, naturally causes suspicion. If the United Gas Improvement Company had given the information to the Commissioners necessary to have enabled them to have ascertained the real amount due, it might have been that your Honorable Bodies would have preferred to have continued the lease until the expiration of the thirty-year period, but without this information it is absolutely impossible for you to intelligently determine the question. It has been suggested that the City was not in a position financially to take back the Gas Works, but I say it is impossible for us to tell until we know what amount is payable, and we are unable to say at the present time whether five million dollars or ten million dollars or more would be payable to the United Gas Improvement Company.

It scarcely seems possible that the Gas Works, that I believe were estimated to have been worth twenty million dollars at the time of the execution of the lease, and from the estimates I have had they do not seem to be worth any more at the present time, could have had an amount expended on them—not for repairs, but for extensions and improvements—that would amount to-day, with interest, to a sum of more than twenty million dollars, that is, more than the original value of the plant ten years ago, and more than the value of the plant to-day. But it has occurred to me that the question of the City's borrowing capacity and the amount to be paid to the United Gas Improvement Company, if once ascertained, could be met in some other way than by the City borrowing it and taking it back themselves. If it was again advertised, I believe that a company could be formed to take over the Gas Works and give to the people of the City gas at seventy-five cents a thousand feet immediately, and still have a large profit left which could be divided between the manufacturing company and the City, this new manufacturing company to hold under a lease from the City for a period of say twenty or twenty-five years, and be bound by contract to deliver the gas to the consumer and to charge only seventy-five cents for it, the main object of the Municipality at the present time being to give the citizens not only good gas, but as cheap as they can possibly give it; and surely, if such a contract was made and the people received gas at seventy-five cents a thousand feet, and there was an arrangement that the net profits of the company should be divided between the company and the City, the City would still receive a very much larger sum than they are now receiving on the dollar-gas from the United Gas Improvement Company. I have urged the appointing of a councilmanic commission with the necessary authority to subpoena witnesses and compel the production of books and papers,

and I am confident that within a month the necessary information could be obtained from the United Gas Improvement Company that would enable your Honorable Bodies to know just exactly what amount is due and payable to them under the contract. I am also confident that you will not know it unless you adopt this plan.

Bureau of Lighting.

I have had the honor of reporting to you heretofore that the Department of Public Works was enabled to secure competition for the work of gasoline lighting, by reason of the purchase by the City of all the posts upon which the lamps are placed, as was recommended in the last annual report by the then Director of Public Works, A. Lincoln Acker, Esq. The lowest bidder was the Keystone Contracting Company, who underbid by some fifteen thousand dollars the Pennsylvania Globe Gas Light Company, who had had the contract for a number of years and who owned the lamp posts prior to the City's purchase of them. Notwithstanding the low bid of the Keystone Contracting Company, the Pennsylvania Globe Gas Light Company, that is one of the subsidiary companies of the United Gas Improvement Company, used their best efforts to get this contract, and continued these efforts until after the first of the year, and after the contract had been executed to the Keystone Contracting Company, and on February 21st of the present year I had the honor of forwarding your Honorable Bodies a message on the subject, which was as follows:

"February 21, 1907.

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

GENTLEMEN:—As your Honorable Bodies are aware, the contract for gasoline lighting for 1907 was

awarded to the Keystone Contracting Company, who had underbid the Pennsylvania Globe Gas Light Company something like twenty thousand dollars. This condition has been brought about by the purchase by the City of the posts upon which the lamps were erected. I believe you have also been made aware of the efforts made by the Pennsylvania Globe Gas Light Company to obtain this contract, notwithstanding the bid of the Keystone Contracting Company, and notwithstanding the fact that the City had paid seventy or eighty thousand dollars to buy these posts in order to get competition. There has been some dispute over the amount that should be paid the Keystone Contracting Company for their work during the first month, and this has been taken up very carefully by the Director of Public Works, the amount has been determined upon, and the Company charged with some twenty thousand lamps that were out during the month, and I believe has finally been paid by the City Treasurer. During this controversy there has been a number of affidavits furnished to the Director of the Department of Public Works which, if true, gives a very complete history of the most remarkable combined effort to destroy a competitor and competition in municipal contracts that has ever been brought to my notice. I send you these to show you what we have to contend with in getting competition with old municipal contractors and what the new bidders have to contend with.

Yours very respectfully,

(Signed) JOHN WEAVER,
Mayor."

I think, however, that I should call your attention to the fact that after the bids were received for the lighting

of 13,494 incandescent naphtha lamps, and it was found that the Keystone Contracting Company was the lowest bidder, being one dollar and ten cents (1.10) per lamp per year lower than the bid submitted by the Pennsylvania Globe Gas Light Co., a test was made of the lamps of both bidders—both a light test and a test of the burners—by an experienced, impartial expert, and the test was determined in favor of the light of the Keystone Contracting Company, so that there was absolutely no doubt that the Keystone Contracting Company were the only parties to whom the City authorities could rightfully award the contract.

Bureau of Highways.

During the year this Bureau has done a very large amount of work. Eighteen miles of new streets were opened and graded to the established City grade, and over fourteen miles of streets were paved with asphalt granite and vitrified block. The loan bill of thirteen and one-half million dollars recently provided for contains an item of one and a half million dollars for improved paving. This will enable this Bureau to get rid of nearly all the cobble and rubble pavements still remaining in use in so many of the streets, and when this is done, surely we shall have "a well-paved City." There has been a great decrease in the cost of paving during the past four years. The City was limited by ordinance to the use of "Lake" asphaltum, and with the aid of your Honorable Bodies we succeeded in reducing the average cost of asphalt paving from two dollars and sixty cents (2.60) per yard to one dollar and sixty cents (1.60) per yard. The same can be said of brick paving, all the brick paving being limited to vitrified brick, while our tests showed that some shale bricks were better than any vitrified brick. With the aid of your Honorable Bodies we opened up competition by eliminating the requirement of "vitrified" brick and making a

standard for all bricks to be determined by a test in the Department.

During the year the streets have been kept in very good repair, the Rapid Transit Company keeping up the pavements of the streets occupied by them fairly well. I think if there is one nuisance it is the constant digging up of our streets. We no sooner get a new pavement down than it is dug up for some purpose or other, and the Board of Highway Supervisors passed a resolution to the following effect:

“Resolved, That the Secretary be directed to notify The United Gas Improvement Co., The Bell Telephone Co., The Keystone Telephone Co., The Philadelphia Electric Co., and The Edison Electric Co., that hereafter no permits will be granted to open newly paved streets within five years after said paving is laid and that said companies shall lay all needed pipes and conduits in advance of the street being paved.”

Of course, repairs have to be made, but there is surely no necessity for opening newly paved streets for square after square immediately after the paving is laid. The pavement around the City Hall has been in bad shape for the past year on account of the building of the Subway, and Market street, east of Broad, will necessarily be a little more difficult for traveling for two years or until the Subway is completed, but I trust our people will have patience as it will be a great convenience to every one of our citizens when completed, working as it will be in conjunction with the Market Street Elevated and Subway already completed.

Bridges.

The City owns and maintains about three hundred and fifty bridges, and new bridges are constantly being built,

and it takes a great deal of work to watch them and keep them in repair. An accident on the morning of September 26, 1906, on the bridge over the New York branch of the Pennsylvania Railroad at Columbia avenue, caused by a gondola car of the Rapid Transit Company, loaded with paving stone, gravel and mortar, and weighing, I am informed, over forty tons, and which broke through the bridge (one report saying the car was going so fast that it jumped the track) has called to our attention the fact that our bridges have been built to carry a certain weight, and that the Traction Company have recently been coming to use a very much heavier car, and I should think before any of these new cars of increased weight are put on the street, the weight of such a car loaded should be submitted to the Bureau of Highways so that they could determine the elements of safety. The running of the gondola car, however, by the Rapid Transit Company was entirely without right. In the first place, they have no right to run freight cars or carry freight; then they had no right to put anywhere on our bridges a car of such immense weight as this without a permit. We at once demanded that the Rapid Transit Company should make good the injury, and rebuild the bridge, the destruction of which was caused by their negligence and unauthorized acts. They not only refused to rebuild the bridge, but refused to contribute anything towards its rebuilding. There is no doubt in my mind that they are liable, and I recommend that the matter be placed in the City Solicitor's hands to compel them to do so, unless you prefer to take the more drastic method of refusing any of the many privileges they are constantly asking for until they do what is right in this bridge matter.

For a more comprehensive report on bridge work for 1906 I call your attention to the report of George S. Webster, Chief Engineer of the Bureau of Surveys, pages

twenty-three to thirty inclusive, in which he gives a brief history of new bridges under construction with plates showing either the bridge as it will be when finished (such as Walnut Lane Bridge) or in its present stage of completion (such as Allen's Lane Bridge). It is very interesting to notice the number of bridges under contract and in process of construction; they are as follows:

Allen's Lane, over Wissahickon Creek,
 Twenty-fifth street, under Connecting Railroad.
 Front street, over Connecting Railroad,
 Mout Pleasant avenue, Gorgas street, Philellena
 street, under Chestnut Hill Branch of Phila. &
 Reading,
 Spring Garden street, over tracks of Penna. Railroad,
 main line,
 Walnut Lane (high level) over the Wissahickon Val-
 ley, connecting Germantown and Roxborough,
 Sedgeley avenue, over Richmond Branch, Phila. &
 Reading,
 Cresson street, over Midvale avenue,
 Fifty-eighth street, over W. C. & Penna. Railroad,
 Duval street, foot-bridge,
 Walnut Lane Bridge, over Lincoln Drive to be chang-
 ed to permit widening Lincoln Drive.

Four other bridges that were uncompleted on January 1, 1906, were completed during the year; they were

Erie avenue, over Richmond Branch, P. & R. Rail-
 road,
 Graver's Lane, over Chestnut Hill Branch, P. & R.
 Railroad,
 Boulevard, over North Penn Railroad,
 Allegheny avenue, under Connecting Railroad.

Work on the Parkway has been commenced west of

Logan Square, and I trust this portion of this magnificent work will be completed within the next few months.

Work on the South Broad Street Boulevard has been carried along as far as the appropriation would permit, the filling in or raising the grade has practically been accomplished, and an amount has been provided in the new loan bill to complete it. I should urge the speedy completion of this Boulevard, thus making a magnificent highway to the Navy Yard, and the opening up of League Island Park, which will make a magnificent recreation park of five hundred acres for South Philadelphia. We could not make any arrangement with the Pennsylvania Railroad and the Baltimore & Ohio Railroad for the raising of their tracks across Broad street, so that we have put a temporary bridge across the Pennsylvania tracks, and I would recommend a permanent one being placed there, and then compelling the Baltimore & Ohio Railroad Company to bridge their tracks over as they are compelled to do at their own expense under the ordinance that enabled them to lay their tracks.

Work on the Northeast Boulevard was stopped sometime ago because it was discovered that the contractor had been using improper material in the construction thereof, and they have now been notified under the authority of a City Solicitor's opinion to take out the improper material and put in that required by the specifications. I have never been able to see, however, the necessity for building four magnificent roadways, three hundred feet wide, through the farming districts of the northeast, for the purpose of developing this territory. One road, one hundred feet wide, would accomplish this purpose, and I would strongly urge a revision of the plan, and reducing it to this width northeast of Second street. It would save the City millions of dollars, and would give to this territory all that they can reasonably ask, and a beautiful Boulevard as wide as

Broad street is now. A further reason for a revision of the lines of this Boulevard and a reduction of its width is the fact that even now on the line of the Boulevard where it has been constructed and opened to the width of three hundred feet, the bridges that have been constructed are only one hundred feet wide, and I call attention especially to the report of the Chief Engineer of the Bureau of Surveys, on page 25, under the head "Boulevard Bridge," in which he says:

"The Boulevard Bridge over the North Penna. Railroad is an ornamental arch spanning the whole right of way of the railroad and carrying 100 feet in width of the Boulevard—76 feet of macadamized driveway and two 12-foot granolithic sidewalks."

This makes one hundred feet of the Boulevard that is carried over on the bridge, and I certainly cannot see the wisdom of building a three-hundred-foot boulevard and reducing it to one hundred feet in width at every bridge. There is certainly no reason for it—for the 300 feet I mean.

Bureau of Street Cleaning.

I called your attention in my Annual Message of 1905 to the saving that would be made in 1906 over 1905 by the increased competition, thereby reducing the bids. With two competitors in the field for the collection of garbage we succeeded in saving one hundred and sixty thousand four hundred and twenty-five (160,425) dollars over 1905. The Director's report is to the effect that this work was done, and was probably better done by the Penn Reduction Company than the work had been done by the old company.

We adopted the same plan in the matter of street cleaning, and by increased competition succeeded in getting a bid for cleaning in 1906 one hundred and five thousand

seven hundred and twenty-eight (105,728) dollars lower than the bid for the cleaning in 1905, and the report of the Department is that the streets presented generally a better appearance than in previous years, and I am quite sure that if your Honorable Bodies, or any of your members, will compare the condition of our streets with the streets of any large city, take New York for instance, they would compare very favorably with the streets of any city.

The Director calls attention to the fact that if the householders would insist on the separation of the household waste from the ashes that it would help the collectors very much, and also prevent a lot of paper and other refuse being scattered around the streets during the time that the ashes are being collected.

Bureau of Surveys.

I call your special attention to the very excellent report of the Chief Engineer of the Bureau of Surveys. As I have had occasion to call to your attention before, this is the most important bureau in the entire City government, and the report is so carefully written that although it deals with engineering and scientific subjects, the average reader could not fail to understand immediately the entire subject in all its details. I cannot permit this opportunity to go by without paying a very just and deserved compliment to the great efficiency of the Chief Engineer of this Bureau, Mr. George S. Webster. He is thoroughly familiar with all the great municipal work that his Department has charge of; he seems to be a walking encyclopedia of information on all affairs pertaining to his Bureau, and his great ability as an engineer, and in dealing with the engineering problems that every day confront his Bureau is only equalled by his modesty. In the four years of my term in constant communication with him, I have been impressed not only with his great ability and his immense

value to the Municipality, but also by his patriotic devotion to the interests of the City. No man is harder worked than the Chief Engineer of this Bureau, and sometime ago I had the honor to transmit to your Honorable Bodies a message recommending that his salary be increased from eight thousand (8,000) dollars to ten thousand (10,000) dollars a year. I am quite sure that you would make no mistake in doing this.

In regard to bridges, I have already under the head of the Bureau of Highways called your attention to the report of the Bureau of Surveys on new bridges. I should perhaps have kept this for the Bureau of Surveys' report, but desired to dispose of the subject of bridges together. The reason that they are reported by both the Bureau of Highways and the Bureau of Surveys, is that the Bureau of Surveys have the planning and the building of all new bridges, while the Bureau of Highways have charge of the repair of the same.

During the year a Commission was appointed in accordance with the provisions of the Act of Assembly of April 14, 1905, for the purpose of fixing and determining the new County Line between Delaware County and Philadelphia County. The Commission consisted of

Edwin A. Howell, of Delaware County,
 Joseph Johnson, of Philadelphia County,
 Joseph W. Hunter, of Montgomery County,
 Charles Henry Moon, of Berks County,
 Nathan R. Rambo, of Chester County,

all of whom are surveyors. The Commissioners unanimously adopted a new line between Delaware and Philadelphia Counties at Clearview street between Seventy-eighth street and Eighty-fourth street, which appears on a map filed in the Court of Quarter Sessions of Philadelphia County.

I call your attention to the very interesting report of the Chief Engineer of the Bureau of Surveys from page five to twenty-two inclusive, which shows the amount of work done during the past year upon this vast system of the City drainage, and his recommendations as to what should be done in the future. There were over twenty-five miles of main and branch sewers built and inspected during the year which gives a total length of main and branch sewers now in the City of over one thousand and sixty-six miles.

Complying with the provisions of the Act of Assembly of April 22, 1905, creating a Department of Health, and providing for the appointment by the Governor of a Commissioner of Health, the Bureau of Surveys prepared and forwarded to Harrisburg within the time specified a plan showing the existing sewer systems of the City. The officials of the City and the State Department have been working in harmony to secure a practical compliance with the law, and at the same time not to restrict the development and expansion of a great City. As new sewers are authorized by your Honorable Bodies, plans and details are forwarded to Harrisburg before entering into any contracts.

Grade Crossings.

Abolition of grade crossings on The Philadelphia, Germantown & Norristown Railroad and the Richmond Branch of The Philadelphia & Reading Railway.

On April 2, 1906, in my Annual Message for 1905, I said to you, among other things, as follows:

“The negotiations which have been conducted between the City and the Railroad Companies for the abolition of grade crossings along Ninth street, between Spring Garden street and Hunting Park avenue, $3\frac{1}{2}$ miles with 30 grade crossings along the Richmond Branch of the Philadelphia & Reading Railway,

between Somerset and Richmond street, $1\frac{1}{4}$ miles with 2 grade crossings, and several new streets to be opened, and along the Philadelphia and Trenton Railroad on Trenton avenue, between Norris and Butler street, $2\frac{1}{2}$ miles with 33 grade crossings, has progressed very favorably, and there is now reasonable hope that very much will be accomplished during the present year. This work alone will abolish 65 grade crossings and open a number of new streets under the elevated railroads."

After this the negotiations did not go along as favorably. We could not get the Railroad Company's officials to agree with us as to the grade that should be used through Tioga nor as to the method of construction between Girard avenue and Jefferson street. In our many conferences we could not get the Railroad officials to recede from their position one bit; although we had agreed on all the other details of the work, it was impossible to get them to accept our views that we believed to be absolutely just. Finally, on May 3, 1906, I sent the matter to your Honorable Bodies in an exhaustive message, setting forth the points we had been unable to agree upon and the points we had agreed upon but which had been reopened by the Railroad Company, and on the 13th of October, 1906, I approved an ordinance which your Honorable Bodies passed, authorizing the making of a contract between the City and the Philadelphia & Reading Railroad for the abolition of the grade crossings and in which the disputed points had generally been resolved in favor of the Railroad and against the City. We at once had a contract prepared based upon the ordinance, and had the plans rushed, and did everything in our power to get the contract executed and the work started, but from time to time the Railroad officials have made excuse after excuse, such as insisting on having the plans (detailed as

well as general) finished before the agreement was executed—the plans approved by the Board of Surveyors; finally an ordinance must be passed to amend the one of October 13th, and at a private conference when this was demanded the President of the Railroad agreed to sign the contract if I would send to your Honorable Bodies a message advocating the passage of this amendatory ordinance. This I did several weeks ago, but the contract is still unsigned, further excuses being made that the plans and contract had to be submitted to several Boards of Directors to get their authority to execute this contract. I have been fighting for four years for the abolition of the grade crossings on these roads, the doing what the people of the City have been demanding for years, viz., the abolition of grade crossings, which have come to be known, and properly so, as death traps. Yet after four years' hard work after coming to a verbal agreement by making concession after concession to the Railroad, your Honorable Bodies making the last concessions to the Company by your ordinance of October 13, 1906, and urging day after day the signing of the contract, and the commencement of the work, we are still without the Railroad Company's signature to the contract drafted four months ago, and which was authorized by your ordinance of six months ago. I am told, however, that everything will be in readiness in a few days for the papers to be signed.

In my Annual Message for 1903 to your Honorable Bodies on this subject I said *inter alia*,

“It is also of great importance to the City that either the grade crossings shall be abolished or that something shall be done to protect our citizens from danger who have to cross the tracks and, if the Railroad Company shall continue to refuse to meet the City upon equitable terms, it may be necessary to so regulate the speed of the trains within the City limits

that there shall be no danger to pedestrians or vehicles crossing the tracks. This of course, would very seriously inconvenience the public traveling on the trains of the Railroad Company, but better this inconvenience than the constant killing of people at the grade crossings.

“The Act of February 17, 1831, which incorporated the Philadelphia, Germantown & Norristown Railway Company, Section 16, is as follows:

‘And be it further enacted by the authority aforesaid, That the said railroad shall be so constructed by the said company, as not to obstruct or impede the free use and passage of any public road or roads which may cross or enter at the same, being now laid out or hereafter to be laid out; and in all places where the said railroad may cross, or in any way interfere with any public road, it shall be the duty of the said company to make or cause to be made, a good and sufficient causeway or causeways, to enable all persons passing or travelling such public road, to cross and pass over or under the said railway, which causeway or causeways shall be made and maintained by the said company, and if the said company shall refuse or neglect to make such causeway or causeways, or when made, to keep the same in good repair, they shall be liable to pay a penalty of ten dollars for every day the same shall be neglected or refused to be made or repaired, after having been duly notified thereof. to be recovered by the supervisor of the township, with costs, for the use of the township, as debts of like amount are by law recoverable; and shall, moreover, be liable to an action or actions at the suit of any person who may be aggrieved thereby; and the service of process upon any officer or agent of said company shall be as good and available in law as if served upon the president thereof.’ ”

If the contract can be signed in a few days the work ought to be started at once—but in the light of all these delays, I am almost compelled to say that I regret not having started in four years ago in a more drastic way than by negotiation.

Rapid Transit.

The finished part of the Subway west of Fifteenth street and the bridge across the Schuylkill connecting with the Market Street Elevated has just been put into operation, and I have no doubt will help the question of transporting passengers to West Philadelphia very much indeed, and will certainly be a great relief to the travelling public of that section. They are now at work on the sections around the City Hall (on both sides) and on Market street east of City Hall. There has been a good deal of complaint about the trolley congestion on Market, Chestnut and Walnut streets, and some complaint of the service in other sections of the City. The community was startled a few weeks ago by a plan called "The Retail Merchants' Plan," which was supposed to be a plan to relieve the Transit situation, yet, strange to say, an examination of it revealed the fact that it did not touch this situation, but was merely a plan to relieve the Rapid Transit Company of certain duties and obligations, and to relieve the underlying companies of certain legislation to which their franchises were liable. It may be well to sound a note of warning here because I am informed that this plan may in the near future be before your Honorable Bodies for rejection. While it is called "The Retail Merchants' Plan," I think you may safely call it "The Rapid Transit Company's Plan," because a number of its salient features had been discussed with me twelve months ago by one of the Directors of the Traction Company, and surely a plan that has no benefit except alone to the Rapid Transit Company and its under-

lying companies, whose roads it leases, must be a Rapid Transit Company Plan.

Look, for a moment, of what it consists! First, foremost and above all it provides for the repeal at once of an ordinance of 1857, which gives the City some hold on street railway companies. They are fearful that the City will exercise its rights under this ordinance, and although the Company and its franchise, and therefore its capital stock, has always been subject to this ordinance they fear that it may interfere with the value of the stock of the Company, hence it must be repealed. There is absolutely no reason for its repeal and every reason why it should not be repealed. It is the one hold the City has on these companies with which to compel them to do what other ordinances require them to do; it is the one ordinance that will enable the City to take back its franchises, otherwise they are everlasting and without end. And you are asked to do this, why? Is it because the Rapid Transit Company paid to individuals one and a half million dollars for franchises just secured from the City for nothing? If those franchises were worth one and a half million dollars (and that they were is evidenced by the fact that the Rapid Transit Company paid that amount for them), then the one and a half million dollars should have gone into the City Treasury and not into the pockets of individuals.

Or is it because The Rapid Transit Company succeeded in having the ordinances passed that enabled them to saddle upon the City the total cost of widening Market street, and changing its grade to enable them to have an opening for the Subway to come out on to their bridge across the Schuylkill, the City paying thousands upon thousands of dollars for this work, and The Rapid Transit Company, as far as I can ascertain, did not pay one cent.

It has just been brought to my notice that the contract for doing the physical work of changing the grade of

Market street where the Subway comes out to take the bridge across the Schuylkill, was actually given by the City to C. P. Weaver, a special agent of the Philadelphia Rapid Transit Company. The contract was executed April 2, 1903, four days before I came into office and provided for the City paying sixty-nine thousand dollars for this work, and I suppose this sixty-nine thousand dollars was really paid to the Rapid Transit Company (as C. P. Weaver was their special agent) for doing work that was necessary to be done in the building of their Subway, and I further find that the City paid for land damages for the change of grade at this place ninety-two thousand one hundred and ninety-five dollars, and there are claims still pending against the City amounting to one hundred and forty thousand three hundred and fifty dollars for further damages to property brought about by the change of grade at this place; and a large piece of ground belonging to the City was also taken and I do not find that the Transit Company paid one dollar towards all this that was done exclusively for their benefit, nor have I been able to ascertain whether or not this was to be paid by the City in addition to the franchises that somebody got for nothing, but for which the Rapid Transit Company paid one million five hundred thousand dollars to these somebodies.

Then they want to pay a lump sum (approximately what they are paying now, I suppose) for the repairing of streets. Just to think! When the City is double its present size or three times, they will still pay the same amount they want to pay now. The Company is compelled under their charters to repair the streets they occupy. It is a solemn obligation they have entered into with the City. Why should they try to evade it, or why should the City say we will change the terms so that in a few years you won't have to pay near as much as you would if you were still doing the repairs. This subject has been discussed with me several

times by the President of The Rapid Transit Company, and I have said to him that I would recommend to you a change, but that it must be based upon the payment of a percentage of gross receipts so that as the City increases and their receipts increase we shall get an increased amount of money for the increased cost of keeping streets in repair.

Then the Rapid Transit Plan provides that the franchises of all the underlying companies shall become perpetual. It has been a popular fallacy fostered perhaps by the transit interests that the franchises that these underlying companies held were perpetual. They never have been perpetual. The ordinance and laws show that they are "*revocable at any time at the will of the people through their representatives in Councils.*" Every company obtaining a franchise has known this always, and every director of every company has known it or ought to have known it, and every stockholder of every company has known it or ought to have known it, and now in the very middle of our agitation for a limited franchise the Rapid Transit Company comes with a proposition that we shall make the franchises of every underlying company perpetual. This is a flying in the face of all modern thought on the subject of franchises. They never should be perpetual. The people of Philadelphia have a right to take back these franchises, and I beg of you, under no circumstances, to take this right away from them. Even the State Legislature would not take this right away from the people of this Municipality, for under a decision of the United States Supreme Court in regard to an Act of Assembly of the State of Illinois that undertook to extend the life of the franchise of certain street railways in Chicago to ninety-nine years, it was decided by the United States Supreme Court that while this Act extended the life of the corporation to ninety-nine years it did not extend the life of the grant issued by the municipality and had no effect upon it, and

in consequence of that very decision the traction interests in Chicago finally agreed with the municipality upon a plan whereby the city can at any time after six months' notice purchase the seven hundred miles of surface roads in Chicago, and doubtless the Rapid Transit Company here finding that they could not get relief in the Legislature will endeavor to deprive the people of their rights in the premises by asking the people's representatives in Councils to do what they cannot do in any other way, but I believe the people's representatives in Councils will not give away such valuable rights as these without any return, and I beg of you to keep the laws on the books, and not repeal them, that the City shall retain the power and the means to correct abuses, prevent imposition upon its citizens, and prevent converting what should be a public benefit into a nuisance, and in using this language I am merely using essentially the same language that was used by Mr. Strickland Kneass, the Chief Engineer and Surveyor of the City in 1855 when he recommended that the contracts for building the street railroads might be entered into with Philadelphia capitalists, but in such a way as would enable the City to obtain possession of the roads as soon as the financial condition of its treasury would permit, so that at the very inception of the building of street railroads in the City of Philadelphia it was distinctly and emphatically stated that the grants of the City to the Railroad Companies were not to be perpetual. The ordinance that the Rapid Transit Company want repealed is the ordinance of 1857, which provides as follows:

“SECT. 8. The Directors of any such company or companies shall immediately after the completion of any passenger railroad in the City, file, in the office of the City Solicitor, a detailed statement, under the seal of the company, and certified under oath or affir-

mation by the President or Secretary, of the entire cost of same, and the City of Philadelphia reserves the right any time to purchase the same by paying the original cost of said road or roads and cars at a fair valuation. And any such company or companies refusing to consent to such purchase shall thereby forfeit all privileges, rights and immunities they may have acquired in the use or possession of any of the highways as aforesaid."

and Section 9 requires that

"Any passenger railroad company which is now, or may hereafter be incorporated in the City of Philadelphia, shall, by their proper officer or officers, who shall sign the same, file in the office of the City Solicitor, a written obligation to comply with the provisions of this ordinance."

It has been suggested in the Rapid Transit Plan that this ordinance is unconstitutional. If it is unconstitutional then why should they ask to have it repealed; but the very fact that they ask to have it repealed is perhaps the very best evidence that they do consider it constitutional.

I believe that the members of your Honorable Bodies will jealously guard the rights of the citizens and not permit to be taken away from them that measure that will alone give the people of this City the right to have some say in regard to the use or abuse of the grants heretofore given to the various street car companies.

It has only been the agitation of the good people of this City that has resulted first in a five-cent fare, next in exchange tickets, and subsequently in the sale of six tickets for a quarter, the heating of cars, and all the improvements that have taken place in the street car service. There are many things yet that the people hope for and in the prog-

ress that we are making in municipal affairs there is absolutely no reason why the people should be tied for the next hundred years to a five-cent fare, and if you want the people to have any say in it at all or if you, the representatives of the people, desire to have any part in this at all, you will never have it if you repeal the ordinance referred to.

I have already paid my respects to the argument in regard to the "widows and orphans" of our millionaires, whose rights the Rapid Transit Company's scheme seems to be so anxious to protect, that I shall not refer to it further, but I shall beg of you, if the matter comes before you at all, to most rigidly investigate the plan that they have for giving to the City something at the end of fifty years provided the City shall do certain things, which certain things I assert the City will never be able to do under the law and the Constitution.

Dredging of the Channel.

The dredging of the channel is going on, we having secured the use of the Government dredge for a part of the work, not getting any satisfactory bids at first; but after we had secured the Government dredge we then advertised some of the other sections, and got better bids, so that we expect to go on and complete the thirty-foot channel with the help of the Government within a very short time. A large part of this work will be done with the \$750,000 appropriated by the City for the purpose—one of which was appropriated by the State to the City for this purpose.

Bureau of Water.

On March 8, 1906, after twenty years continuous service in the Bureau, Mr. Frank L. Hand resigned his position. This is probably one of the most difficult bureaus in the City to run, and I call your attention to the statement

of the Director in saying that in Mr. Hand's resignation the City lost the service of a faithful, conscientious and efficient public servant, which I heartily endorse.

Mr. Allen J. Fuller, the General Superintendent, was made Chief of the Bureau temporarily, but the temporary position he was not permitted to hold for any length of time on account of the position taken by the Civil Service Commissioners, and while an examination has been held by the Civil Service Commissioners for this position, only one out of the many applicants has succeeded in passing the examination, so at the present time there is no eligible list from which the Director can select.

I desire to compliment Mr. Fuller, the General Superintendent, however, who has had the Bureau in charge for a year and has demonstrated his ability to satisfactorily conduct the work.

A great deal of work will have to be done on the machinery of the Department, but the money for this will be supplied by the thirteen million five hundred thousand dollar loan.

The average consumption of water during the past year has been upwards of three hundred and nineteen million gallons per day. There has been an insufficient pressure in some parts of the City, but we hope that this will be remedied in a very short time, as soon as the filtration plants are entirely completed, as, where we have filtered water, we desire to give the people nothing but the filtered water and not to mix it with raw water. This brings us to the

Bureau of Filtration.

This work has been progressing rapidly, or as rapidly as your Honorable Bodies would give us the money to perform it, under the very capable management of the Chief Engineer of the Bureau, Major Cassius E. Gillette, who was appointed Chief of the Bureau on February 28, 1906,

having resigned his commission in the Army to take this position as Chief Engineer of the Bureau of Filtration.

I call your attention to Major Gillette's very excellent report to the Director of Public Works. On the first page he gives a description of the three independent plants which the City will have when the filtration plant is completed, and a financial statement on the following pages, also the cost of all the land that has been taken, and the quantity. He then gives in detail the work on the Torresdale system, which is exceedingly interesting, and I invite your very careful attention thereto.

He also gives a report on the repairs to the Torresdale conduit, and a very clear and concise statement of all the work that his Bureau has undertaken and has carried on during the past year. There is also a very careful statement of the operation of the filters, both at Lower and Upper Roxborough and Belmont, with the cost of management; also on page 22 a most careful statement of the influence of filtered water on typhoid fever case rates, which is exceedingly interesting, and also on the final page of the report a statement of the experimental investigations made by the Bureau.

I quote from the Director of Public Works report in regard to this Bureau, as follows:

"Owing to the failure of Councils to provide for the approval of contracts and sureties during their summer recess, the contractors refused to commence work or furnish material, and finally, on July 20, 1906, the subject matter was heard before Judge Sulzberger, in mandamus proceedings brought by Norcross & Edmonds, and the Honorable Judge ruled that approval of contracts and sureties by Councils was not necessary.

"This action of the Court did not appear to alleviate the conditions then existing, and it was not until your Honor had convened Councils in special session on

August 17, and steps were taken to provide the necessary funds out of a temporary loan, which was authorized on September 22, 1906, for \$1,200,000, to pay for pipe lines, that the work was begun and pushed with due energy until the close of the year.

“The Torresdale conduit, upon an examination by the Board of Investigating Engineers, was found to be in such leaky condition as to be unfit for use. Repairs were started soon thereafter by a system of grouting and the work has been pushed vigorously, It is anticipated the conduit will be ready for service by March 15, 1907, at an approximate cost of \$165,000 in addition to that paid the contractors who constructed the conduit.”

I must say here that Major Gillette has taken hold of the work of the Filtration Bureau and untangled a mass of complicated matters in a very able manner, and is carrying on the work of completing the filtration plant in such a way that it must be completed within a very few months.

The installing of the pumping station at Torresdale for the purpose of pumping the water on to the filter beds we had expected would be completed during March of this year, but the weather has been against us so that it may be delayed until some time in April, but I have no doubt that under the able management of Major Gillette, the whole work will be completed satisfactorily and will be put in operation in a very short time.

There is a very elaborate report by the Commission, consisting of Dr. W. M. L. Coplin, George S. Webster and Major Gillette, appointed by me under the authority of your Honorable Bodies for the purpose of investigating the source of pollution of the water in the Schuylkill river from coal dust, etc., which I had the honor of forwarding to your Honorable Bodies some weeks ago, and which I shall have printed with this Annual Message.

There is another matter that I desire to call your attention to in connection with the litigation over the filtration contracts. There seems to have been a very marked effort to create the impression, both with your Honorable Bodies and with the people in general, that the litigation pending in Court was now delaying the completion of the filtration plant. I desire to say that this litigation has nothing whatever to do in delaying the completion of the filtration plant. The work has been going on as vigorously as it ever has, and will go on, regardless of litigation, and I desire to correct an erroneous impression that seems to have gotten abroad.

CIVIL SERVICE COMMISSION.

On the fifth of March, 1906, Governor Pennypacker approved an Act of Assembly entitled,

“An Act to regulate and improve the Civil Service of cities of the first-class in the Commonwealth of Pennsylvania, making violations of its provisions to be a misdemeanor and providing penalties for violations thereof.”

Under the provisions of this Act, I appointed, on the 15th of March, 1906, three commissioners to serve for a period of five years, three years and one year respectively.

I send you a copy of the first annual report which gives a history of the Civil Service in this City and the work of the Bureau, and also a partial history of the passage of the legislation.

I cannot agree with the Commission in their criticism of the soldier exemption clause of the Act, nor in their statement that it is unwise to liberally use the soldier clause. The purpose of the Act of Assembly providing for the exemption of soldiers, sailors or marines honorably discharged from service in any war for the United States Gov-

ernment, and the provision extending this to the widows and children of such soldier, sailor or marine, is a very salutary one and enables the appointing powers to so recognize the great services rendered to his country by such soldier, sailor or marine as to appoint him to office in the municipal Government without going through a civil service examination, and the criticism of the Commissioners of the appointing power making so many appointments of honorably discharged soldiers was entirely uncalled for, and it seems to me was not at all in the province of the Commission. The fact that seventeen per cent. of all the appointments in the competitive class since last March have been under the soldier clause, instead of being a subject for criticism by the Commission should be a subject of commendation, and I certainly cannot refrain from commending the appointing powers in not only recognizing the distinct provisions of an Act of Assembly, but also in recognizing the great debt that the country owes to the man who has given his time and risked his life on the battlefield for his country's benefit, and the criticism by the Commission of the wisdom of the Legislature in extending this benefit to honorably discharged soldiers, to their widows and children, was entirely uncalled for, if not very improper. Again, I have not seen the slightest effort on the part of the appointing power to "mould the soldier clause appointments into a complete political machine" and the statement by the Commissioners that it might be so used has no more foundation than that such a machine could be moulded by the Commissioners of all appointments. If the Commissioners knew of any one having been appointed under the soldier exemption clause for political purposes it was their duty to have called my attention to it or to have taken such other action as the case warranted, and not to have argued about what could possibly have been done, nor can I accept their suggestion that there should be any self-imposed regulation by the head of a department

limiting his power of appointment under the soldier exemption clause unless it should be the ability of the appointee to perform the services, and this has been already done, nor can I see that it is any part of our duty, either the Commissioners or the executive officers of the Government, to endeavor to secure a modification of what has been written into an Act of Assembly as the instructions of the legislative bodies, and therefore the mandate of the people whom they represent. It is our duty to administer the laws and not to criticize them.

There is absolutely no doubt that the civil service system applied to the municipal employment is most desirable, and if administered practically will be a great benefit to the public service in, first, absolutely eliminating politics from the consideration of any appointment, and, second, in giving to the City a perfect merit system.

In making the appointment of the Commissioners I probably made two mistakes. In the first place I absolutely ignored the Republican party and appointed two members of the City Party and one of the Democratic party. Inasmuch as the Republican party has generally been the dominant party in this City, I probably made a mistake in thus ignoring them, but this can be rectified upon future appointments.

Secondly, I probably made a mistake in appointing three lawyers as the Commissioners of the Civil Service, because while most lawyers are excellent men I am afraid they are not very good business men as a rule. I should not feel justified in saying this if I was not myself a lawyer. There should have been in the Commission at least one broad-gauge business man who had a thorough knowledge of men and affairs. This, however, can also be remedied, and I am confident that with a practical administration of the Civil Service Bureau it will prove of great benefit to the municipal service in both building up the merit system and in eliminating politics therefrom.

THOMAS W. EVANS MUSEUM AND INSTITUTE.

I gave your Honorable Bodies a very full report of the condition of affairs in this Estate in my last annual message. Since that time we commenced litigation on behalf of the City and the Museum and Institute Society in Paris, and negotiations have been had between counsel representing the various interests, and on the twentieth day of December, 1906, I sent to your Honorable Bodies a message recommending a settlement that counsel for the various parties had partly agreed upon, and your Honorable Bodies passed a resolution authorizing such settlement, which provided that the Thomas W. Evans Museum and Institute Society should receive all the American assets of the Estate less \$75,000 and the heirs and the executors should be paid out of the Paris part of the Estate. This settlement has not yet been consummated, but I trust that it will be in the next few weeks.

CITIZENS' PERMANENT RELIEF COMMITTEE.

This Committee is composed of the following gentlemen:

	The Mayor, <i>Chairman</i> ,
	Francis B. Reeves, <i>Vice-Chairman</i> ,
	Drexel & Company, <i>Treasurer</i> ,
	Thomas S. Williams, <i>Secretary</i> ,
George D. McCreary,	Morris Newburger,
Daniel Baugh,	Robert C. Ogden,
John H. Converse,	William Potter,
W. W. Foulkrod,	Theodore C. Search,
Charles J. Harrah,	Rudolph Blankenburg,
Alexander Van Rensselaer,	George B. Woodward.

The Mayor is ex-officio Chairman of the Committee.

During the last four years, the Committee has been very busy, and in glancing over its work one cannot help but

be impressed with the fact that our good City has been specially blessed by Divine Providence, and we should not fail to give thanks to Almighty God for his goodness towards us. While in other parts of our own county, and in many other countries, the people have been afflicted with great suffering from earthquakes, volcanic eruptions, fires, floods and famine, we have been permitted to go along steadily without any catastrophe of any moment to destroy life or interfere with our citizens in their enjoyment of life and happiness.

During June, 1903, the small town of Heppner, Oregon, was partially destroyed by flood, a great many lives lost and a great deal of property destroyed and damaged; they appealed to us for aid. The Committee sent them one thousand dollars to assist their citizens.

During the same period the good people in the Mississippi Valley suffered very severely with the extraordinary floods, and they appealed to us for assistance and the Committee sent to the Mayor of Topeka, Kansas, five thousand dollars, and to the Mayor of Kansas City, Kansas, two thousand dollars. Of course, all of these cases are investigated thoroughly by the Committee.

In December, 1903, the little town of Butler, Pennsylvania, appealed to us for help, saying that ten per cent. of their entire population was down with typhoid fever. With the assistance of the then Director of Public Health and Charities, Dr. Edward Martin, we organized a corps of nurses and the Pennsylvania Railroad very generously gave us the use of a special train, and with two members of the Committee the trains proceeded to Butler, and we opened there a temporary hospital, and with the nurses and doctors helped the situation there very much. We did not leave there until the epidemic had disappeared.

In March, 1904, the small towns of Middletown and Royalton on the Susquehanna (very much nearer home)

were very seriously damaged by flood. They appealed to us for assistance, and we appropriated two thousand dollars to Middletown and five hundred dollars to Royalton, besides looking after a number of individual cases of suffering and relieving them direct.

On July 13, 1904, Millington, Maryland, informed us that two hundred of their people were without food, clothing or shelter, and every business place destroyed. The Committee immediately appropriated five hundred dollars for the relief of their suffering people.

In April, 1906, we cabled to Rome, Italy, ten thousand francs to aid the sufferers from the very severe eruption of Mt. Vesuvius, and in the same month we sent five thousand dollars to the Treasurer of the National Red Cross Society to help the famine stricken districts of Japan. We had no sooner done this than we were startled, as all the world was, to hear of the fearful earthquake at San Francisco, and the awful sufferings of the people there. We at once wired the Tacoma Chamber of Commerce and Board of Trade to ship twenty-five thousand dollars worth of provisions on our account to San Francisco, for which we paid, and including this amount we collected and sent to San Francisco four hundred thousand dollars, besides a special fund of six thousand seven hundred and thirty-one dollars and seventy-nine cents, and another of eighteen dollars to the Board of Education at San Francisco; this was in addition to the sum of one hundred thousand dollars appropriated by your Honorable Bodies to the sufferers by the earthquake. In addition to this, our Committee investigated and relieved a large number of individual cases here of people from San Francisco, and secured a number transportation to different parts of the country. The people of our City were very generous in this matter, as they always are in fact.

In November, 1906, we contributed five thousand dol-

lars to help the sufferers by earthquake in Valparaiso, Chili, and again this year five thousand dollars to the sufferers by earthquake at Kingston, Jamaica, and to Augusta, Kentucky, to help the sufferers by flood, one thousand dollars, and we are now collecting for the sufferers by famine in China and in Russia—the famine being very severe and the suffering intense, and the death rate very heavy. The members of this Committee have certainly been devoted to their work, and I am sure feel well repaid by the thought of the many thousands they have relieved of pain and suffering. I must say one word, however, for our Treasurers, Drexel & Company, who not only contribute largely themselves (as most of the other members do) but always permit the Relief Committee to overdraw their account in any amount the Committee have desired in order that the Committee can relieve suffering and distress at once, without waiting for returns of collections. All honor to Drexel & Company!

FREE LIBRARY.

I have not seen the report of the Free Library, and I understand it was not prepared in time to send to me. I have, however, a short report from the Librarian, as follows:

“Having regard to the fact that the Free Library of Philadelphia has been in existence twelve years only, the report for 1906 is remarkable and gratifying.

“In a list of 121 greatest libraries in the world (according to the number of books in each library), when the International Encyclopedia was printed in the early part of 1905, the Free Library stood number 81, having in actual use 239,183 volumes. At the

end of 1906, the number had increased to 310,630 volumes, making the Free Library of Philadelphia number 64 in the list as now revised. Outside of such libraries as the British Museum, the Library of Congress, and University Libraries, the only American 'public libraries' larger than the one in Philadelphia are the Boston Public Library, New York Public Library, Chicago Public, Brooklyn Public, and the Newberry at Chicago.

"The figures given above are entirely exclusive of pamphlets and other like material.

"During the year 1906, 845,206 persons were counted as using books for purposes of reference and reading in the Library and its Branches. This shows a steady increase in the best use of the Library, that of consulting books within its walls. The number of persons using the Art Room for consultation has increased from 4,221 in 1899, to 25,078 in 1906. The total number of cards issued to readers permitting them to take books for home reading amounts to 139,040.

"An important feature of the Free Library work has been the delivery of upwards of fifty lectures with a total attendance exceeding 16,500 persons, giving an average of 330 to each lecture. There have also been thirty lectures delivered to children from the various schools at several of the Branches with a total attendance of upwards of 11,000.

"The use of the lecture rooms attached to the new Branch Buildings erected with the money of Mr. Carnegie is increasingly large, and various societies like the Philomusian, the different Branches of the County Medical Society and others are making these lecture rooms their headquarters for monthly and more frequent meetings.

"The circulation of embossed books from the Department for the Blind is steadily increasing. The total circulation for 1906 numbered 9,829 volumes, an increase of 37 per cent. over the circulation for 1905.

"During 1906, Travelling Libraries were in use in 37 fire stations, 7 police stations, 5 telegraph stations and 35 other places. A total of 10,235 volumes were sent to these different places.

"Of the thirty buildings proposed to be erected with Mr. Carnegie's money, four have been completed and are actually opened; three will be opened within the next two or three months; cornerstones of two others have been laid, and foundations are being put in for the tenth.

"It is most gratifying that hitherto the City has not been called upon to pay any money whatever for the purchase of sites. Eight of those above mentioned have been gifts from large corporations or private donors, and the other two were erected on City property at Lehigh avenue and in Vernon Park.

"Arrangements are nearly completed for the donation to the City of three valuable sites which will enable three more of the Carnegie Branches to be undertaken in the very near future.

"Negotiations for one or two more sites are in progress but not so near accomplishment.

"The greatest step in the interest of the Library hitherto taken has been the selection of a site for the Main Library. After lengthy negotiations, the Committee on Public Libraries and Museums recommended to the Board of Trustees of the Free Library the selection of a piece of land facing the Parkway, bounded by Cherry and Arch, and 15th and 16th streets. This land can be purchased out of the monies voted by the people several years ago. The Mayor

in a special message to Councils recommended passage of the ordinance to secure this ideal site. Nothing so good has been hitherto suggested, and having regard to the increasing scarcity of sites, it is not reasonable to think that anything nearly equal to it can be obtained hereafter.

“The proposal is to secure this site and then to invite plans for a suitable building, and proceed with such building as funds voted by the City or donated by liberal donors shall permit. Boston made a great mistake in placing her library on a piece of land which has already proved insufficient. The acquisition of the great hospital erected after the completion of the library in the rear of the present Boston Library will be a very costly operation, and it is hoped that in Philadelphia the wise example set by the Chicago Public Library will be followed. In that case, a magnificent building has been placed on a part of the library site, and as need arises, and funds are provided, the building can be increased in size.

“Until the land is secured, it will be impossible to procure plans, and until these are approved, no estimate of what amount will ultimately have to be secured from private donors and others can be even reasonably guessed at.

“The whole future of the Library is very bright, and such a Free Library as is being provided for, including a Main Library Building on the new Parkway, with thirty-two branches (including those provided by Mr. Widener and Mr. Wanamaker), the immense educational work that can be accomplished for the citizens of Philadelphia can hardly be estimated.”

I shall be very glad if your Honorable Bodies should authorize the condemnation of the piece of property that has been selected for a site for the Free Library.

COMMERCIAL MUSEUMS.

In regard to the Commercial Museums the annual report did not reach me in time to say anything about it in my annual message except that I know, as an ex-officio member of the Board, that they are going on with their work of installation, their educational work and the rest of the activities in which they are engaged.

LAW DEPARTMENT.

I did not receive the City Solicitor's report in time to give you any of the facts in regard to it. I know it has been a very busy year for this Department under the management of the Hon. John L. Kinsey, the City Solicitor.

I send, herewith, the Annual Reports of the Directors of Public Safety, Public Works, Public Health and Charities, and Supplies. I also send, herewith, the Annual Reports of the Receiver of Taxes, City Treasurer, City Controller, City Solicitor, Board of Revision of Taxes, Sinking Fund Commissioners, Commercial Museums, and the Civil Service Commission.

Yours very truly,

JOHN WEAVER,

Mayor.

ANNUAL REPORT

OF THE

DEPARTMENT OF PUBLIC WORKS

FOR THE

YEAR ENDING DECEMBER 31, 1906

OFFICERS
OF THE
DEPARTMENT OF PUBLIC WORKS

Director:

J. R. HATHAWAY.

Assistant Director:

JOS. S. MacLAUGHLIN.

CHIEF CLERK—WILLIS SHEBLE.

CLERK—ERNEST T. HANEFELD.

ASSISTANT CLERK—ANDREW L. TEAMER.

STENOGRAPHER AND CLERK—HARRY A. STOY.

STENOGRAPHER AND TYPEWRITER—JOSEPH B. SMARR.

GENERAL INSPECTOR—ROBERT C. HICKS.

OFFICIAL PHOTOGRAPHER—LEWIS R. SNOW.

ASSISTANT OFFICIAL PHOTOGRAPHER—WILLIAM SHANE.

MESSENGER—J. J. JOHNSTON.

Chiefs of Bureau:

CITY ICE BOATS—JAMES S. JEFFERSON.

GAS—DR. N. WILEY THOMAS.

HIGHWAYS—J. A. HUNTER.

LIGHTING—JOHN J. KIRK.

STREET CLEANING—WILLIAM C. FELTON.

SURVEYS—GEORGE S. WEBSTER.

WATER—A. J. FULLER (Acting).

FILTRATION—C. E. GILLETTE.

TWENTIETH ANNUAL REPORT
OF THE
DEPARTMENT OF PUBLIC WORKS

JOHN R. HATHAWAY, Director

Philadelphia, January 2, 1907.

HON. JOHN WEAVER,
Mayor of Philadelphia.

DEAR SIR:—I have the honor to submit herewith a report of the operations of the Department of Public Works for the year ending December 31, 1906, the 20th Annual Report. I have omitted details which may be found in the comprehensive reports of the Chiefs of the several Bureaus which are submitted herewith.

The changes in the executive force have been as follows: On March 5, 1906, Mr. A. Lincoln Acker, Director, resigned, on which day you appointed Assistant Director Thomas L. Hicks to the position vacated by Mr. Acker. On May 28, 1906, Mr. J. R. Hathaway was appointed Assistant Director to succeed to the vacancy caused by Mr. Hicks's promotion. On October 11, 1906, Mr. Hicks resigned from the position of Director, and on the same day you appointed me his successor. On November 9, 1906, Mr. Joseph S. MacLaughlin was appointed Assistant Director.

The total amount of money available during the year was \$16,164,912.39, of which \$8,855,714.43 was obtained from loans and \$7,309,197.96 from direct taxation.

The total expenditures during the year were \$7,608,349.29 of which \$4,304,858.59 was expended for operation and maintenance and \$3,303,490.70 for extensions and improvements.

The total receipts from all sources were \$4,474,978.56, being an increase of \$274,746.62 over 1905.

The total number of employes on December 31, 1906, was 2,250, an increase over 1905 of 456. This increase is explained by the large number of men who were detailed to make a house to house inspection with a view to checking the waste of water and also to the laying of additional water distributing mains in the central section of the City. Also, in anticipation of the strike in the coal regions, it was necessary in the early part of the year to accumulate large reserves in our coal supply at the different pumping stations, for which we had to employ large numbers of men to assist in storing the coal, etc.

Bureau of City Ice Boats.

The winter of 1905-06 was very mild and the first season for twelve years that it was unnecessary for the boats to go into commission with full crews and at no time did ice form of sufficient thickness to interfere with navigation.

On March 11, 1906, the new ice breaker "John Weaver" was formally delivered to the City authorities and with this valuable addition to the fleet of ice boats, the Department feels thoroughly competent to battle with the severest ice conditions.

During the summer of 1906, Boats Nos. 1 and 2 were thoroughly overhauled by the caretakers and new deck pumps installed for fire purposes and both boats dry-docked and painted. The "John Weaver" was also given a thorough coating of paint inside. This boat being a steel vessel will require dry-docking and painting every year, in order to properly care for her plating.

SUMMARY OF APPROPRIATIONS, EXPENDITURES, RECEIPTS, ETC., OF THE DEPARTMENT OF PUBLIC WORKS DURING THE YEAR 1906
AND TOTALS FOR THE YEARS 1903, 1904, 1905.

BUREAUS	Balance from Previous Years.	Annual Appropriation for the Year 1906.	Additional Appropriations and Transfers.	Transfers from	Net Amount Available 1906.	Number of Warrants Drawn.	AMOUNT OF WARRANTS DRAWN.				Unexpended Balance Available for 1907.	Amount Mergin.	Receipts.	Number of Employees Dec. 31, 1906.
							Salaries and Wages.	Maintenance.	Improvements.	Total.				
Director's Office		\$26,920 00		\$885 00	\$26,035 00	201	\$23,028 71	\$2,421 66		\$25,450 37		\$584 63		11
City Ice Boats.....	\$67,400 00	185,300 00		2,572 00	200,128 00	95	10,313 16	2,845 26	\$186,327 54	199,485 96		642 04	\$55 80	56
Gas		10,000 00			10,000 00	105	9,500 00	500 00		10,000 00			33 00	6
Highways.....	1,507,057 58	759,226 00	\$571,351 34	1,300 00	2,836,334 92	3,174	130,250 50	726,672 10	570,024 40	1,426,947 00	\$1,339,137 68	20,250 24	247,817 94	125
Board of Highway Supervisors.....*													39,487 42	8
Lighting		480,646 00			480,646 00	194	7,925 00	472,261 07		480,186 07		459 93		7
Street Cleaning.....		1,292,767 00	570 75	16,861 00	1,276,476 75	517	20,856 47	1,252,426 14		1,273,282 61		3,194 14		15
Surveys	2,626,686 00	511,660 00	1,618,199 50	6,000 00	4,750,545 50	2,593	300,245 18	29,550 53	787,656 20	1,117,451 91	3,630,852 26	2,241 33		265
District Surveyors.....†													167,079 97	14
Water.....	1,135,915 07	938,333 00	214,879 25	43,404 00	2,245,723 32	2,613	922,839 21	105,252 40	547,893 60	1,575,985 21	656,872 46	12,865 65	4,020,504 43	1,440
Filtration	3,068,042 90	94,980 00	1,200,000 00	24,000 00	4,339,022 90	2,482	208,245 00	79,726 20	1,211,588 96	1,499,560 16	2,834,902 40	4,560 34		303
Total 1906	\$8,405,101 55	\$4,249,332 00	\$3,605,000 84	\$95,022 00	\$16,164,912 39	11,974	\$1,633,203 23	\$2,671,655 36	\$3,303,490 70	\$7,608,349 29	\$8,511,764 80	\$44,798 80	\$4,474,978 56	2,250
Total, 1905.....	\$9,752,454 80	\$4,772,718 00	\$1,595,172 47	\$205,590 07	\$15,914,755 20	11,368	\$1,564,056 57	\$2,509,793 78	\$3,407,354 47	\$7,481,204 82	\$8,405,101 55	\$28,448 83	\$4,200,231 94	1,794
Total, 1904.....	\$6,700,238 74	\$3,965,948 00	\$11,155,874 32	\$1,212,532 09	\$20,609,528 97	11,815	\$1,424,774 47	\$3,143,855 94	\$6,277,082 14	\$10,845,712 55	\$9,752,454 80	\$11,361 62	\$4,015,725 68	1,873
Total, 1903.....	\$13,516,201 55	\$5,460,462 07	\$1,335,205 21	\$330,893 08	\$19,980,975 75	14,539	\$1,382,203 34	\$2,708,542 94	\$9,124,196 47	\$13,215,942 75	\$6,700,238 74	\$64,794 26	\$3,929,266 57	1,807

* Included in the appropriation and in the expenditures of the Bureau of Highways. † Included in the appropriation and in the expenditures of the Bureau of Surveys. ‡ Also included in the appropriations and in the expenditures of the Bureau of Water.

The recommendation of the Superintendent of the Ice Boats that some provision be made for dredging the dock at the House of Correction wharf, where the boats are laid up during the summer months, to a depth of fourteen feet at low water, has my approval and Councils should be requested to provide the funds for this work.

The following table gives a comparison of receipts and expenditures of the Bureau for the years 1903, 1904, 1905 and 1906:

	1903.	1904.	1905.	1906.
Amount received for towage and sale of old material.....	\$310 00	\$2,319 46	\$1,485 00	\$55 80
Total expenditures.....	\$41,662 26	\$119,426 80	\$202,273 70	\$199,485 96

Bureau of Gas.

In accordance with the terms of the lease of the Philadelphia Gas Works to the United Gas Improvement Co., the sum of \$10,000.00 is annually paid into the City Treasury by the said Company to meet the expenses of the Bureau of Gas.

This Bureau makes daily tests of the quality of the gas supplied and its illuminating properties, and to the proving of meters when complaints are lodged that meters are registering too fast.

The average candle power of the daily tests made during the year give the following results:

January	23.21
February	23.12
March	22.79
April	22.82
May	22.74
June	22.78
July	22.64
August	22.72
September	23.03

October	22.84
November	22.85
December	22.96
Maximum monthly average	23.21
Minimum monthly average	22.64

The terms of the lease of the gas works require that no less than 22 candle power must be obtained.

Chemical analyses made during the year indicate the average composition of the gas supplied as follows:

Carbon dioxide	2.30
Illuminants	10.20
Oxygen .....	.80
Hydrogen	35.40
Carbon monoxide	25.20
Methane	24.30
Nitrogen	1.80
	100.00

Bureau of Highways.

The expenditures of the Bureau of Highways for the year were \$1,426,947.00 of which \$856,922.60 were current expenses and \$570,024.40 for improvements and extensions.

The total receipts were \$208,330.52.

The following statement is a comparison of expenditures for the years 1903, 1904, 1905 and 1906:

	1903.	1904.	1905.	1906.
Current expenses	\$647,082 61	\$647,112 16	\$612,080 40	\$856,922 60
For extensions	1,587,380 28	1,222,455 52	975,680 10	570,024 40
Total.....	\$2,234,462 89	\$1,869,567 68	\$1,587,760 50	\$1,426,947 00

During the past year, 18 miles of new streets were opened and graded to the established City grade, at a cost to the City of \$196,939.46. Much more grading would have been done had the funds been available.

Over fourteen miles of streets were paved during the year, by the City and under private contract, the material used being refined natural asphalt, granite block, and vitrified block, all laid upon a cement concrete foundation, six inches in thickness. The cost of this work falls upon the property owners, the City paying for intersections and in front of unassessable property.

The amount of money available for repaving streets with improved pavements was so limited that scarcely any work of this character was done. The recent loan bill provides funds for this work and as soon as it becomes available and Councils designate the streets to be repaved, the Department will use every effort to remove the old style and objectionable cobble and rubble pavements, thereby giving increased comfort to the traveling public and enhanced beauty to the streets.

The specifications covering the repairs to unpaved and macadamized public highways, were radically changed for doing the work during 1906, resulting in excellent work being done, as is attested by the present condition of the macadamized roads. The contract for 1907 will be practically done under the same methods.

There is no better result attained by the expenditure of the City's money than that secured by sprinkling macadam roads. The Department should be liberally supplied with funds for doing this work, as by judicious sprinkling the life of macadam roads is greatly lengthened and the residents living along the lines thereof are permitted to live in a degree of comfort which is sadly lacking when the roads are not sprinkled.

The paved streets of the City were kept in good condition throughout the year. The method of doing this work during the past year was by the square yard system, instead of by the lump sum, as had been the custom for a number of years. This allowed the Bureau officials to

make inspection of work while in progress, resulting in the City receiving full value for all money expended.

There was no appropriation for resurfacing streets with sheet asphalt during the year. Such work as was done under the repair item amounted to 34,359 square yards, all of which is under a guarantee for maintenance of five years.

During the past year a number of breaks occurred in main sewers, and a great many of the old sewers are in a delapidated condition and will continue to collapse whenever there are severe rain storms.

For many years past, the Department has requested that liberal appropriations be made for repairs to bridges, but with the meagre amount of money generally furnished, it is possible to take care of only such as are practically in a dangerous condition and otherwise would be closed to travel.

During 1906, the following important bridges which were sadly deteriorating, through rust, were painted: Gray's Ferry, South street, Walnut street, Girard avenue, City avenue, and the Falls Bridge. Besides the above bridges, there were a number of minor structures that were painted during the year.

I would call your attention to the clause in the annual report of this Department for the year 1905, wherein it was stated that there are over 300 bridges in the City under the care of the Bureau of Highways, representing a total valuation of more than \$20,000,000, and that in the past five years, the appropriations for their repairs had been less than one-half of one per cent. of their value. This parsimonious policy, if pursued in the future, will result in enormous damage to these valuable structures.

In connection with this subject, I would call attention to the collapse of the bridge on the line of Columbia avenue at Thirty-first street, over the tracks of the Pennsylvania

Railroad, on September 26, 1906, due to the extra heavy load which the Philadelphia Rapid Transit Company placed upon the structure and which it was not designed to carry. The bridge was temporarily repaired by the P. R. T. Co., which bore the entire expense. Plans are now prepared to rebuild the entire structure.

The Spring Garden street bridge over the Schuylkill river and tracks of the Penna. R. R., and one of the City's largest bridges, is undergoing thorough repairs, both by the Bureau of Highways and Bureau of Surveys. When the work is completed, it will result in relieving a long-felt anxiety, as this structure has been in a precarious condition for a long time.

The bridge at Belmont and Girard avenue, over the tracks of the P. R. R., and a structure which carries a very heavy traffic, is now being reinforced by the Philadelphia Rapid Transit Co., until such time as it can be rebuilt, which will be done in the near future.

During the year a thorough inspection has been made jointly by City and railroad officials, of all City bridges spanning lines of railroads. A number of bridges were found to be in a dangerous condition and steps were taken to place them in a state of thorough repair, and all important bridges marked with their names.

Work on the Southern Boulevard has progressed as far as the appropriation will permit. The principal item in this contract—filling—is practically completed. When additional funds are provided out of the recent loan bill, the avenue will be macadamized and hastened to completion.

Work on the Northeast Boulevard has been suspended since June, 1905, pending an investigation of the character of the work done. No steps have been taken to maintain that portion of the avenue which has been finished and unless steps are taken quickly to restore the work to its

original condition, it will become necessary to make very extensive repairs to the finished work. Realizing the importance of this roadway to the northeast section, I would advise commencing work upon that section of the Boulevard now under contract, and likewise the opening up of this avenue to the width of 300 feet from Second street northeastward to Adams avenue, thereby having a gateway to Frankford, Torresdale, Holmesburg, Bustleton and Byberry, at which latter place the City has purchased property for a Home for the Indigent and other municipal purposes.

Notices have been served upon the owners of property along the line of the Parkway, between Logan Square and Spring Garden street, that the City desires to take possession, contracts have been awarded for the removal of obstructions on the line of the proposed Parkway, the work of demolition to be completed within one hundred days, from Washington's Birthday, February 22, after which the actual work of construction will begin.

I direct your attention and consideration to the work that has been done upon our highways, of late years, where the character of the paving was sheet asphalt.

Late in October, I made an investigation of the work being done by the several parties holding contracts with the City for this character of work, and I found that in a great many cases the concrete was of very poor material and not of the required six-inch thickness. I also found that in almost every instance the binder course, which the specifications required should be composed of clean broken stone, was composed of a very cheap grade of slag, and in many cases, the asphalt surface was less than the required two inches in thickness.

I required that the Barber Asphalt Paving Co., then at work upon Pacific, Twenty-first and Twenty-third streets, from Ontario to Tioga streets, should remove all of the

The following Statement is a Classification of the Street Pavements laid during the Year, and their Mileage; also Total Mileage of the various Street Pavements to December 31, 1903, 1904, 1905 and 1906.

Kinds of Pavements.	LAID DURING 1903.		MAKING TOTAL IN CITY, DEC. 31, 1903.		LAID DURING 1904.		MAKING TOTAL IN CITY, DEC. 31, 1904.		LAID DURING 1905.		MAKING TOTAL IN CITY, DEC. 31, 1905.		LAID DURING 1906.		MAKING TOTAL IN CITY, DEC. 31, 1906.	
	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.	Sq. Yards.	Miles.
Sheet asphalt.....	257,041	16.05	5,166,463	337.69	162,989	9.87	5,329,452	347.56	238,276	13.13	5,567,728	360.69	182,170	11.35	5,749,898	372.04
Asphalt block.....			180,702	19.30			178,238	19.00			178,238	19.00			178,238	19.00
Granite block.....	62,797	3.02	6,169,984	367.80	78,557	6.58	6,248,541	374.38	53,063	4.22	6,301,604	378.60	11,531	.80	6,313,135	379.40
Cobble or rubble.....			2,049,183	73.12			1,973,622	66.96			1,884,472	61.40			1,872,911	60.57
Vitrified brick.....	33,858	3.11	2,239,789	141.73	13,678	.86	2,253,467	142.59	40,713	3.12	2,294,180	145.71	31,860	2.24	2,326,040	147.95
Granolithic.....			72,726	12.77			72,726	12.77			72,726	12.77			72,726	12.77
Slag block.....			71,280	9.82			71,280	9.82			71,280	9.82			71,280	9.82
Macadam.....	26,997	26.87	2,722,976	262.66	63,443	6.25	2,786,419	268.91	46,125	4.43	2,832,544	273.34	27,014	2.72	2,859,558	276.06
Total.....	627,898	49.05	18,673,103	1,224.89	318,667	23.56	18,913,745	1,241.99	378,177	24.90	19,292,772	1,261.33	252,575	17.11	19,448,786	1,277.61

In addition to the paved and macadam streets, there are of unpaved streets or dirt roads, in 1903, 437 miles; 1904, 467 miles; 1905, 469 miles; 1906, 470 miles.

material which had been placed in the street and reconstruct the work in accordance with the specifications. This the company did. I have also directed the same company to reconstruct the work on Courtland street, west from Broad street, but this they refuse to do and I have therefore turned the matter over to the Department of Law.

I have also refused to transmit the assessment bills to the contractors for the paving of Seventeenth street, from Wingohocking to Cayuga streets; Ditman street, from Plum to Meadow streets; Margaret street, from Tackawanna to Melrose streets; Thompson street, from Fifty-third to Fifty-fourth streets, and Union street, from Girard avenue to Cambridge street, for the reason that these streets have been paved with a slag binder course instead of clean broken stone, as required by the specifications.

I find upon a perusal and close study of the specifications governing the above work, that they require everything and permit anything, for which reason I have carefully revamped and reconstructed the specifications for all kinds of paving work to be done during 1907, from which I am sure the City will obtain a far superior pavement, although it may involve a slight increase in the cost. I have made these new specifications definite in every respect, so there is no possibility of the City securing anything else but what they call for, if a proper inspection is enforced at the time of laying the paving.

Replacing Cobblestones with Improved Pavements.—Old Streets.

	1903.		1904.		1905.		1906.	
	Sq. yards.	Lin. feet.	Sq. yards.	Lin. feet.	Sq. yards.	Lin. feet.	Sq. yards.	Lin. feet.
Granite blocks.	43,203	11,198	49,760	23,968	29,592	9,968	4,316	1,835
Sheet asphalt..	28,111	10,291	27,746	9,912	52,936	15,517	4,477	1,882
Vitrified bricks	4,811	3,236	519	240	6,642	3,868	308	647
Total	76,125	*24,725	78,025	†34,120	89,150	†29,353	9,101	‡4,364

*1903—Total amount of new paving, 258,987 linear feet, equal to 49 miles 267 linear feet.

†1904—Total amount of new paving, 124,428 linear feet, equal to 23 miles 2,988 linear feet.

‡1905—Total amount of new paving, 131,491 linear feet, equal to 24 miles 4,771 linear feet.

§1906—Total amount of new paving, 90,359 linear feet, equal to 17 miles 59 linear feet.

Comparative Statement of Work Done.

		1903.	1904.	1905.	1906.
New paving	linear feet.	117,099	91,348	108,101	76,009
Macadamizing (new)	linear feet.	141,888	32,900	23,390	14,350
Grading	cub. yards.	1,097,522	1,120,946	991,401	787,557
New footway paving	sq. yards.	57,433	76,166	79,385	140,716
Repairs to paved streets	sq. yards.	391,064	370,868	580,443	305,230
Footways repaved	sq. yards.	18,401	37,135	22,172	31,111
Ditches repaved	sq. yards.	50,329	55,338	56,136	51,568
Gutter stone laid	linear feet.	4,930			
Crossing stone laid	linear feet.	8,394	7,384	6,235	1,006
Curbstone reset	linear feet.	106,244	155,991	114,963	58,952
Wooden trunks	linear feet.	12,467	10,147	5,675	4,376
Brick and stone drains	linear feet.	1,981	1,528	927	1,981
Hand railings	linear feet.	4,900	4,093	4,944	5,003
Curved curb corners	linear feet.	10,247	16,989	10,540	3,874
New curbstone set	linear feet.	175,921	219,756	148,217	184,295
Vitrified brick and stone gutters ..	linear feet.	5,670	23,963	11,480	4,802
Resurfacing sheet asphalt	sq. yards.	10,672	15,307	3,169	34,359
Resurfacing broken stone	linear feet.	132,809	110,765	62,540	109,680
Footway, curb and railroad notices served		25,732	31,705	25,734	23,255

Board of Highway Supervisors.

The receipts of the Board of Highway Supervisors during the year amounted to \$39,487.42, and the expenditures were \$10,788.18, showing an excess of receipts over expenditures of \$28,699.24.

I have noticed since my connection with the Department that, immediately after paving a street, permits are issued to franchise holding companies for the purpose of tearing up the street, for the purpose of placing conduits, pipes or work of a like character, to the detriment of the paving and a loss to the contractor who has to maintain it in good condition for a number of years, for which reason the Board of Highway Supervisors passed the following Resolution, which, if adhered to, will remedy this growing evil:

Resolved, That the Secretary be directed to notify the United Gas Improvement Co., The Bell Telephone Co., The Keystone Telephone Co., The Philadelphia Electric Co., and The Edison Electric Co., that hereafter no permits will be granted to open newly paved streets within five years after said paving is laid and that said companies shall lay all needed pipes and conduits in advance of the street being paved.

Also, Resolved, That the Chief of the Bureau of Highways be requested to notify said companies of the intention of the City to pave any street, prior to commencing work thereon, and to request a certificate that all pipes or conduits required have been laid in advance of proceeding with the street paving.

The importance of the work performed by this branch of the service becomes more apparent every year, and is of immeasurable assistance to not only the City authorities, but to all corporations maintaining underground structures.

*Comparative Statement of Transactions of the Board of
Highway Supervisors.*

	1903.	1904.	1905.	1906.
Pneumatic tubes.....	.....	.....	6	.....
For vaults.....	8	8	7	11
For railroad tracks, curves and turnouts.....	149	110	47	58
For underground pipes.....	559	460	533	611
For electrical conduits.....	458	458	4,894	5,951
For erecting bridges.....	7	1	6	8
For tunnels.....	1	2	1	4
For drinking fountain.....	2	10	1	4
For subway.....	1	.....	.....	15
For connection to sewers.....	1	.....	4	.....
For elevated railroad.....	.....	1	3	6
Platform scales.....	.....	.....	1	2

*Comparative Statement of Work Done by the Draughts-
men of the Board of Highway Supervisors.*

	1903.	1904.	1905.	1906.
New street record plans pre- pared.....	85	47	143	107
Blue print plans placed on file..	402	375	364	254

Comparative Statement of Receipts and Expenditures.

	1903.	1904.	1905.	1906.
Receipts.....	\$24,008 56	\$25,822 68	\$31,110 24	\$39,487 42
Expenditures.....	11,369 83	11,120 00	10,593 68	10,788 18
Excess of receipts.....	\$12,728 73	\$14,702 68	\$20,516 56	\$28,699 24

Recapitulation.

	1903.	1904.	1905.	1906.
Amount of earnings	\$18,382 98	\$17,274 49	\$34,928 30	\$38,916 55
Amount outstanding from previous years	19,372 97	12,971 08	4,422 84	8,215 90
	\$37,755 95	\$30,245 52	\$39,351 14	\$47,132 45
Amount received and deposited with City Treasurer	24,098 56	25,822 68	31,110 24	39,487 42
Amount outstanding	\$13,657 39	\$4,422 84	\$8,240 90	\$7,645 03

Bureau of Lighting.

The total appropriation to this Bureau for the year 1906, was \$480,646.00, of which amount \$480,186.07 was expended and \$459.93 merged.

The following table will show the total number of lamps maintained and under the supervision of the Bureau for the years 1903, 1904, 1905 and 1906; also a comparative statement of expenditures:

	1903.		1904.		1905.		1906.	
	Number of Lamps.	Cost during the year.	Number of Lamps.	Cost during the year.	Number of Lamps.	Cost during the year.	Number of Lamps.	Cost during the year.
Gas lamps maintained by the United Gas Improvement Company	21,142		21,444		21,745		22,154	
Gasoline lamps.....	13,034	\$315,650 35	12,370	\$355,798 79	13,454	\$386,377 40	13,024	\$468,494 21
Gas lamps supplied by the Northern Liberties Gas Company	74	1,500 96	74	1,494 84	73	1,493 15	73	1,474 56
Gas lamps maintained by the Bureau of Correction.....	231		231		231		231	
Salaries and office expenses.....		11,762 13		11,592 45		10,712 03		10,217 30
Total.....	34,481	\$328,922 44	34,619	\$368,886 08	35,508	\$398,582 58	36,382	\$480,186 07
Of the gas lamps maintained by the United Gas Improvement Company there were not lighted, because of their proximity to electric lights.....		1903.		1904.		1905.		1906.
		121		121		121		121
Of the gas lamps maintained by the Department of Charities and Correction there were not lighted, because of their proximity to electric lights		108		108		99		108
		229		229		220		220

I would call your attention to the fact that during the past year there were not enough gas lamps available to meet the demands from operative builders and the requirements of the Department where streets were to be newly paved, and it is a question which will in the very near future require serious thought. The United Gas Improvement Co., by the terms of the lease, are only required to erect 300 new gas lamps annually, which is totally inadequate to meet the demands made on us. In addition to these 300 lamps, we have entered into an agreement with the company to relocate such lamps as are in proximity to electric lights, but even under this arrangement, we are handicapped by the lack of lamps at the close of each year.

On April 3, 1906, bids were opened for the furnishing and lighting of incandescent naphtha lamps (13,494) throughout the City during the year 1907; the contract was awarded to the lowest bidder, The Keystone Contracting Co., at a rate of \$26.90 per lamp, being \$1.10 per lamp lower than the bid submitted by the Penna. Globe Gas Light Co., who have held the contract for 27 years. The total saving effected by the City is \$15,000.

The Department was enabled to secure competition for this work, by reason of the purchase of all the posts upon which the lanterns are placed, as recommended in the last annual report by Director Acker.

Bureau of Street Cleaning.

The expenditures of the Bureau during the year were \$1,273,282.61, being \$265,062.40 less than was spent in 1905.

The following tables give a comparative summary of the expenditures for the years 1903, 1904, 1905 and 1906:

	1903.	1904.	1905.	1906.
Item 1. For salaries.....	\$21,569 58	\$24,120 00	\$23,249 45	\$21,219 47
Item 2. For horsekeep.....	5,199 66	5,500 00	5,342 26	5,007 53
Item 3. For incidentals.....	944 12	550 00	750 00	748 47
Item 4. For cleaning streets, removal of ashes, etc.	666,233 45	980,060 22	930,322 00	833,155 00
Item 5. For removal and dis- posal of garbage.....	516,340 00	536,310 00	557,282 00	396,890 00
Item 6. For removal of snow, etc.....	2,212 25	3,329 24	21,399 00	16,262 14
	\$1,212,549 01	\$1,550,069 46	\$1,538,345 01	\$1,273,282 61

	1903.	1904.	1905.	1906.
Deducted from pay of contrac- tors for violation of contracts, and which sums reverted back to the City Treasury.....	\$42,465 50	\$7,327 00	\$22,396 00	\$13,802 00

During the year there were cleaned 305,311 miles of streets, together with 1,095,954 inlets and 208,035 private alleys, from which were removed, 209,364 cartloads of dirt.

There were removed from buildings 814,414 cartloads of ashes and 50,481 cartloads of dry waste. There were also collected and disposed of 390,465 cartloads of garbage and 21,189 dead animals.

The amount expended for removing snow during the year was \$12,060.73. The importance of this work is demonstrated more each winter, and Councils should provide liberal appropriations for this purpose, in order to enable us to enlarge the scope of our work to the entire business section and much traveled streets of the City.

The Bureau has endeavored, during the past year, to educate the masses to the desirability of placing their household waste separate from the ashes, but the efforts put forth have not been productive of very gratifying results. Unless strict attention is observed by the householder in this

regard it is not possible to keep the streets of the City in a tidy condition.

The Department needs, and should have, the help of the Bureau of Police in this connection, to enforce the Act of Assembly prohibiting the disturbance of ashes, waste, etc., placed on the sidewalks by the householders for collection.

I also call attention to the increasing number of complaints relative to private collectors of garbage. If by any means this could, it should be prohibited.

Another factor which promotes an unsightly appearance is the practice of householders to place ash and waste receptacles on the sidewalks from ten to twenty-four hours prior to the time of collection.

The sprinkling of streets in the business section of the City during the summer months has added much to the comfort of the public and has been a boon to those merchants whose establishments are along the lines of streets where this good work has been done. It would be money well expended, were Councils to make more liberal provisions for this work thus enabling us to enlarge the territory to receive the benefits of sprinkling.

The experiment of placing waste cans on the business streets has met with success, and it is urged that the system be extended to cover a greater area.

As a result of the more rigid inspections by the Bureau, the streets of the City have presented an improved appearance during the year.

During the year, I thoroughly investigated the merits of the so-called "great square system" for cleaning streets and collecting ashes and the conclusions I reached, after bids had been received for both the "great square system" and for lump sum, convinced me that the City would have to pay, at this time, a very much larger amount of money under the new system, for practically the same amount of work. Therefore, the contracts for 1907 were let under the old system, with revised specifications, which I feel assured should have beneficial results.

Statement showing Total Work during the Year 1906, and Totals for Years 1905, 1904 and 1903 in Comparison.

	CLEANED.						REMOVED				Number of Complaints of all kinds.	
	Squares.	Alleys.	Inlets.	Cross-ings.	Market Houses.	Snow from Fire Plugs.	Number of Dead Animals.	NUMBER OF LOADS.				
								Dirt.	Ashes.	Dry Waste.		Garbage.
Total 1906.....	3,053,110	208,035	1,005,954	240,890	1,168	17,345	21,189	200,374	814,414	50,481	390,465	5,215
Total 1905.....	2,687,798	123,966	1,082,387	706,175	1,708	22,525	23,580	197,362	802,392	23,462	344,901	3,976
Total 1904.....	2,945,011	165,306	1,110,563	755,219	2,199	25,128	34,949	230,271	644,973	29,737	380,520	2,858
Total 1903.....	2,302,398	153,074	1,083,759	219,642	2,144	6,100	17,513	218,923	680,593	27,949	301,643	4,169

Bureau of Surveys.

The total expenditures of the Bureau of Surveys during the past year were \$1,117,451.91, of which the sum of \$329,795.71 was for current expenses and \$787,656.20 for improvements and extensions.

The receipts of the Bureau were \$167,079.97, being \$17,199.73 greater than the previous year.

The Commission appointed to fix the boundary line between Philadelphia and Delaware County held five stated meetings during the year and, after taking the testimony of property owners affected, adopted a line, which appears upon a map filed December 21, 1906, in offices of the Clerks of the Court of Quarter Sessions of the Peace in the two counties named. Copy was also filed in the Bureau of Surveys.

During the year, there became available for the construction of main sewers \$404,000, of which amount \$30,000 was set aside for the repair and improvement of old sewers. This appropriation enabled the Department to complete the drainage scheme in various parts of the City and in a number of instances allowed the Bureau to commence work along contemplated plans.

The appropriation of \$1,000,000 out of the loan recently authorized will enable the City to build many main sewers, which, for years, have been considered of the utmost importance in the development of the City.

The total amount of money available for the construction of branch sewers during 1906 was \$404,499.50, and 15.664 miles of sewers were built at a total cost to the City of \$355,677.62.

Councils appropriated \$5,000 for the reconstruction of inlets, which work was placed under contract. Contracts were also entered into for the construction of new inlets, man-holes, laterals, etc., to the amount of \$15,000. This work consisted in the construction and reconstruction of

166 inlets not included in sewer contracts, the placing of 4,018 feet of curved and straight curbing in connection therewith and the laying of 7,232 linear feet of lateral sewer connections.

The total length of all sewers built during 1906, was 25.046 miles, divided as follows:

Main sewers	1.896 miles
Branch sewers	15.664 "
Sewers built at private expense.....	7.486 "

The total length of all sewers constructed to Jan. 1, 1907, is as follows:

Main sewers	169.235 miles
Branch sewers	789.434 "
Branch sewers built at private expense....	107.584 "

Total.....1,066.253 miles

The Bureau of Surveys has continued its studies of drainage systems to improve the sanitary condition of the larger streams within the City's limits, which have become polluted, and the necessity of speedily constructing sewers which will intercept the drains now reaching Cobb's Creek and Frankford Creek, has been called to the attention of the Department by the Commissioner of Health of the State. As a result of this agitation, an intercepting system along Cobb's Creek is projected and a portion now under contract; also, a large percentage of the system with the ultimate purpose of intercepting the drainage now flowing into Little Tacony Creek has been constructed.

The total amount available for the construction of bridges was \$838,582.34; a reference to the comprehensive report of the Chief Engineer will give the details of the large amount of work performed. Your special attention is called to the work on the Walnut Lane Bridge, which, when completed, will open up communication between Germantown and Manayunk and be the means of developing a large and growing territory.

The proposition to abolish the grade crossings on the Philadelphia, Germantown and Norristown Railroad, and the Richmond Branch of the Philadelphia and Reading Railway, has been under consideration for a number of years, and an ordinance approved October 13, 1906, authorizes the City and the Railway Company to enter into a contract to enable the Company to relocate, change and elevate certain portions of the P. G. & N. R. R. between Green street and the Richmond Branch of the P. & R. R., and of the Richmond Branch between Somerset street and Richmond street, so that all grade crossings on these lines will be abolished.

The City will prepare plans and specifications and award contract for the necessary changes and construction work upon the streets and will have direct supervision of the execution of the same. The Railway Company will prepare plans and specifications and award contracts for all railroad changes and work upon railroad property, and will have direct supervision of the execution of the same. This work will not be done as a whole, but be divided into sections and, in accordance with the provisions of the ordinance, construction work will be commenced as quickly as possible, and at as many points as practicable, and carried to completion with the least possible delay.

The estimated cost of this work is \$10,000,000, which is to be equally divided between the City and the Railroad Company.

The Loan Bill provides one million dollars for the abolition of grade crossings in South Philadelphia, and plans are now being prepared for that work.

The work of the Philadelphia Rapid Transit Co. upon the elevated structure in West Philadelphia is practically completed, with the exception of the building of the various stations, and at the time of writing this report it is confidently believed that cars will be operated between the

City Hall and the Sixty-third street terminus within a very short period. Work is in progress on the subway around the City Hall, as well as that portion lying between Delaware avenue and Tenth street.

By Act of Assembly, \$375,000 were appropriated by the State authorities and the like sum was appropriated by the City Councils for the dredging of the channel of the Delaware River. This work was advertised several times, but none of the bids received was considered satisfactory. In the meantime, an agreement was reached between the City and the engineer officer in charge of the Delaware River improvement under the Federal Government, by which the City has the use of the Government dredging plant at the City's expense, said plant being now at work on sections 7 and 8. To January 1, 1907, the City has paid \$61,361.60 in connection with this work.

Subsequent to this arrangement being made, a new set of dredging specifications was prepared, and proposals received on August 15, 1906, for the remaining sections.

The award of contract was held in abeyance until after the passage of an ordinance approved October 15, 1906, removing the restriction as to the place of deposit of the dredged material. Under the provisions of this ordinance, the contract was awarded to the lowest bidder, the American Dredging Company, which was notified to proceed with the work on November 3, 1906, the work to be completed June 30, 1908.

During the year 22 stated meetings were held by the Board of Surveyors and Regulators for the transaction of general business. It was also found necessary to hold 17 special meetings for other important business. The cash receipts and credits of the District Surveyors amounted to \$151,617.30, being \$98,397.37 in excess of their expenses.

The following is a summary of the receipts and expenditures of the District Surveyors for the year 1906, and totals for the years 1903, 1904 and 1905:

Comparative Statement of Receipts and Expenses for the Years 1903, 1904, 1905 and 1906.

Districts.	SURVEYORS.	Cash Receipts.	Credit for work done for the City.	Total credit.	EXPENSES.				Balance profit to the City.	Profit to the City in 1905.	Increase.	Decrease.
					Salaries.	Pay of Assist'nts.	Miscellaneous.	Total.				
1	John M. Nobre.....	\$6,418 31	\$16,160 47	\$22,573 78	\$3,000 00	\$3,870 00	\$1,376 17	\$13,246 17	\$9,327 61	\$7,255 30	\$2,072 31	
2	Chas. W. Close.....	14,009 19	6,084 00	20,093 19	3,000 00	5,670 00	1,424 95	10,094 95	9,998 24	411 71	9,586 53	
3	W. C. Cranmer.....	8,283 25	8,306 59	16,589 84	3,000 00	8,029 92	1,159 21	12,189 13	4,400 71	4,065 23	335 48	
4	F. Bloch.....	3,743 44	7,979 09	11,722 53	3,000 00	4,804 30	1,058 85	8,863 15	2,859 38	1,482 88	1,376 50	
5	Walter Brinton.....	14,230 81	9,116 00	23,346 81	3,000 00	10,269 92	1,667 48	14,937 40	8,409 41	5,389 31	3,020 10	
6	Joseph Mercer.....	8,935 84	10,277 85	19,213 69	3,000 00	9,650 00	1,879 44	14,529 44	4,684 25	7,633 07		\$2,948 82
7	W. K. Carlile.....	3,656 99	6,313 85	9,970 84	3,000 00	3,360 00	1,111 57	7,471 57	2,499 27	1,295 33	1,203 94	
8	C. A. Sundstrom.....	2,685 72	15,826 88	18,512 60	3,000 00	11,372 32	2,156 31	16,528 63	1,983 97	824 28	1,159 69	
9	Joseph C. Wagner....	11,566 46	9,396 00	20,962 46	3,000 00	10,699 47	1,848 16	15,547 63	5,414 83	4,767 13	647 70	
10	John H. Webster, Jr..	6,153 47	11,943 40	18,096 87	3,000 00	8,105 00	1,182 06	12,287 06	5,809 81	6,198 37		388 56
11	Joseph Johnson.....	12,468 83	6,917 73	19,386 56	3,000 00	9,483 69	2,137 10	14,620 79	4,765 77	5,046 18		280 41
12	J. H. Gillingham.....	25,252 01	16,515 41	41,767 42	3,000 00	11,477 27	1,934 59	16,411 86	25,355 56	22,760 75	2,594 81	
13	H. M. Fuller.....	9,163 55	11,374 70	20,538 25	3,000 00	7,924 88	2,058 50	12,983 38	7,554 87	3,596 91	3,957 96	
14	C. B. Webster.....	2,769 24	15,405 33	18,174 57	3,000 06	7,864 64	1,976 24	12,840 88	5,833 69	6,262 11		928 42
	Total 1906.....	\$129,332 11	\$151,617 30	\$280,949 41	\$42,000 00	\$117,581 41	\$22,970 63	\$182,552 04	\$98,397 37	\$76,988 56	\$25,955 02	\$4,546 21
	Total 1905.....	\$114,194 44	\$144,925 27	\$259,119 71	\$42,000 00	\$118,113 65	\$22,017 30	\$182,131 15	\$76,959 16	\$73,308 36	\$13,722 83	\$10,042 60
	Total 1904.....	\$101,004 77	\$152,439 89	\$253,444 66	\$42,000 00	\$117,707 25	\$20,429 05	\$180,136 30	\$73,308 36	\$67,903 84	\$16,383 19	\$11,068 67
	Total 1903.....	\$102,396 61	\$150,593 33	\$252,989 94	\$42,000 00	\$114,996 40	\$27,999 70	\$184,996 10	\$67,993 84	\$58,522 53	\$17,500 48	\$8,029 17

I cannot refrain from calling attention to the clause in the report of the Chief Engineer, in which he states that the demand for men of skill in this branch of the service cannot be met, owing to the higher rate of compensation offered by outside corporations and individuals; this is, at present, a serious detriment to the municipal service.

The following is a comparative statement of the operations of the Registry Division of the Bureau of Surveys during the years 1903, 1904, 1905 and 1906:

Registry Division.

	1903.	1904.	1905.	1906.
Number of certificates of registered owners issued.....	4,223	4,396	4,820	4,958
Number issued for use of Law Department.....	547	575	742	603
Receipts from certificates of registered owners.....	\$1,054 02	\$1,102 00	\$1,201 50	\$1,238 00
Receipts from miscellaneous sources..	\$216 60	\$383 10	\$396 90	\$362 10
Number of original lots plotted.....	10,171	12,099	12,811	15,621
Number of transfers registered.....	35,369	37,765	40,541	49,183
Number of plans made for use of City Departments, Bureaus, etc.....	501	62	264	520
Number of examinations of registry plan books made by the public.....	54,833	57,088	60,327	69,480
Number of descriptions of property filed for registry.....	45,540	49,864	53,352	64,804
Number of titles perfected.....	2,361	2,047	2,094	2,364
Number of certificates of legal opening of streets issued to Bureaus, etc.....	2,078	1,703	2,461	2,540
Number of certificates of registered owners in municipal lien cases for Law Department.....	1,181	668	912	999
Number of certificates of registered owners in municipal lien cases for Receiver of Taxes.....		1,086	895	745

Comparative Statement of Main, Branch and Private Sewers built during the years 1903, 1904, 1905 and 1906.

	1903.		1904.		1905.		1906.	
	No.	Linear feet.	No.	Linear feet.	No.	Linear feet.	No.	Linear feet.
Intercepting sewer extensions.....	3	12,497.48	3	1,332	1	679	2	1,529
Main sewers.....	29	30,933.93	23	11,984	20	22,608	19	8,480
Branch sewers.....	103	82,583.39	157	113,514	155	103,370	111	82,710
Private sewers.....	58	21,421.00	62	30,256	75	44,306	66	39,525
Total.....	193	*147,441.80	245	†157,086	251	†171,463	198	‡192,244

* Equal to 27.32 miles.
† Equal to 29.75 miles.

‡ Equal to 32.74 miles.
‡ Equal to 25.046 miles.

Comparative Statement of Work upon Bridges during the years 1903, 1904, 1905 and 1906.

	1903.	1904.	1905.	1906.
Finished.....	6	5	3	4
Begun.....	5	3	6	11
Authorized.....	3	9	9	4
Planned.....	5	9	5	6

Comparative Statement of Receipts.

Year.	Receipts of Bureau.	Receipts of District Surveyors.	Total.
1903.....	\$28,005 94	\$102,396 61	\$130,402 55
1904.....	30,882 83	101,004 77	131,887 10
1905.....	34,147 40	114,104 44	149,880 24
1906.....	37,747 86	129,332 11	167,079 97

Comparative Statement of Expenditures.

	1903.	1904.	1905.	1906.
Current expenses.....	\$275,701 08	\$261,818 34	\$268,968 53	\$264,681 34
For extensions	1,560,008 80	903,379 68	1,090,924 67	852,770 57
Total	\$1,835,704 88	\$1,164,608 02	\$1,954,893 20	\$1,117,451 91

Bureau of Water.

During the past year, the expenditures of the Bureau of Water for all purposes amounted to \$2,614,891.58 (not including materials and supplies furnished by the Department of Supplies), of which \$2,066,997.98 were for current expenses and \$547,893.60 were for improvements and extensions.

The total receipts for the year were \$4,020,504.43, being \$230,057.17 in excess of the receipts for the year 1905.

The total receipts for the four years ending December 31, 1906, were	\$15,049,376.79
For the four years ending December 31, 1902, the receipts were	13,163,677.61
Showing increased receipts during 1903 to 1906 of	\$1,885,699.18

The total net profits of the Bureau of Water since the installation of the water works in 1799, to December 31, 1906, have been \$18,109,686.98.

On March 8, 1906, after 20 years continuous service in the Bureau, Mr. Frank L. Hand resigned his position as Chief of the Bureau of Water; by his resignation the City has lost the services of a faithful, conscientious and efficient servant. On March 9, 1906, Mr. A. J. Fuller, General Superintendent, was placed in charge of the Bureau, and has demonstrated his ability to satisfactorily conduct the work of this important Bureau.

The expenditures of the Bureau were \$153,454.05 in excess of 1905, caused principally by the increased cost of material, etc. to additional wages paid mechanics to conform to the Union rate, as directed by Ordinance of Councils; to the extensive repairs made to the engines and boilers and to the laying of supply mains in Locust street to give a more ample supply to the southern section of the City; also to the laying of supply main to give water to the residents of Bustleton and vicinity.

The total consumption of water during the past year, computed from plunger displacement, was 116,732,205,859 gallons, or an average daily consumption of 319,814,262 gallons. The average per capita consumption per day was 217.8 gallons, a decrease in comparison with 1905 of 9.4 gallons.

The Bureau met the demands upon it for an adequate supply of water with satisfaction, excepting in that portion of the City below Vine street, between the two rivers, which was due to the inability of the pumps at the Spring Garden Station to supply this district without the aid of the turbine pumps at Fairmount, which had to be shut down during the summer months on account of low water in the river. The completion of one or two mains now being laid by the Bureau of Filtration will overcome this difficulty to a great extent by reason of additional pumpage from the Lardner's Point Station. It is believed these latter mains will be put in service the early part of the current year.

Extensive repairs have been made to the pumping engines during the year, and in this respect greater progress has been made than for a number of years past. This same condition applies with equal force to the steam boilers, all of which have been thoroughly cleaned and many of them retubed, the latter work only being limited by our inability to secure tubes as fast as required. These repairs

have resulted in a saving in the consumption of coal amounting approximately to \$18,000.00.

The Bureau is still seriously handicapped by the lack of adequate funds for the purchase of distributing mains and for labor, and unless appropriations are made to these two items, the Department will be utterly unable to meet the demands of builders who are developing our suburban sections and seriously embarrasses us in completing the paving of streets with improved pavements.

As an instance of the above lack of money, I would call attention to the fact that during the months of July and August, when the weather conditions for outside work are most favorable, it became necessary to dispense with the services of over 300 men, thus bringing the work practically to a complete standstill until Councils provided additional funds late in the fall.

The total amount of pipe laid by the Bureau of Water during the year was 33.31 miles, an excess over that of the preceding year of 3.14 miles, notwithstanding the unfavorable conditions noted above.

At the close of 1906, there were 77,000,000 gallons more water stored in the reservoirs than for the same period of 1905, the storage having increased from 487,000,000 gallons in September to 1,428,000,000 in December.

The several recommendations of the General Superintendent in charge of the Bureau of Water have my hearty endorsement, as the carrying out of same will result in increased efficiency and provide our citizens with a more satisfactory supply of water.

*Comparative Statement of Receipts and Expenditures for
the years 1903, 1904, 1905 and 1906.*

	Receipts, 1903.	Receipts, 1904.	Receipts, 1905.	Receipts, 1906.
Receipts from water rents.....	\$3,275,997 53	\$3,368,408 06	\$3,435,213 65	\$3,612,312 28
Receipts from fractional rent.....	68,992 21	66,156 60	77,422 23	95,087 39
Receipts from water pipes.....	128,265 82	85,003 76	128,599 68	193,164 30
Receipts from City Solicitor's office.....	43,555 83	37,887 35	66,671 66	41,946 21
Receipts from penalties	31,512 60	32,539 27	23,320 34	33,218 10
Receipts from delinquent rent.....	31,041 32	36,607 50	39,664 70	31,704 15
Receipts from Chief Engineer's office.....	7,709 19	8,627 62	10,392 29	2,944 51
Receipts from searches.	3,021 75	2,986 75	3,306 50	3,610 00
Receipts from delinquent penalties.....	4,657 72	5,454 22	5,856 21	6,517 49
Total.....	\$3,594,753 97	\$3,643,671 13	\$3,790,447 26	\$4,020,504 43
	Expenditures, 1903.	Expenditures, 1904.	Expenditures, 1905.	Expenditures, 1906.
Current expenses.....	\$1,463,065 14	\$1,526,954 06	\$945,389 16	\$1,023,091 61
For extensions.....	6,074,269 48	3,392,676 32	800,636 55	547,893 60
Total.....	\$7,537,334 62	\$4,919,630 38	\$1,746,025 71	\$1,575,985 21

Statement relating to Pipe Laying and Fire Hydrants Placed.

YEAR.	PIPE LAID.		*PIPE RELAID.	FIRE HYDRANTS PLACED IN POSITION.			.SUBSTITUTED FOR DEFECTIVE HYDRANTS.			Fire Hy- drants in Use.	New Water Attach- ments.	
	Feet.	EQUAL TO		Feet.	New Style.	Old Style.	Total.	New Style,	Old Style.			Total.
		Miles.	Feet.							Feet.		
1903.....	136,391	25	4,391	† 15,254	348	.....	348	190	.....	190	13,647	5,637
1904.....	111,770	21	890	‡ 28,719	370	.....	370	229	1	230	14,017	5,780
1905.....	159,307	30	907	§ 17,766	345	.....	345	324	2	326	14,311	8,097
1906.....	175,881	33	1,641	|| 8,273	315	1	316	319	0	319	14,582	9,566

Total pipe laid, 1,529.62 miles.

* Adds nothing to feet in ground.

† 1904. Pipe taken up exceeds quantity relaid 462 feet.

‡ 1903. Pipe taken up is less than quantity relaid 1,382 feet

§ 1905. Pipe taken up exceeds quantity relaid 616 feet.

|| 1906. Pipe taken up exceeds quantity relaid 2,746 feet.

Statement of the Number and Type of Engines and their several Aggregate Capacities, at the Various Stations.

Pumping Stations.		Designated Number of Engine or Turbine.	Type of Engine.	Designed Capacity in Million Gallons per day.	Total.
Spring Garden	Old Station.....	5	Compound Rotary.....	20,000,000	170,000,000
	Old Station.....	6	Simpson Compound Rotary.....	10,000,000	
	Old Station.....	7	Marine Compound Rotary.....	20,000,000	
	Old Station.....	8	Worthington Duplex.....	10,000,000	
	Old Station.....	11	Gaskill.....	20,000,000	
	New Station.....	9	Worthington Duplex.....	15,000,000	
	New Station.....	10	Worthington Duplex.....	15,000,000	
	New Station.....	2	Holly.....	30,000,000	
	New Station.....	3	Holly.....	30,000,000	
	Queen Lane.....	1	Southwark.....	20,000,000	
Queen Lane.....	2	Southwark.....	20,000,000		
Queen Lane.....	3	Southwark.....	20,000,000		
Queen Lane.....	4	Southwark.....	20,000,000		
Belmont.....	1	Worthington Duplex.....	4,500,000	65,500,000	
Belmont.....	2	Worthington Duplex.....	4,500,000		
Belmont.....	3	Worthington Duplex.....	6,500,000		
Belmont.....	4	Worthington Duplex.....	20,000,000		
Belmont.....	5	Holly Horizontal Compound.....	10,000,000		
Belmont.....	6	Holly Horizontal Compound.....	10,000,000		
Belmont.....	7	Holly Horizontal Compound.....	10,000,000		
Belmont High Service.....	1	Worthington.....	2,000,000	7,000,000	
Belmont High Service.....	1	Worthington.....	5,000,000		
Roxborough, Old House.....	1	Worthington Duplex.....	4,000,000	35,500,000	
Roxborough, Old House.....	2	Worthington Duplex.....	5,000,000		
Roxborough, Old House.....	3	Worthington Duplex.....	6,500,000		
Roxborough, New House.....	4	Worthington Horizontal Compound.....	5,000,000		
Roxborough, New House.....	5	Worthington Horizontal Compound.....	5,000,000		
Roxborough, New House.....	6	Worthington Horizontal Compound.....	5,000,000		
Roxborough, New House.....	7	Worthington Horizontal Compound.....	5,000,000		
Roxborough High Service.....	1	Worthington.....	5,000,000	40,000,000	
Roxborough High Service.....	2	Worthington.....	5,000,000		
Roxborough High Service.....	3	Worthington Centrifugal.....	10,000,000		
Roxborough High Service.....	4	Worthington Centrifugal.....	10,000,000		
Roxborough High Service.....	5	Worthington Centrifugal.....	10,000,000		
Mt. Airy.....	1	Davidson.....	1,000,000	3,000,000	
Mt. Airy.....	2	Davidson.....	1,000,000		
Mt. Airy.....	3	Knowles.....	1,000,000		
Chestnut Hill.....	1	Knowles.....	250,000	750,000	
Chestnut Hill.....	2	Worthington Duplex.....	500,000		
Frankford.....	1	Marine Compound Rotary.....	10,000,000	117,000,000	
Frankford.....	2	Corliss Compound Rotary.....	10,000,000		
Frankford.....	3	Southwark Rotary.....	22,000,000		
Frankford.....	4	Southwark Foundry Quarter Crank Flywheel.....	15,000,000		
Frankford.....	5	Holly Vertical Triple Expansion.....	20,000,000		
Frankford.....	6	Holly Vertical Triple Expansion.....	20,000,000		
Frankford.....	7	Holly Vertical Triple Expansion.....	20,000,000		
Frankford High Service.....	1	Holly Horizontal Compound.....	3,000,000	7,000,000	
Frankford High Service.....	2	D'Auria Compound Duplex.....	4,000,000		
Fairmount	New House.....	1	Turbine Wheels.....	2,000,000	33,290,000
	New House.....	3	Turbine Wheels.....	5,330,000	
	New House.....	4	Turbine Wheels.....	5,330,000	
	New House.....	5	Turbine Wheels.....	5,330,000	
	Old House.....	7	Turbine Wheels.....	5,100,000	
	Old House.....	9	Turbine Wheels.....	5,100,000	
Total.....					559,040,000

Statement of the Location, Date of Completion, Elevation and Capacity of the City's Reservoirs.

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Name of Reservoir.	Location.	Date of Completion.	Height ab've City Datum.	Capacity in Gallons.
Fairmount. {	East Fairmount Park.....	1815	94 feet..	26,850,000
		1821		
		1827		
		1835		
		1836		
		1836		
Spring Garden.....	Twenty-sixth and Master streets.....	1844	120 "	12,950,000
Corinthian.....	Corinthian avenue and Poplar street.....	1852	120 "	27,341,000
East Park. {	East Fairmount Park.....	1887	193 "	62,788,000
		1888		
		1889		
Queen Lane {	Thirty-third street and Queen Lane.....	1894	238 "	205,620,000
				177,480,000
Frankford.....	Oxford turnpike and Comly street.....	1877	167 "	86,046,000
Belmont.....	West Fairmount Park.....	1870	212 "	89,758,000
Belmont.....	Belmont and City avenues.....	1903	279 "	72,000,000
Belmont Clear Water Basin.....	Monument avenue and Ford Road.....	1903	239 "	16,500,000
Mount Airy.....	Allen's Lane and Mower street, Germantown.....	1851	363 "	4,546,000
Roxborough.....	Ridge and Shawmont avenues.....	1866	366 "	12,888,000
Roxborough Clear Water Basin.....	Dearnley and Fowler streets.....	1903	325.75"	3,000,000
New Roxborough. {	Port Royal avenue and Ann street.....	1893	414 "	71,594,000
				75,438,000
New Roxborough Clear Water.....	Port Royal avenue and Hagy street.....	1903	410 "	8,000,000
Belmont Stand Pipe.....	West Fairmount Park.....	1895	364 "	106,000
Roxborough Stand Pipe.....	Port Royal avenue and Ann street.....	1895	491 "	106,000
Frankford Stand Pipe.....	Oxford turnpike and Comly street.....	1900	300 "	106,000
*Oak Lane.....	Fifth and Medary avenue.....	1904	210 "	70,000,000
Total.....				1,568,397,000

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	1903. Gallons.	1904. Gallons.	1905. Gallons.	1906. Gallons.
Pumped to reservoirs....	124,015,984,669	126,181,026,489	125,867,447,176	128,808,864,708
Equal to gallons pumped 100 feet high.....	248,768,806,094	251,214,168,044	261,281,445,628	257,269,023,542

NOTE.—The “pumped to reservoirs,” etc., includes (6,576,658,849) gallons or repumpage to higher levels at Belmont, Roxborough, Roxborough Annex, Mt. Airy, Chestnut Hill and Frankford High Service Stations, which deducted from the total pumped gives a total pumpage from rivers of 116,782,205,859 gallons.

The quantity stored in reservoirs on December 31, 1906, was 76,708,806 gallons more than that stored on December 31, 1905. This quantity deducted from the total pumpage from rivers makes the total consumption for 1906, 116,655,497,053 gallons. The cost of pumpage is based on the total pumpage. The consumption per capita is computed from the average consumption during 1906, of 319,604,102 gallons per day.

	1903. Gallons.	1904. Gallons.	1905. Gallons.	1906. Gallons.
Pumped by water power	7,736,381,408	6,965,281,094	7,081,998,186	6,645,143,684
Pumped by steam power	116,279,558,266	119,215,745,895	118,835,453,990	116,663,721,024
Largest quantity pumped in 24 hours.....	884,393,464	889,485,408	394,722,998	382,727,730
Smallest quantity pumped in 24 hours.....	213,159,635	274,725,827	272,124,092	231,179,685

Year.	Average daily consumption.	Average consumption in gallons per capita per day.*	Cost of one million gallons pumped one hundred feet high.
	Gallons.	Gallons.	
1903.....	327,278,153	237.5	\$5 20
1904.....	328,239,075	233.1	5 11
1905.....	326,630,258	227.2	4 61
1906.....	319,604,102	217.7	5 06

*Estimating the population at, 1903, 1,378,298; 1904, 1,407,690; 1905, 1,437,730; 1906, 1,468,411.

Bureau of Filtration.

The total appropriations made for the Improvement, Extension and Filtration of the Water Supply amount to \$23,700,000. Of this amount there has been charged off on account of contracts, and expended, \$21,635,866.76, leaving an available balance December 31, 1906, of \$2,064,133.24.

During the past year, there were expended \$1,499,560.16 of which \$287,971.20 were for current expenses and \$1,211,588.96 for improvements and extensions.

The Bureau was in temporary charge of Mr. Geo. S. Webster until Feb. 28, 1906, at which time Major Cassius E. Gillette was appointed Chief Engineer of the Bureau.

When the filtration plant is completed, the City will derive its supply from three independent sources: Roxborough, Belmont and Torresdale. The Roxborough plant has been in operation throughout the year and supplies filtered water to the Twenty-first and Twenty-second Wards at the rate of 20,000,000 gallons per day. The Belmont plant was in operation during the entire year and is now furnishing all of West Philadelphia with filtered water at the rate of 30,000,000 gallons per day. Work is now progressing at the Torresdale plant and it is hoped to have a portion of the system in operation before April 1, 1907, which will supply all that section of the City north of Lehigh avenue.

Plans are also being made for the purpose of connecting the mains laid in the Tioga district of the City with the mains in Wissahickon avenue, which, when the work is completed, will bring sufficient water from the Roxborough filters to supply all that district.

Owing to the failure of Councils to provide for the approval of contracts and sureties during their summer recess, the contractors refused to commence work or furnish material, and finally, on July 20, 1906, the subject matter

was heard before Judge Sulzberger, in mandamus proceedings brought by Norcross & Edmonds, and the Honorable Judge ruled that approval of contracts and sureties by Councils was not necessary.

This action of the Court did not appear to alleviate the conditions then existing, and it was not until your Honor had convened Councils in special session on August 17, and steps were taken to provide the necessary funds out of a temporary loan, which was authorized on September 22, 1906, for \$1,200,000, to pay for pipe lines, that the work was begun and pushed with due energy until the close of the year.

The Torresdale conduit, upon an examination by the Board of Investigating Engineers, was found to be in such leaky condition as to be unfit for use. Repairs were started soon thereafter by a system of grouting and the work has been pushed vigorously. It is anticipated the conduit will be ready for service by March 15, 1907, at an approximate cost of \$165,000 in addition to that paid the contractors who constructed the conduit.

During the past year, it was deemed advisable to have a house to house inspection made in the West Philadelphia district, for the purpose of discovering and checking the enormous waste of water which our pitometer examinations proved to exist in this section. The result of this investigation proved that the Department's surmises were correct as to this waste and notices were served upon hundreds of owners and tenants to make immediate repairs to fixtures. The benefits derived from the action of the Bureau have proved of great value, inasmuch as it enabled the entire West Philadelphia district to secure a supply of filtered water at a no greater increase in the cost of pumpage.

It is planned to continue this inspection throughout the entire City, with the anticipated result of checking an estimated waste of 100,000,000 gallons of water per day.

In the report of the Chief Engineer, which is attached, he states that for economical reasons it will be advisable to install preliminary filters at Torresdale (work of which character is now in progress at Belmont), as the capacity of the main filters will be doubled, and insure an ample supply of water when needed.

To enable the Bureau to store filtered water, contracts were entered into for the cleaning of George's Hill Reservoir and the north basin of the Queen Lane Reservoir, preparatory to their use in connection with the filtered water supply. The work at Queen Lane has been completed and that at George's Hill will be finished at an early date.

The introduction of filtered water in the various sections of the City has resulted in a marked decrease in the typhoid fever rates in the sections heretofore affected, and it proves conclusively that when the entire City receives the benefit of filtered water, this much dreaded disease will practically be obliterated.

I would refer you to the comprehensive tables embraced in the report of the Chief Engineer, which give in detail the results of the operation of the Roxborough and Belmont Filter Plants, together with the valuable data of progress of the work now under construction.

I am loath to close this report without calling your attention to the filter plants owned and operated by the City of Philadelphia. I have made various examinations of same and the work they perform, and it seems to me we have a plant far superior to anything of like nature in this country; certainly finer and better than anything I, myself, have seen, and when completed I am sure it will be the peer of anything in the world.

Likewise, I would say a few words in connection with the available uses of the vast area of ground that we have at Torresdale. It strikes me that in the continuation of

our great Parkway system, which we are from time to time developing, and the placing on the City plan of the Pennypack Creek Park, I would advise the carrying out of the lines thereof as far north as the Bustleton branch of the Pennsylvania Railroad, east of the Frankford and Bristol Pike, north of the Creek, coming south on Solly street to the New York Division of the Pennsylvania Railroad and connecting with the property now owned by the City running north from Rhawn street to Arendel street. This would permit of the connection of this Park system with the Torresdale Filtration Plant and the clear water basin, and which, after the completion of the plant, should be turned into a public park— a beautiful location directly bordering on the river.

Director's Office.

The work of this office increases in volume from year to year, and requires the undivided time and attention of the force in order to cope with same, the number of employees being practically the same since the organization of the Department, which the work has increased to a tremendous extent. The employees are almost constantly required to work until late in the evening, it being the policy of the office to finish each day's work before closing.

The Official Photographer's work grows in value each year, and during 1906 it is estimated there was a saving effected of \$1,834.81 by having the work done in the Department instead of by contract.

The following is a summary of the expenditures of the Director's office for the years 1903, 1904, 1905 and 1906.

ITEMS.	1903.	1904.	1905.	1906.
Salaries.....	\$22,720 00	\$24,320 00	\$24,320 00	\$23,028 71
Horsekeep.....	1,399 98	1,400 00	808 71	400 00
Printing, stationery, etc.....	3,299 87			
Advertising, incidentals, etc.....		1,450 00	1,603 55	2,021 66
Fitting up rooms for photog- rapher.....	2,498 75			
Torresdale Fish Hatchery.....			5,000 00	
	\$29,918 60	\$27,170 00	\$31,732 26	\$25,450 87

In closing this report, I desire to express my profound thanks to you for the vast aid you have given me in the performance of my duties, and to acknowledge the courteous treatment and co-operation I have received from the Chiefs and employees of the several Bureaus of this Department.

Respectfully submitted,

JOHN R. HATHAWAY,

Director.

ANNUAL REPORT

OF THE

BUREAU OF WATER

FOR THE

YEAR ENDING DECEMBER 31, 1906

OFFICERS
OF THE
BUREAU OF WATER

Chief,

FRANK L. HAND. To March 8th.

ALLEN J. FULLER, *Acting Chief*, March 9th to May
31st. *General Superintendent* in charge of Bureau, from
June 1st.

Chief Clerk,

J. T. HICKMAN.

Assistants to Chief,

WILLIAM WHITBY,

H. J. JOHNSON.

Correspondence Clerk, P. DEHAVEN.

Chief Draughtsman,

JOHN E. CODMAN.

Draughtsmen,

Martin Murphy,

James H. Hand, Jr.,

John R. Gorman,

Charles B. F. Waller,

Andrew P. Peterson, to Aug. 5th,

Joseph D. Austin.

Assistants to Chief Clerk,

Thomas Spence,

A. H. Raven.

Time Clerk—Walter R. Timby.

Clerk—George G. Whitby.

Assistant Clerk—Kennedy McNeal.

Search Clerk—John S. Todd.

Assistant Clerk—John J. Barney.

Pipe Inspector—Max M. Segl.

Pipe Clerk—Charles H. Pyrah.

Messenger—Haines Lewis.

Janitor—David Richards.

Watchman—James Robinson.

Watchman—George Harper.

CONSTRUCTION AND REPAIR SHOP, Twelfth and Reed Sts.

Superintendent of Shop—James H. Dean.*Clerk*—Arthur Breining. From Jan. 23.*Watchman*—John W. Watkins.

PURVEYORS' DISTRICTS

FIRST DISTRICT OFFICE, 1120 Wharton Street.

Purveyor—Charles T. Erichson.*Clerk*—James McCracken.*Assistant Clerk*—James Shepley.*General Foreman*—Peter Carrigan.*Foreman of Repairs*—W. W. Wellington.*Hydrant Inspector*—James Preston.*Watchman*—John H. Peterson.

SECOND DISTRICT OFFICE, 918 Cherry Street.

Purveyor—J. H. Bilyeu.*Clerk*—John G. Campbell.*Assistant Clerk*—Patrick J. Gallen.*General Foreman*—Fred. J. Gheen.*Foreman of Repairs*—Edw. Homan.*Hydrant Inspector*—Robert S. Hughes.*Watchman*—J. D. Kirkpatrick.

THIRD DISTRICT OFFICE, Beach St. and Susquehanna Ave.

Purveyor—Charles J. Lowry.*Clerk*—Edwin Green.*Assistant Clerk*—Milton Fredericks.*General Foreman*—Robert Glenn.*Foreman of Repairs*—Wm. P. Yetter.*Hydrant Inspector*—Thos. P. Cowden.*Hydrant Inspector*—Wm. Gerstner.—Died Oct. 24th.*Hydrant Inspector*—Daniel J. Williams. From Nov. 1.*Hydrant Inspector*—John R. Horn.*Watchman*—Samuel Crowther.

FOURTH DISTRICT OFFICE, Twenty-sixth and Master Streets.*Purveyor*—John Montgomery. Died Nov. 30.*Clerk*—Philip S. Thomas.*Assistant Clerk*—Jay T. Wilson.*Assistant Clerk*—William W. Davis.*General Foreman*—George W. Showaker.*Foreman of Repairs*—John Richards.*Yardman*—Thos. F. Kelley.*Hydrant Inspector*—Wilson Lancaster.*Hydrant Inspector*—John H. Zepp, Jr.*Watchman*—John H. Martin.**FIFTH DISTRICT OFFICE, 4377 Manayunk Avenue.***Purveyor*—H. A. Markley.*Clerk*—F. J. Cornman.*General Foreman*—W. H. Dawson.*Foreman of Repairs*—George Rittenhouse.*Hydrant Inspector*—Jos. R. Gardy.**SIXTH DISTRICT OFFICE, Town Hall, Germantown.***Purveyor*—George W. Bardens.*Clerk*—R. M. J. Livezey.*Assistant Clerk*—Godfrey Dieter.*General Foreman*—Jos. B. Fowler.*Foreman of Repairs*—John L. Cameron.*Hydrant Inspector*—Samuel Atmore.**SEVENTH DISTRICT OFFICE, Thirteenth and South Streets.***Purveyor*—Michael Young.*Clerk*—John. F. Mahaun.*Assistant Clerk*—Jas. S. Ashworth.*General Foreman*—Jas. H. Tawney.*Foreman of Repairs*—David Anderson.*Watchman*—John C. Bishop.*Watchman*—Jacob H. Boon.

Telephone Operators,

Jennie M. Hannings,

Calvin Craner.

Permit Clerk—Charles H. Russell.*Assistant Permit Clerk*—James S. Van Vranken.*Chief Inspector*—Edward Harshaw.*Inspectors,*

Wm. A. Agnew,

Lewis Obermiller,

Theo. Yeager,

Jas. Buchanan,

George Crooks,

Henry Homiller,

Wm. J. Reed, to Oct. 31.

Conrad L. Eagle,

George Hoffman,

Robert Crooks,

Harry J. Stone,

John A. Brown,

Geo. W. Eckert,

Frank Sloan,

George Spence,

Hillary Conner,

Harrison D. Bates,

Edw. Blum,

Thos. G. Morris, to Nov. 5.

Robert M. Snyder,

Chas. W. Wells.

WORKS—GENERAL*Assistant to General Superintendent*—Chas. S. Teal.*Assistant Engineer*—Fredk. Schaffhauser. To Dec. 25.*Clerk and Paymaster*—Frank Hohlfeld.*Assistant Clerk*—John B. Wright.*Foreman Machinist*—Robt. F. Halpin.*Foreman Bricklayer*—Jos. F. Ogden.*Foreman Carpenter*—Henry Guest.*Foreman Plumber*—Chas. H. Green.*Foreman Stonemason*—Michael Farrell.*Foreman Painter* { Christian Steube. From Aug. 5.
Joseph Work. To May 30.*Foreman Rigger*—Lewis Pederson.*Foreman Laborer*—Wm. Calhoun.*General Storekeeper*—Wm. J. Heydrick.*Storekeepers,*

Daniel D. Todd,

Jos. K. Johnston,

Wm. F. Glenn.

Electrician—Henry F. Morgan.*Lineman*—Edw. J. Cavanaugh.

ANNUAL REPORT
OF THE
BUREAU OF WATER
FOR THE YEAR 1906

TWENTIETH ANNUAL REPORT
OF THE
BUREAU OF WATER

ONE HUNDRED AND FIFTH ANNUAL REPORT
OF
OPERATIONS CONNECTED WITH THE CITY
WATER SUPPLY

Philadelphia, January 26, 1907.

JOHN R. HATHAWAY, Esq.,
Director, Department of Public Works.

DEAR SIR:—I have the honor to present herewith my annual report of the work performed by the Bureau of Water during the year ending December 31, 1906:

Early in the year Mr. Frank L. Hand, Chief of the Bureau, tendered his resignation, which was finally accepted on March 8. The vacancy caused by his resignation has not yet been filled, and this deficiency in the force has added

materially to the labors of the executive heads of the several branches of the Bureau, particularly to that pertaining to the management of the several pumping stations.

This branch of the service was further handicapped by the laying off of nearly all the machinists and by placing the mechanical work at four of our five large pumping stations in the hands of new and inexperienced men. Prior to this time all that was possible was done by our limited force of mechanics to maintain and improve the working condition of the engines, and considerable progress was made in this direction. The result, however, of the reduction in the number of the old and experienced mechanics soon became apparent in the deplorable state of the machinery.

In September, the work of making repairs to the engines at the several stations, with the exception of that at Frankford, was again placed in charge of this Bureau. The old mechanics were restored to duty and the new men were retained. With this additional force the work of placing the pumps in serviceable condition progressed rapidly, and the thorough overhauling of engines has been accomplished as fast as the service permitted shutting down the pumps for that purpose.

In addition to a vast quantity of minor, but important, repairs which have been made, practically ten pumping engines have been thoroughly overhauled and placed in as good condition as it is possible to have them.

The same remarks apply to the steam boilers, all of which have been cleaned and many retubed, the latter work being limited by our inability to secure tubes as fast as desirable.

The improvement in the engines and boilers has resulted in a saving in the consumption of coal to the extent of 6.075 tons, amounting to \$17,933.36, and if the pres-

ent progress can be continued, the machinery and boilers, except the engines at the Queen Lane pumping station, should be in excellent condition by the end of the current year.

The revenue collected from water rents, etc., exceeds that of the preceding year by \$230,057.17.

The revenue collected during the past four years exceeds that of the preceding four years by \$1,885,699.18.

The total pipe laid, exclusive of that put in by the Bureau of Filtration, was 33.31 miles; an excess over that of the preceding year of 3.14 miles.

During the past *four* years, the increase in the quantity of pipe laid was 21,284 feet, and the total number of service connections was 29,070; or, compared with 21,142 during the four years prior, an increase of 7,928, showing that recent building operations have increased extensively.

The total expenditures of the Bureau, for all purposes, during 1906, were \$1,995,500.42; an increase of \$153,454.05 over 1905. This excess was due principally to the advance in the cost of materials and in the price of coal, owing to the strike of the coal miners; to additional wages paid mechanics, to conform to the union rates, as authorized by ordinance of Councils; to extensive repairs made to engines and boilers, and to the laying of supply mains in Locust street, also one for the supply of Bustleton.

The water supply throughout the several distribution districts was more satisfactory than during the preceding year, except in the summer months, which period also embraced that referred to above, when the machinery lacked proper attention.

There was a decrease in the pumpage, computed from the plunger displacements, averaging about 7,000,000 gallons per day, which was partly due to the improved condition of the pumps in the early and latter part of the sea-

son, and partly to the reduction of waste of water by reason of a house-to-house inspection in West Philadelphia, made under the supervision of the Bureau of Filtration.

At the end of the year there were 77,000,000 gallons more water stored in the reservoirs than for the same period in 1905, the storage having increased from 487 million gallons in September to 1,428 million gallons in December.

The pumpage records have been considerably criticised for alleged pumpage when, as a matter of fact, the actual quantity of water discharged was much less than that stated. It is the universal practice, except in some few instances where meters or weirs are provided to measure the discharge, to compute by plunger displacement, the quantity of water pumped. In all such cases these computations are more or less erroneous, and it is impossible to determine to what extent they are inaccurate except by checking the discharge by meter or weir measurements.

Three of our stations are provided with meters, and it is found that the deficiency, or "slip," of the pumps will sometimes increase as much as 10% in a few days, depending upon the condition or quality of the pump valves, and often when such excessive "slip" occurs it is difficult to detect it without the use of a meter.

It has been found that the slippage varies, according to the condition and style of the engines, from 2% to 25%, and in one instance 65% was reported on one of the engines at the Spring Garden pumping station, but this was immediately after a freshet in the river, and it was found upon examination that the valve ports of the pump were choked with rubbish.

Until provision can be made to determine by some means other than plunger displacement the quantity of water pumped, it is considered best to continue the usual practice rather than depend upon occasional examinations,

which are reliable only for the period covering such examinations.

The average daily pumpage measured by plunger displacement was 319.8 million gallons, or about 217.8 gallons per capita.

The actual pumpage computed and checked by meter measurements, as far as this was possible, averaged 277 million gallons per day, or about 188.5 gallons per capita. This, however, is the average daily quantity pumped. The maximum consumption during periods of extreme hot and cold weather would approximate 295 million gallons per day, or about 200 gallons per capita per day.

The water supply has been adequate in all sections of the City except that below Vine street between the Delaware and Schuylkill rivers. The unsatisfactory condition in this section was due to the inability of the pumps at the Spring Garden pumping station to supply this district without the aid of the turbine pumps at Fairmount, which have to be shut down during the summer months on account of low water in the river. It is expected, however, that by next summer one or two of the mains now being laid by the Bureau of Filtration will be completed, and the deficiency in this supply can then be more than provided for by pumpage at the Lardner's Point pumping station.

Improvements Required.

A number of improvements are required for which provision should be made at the earliest date possible, the most important of which are:

Belmont Pumping Station.

Extension of engine house and three 10,000,000 gallon engines.....	\$275,000
Five steam boilers	40,000
One pumping main	95,000
	\$410,000

Belmont High Service Station.

One 5,000,000 gallon pumping engine..... \$45,000

Roxborough Pumping Station.

Two 5,000,000 gallon pumping engines
and ten steam boilers..... \$170,000
Coal shed 55,000
Electric crane 8,000

\$233,000

Roxborough High Service Station.

Extension to boiler house, two steam boilers and
one 5,000,000 gallon pumping engine..... \$75,000
Improvements and repairs to engines at the sev-
eral pumping stations 150,000.

A number of supply mains are also required. These are given below in the order of their importance:

Size.	Main in	Amount.
30-inch....	Walnut lane across Wissahickon creek.....	\$18,000
20-inch....	Oxford road from Castor road to Lelper street.....	
20-inch....	Lelper street from Oxford road to Orthodox street.....	
16-inch....	Lelper street from Orthodox to Unity street.....	38,000
16-inch....	Lackawanna from Orthodox to Foulkrod streets.....	
16-inch....	Chester ave. from Fifty-seventh to Sixtieth streets....	
16-inch....	Sixtieth street from Chester to Kingsessing aves.....	
16-inch....	Kingsessing ave from Sixtieth to Sixty-fifth streets....	
16-inch....	Sixty-fifth street from Kingsessing to Chester aves....	
16-inch....	Chester ave. from Sixty-fifth to Seventieth streets.....	42,000
20-inch....	Cherokee street from Hartwell to Al en's lane.....	
20-inch....	Wissahickon ave. from Allen's lane to Chelten ave....	77,500
16-inch....	Kensington and Oxford turnpike from Tabor road to Fifth street.....	
16-inch....	Chew street from Tulpehocken to Haines streets.....	
16-inch....	Haines street from Chew street to Limekiln turnpike..	35,800
20-inch....	Chelten ave. from Greene street to Stenton ave.....	45,500
16-inch....	Locust street from Fifty-second to Fifty-fifth streets....	
16-inch....	Locust street from Fifty-sixth to Sixty-third streets....	21,500
20-inch....	Snyder ave. from Seventeenth to Twentieth streets....	
20-inch....	Twenty-second st. from Snyder ave. to Federal street...	30,000

Revenue Collected.

The total collections during 1906 and the amounts for the several items, as compared with those of the preceding year, were as follows:

	1905.	1906
Water rents.....	\$3,264,046 28	\$3,385,343 44
Meter rents.....	272,530 30	338,567 38
Frontage.....	128,599 68	193,164 30
Amounts collected by City Solicitor.....	66,671 66	43,725 05
Penalties.....	29,176 55	37,956 75
New connections.....	15,724 00	15,193 00
Searches.....	3,306 50	3,610 90
Miscellaneous.....	10,393 29	2,944 51
Totals.....	\$3,790,447 26	\$4,020,504 43
Total collections 1905.....		3,790,447 26
Increase in collections 1906.....		\$230,057 17

Collections for the Past Four Years.

The total collections from water rents, etc., for the four years ending December 31, 1906, were.....	\$15,049,376.79
For the preceding four years, ending December 31, 1902, they were.....	13,163,677.61
Increased collections 1902-1906.....	\$1,885,699.18

Expenditures.

The expenditures for maintenance, service mains, etc., were.....	\$2,066,997.98
Expenditures for improvements and extensions	547,893.60
Total	\$2,614,891.58

Net Earnings of the Bureau of Water.

Total revenue from Water Rents, etc.:	
Total revenue from water rents, etc., from the installation of the water works, 1799, to December 31, 1906.....	\$95,253,273.08

Total Expenditures.

Total expenditures for maintenance and construction, including amounts paid for improvement, extension and filtration of the water supply, from 1799 to December 31, 1906..... \$77,143,586.10

Net Profit Earned by the Bureau of Water.

Net profit earned by the Bureau of Water from the installation of the works in 1799 to December 31, 1906..... \$18,109,686.98

In the Annual Report for 1905 there were several items of expense incurred by the Bureau of Filtration not included in the estimate of "Total Expenditures." They have been incorporated in the above statement of "Total Expenditures," and the correct balance of profits earned by the Bureau of Water is \$18,109,686.98.

Consumption.

The total consumption of water during 1906, computed from plunger displacement, was 116,732,205,859 gallons, or at an average rate of 319,814,262 gallons per day.

The average per capita consumption was 217.8 gallons, a decrease, as compared with that of 1905, of 9.4 gallons.

The following table shows the estimated average daily pumpage of water from the Delaware and Schuylkill rivers to the several distribution systems named:

Distribution Systems.	Average Daily Pumpage in Gallons.
East Park	136,409,000
Belmont	37,591,000
Queen Lane	64,787,000
Roxborough	22,183,000
Frankford	15,919,000
Total	276,889,000
Per capita	188.5

Cost of Pumpage.

The following table shows the cost of pumping 1,000,000, gallons of water 100 feet high, including all incidental expenses, at the several stations named:

Pumpage from Rivers.

Stations.	1903.	1904.	1905.	1906.
Fairmount, water power	\$2 48	\$2 78	\$2 56	\$3 28
Spring Garden, steam power	5 16	5 07	5 10	5 58
Belmont, steam power	5 40	5 04	4 48	4 91
Queen Lane, steam power	3 88	3 61	3 16	3 79
Roxborough, steam power	6 70	6 99	5 86	6 58
Frankford, No. 1, steam power..	6 93	6 19	13 08	530 75
Frankford, No. 2, steam power.....			2 75	2 90
Average cost.....	\$5 04	\$4 93	\$4 42	\$4 86

Supplemental Pumpage from Reservoirs.

Reservoirs.	1903.	1904.	1905.	1906.
Belmont High Service, steam power...	\$12 72	\$14 52	\$11 53	\$14 59
Rox. High Service, steam power	9 17	9 61	13 11	14 44
Rox. Annex, Filtration, steam power ..	8 63	13 71	14 95	13 02
Mt. Airy High Service, steam power...	221 76	296 46	471 65	746 73
Chest. Hill High Service, steam power.	1,550 65	10,091 48	3,337 42	17,557 55
Wentz Farm High Service, st'm power	216 67	180 08	34 51	30 64
Average cost,	\$15 56	\$16 99	\$17 19	\$17 88

From the above it will be seen that during the past four years the cost of pumping 1,000,000 gallons of water 100 feet high from the rivers has been reduced from \$5.04 in 1903, to \$4.86 in 1906.

There has, however, been an increase in this expense during the past year, as compared with that preceding,

amounting to 18 cents per 1,000,000 gallons. This additional cost is due to the extensive repairs, etc., as previously stated.

The high rate for Frankford Station No. 1 is due to the small quantity of water pumped at that place, it having been shut down most of the year for repairs.

During the same period the cost of pumping 1,000,000 gallons 100 feet high has increased \$2.32 at the High Service stations. This is mainly due to additional cost of repairs, but partly to the very great reduction in the quantity of water pumped at the Mt. Airy station.

Coal.

Early in the year a strike of the anthracite coal miners became imminent, and, as on a similar occasion in 1902, efforts were made to store as much coal as possible in the bins and in piles adjacent to the pumping stations. Altogether there were stored in this manner about 25,000 tons, or approximately forty-two days' supply.

Fortunately, however, an amicable settlement between the coal miners and the operators was made and the strike was averted, but not until consumers were seriously affected by difficulty in getting coal, by increased prices, and, in many cases, by suffering the additional expense of accumulating a reserve supply.

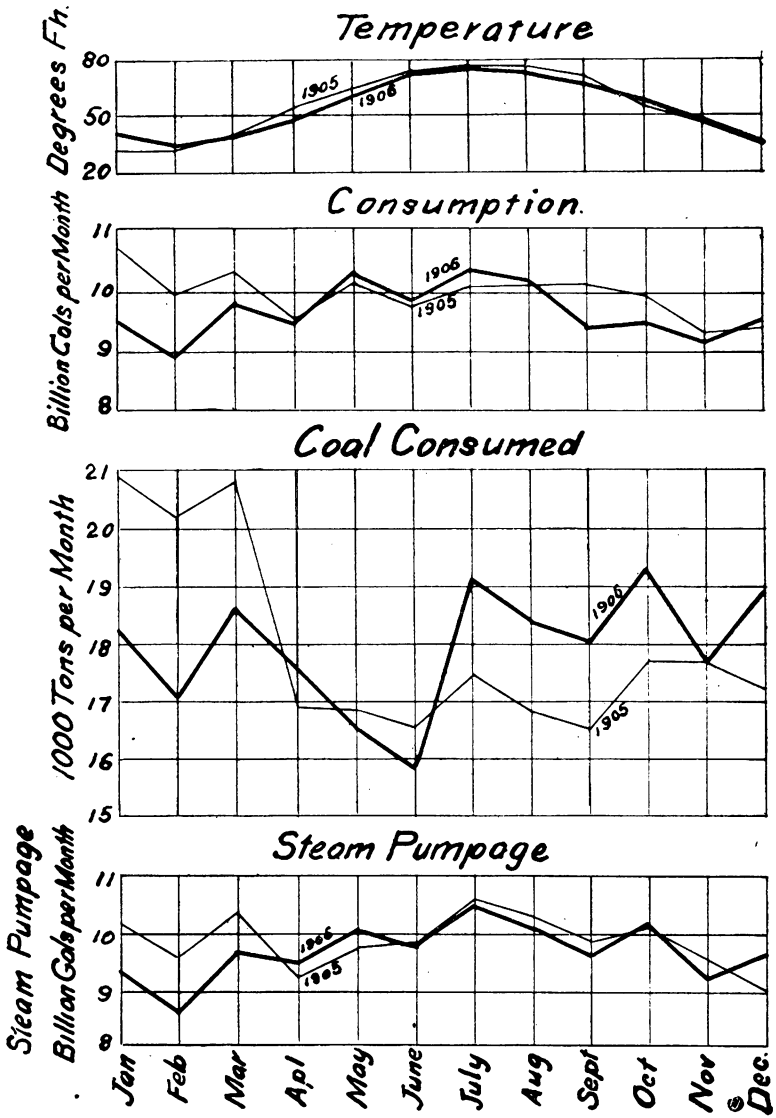
The additional expense incurred by the Bureau for extra handling and storing of coal, due to the anticipated strike, was \$34,389.28, and \$4,596.95 for increased price, making a total of \$38,986.23 additional cost of coal over and above the contract price for 1906.

Another item of expense which cannot be very accurately calculated is the inferior grade of coal often furnished, and which, on such occasions, we are either obliged to take or go without any.

The recent increased cost of coal and the important question of the quality supplied are becoming very important factors in its purchase. The method of preparing it for the market has undergone a considerable change of late, so that there is no assurance that because a fair price is paid a correspondingly good quality will be furnished.

I would, therefore, recommend that hereafter all lettings of contracts be based upon samples of the coal offered by bidders, and that all coal delivered by the successful bidder be equal to the sample, and that the quality shall be determined by tests made by the Department of Public Works; also, that for any coal that may fall below the standard (sample) in calorific value a corresponding reduction in price shall be paid, and for any coal of greater calorific value, an increased price be paid, but such increased or decreased value shall be limited so as to obtain as nearly as practicable a standard coal.

The following chart shows the pumpage from rivers by steam power and the number of tons of coal consumed in 1906, as compared with that of 1905:



Fairmount Dam.

The repairs to this structure were begun in 1904 and have now been completed. The entire surface of the top of the dam has been renewed with new timbers. Many new crib and tie logs were put in place of those found to be defective. Additional stone ballast was placed in the cribs where it had been washed out, and wherever crevices were found between the old and the new dams, which are constructed one in front of the other, broken stone and grouting were used to fill the spaces. In this manner nearly all the leakage through the dam was effectually checked.

The total cost of these repairs, covering a period from 1904 to 1906, was \$25,050.58.

Pumping Stations.

The total pumpage at the Fairmount station was 6,645,-143,684 gallons, a decrease, in 1906, of 386,849,502 gallons.

The decrease in quantity pumped at this station was due to the breaking down of Nos. 5 and 8 pumps.

In January the coupling of the runner shaft of No. 5 wheel at this station broke and badly fractured the turbine casing.

It was first considered necessary to furnish a new shaft, but upon disconnecting the two sections of the latter it was found that the flanges were not seriously injured, and the repairs were made by shrinking heavy wrought iron bands on them, and, in addition to a set of bolts as originally designed, another set of $1\frac{1}{4}$ inch bolts were used to strengthen the coupling, which is now probably stronger than when new.

The broken casing is of cast iron, and it was effectually

repaired with boiler plate fitted to and riveted on the outside.

While this work was in progress a bulkhead was constructed across the spillway and the wheel pit pumped out for the purpose of repairing the step, which ordinarily is below water, and, except in this manner, can receive attention only during periods of extremely low tide.

Minor repairs were made to the engine, and the pump is now in first-class condition.

On the evening of March 24 the beveled driving wheel in the runner shaft of No. 8 turbine broke. A new wheel was purchased, minor repairs were made, and this turbine is now in good condition.

No. 1 wheel was thoroughly overhauled and is now in good condition, as are also all the other wheels at this station.

Spring Garden Station.

The total pumpage at the Spring Garden station was 46,636,759,120 gallons, a decrease during the year of 481,736,711 gallons.

The reduction in the quantity of water pumped at this station was due, mainly, to the improved condition of the pumping engines; or, in other words, the engines are pumping nearer to their rated capacity, and less revolutions of the engines were required to meet the demands.

No. 2 engine requires two new plungers, which are now completed and ready to put in place as soon as an opportunity presents to shut down the engine for this purpose.

No. 3 engine requires a complete overhauling, and awaits the same opportunity.

Nos. 5 and 6 engines are in first-class condition; No. 7 in fair condition; No. 8 requires overhauling, which work will be begun soon; No. 9 is in good condition; No. 10 in excellent shape, and No. 11 in poor condition; but the lat-

ter is under contract to be moved to Shawmont, and is to be equipped with new pumps and be placed in first-class order.

All the boilers at the Spring Garden station were scaled as thoroughly as possible. The tubes of six of them were cut out, cleaned, "safe-ended" and replaced, thus putting these boilers in a first-class condition. A corresponding result was obtained with regard to five other boilers by retubing them with new tubes. Similar work is in progress on the balance of the boilers at this station, and the work will be pushed to completion as fast as the tubes can be obtained.

Twelve boilers at the lower house have been equipped with the Diamond Flue Blower, a device which cleans the tubes of the boiler without interrupting the service. It has proven effective and a labor and fuel saver.

A new machine shop was constructed at this station, on the site of the old one, but enlarged so as to occupy all the space between the old boiler house and the opposite retaining wall. This adds materially to the convenience of making repairs at this station.

A conveyor, for conveying coal from a siding, which was constructed for the convenient unloading of coal to be stored on the hill between these works and the Pennsylvania Railroad, was erected, to deliver coal on the storage lot and to discharge it into a coal bin now being excavated adjacent to the present coal shed.

The completion of this work will permit the storing of about twelve days' supply, instead of four, a quantity so limited that the slightest interruption of shipments of coal imperils the operation of the works.

Belmont Station.

The total pumpage at the Belmont station was 15,591,806,813 gallons, a decrease of 312,253,174 gallons, which,

as in the case at the Spring arden station, was due to the improved condition of the machinery, in addition to the house-to-house inspection in West Philadelphia for the purpose of reducing the wast of water in that section of the city. This inspection was undoubtedly effective, as is evidenced by the reduction of over 6,000,000 gallons per day during the last two months of the year. Of this reduction in the pumpage, part, as stated, is due to the improved condition of the machinery; part to reducing the pressure on the distribution system by partially closing the valves on the supply mains, and the balance to the prevention of waste by the house-to-house inspection.

Of the engines at this station, No. 1, 2, 3 and 4 were thoroughly repaired and are now in good condition. No. 6 was equipped with two new back pump chambers, and is in first-class condition. Nos. 5 and 7 are in fair condition, but will also be placed in good order early in the year.

Seven (7) tubular boilers, erected in 1881, were condemned and ordered out of service by the Chief of the Bureau of Boiler Inspection. Fortunately, ten (10) new boilers were being installed in a new boiler house, constructed south of the pumping station, by the Bureau of Filtration. These were completed and put into service in June, and have proved of great assistance in the operation of the engines at this station.

All the remaining old boilers were cleaned and scaled. The tubes of twelve of them were "rattled" to remove the scale, by means of a machine constructed for that purpose, and the tubes of three of them were removed, cleaned, safe-ended and replaced.

In order to put these boilers in first-class condition, however, it is intended to safe-end the tubes of all of those which have not been so treated, and after overhauling Nos.

5 and 7 engines, all the machinery at this station will be in first-class shape.

Queen Lane Station.

The total pumpage at the Queen Lane station was 25,776,795,840 gallons, a decrease of 530,597,650 gallons.

As has been stated in former reports, the engines at this station are erected on steel sub-structures which are so elastic that the engines and pumps are subject to excessive vibration, and, in consequence, it is almost impossible to keep them in good condition.

It is proposed, however, as soon as sufficient relief can be obtained from the new Torresdale system, to shut these pumps down one at a time, and partially reconstruct and thoroughly overhaul them.

Early in the year, while cleaning and scaling the boilers, the back tube sheets of all the boilers at this station were found to be cracked at the bottom flange, 24 to 30 inches in length. This defect was caused by lack of sufficient bracing.

The method adopted for making the repairs was to place a patch of $\frac{5}{8}$ -inch sheet steel, about 4 x 2 feet, extending under the boiler 15 inches, riveting it to the head and triple riveting it to the shell; also reinforcing with two 2½-inch rods, extending from the front to the back of the boiler.

The front heads showed signs of springing, and two Huston braces were attached to prevent any further action of this kind. To carry on this work, two, three, and even four of the boilers were shut down at one time, as they could be spared, which caused a deficiency in the steam power and less pumpage by the engines.

The work on 19 of the 24 boilers is completed. A number of boilers have been retubed, and the balance of this work will be completed at the earliest date possible.

The deficiency in the pumpage, as stated above, was mainly owing to lack of steam power.

Roxborough Station.

The total pumpage at this station was 8,897,420,905 gallons, a decrease of 773,024,060 gallons, due principally to the better condition of the pumping machinery, and partly to a slight reduction in the area supplied with water from this station.

Nos. 2 and 3 engines are in first-class condition, and Nos. 1, 4, 5, 6 and 7 in fairly good shape, but require general repairs also a number of new pump chambers to replace those which are cracked across the valve decks, caused by shrinkage strains in making the castings. The new chambers are now under contract to be made.

Three of the boilers at this station are equipped with Diamond Flue Blowers, similar to those at the Spring Garden Works.

Ninetten (19) of the boilers have been retubed, and the balance, two in number, are undergoing a like treatment.

Frankford Station.

The total pumpage at Station No. 1 was 34,854,948 gallons, and at Station No. 2, 13,149,424,549 gallons, a total of 13,184,274,497, which is apparently a decrease of about 267,000,000 gallons but most of the pumpage was pumped at the new station, No. 2, where the engines are in first-class condition, and, therefore, register less for the actual quantity pumped than was the case with the old engines during the preceding year.

The old station, No. 1, is practically shut down, and the repairs to the machinery have been, since July, under the supervision of the Bureau of Filtration, as also have been those at the new station, No. 2.

High Service Stations.

The total pumpage at the high service stations was 6,576,658,849 gallons, an increase of 692,853,484 gallons.

The increase and decrease in pumpage at the several high service stations were as follows:

Stations.	Pumpage. Gallons.	Increase. Gallons.	Decrease. Gallons.
Belmont.....	845,850,370	14,460,888	
Roxborough.....	1,089,008,620		107,823,907
Roxboro annex.....	4,380,947,000	728,788,555	
Mt. Airy.....	8,190,000		7,876,500
Chestnut hill.....	125,460		694,440
Frankford.....	302,447,399	65,998,888	
Totals.....	6,576,658,849	809,248,331	116,394,847
		116,394,847	
Increase.....		692,853,484	

The increase at Belmont is due to the increased area supplied; that at the Roxborough Annex was principally due to the Upper Roxborough supplying the Lower Roxborough reservoir; and that at Frankford, to pumping to the Oak Lane reservoir.

The decrease in the pumpage at Roxborough was probably owing to the reduced area supplied, and that at Mt. Airy and Chestnut Hill to the fact that both these stations were longer out of service than during the preceding year.

Distribution.

The total quantity of pipe laid for the distribution of water was 175,881 feet, or 26,074 feet in excess of that of 1905.

There have, however, been no additions to supply mains

with the exception of a 16-inch pipe to supply Bustleton with water, and a 12-inch main in Locust street, from 7th to 23d streets. The former is about 70% completed, and the latter nearly finished.

The total quantity of pipe now in use is 1529.6 miles, and the total number of fire hydrants, 14,582.

The total number of meters of all sizes in use is 1733, a decrease, since the year 1905, of 2 meters.

Very respectfully yours,

A. J. FULLER,
General Superintendent,
in Charge of Bureau.

Comparison of Pumpage from the Delaware and Schuyl-kill Rivers for 1905 and 1906.

	GALLONS.		GALLONS.	
	1095.	1906.	Increase.	Decrease.
Annual Pumpage:				
From rivers.....	119,483,641,811	116,782,205,859	.....	2,751,485,952
High service.....	5,883,805,365	6,576,658,849	692,853,484	
Total.....	125,367,447,176	123,308,864,708		2,058,582,468
Maximum Daily Pumpage:				
From rivers.....	379,532,502	364,001,240	.....	15,531,262
High service.....	15,190,496	18,726,490	3,535,994	
Total.....	394,722,998	382,727,730		11,995,268
Average Daily Pumpage:				
From rivers.....	327,352,443	319,814,268	.....	7,538,180
High service.....	16,120,015	18,018,243	1,898,228	
Total.....	343,472,458	337,832,506		5,639,952
Average Daily Pumpage from rivers. Per capita.	227.7	217.8	.....	9.9

*Volume and Cost of Pumpage for the Years 1896 to 1906
(Inclusive).*

Years.	Number of Gal- lons Pumped.†	Number of Gal- lons Pumped 100 Feet High.†	Cost per Million Gallons Pumped 100 Feet High.	Gallons Pumped per Capita, per Day.	Population Estimated.
1896	87,693,642,529	161,776,711,713	\$8 48	172	1,367,815
1897	95,667,466,871	187,371,927,277	8 16	185	1,385,784
1898	102,241,885,372	210,828,629,625	2 97	196	1,400,000
1899	107,091,371,604	231,813,686,728	2 90	193	1,425,848
1900	106,822,576,055	218,110,582,621	3 71	221	*1,298,697
1901	103,805,457,224	210,456,847,513	4 14	211	1,321,304
1902	116,798,424,500	239,698,545,013	4 80	232	1,349,500
1903	124,015,934,669	248,768,806,094	5 20	238	1,378,298
1904	126,181,026,489	251,214,168,044	5 11	234	1,407,690
1905	125,367,447,176	261,281,445,628	4 61	227.7	1,437,780
1906	123,308,864,708	257,269,023,542	5 06	217.8	1,468,411

*United States Census. † Including Repumpage or High Service.

*Cost of raising 1,000,000 gallons 100 feet during 1905
and 1906.*

Pumping Stations.	1905.	1906.	Increase.	Decrease.
Fairmount	\$2 56	\$3 28	\$0 72	
Spring Garden	5 10	5 58	48	
Belmont	4 48	4 91	43	
Queen Lane	8 16	8 79	63	
Roxborough	5 86	6 58	72	
Frankford No. 1	13 03	580 75	517 72	
Frankford No. 2	2 75	2 90	15	
Average	\$4 42	\$4 86	\$0 44	
High Service Stations.				
Belmont	\$11 53	\$14 59	\$3 06	
Roxborough	13 11	14 44	1 33	
Roxborough Annex	14 95	13 02	.....	\$1 93
Mt. Airy	471 65	746 73	275 08	
Chestnut Hill*	3,337 42	17,557 55	14,220 13	
Frankford	34 51	30 64	.....	\$3 87
Average	\$17 19	\$17 88	\$0 69	
Total average	\$4 61	\$5 06	\$0 45	

*This Station is practically out of service.

Comparison of the Nominal, Maximum, Minimum and Average Daily Pumpage for 1905 and 1906.

PUMPING STATIONS.	NOMINAL.		MAXIMUM.		MINIMUM.		AVERAGE.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
Fairmount.....	33,290,000	33,290,000	34,173,206	32,089,585	1,069,520	848,240	19,265,734	18,205,873
Spring Garden.....	170,000,000	170,000,000	151,922,170	148,628,200	74,127,560	70,766,320	129,091,769	127,771,948
Belmont.....	65,500,000	65,500,000	53,888,340	56,971,820	26,750,800	9,834,520	43,572,768	42,717,279
Queen Lane.....	80,000,000	80,000,000	79,274,650	78,606,550	37,086,100	39,064,900	72,075,051	70,621,359
Roxborough.....	35,500,000	35,500,000	31,761,135	30,612,660	15,637,335	5,469,300	26,494,369	24,376,406
Total from Schuylkill.....	384,290,000	384,290,000	350,419,501	346,908,315	154,691,315	125,938,280	290,499,691	283,692,950
Increase.....				3,510,686		28,708,035		6,806,741
Decrease.....								
Frankford No. 1.....	57,000,000	57,000,000	39,363,180	4,345,230	2,517,000	517,420	7,362,103	95,493
Frankford No. 2.....	60,000,000	60,000,000	42,005,830	43,333,350	1,233,585	25,851,960	29,490,649	36,025,820
Total from Delaware.....	117,000,000	117,000,000	81,369,060	47,678,580	3,751,485	26,369,380	36,852,752	36,121,313
Increase.....						22,617,895		
Decrease.....				33,690,480				731,439
Totals from Delaware and Schuylkill..	501,290,000	501,290,000	431,788,561	394,587,395	158,442,800	152,362,660	327,352,443	319,814,263
Increase.....								
Decrease.....				37,201,166		6,090,140		7,533,180

Comparison of the Nominal, Maximum, Minimum and Average Daily Pumpage, etc.—Continued.

HIGH SERVICE STATIONS.	NOMINAL.		MAXIMUM.		MINIMUM.		AVERAGE.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
Belmont.....	7,080,000	7,000,000	2,084,800	3,336,450	1,341,440	1,254,500	2,277,779	2,317,398
Roxborough.....	10,000,000	10,000,000	3,027,450	3,562,110	2,448,440	2,090,450	3,142,253	2,846,846
Roxborough Annex.....	30,000,000	30,000,000	12,050,000	17,500,000	7,180,000	7,850,000	10,005,915	12,002,594
Mt. Airy.....	3,000,000	3,000,000	1,170,000	450,000	90,000	45,000	44,018	22,438
Chestnut Hill.....	750,000	750,000	275,520	125,460	20,400	125,460	2,246	344
Frankford.....	7,000,000	7,000,000	2,864,373	1,564,200	70,020	119,960	647,804	828,623
Total High Service.....	57,750,000	57,750,000	24,122,143	26,588,220	11,151,200	11,425,370	16,120,015	18,018,243
Total daily.....	559,040,000	559,040,000	455,910,704	421,125,615	169,594,000	163,778,130	343,472,458	337,832,506
Increase.....								
Decrease.....				34,785,089		5,815,070		5,689,952

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The following appendices accompany this report:

- A. Report of Chief Clerk.
- B. Report of General Superintendent.
- C. Report of Assistant in Charge of Distribution.
- D. Report of Superintendent of Construction and Repair Shop.
- E. Report of Chief Draughtsman.

APPENDIX A

REPORT OF CHIEF CLERK

Philadelphia, January 15, 1907.

MR. A. J. FULLER,
General Superintendent,
in Charge of Bureau.

DEAR SIR:—I have the honor to transmit, herewith, a detailed statement of the expenditures of the Bureau from the appropriation made directly thereto, an itemized list of miscellaneous receipts, and a table of the revenues derived from the operations of the Bureau during the year 1906.

A statement taken from the books of the City Controller shows the amount expended for supplies by the Department created for that purpose.

Yours respectfully,

J. T. HICKMAN,

Chief Clerk.

Detailed Expenditures of the Bureau for 1906.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
An ordinance to make an appropriation to the Bureau of Water, approved Dec. 26, 1905.....	\$938,333 00			
Balance from books of 1905.....	1,135,915 07			
Increased by additional appropriations and transfers	214,879 25			
	<u>\$2,289,127 32</u>			
Diminished by transfer.....	43,404 00			
Net appropriation.....		\$2,245,723 32		
Item 1—Salaries....	\$417,533 00			
Diminished by transfer.....	25,000 00			
Net appropriation.....	392,533 00			
Chief of Bureau.....	6,000 00	\$2,500 00		
Chief clerk.....	2,000 00	2,000 00		
Assistant clerk.....	1,200 00	1,200 00		
Correspondence clerk.....	900 00	900 00		
Time clerk.....	1,000 00	1,000 00		
Messenger.....	720 00	720 00		
Draftsmen.....	7,200 00	6,555 10		
General superintendent.....	3,500 00	2,700 29		
Assistant to general superintendent.....	1,000 00	1,000 00		
Assistant engineer.....	1,000 00	1,000 00		
Clerk and paymaster.....	1,100 00	1,100 00		
Assistant clerk and paymaster.....	900 00	900 00		
Assistant clerks.....	4,550 00	4,550 00		
Assistants to chief.....	3,600 00	3,600 00		
Pipe inspector and clerk.....	2,200 00	2,200 00		
Search clerk.....	1,200 00	1,200 00		
Stop attendants.....	2,000 00	2,000 00		
Chief inspector.....	1,200 00	1,200 00		
Inspectors.....	22,000 00	21,560 59		
Permit clerks.....	2,300 00	2,300 00		
Purveyors.....	10,680 00	10,530 00		
Clerks to purveyors.....	5,600 00	5,405 32		
Assistant purveyors' clerks.....	5,250 00	5,224 73		
Hydrant inspectors.....	7,050 00	7,036 73		
General foreman.....	6,373 00	6,540 19		
For man of repairs.....	7,023 00	5,460 00		
Superintendent of shop.....	1,500 00	1,500 00		
(Clerk to superintendent of shop.....	900 00	841 94		
Watchmen, offices and yards.....	6,075 00	5,949 30		
Storekeepers.....	2,400 00	2,333 34		
Foreman machinist.....	1,800 00	1,800 00		
Foreman of shop.....	1,200 00	1,200 00		
Foreman bricklayer.....	1,400 00	1,400 00		
Foreman carpenter.....	1,100 00	1,090 00		
Foreman plumber.....	1,000 00	1,000 00		
Foreman stonemason.....	900 00	703 88		
Foreman painter.....	900 00	670 18		
Foreman rigger.....	900 00	897 58		
Foreman laborer.....	840 00	799 36		
Assistant foreman rigger.....	800 00	567 77		
Janitor, main office.....	720 00	720 00		

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 1.—Continued.				
Telephone operators	\$1,920 00	\$1,920 00		
Electrician	1,200 00	1,200 00		
General storekeeper	1,000 00	1,000 00		
Yardman, fourth district	915 00	915 00		
Lineman	1,000 00	1,000 00		
Total		\$127,307 26		
Salaries of Pumping Stations :				
Fairmount	\$12,510 00	\$12,458 54		
Spring Garden	80,620 00	76,188 40		
Belmont	33,740 00	34,090 52		
Belmont High Service	7,250 00	6,510 67		
Queen Lane	39,800 00	33,998 82		
Roxborough	37,040 00	30,645 07		
Roxborough High Service	10,440 00	10,299 62		
Mt. Airy	4,620 00	4,424 32		
Chestnut Hill	2,250 00	2,008 99		
Frankford	43,120 00	39,252 33		
Frankford High Service	8,850 00	8,514 33		
Uniforms for policemen and watchmen	1,680 00	1,640 00		
Total		\$387,123 87	\$5,409 13	
Item 2. For wages of mechanics, laborers, and other workmen employed upon repairs to machinery and the maintenance and repairs to buildings, grounds, and reservoirs, and the transportation of workmen incident there-				
to	\$175,000 00			
Increased by trans...	38,000 00			
Net appropriation	\$213,000 00			
Bricklayers		\$11,528 66		
Carpenters		10,445 53		
Helpers		6,981 72		
Horses, carts and drivers		2,786 99		
Laborers		129,794 15		
Machinists		35,248 56		
Painters		4,471 54		
Stonemasons		8,402 43		
Transportation		3,478 90		
Total		\$208,143 48	\$4,856 52	
Item 3. For wages of mechanics, drillers, laborers and other workmen connected with the repairs to, and improvement of the distribution; the laying of service mains; the transportation of workmen engaged				

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 3.—Continued.				
in repairs and the traveling expenses of pipe inspectors	\$250,000 00			
Increased by transfer	56,300 00			
	<u>\$306,300 00</u>			
Diminished by trans.	10,000 00			
Net appropriation	\$296,300 00			
Transportation		\$3,633 00		
Traveling expenses		876 69		
Wages:				
Improvement		39,929 63		
First district		25,701 36		
Second district		24,536 30		
Third district		69,593 78		
Fourth district		28,850 04		
Fifth district		19,816 10		
Sixth district		32,009 93		
Seventh district		44,558 79		
Total		\$289,505 62		\$6,794 38
Item 4. For wages of mechanics, helpers and other workmen at the city construction and repair shop				
Increased by transfer	\$32,500 00			
Net appropriation	2,000 00			
Wages	\$34,500 00			
		\$34,235 64	\$264 36	
Item 5. For wages of hydrographic corps and expenses incident thereto				
Diminished by transfer	\$1,600 00			
Net appropriation	4 00			
Wages	\$1,596 00			
		\$1,596 00		
Item 6. For repairs to boilers				
Increased by transfer	\$15,000 00			
Net appropriation	20,000 00			
	\$35,000 00			
Roxborough auxiliary		9 99		
Frankford High Service		62 00		
Bureau of filtration		84 40		
Fairmount		121 30		
Roxborough High Service		144 49		
Belmont High Service		152 00		
Store house		654 15		
Frankford		2,138 86		
Belmont		4,204 60		
Roxborough		5,318 48		
Spring Garden		9,452 06		
Queen Lane		12 514 30		
Total		\$34,856 63	\$143 37	

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 7. For hauling water pipe and machinery.....	\$5,000 00			
Increased by transfer...	2,000 00			
Net appropriation.....	\$7,000 00			
Hauling.....		\$7,000 00		
Item 8. For repairs to roofs.....	2,000 00			
Belmont.....		5 40		
Queen Lane.....		5 40		
Fairmount.....		8 78		
Seventh District.....		9 90		
Frankford High Service.....		18 90		
Chestnut Hill.....		39 15		
Second District.....		62 10		
Belmont High Service.....		147 15		
Roxborough.....		228 83		
Frankford.....		306 45		
Shop.....		370 57		
Spring Garden.....		795 82		
Total.....		\$1,998 45	\$1 55	
Item 9. For clerk hire in writing up duplicates.....	\$2,500 00			
Diminished by transfer.....	265 00			
Net appropriation.....	\$2,235 00	\$2,234 60	\$0 40	
Item 10. For keep of horse for chief of bureau, general superintendent and assistant, four hundred (400) dollars each.....	\$1,200 00			
Diminished by transfer.....	125 00			
Net appropriation.....	1,075 00	875 25	199 74	
Item 11. For advertising, postage, horseshoeing, miscellaneous expenses, repairs to wagons, carts, harness, tools, pipes, pavements, etc., ground rent of 918 Cherry st., rent of office, shop and stable, 5th district, electric current, etc.....	\$4,000 00			
Increased by transfer.....	3,000 00			
Net appropriation.....	7,000 00			
Advertising.....		250 35		
Badges (watchmen).....		9 25		
Brazing.....		16 50		
Car service.....		21 00		
Cleaning well.....		64 50		
Coke.....		20 00		
Copying bath.....		16 30		
Current (electric).....		\$11 25		
Freight.....		5 38		
Glazing.....		6 00		

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 11.—Continued.				
Ground rent.....		\$26 66		
Gum goods.....		11 25		
Hardware.....		85 80		
Hauling sick horses.....		10 00		
Hire of automobiles.....		86 00		
Horseshoeing.....		1,401 91		
Incidentals.....		26 65		
Incidentals, Hydrographic corps.....		64 12		
Maps.....		381 00		
Meals for workmen.....		467 95		
Office supplies.....		29 66		
Paper hanging.....		45 00		
Parts of meters.....		61 58		
Pasture of horses.....		21 00		
Postage stamps.....		843 80		
Professional services, V. S.....		191 25		
Printing.....		159 40		
Rebinding books, etc.....		162 20		
Rent of poles, telephone.....		6 50		
Rent of fire extinguishers.....		90 00		
Rent of stable.....		86 00		
Rent of disinfectors.....		180 00		
Rent of office and shop.....		194 00		
Repairs to and care of clocks.....		44 25		
Repairs to cutters.....		8 40		
Repairs to chairs, etc.....		145 10		
Repairs to electrical.....		40 35		
Repairs to gauges.....		28 50		
Repairs to hose.....		8 00		
Repairs to harness.....		382 93		
Repairs to telephones.....		4 75		
Repairs to pipes.....		97 42		
Repairs to scales.....		212 65		
Repairs to valves.....		8 00		
Repairs to wagons.....		1,144 00		
Serving morning papers.....		15 60		
Stabling horse.....		7 50		
Subscriptions [periodicals].....		45 00		
Transportation.....		90 00		
Use of dump.....		15 00		
Total.....		\$6,999 69	\$0 31	
Item 12. For emergen-				
cies.....	\$5,000 00			
Increased by transfer..	5,000 00			
Net appropriation.....	\$10,000 00			
Brass castings.....		\$365 85		
Coal car bodies.....		130 00		
Coal conveyor.....		2,414 00		
Copper heater pipe.....		898 59		
Flue blowers.....		2,700 00		
Freight.....		115 36		
Furnishing meals for workmen.....		10 50		
Horse shoeing.....		21 80		
Packing.....		155 00		
Printing.....		74 80		
Postage stamps.....		40 00		
Repairs to steam pipes.....		176 98		

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 12.—Continued.				
Repairs to sidings.....		\$384 41		
Repairs to pumps.....		1,882 20		
Supporting tracks.....		327 26		
Valve reseating outfit.....		825 00		
Wagon repairs.....		54 95		
Total.....		\$9,816 70	\$188 80	
Item 13. For hauling ashes from Spring Garden, Queen Lane and Belmont				
Pumping Stations	\$10,000 00			
Diminished by trans	510 00			
Net appropriation.....	\$9,490 00			
Queen Lane.....		\$2,000 00		
Belmont.....		2,490 00		
Spring Garden.....		5,000 00		
Total.....		\$9,490 00		
Item 14. For the purchase of material connected with the repairs to machinery, mains, buildings and sidings.				
Increased by additional appropriation.....	\$2,500 00			
.....	21,000 00			
Net appropriation.....	\$23,500 00			
Asphalt.....		\$50 00		
Bags.....		10 00		
Bevel gear.....		88 00		
Boiler materials.....		2,032 38		
Brass castings.....		5,261 26		
Brass fittings.....		635 11		
Brazing.....		95 20		
Canvass.....		7 50		
Chipper.....		4 00		
Connecting rod.....		1,055 00		
Copper pipe.....		19 55		
Crank shaft.....		680 00		
Electrical materials.....		29 50		
Galvanized cornice.....		49 00		
Gasket.....		2 98		
Hardware.....		272 34		
Iron fittings.....		1,677 61		
Iron castings.....		87 67		
Lumber.....		2,040 27		
Machine work.....		147 11		
Meter material.....		227 08		
Oil.....		2 50		
Packing.....		87 50		
Plunger rod.....		156 97		
Recharging filter.....		4 00		
Rolled brass.....		184 81		

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated,	Amount expended,	Amount merging.	Amount not merging.
Spars.....		\$35 60		
Steam jets.....		5 50		
Steel forgings.....		89 80		
Steel rods.....		120 11		
Wheels for tool box.....		32 50		
Total.....		\$15,030 25		\$8,469 75
Item 15. For the erection of a building and fence for Seventh district.....	\$7,500 00.			
Diminished by transfer	7,500 00			
Item 16. For labor, etc., in laying Water Main supply to Bustleton.....	\$7,000 00			
Excavating pipe trench.....		\$4,109 75		2,890 25
Item 17. For the improvement, extension and filtration of the water supply.				
Balance Jan. 1, 1906.....	16,788 50			
Electric plant Belmont filters		2,807 62		
Pumps and boilers.....		12,182 81		
Wages Bureau of Water.....		1,729 86		
Total.....		\$16,719 29		\$69 30
Item 18. For Filtration.				
Balance Jan. 1, 1906.....	305,107 99			
Fence, Torresdale Filters.....		5,580 25		
Inspection.....		510 50		
Oak Lane Reservoir.....		53,000 00		
Pumping engines, Frankford		86,201 12		
Pumping station, Torresdale		52,394 49		
Wages, Bureau of Water.....		2,778 01		
Total.....		\$200,414 37		\$104,693 62
Item 19. For the completion of the high pressure fire service.				
Balance January 1, 1906.....	\$617 37			\$617 37
Item 20. Furnishing and laying mains for filtered water.				
Balance January 1, 1906.....	318,558 85			
Iron castings.....		\$858 55		
Reparing over mains.....		18,789 48		
Steel pipe.....		215,097 30		
Stop valves.....		2,685 26		
Total.....		\$237,430 59		\$81,123 26

Detailed Expenditures of the Bureau.—Continued.

General Appropriation.	Amount appropriated.	Amount expended.	Amount merging.	Amount not merging.
Item 21. For repairs to Fairmount Dam.				
Balance January 1, 1906.....	\$5,504 77	\$3,697 80	\$1,806 97	
Item 22. For emergencies.				
Balance January 1, 1906.....	2320 00			
Pump chambers.....		2820 00		
Item 23. For sand, etc., for filtration purposes.				
Balance January 1, 1906.....	286,522 50			
Filtering material.....		93,329 35		\$193,193 15
Item 24. For sand for filtration purposes, Torresdale beds.				
Balance January 1, 1906.....	200,000 00			200,000 00
Item 25. For repairs to pumping engines.				
Appropriation May 22, 1906..	66,811 26			
Wages.....		7,780 88		59,021 38
Item 26. To pay John Balzley Iron Works for repairing boiler during the year 1905.				
Appropriated May 22, 1906...	767 99	767 99		

*Statement of the Amount Expended by the Department of
Supplies for this Bureau, During the Year 1906.*

Taken from the Books of the City Controller.	Amount appropriated.	Amount expended.	Amount merging.	
Item 16. For stationery, engineer supplies, etc.....	\$7,000 00	\$5,594 74	\$1,405 26	
Item 17. For coal	684,296 00	679,585 62	4,760 38	
Item 18. For oil, lubricants, paints, etc	10,100 00	7,851 76	2,248 24	
Item 19. For iron water pipe, lead, etc	118,800 00	111,897 71	1,902 29	
Item 20. For hardware, bolts, castings, etc	34,000 00	33,619 87	380 68	
Item 21. For gum goods and packing	20,600 00	19,021 81	1,578 19	
Item 22. For chandlery	5,000 00	3,921 29	1,078 71	
Item 23. For wrought iron pipe and fittings	6,000 00	4,688 14	1,311 86	
Item 24. For fire brick and clay..	1,500 00	1,488 07	16 93	
Item 25. For brass fittings and castings	15,000 00	13,384 53	1,615 47	
Item 26. For covering for boilers and pipes	600 00	447 54	152 46	
Item 27. For lumber	17,000 00	16,120 63	879 87	
Item 28. For forage	6,500 00	6,381 39	118 61	
Item 29. For iron and steel.....	8,000 00	2,999 80	20	
Item 30. For cement, bricks, lime, sand, etc	6,500 00	4,749 67	1,750 33	
Item 31. For electrical supplies..	2,000 00	1,466 27	533 73	
Item 32. For granite curb and coping				
Item 33. For tapping and pipe cutting machines	4,000 00	3,330 10	169 90	
Item 34. For horses, wagons, har- ness, etc	3,000 00	2,382 85	117 15	
Item 35. For donkey pumps, ma- chine tools, etc	1,700 00	1,212 60	487 40	
Item 36. For special articles	3,000 00	2,954 53	45 47	
Item 37. For lead pipe, block tin, etc	7,000 00	6,569 33	430 17	
Item 38. For mains for Bustleton	38,000 00	36,795 56		\$1,204 44
	\$989,596 00	\$967,408 81	\$20,982 75	\$1,204 44

Recapitulation.

Balance from books of 1905.....	\$1,135,915 07		
Additional by transfer.....	214,879 25		
Annual appropriation.....	938,338 00		
Appropriation to the Department of Supplies for Bureau of Water.....	989,596 00		\$3,278,723 82
Expended for deficiency.....	5767 99		
Expended for filtration.....	547,898 60		
Expended for maintenance.....	1,027,323 62		
Expended for supplies.....	967,408 81	\$2,543,894 02	
Amount merging.....	12,865 65		
Amount merging, Department of Supplies.....	20,982 75		
Transferred.....	43,404 00		
Amount not merging.....	656,872 46		
Amount not merging, Department of Supplies.....	1,204 44	735,329 30	3,278,723 82

Receipts from Operations of the Bureau of Water as Reported by the Receiver of Taxes.

1906.	WATER RENTS BY SCHEDULE ON EXISTING CONNECTIONS.		On New Connections.	By Meter, Current and Delinquent.	PENALTIES.		Charges for Ferrules on New Connections.	Fees for Searches.	Frontage Paid to Receiver of Taxes.	Miscellaneous.	Liens.	Interest.	Collected by City Solicitor.	Totals.
	Current.	Delinquent.			Current.	Delinquent.								
January.....		\$8,454 50	\$3,765 85	\$11,282 39	.....	\$538 67	\$918 00	\$272 25	\$11,627 06	\$111 21	\$10 00	\$13 06	\$4,607 55	\$36,601 44
February.....	\$213,384 20	1,679 00	7,060 77	57,761 70	.....	246 91	1,168 00	264 25	20,762 23	169 15	14 00	387 27	2,415 90	805,313 38
March.....	279,906 56	8,565 60	12,901 64	25,902 64	.....	1,271 95	1,772 00	338 00	17,458 38	101 80	15 00	16 12	3,759 18	352,098 87
April.....	318,367 75	8,336 55	11,792 18	13,403 72	.....	1,249 77	1,329 00	317 75	19,724 57	138 97	47 00	101 50	4,099 95	378,908 71
May.....	2,079,545 09	2,905 50	12,551 91	49,032 88	.....	434 66	1,711 00	341 50	16,484 40	294 74	24 00	227 83	2,771 61	2,166,325 72
June.....	72,053 75	2,442 50	10,048 40	32,659 69	\$3,358 21	330 93	1,595 00	349 50	19,250 03	67 54	31 00	555 79	4,235 68	146,978 07
July.....	40,133 85	1,027 50	9,619 57	7,850 91	2,035 90	163 68	1,506 00	283 75	14,422 50	434 17	15 00	26 03	3,000 87	80,609 73
August.....	100,077 90	677 50	10,429 57	40,888 90	5,056 55	104 64	903 00	243 75	16,351 71	263 62	14 00	14 98	2,668 34	117,694 46
September....	27,533 35	671 00	4,304 08	29,103 08	3,852 64	100 21	919 00	259 00	11,103 83	441 59	13 00	28 77	2,305 45	80,635 00
October.....	77,316 45	684 50	4,481 99	8,477 80	11,443 97	103 94	1,443 00	357 75	19,971 68	395 01	13 00	27 42	3,712 05	128,428 56
November....	21,302 35	545 50	2,854 38	30,356 20	3,230 83	83 93	857 00	299 25	15,827 29	148 72	8 00	17 88	5,031 85	81,063 18
December....	28,310 05	714 50	5,277 05	31,847 47	4,240 00	109 31	982 00	283 25	10,179 72	377 99	31 00	127 19	3,337 78	85,847 31
1906.....	\$3,258,551 90	\$31,704 15	\$95,037 39	\$338,567 38	\$33,218 10	\$4,738 65	\$15,193 00	\$3,610 00	\$193,164 30	\$2,944 51	\$235 00	\$1,543 84	\$41,946 21	\$4,020,504 43
1905.....	3,162,683 85	39,664 70	61,698 23	272,530 30	23,320 34	5,856 21	15,724 00	3,306 50	128,599 68	10,392 29	.....	.....	66,671 66	3,790,447 26
Increase.....	\$95,868 55		\$33,339 16	\$66,037 08	\$9,897 76			\$303 50	\$64,564 62		\$235 00	\$1,543 84		\$230,057 17
Decrease.....		\$7,960 55				\$1,117 56	\$531 00			\$7,447 78				\$24,725 45

List of Miscellaneous Receipts for the Year 1906.

Jan.	4	U. G. I. Co.....	Fixing main.....	\$1 37
	22	Phila. Rapid Transit Co.	Moving pipe.....	30 54
	22	Phila. Rapid Transit Co.	Shifting 6-in. stop.....	25 32
	23	Phila. Rapid Transit Co.	Shifting 6 in. stop.....	22 64
	24	Phila. Rapid Transit Co.	Shifting 6-in. stop.....	25 87
	29	Richard Bennis.....	Shutting off water... ..	5 47
Feb.	23	Phila. Rapid Transit Co.	12-in. Public Building main.....	27 00
	23	Phila. Rapid Transit Co.	Cutting 12-inch Public Building main.....	31 25
	23	Phila. Rapid Transit Co.	12-inch Public Building main.....	102 88
	24	Jno. F. McNichol.....	Repairing private pipe..	8 02
Mar.	2	Rex Manufacturing Co.	Changing location of No. 1 F. H.....	27 77
	5	D. J. McNichol.....	Cutting 6-in. pipe.....	23 51
	6	Foerderer Mft'g Co ...	Removing screw and stop box	6 00
	16	D. M. Smart.....	Shutting off and re- driving ferrule.....	2 81
	16	D. M. Smart.....	Drawing ferrule.....	1 61
	26	U. G. I. Co.....	Cutting off 4-in. connec- tion	14 83
	26	U. G. I. Co.....	4-in. connection.....	25 27
Apr.	9	Bureau of Water.....	Overdrawn warrant....	9 68
	19	D. McMahon.....	Break in main.....	10 44
	19	D. McMahon.....	Break in main.....	18 92
	19	D. McMahon.....	Break in main.....	9 60
	19	D. McMahon.....	Break in main.....	11- 85
	19	D. McMahon.....	Break in main.....	15 04
	19	D. McMahon.....	Break in main.....	13 24
	19	D. McMahon.....	Break in main.....	13 22
	19	D. McMahon.....	Break in main.....	26 07
	20	Phila. Rapid Transit Co.	Raising valves and re- pairs 6-in. stop.....	4 10
	24	Boon and Sample.....	Drawing ferrules.....	1 38
	26	John Ford.....	3-in stop... ..	5 43
May	3	Estate Robt. Foerderer.	Two fish traps.....	36 00
	5	Holmesburg Water Co.	No 2 fire hydrant...?..	67 00
	9	Edison Electric Co.....	Locating leak in 6-inch main.....	68 00
	12	Bell Telephone Co.....	Main	11 93
	17	Burnham, Williams & Co.	Putting in main.....	15 73

List of Miscellaneous Receipts.—Continued.

May 16	U. G. I. Co.....	Cutting out main.....	\$24 26
17	Richardson & Ross.....	Break in 6-in. main.....	13 40
21	Phila. Rapid Transit Co.	6-in. stop.....	27 85
21	Phila. Rapid Transit Co.	Moving 10-in. pipe.....	30 57
June 1	David McMahon.....	Repairing 6-in. pipe.....	12 20
2	Midvale Steel Co.....	Testing Gem Meter.....	2 00
2	A. M. Finkbone.....	Removing fire hydrant..	11 76
18	Richardson & Ross..	Taking up 6-in. main....	16 25
18	J. T. Jackson & Co	Private stop box.....	6 13
20	Phila. Transit Co.....	Moving 6 in. stop.....	25 20
July 3	Holmesburg Water Co..	Material delivered.....	14 60
14	J. H. Jackson & Co....	Repairing break in 6-in. pipe.....	15 15
28	Phila. R. R. Co.....	Relaying main.....	400 49
30	Surpass Leather Co....	Repairing 4-in. stop....	3 93
Aug. 3	J. H. Loucheim.....	Relaying 10 in. pipe....	73 62
3	Robert Higgins.....	No. 2 fire hydrants.....	2 60
3	Robert Higgins.....	Shutting down 8-inch main.....	3 50
3	Robert Higgins.....	Repairing 6 in. pipe....	12 46
20	Phila. Rapid Transit Co.	6-in. stop.....	19 96
20	Phila. Rapid Transit Co.	Moving 12-in. stop.....	32 57
20	Phila. Rapid Transit Co.	Moving 6-in. stop.....	23 25
20	Phila. Rapid Transit Co.	Moving 6-in. stop.....	26 47
20	Phila. Rapid Transit Co	Locating 6-in. stop.....	22 81
20	Phila. Rapid Transit Co.	Removing 6-in. stop....	27 98
27	Joseph Perna.....	Drawing ferrules.....	15 62
28	John Stafford.....	Testing Gem Meter.....	2 00
29	Robert Higgins.....	Drawing ½-in. ferrule....	78
Sept. 5	Phila. Rapid Transit Co.	Removing 6 in. stop....	19 78
5	Phila. Rapid Transit Co.	Changing location of fire hydrant.....	46 90
5	Holmesburg Water Co..	Material furnished.....	73 20
5	Phila. Rapid Transit Co.	Moving 6-in. pipe.....	40 55
11	U. G. I. Co.....	Repairing fire hydrant..	6 10
13	Joseph Perna.....	Drawing ½-in. ferrule....	3 74
14	Burnham, Williams & Co.	Removing fire hydrant..	96 24
15	Wm. McKeon.....	Drawing Ferrule.....	3 12
20	Otto Gas Engine Co	Removing 4-in. stop....	28 18
20	Phila. Rapid Transit Co.	Changing location of 6-in. stop.....	46 52
20	Phila. Rapid Transit Co.	Changing location of No. 2 fire hydrant....	66 32

List of Miscellaneous Receipts.—Continued.

Sept. 20	Phila. Rapid Transit Co. Repairing 10-in. main...	\$40 63
20	Phila. Rapid Transit Co. Removing No. 1 fire hydrant.....	9 10
27	Phila. Rapid Transit Co. Moving 6-in. pipe.....	15 22
27	Phila. Rapid Transit Co. Changing location of 6-in. pipe.....	43 13
Oct. 10	Phila. Rapid Transit Co. 6-in. pipe.....	41 47
11	Burnham, Williams & Co. Repairing 3-in. Smith valve.....	9 50
16	David McMahon..... Rai ing 6-in. pipe.....	53 98
22	Phila. Rapid Transit Co. Cutting 12-in. main....	22 43
26	Phila. Rapid Transit Co. Removing 6-in. fire connection.....	37 39
26	Phila. Rapid Transit Co. Relaying 10-in. main....	125 96
29	Peoples Bros..... Removing No. 1 fire hydrant.....	8 04
Nov. 1	Phila. Rapid Transit Co. Relaying 6-in. pip....	18 20
1	Phila. Rapid Transit Co. Shifting No. 2 fire hydrant.....	50 24
2	Penna. R. R..... Shifting No. 2 fire hydrant.....	48 71
7	U. G. I. Co..... Cutting service supply pipe.....	7 52
13	Phila. Rapid Transit Co. Repairing 6-in. main...	9 60
30	Phila. Rapid Transit Co. Moving 20-in. main....	2 25
26	Phila. Ra id Transit Co. Repairing 6-in. fire hydrant.....	2 20
Dec. 1	Bureau of Water..... Overdrawn warrant....	36 52
6	Phila. Rapid Transit Co. 30-in. pipe.....	23 25
6	Phila. Rapid Transit Co. Relaying 10-in. pipe....	48 16
6	Phila. Rapid Transit Co. Relaying 6-in. pipe....	34 49
24	Phila. Rapid Transit Co. Cutting out.....	20 04
24	Phila. Rapid Transit Co. Raising 10-in. pipe.....	120 96
26	Phila. Rapid Transit Co. Re, airing 6-in. main....	14 79
27	J. & J. Dobson..... Repairing private fire connection.....	9 60
27	Hutchinson Baking Co. Shifting fire hydrant....	15 38
29	E. Prentz..... Cutting off 4-in. supply.	11 45
29	Phila. Electric Co..... Removing fire hydrant.	43 35
	Total.....	\$2,944 51

APPENDIX B



REPORT

OF THE

GENERAL SUPERINTENDENT

SUBMITTING

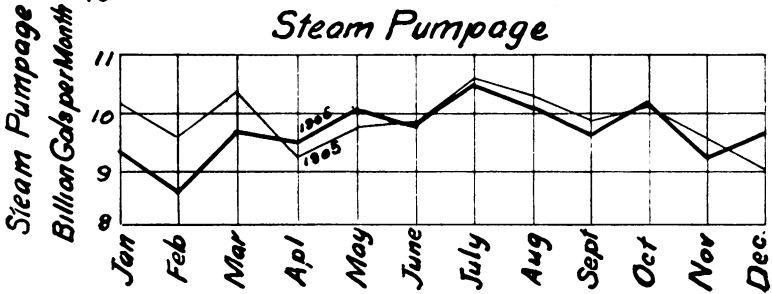
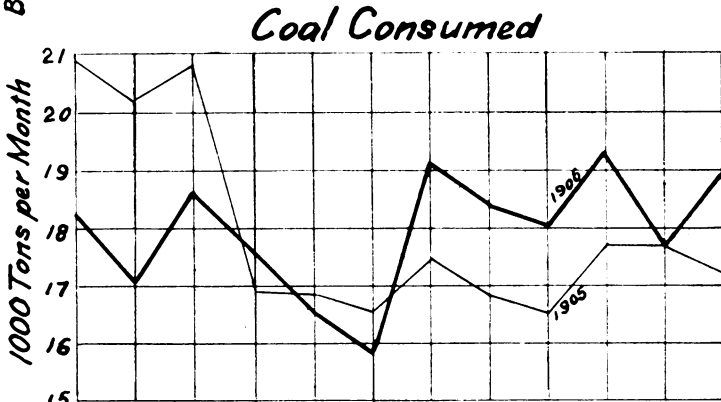
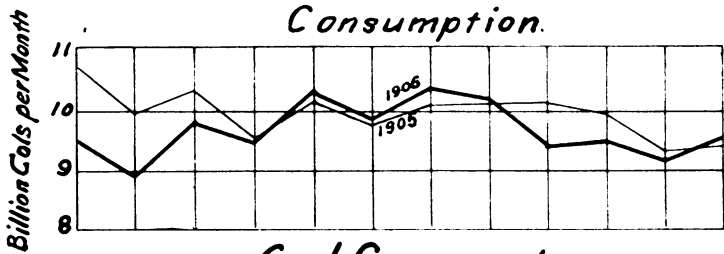
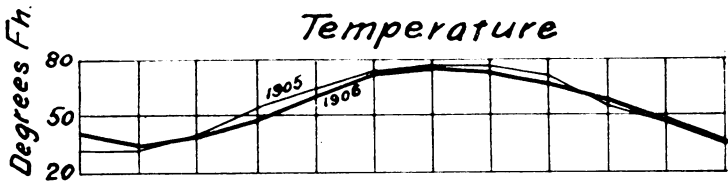
TABLES OF EXPENSES, PUMPAGE AND CONSUMPTION OF WATER DURING 1906

Philadelphia, January, 1907.

MR. J. R. HATHAWAY,
Director, Department of Public Works.

DEAR SIR:—I have the honor to submit the following report of operations and expenses in connection with the work performed at the several pumping stations during 1906.

Respectfully yours,
A. J. FULLER,
General Superintendent.



Coal Consumed During 1906.

Pumping Stations.	Classifica- tion.	Tons.	Price per ton.	Cost.	Total Cost.
Spring Garden.....	Pea.	45,952	\$2 98	\$184,639 36	
Spring Garden.....	Bituminous.	3,427	3 15	10,795 05	
Spring Garden.....	Bituminous.	17,712	2 97	52,604 64	\$198,039 05
Belmont.....	Pea.	88,307	2 90	111,090 30	111,090 30
Queen Lane.....	Pea.	45,162	3 18	143,615 16	
Queen Lane.....	Bituminous.	2,282	3 15	7,125 30	
Queen Lane.....	Bituminous.	1,700	2 97	5,049 00	155,789 46
Roxborough.....	Pea.	33,054	2 98	96,848 22	
Roxborough.....	Bituminous.	6,119	2 97	18,133 43	115,021 65
Frankford, No. 1.....	Pea.	936	2 89	2,705 04	2,705 04
Frankford, No. 2.....	Pea.	4,747	2 89	13,718 83	
Frankford, No. 2.....	Bituminous.	8,677	2 97	25,770 69	39,489 52
Totals and averages.....		208,055	\$2 99		\$622,135 02
HIGH SERVICE STA- TIONS					
Belmont.....	Pea.	1,687	\$3 70	\$6,241 90	\$6,241 90
Roxborough.....	Pea.	1,247	3 40	4,239 80	4,239 80
Roxborough Annex.....	Pea.	3,476	3 40	11,818 40	11,818 40
Mt. Airy.....	Pea.	258	3 20	825 60	825 60
Chestnut Hill.....	Pea.	98	3 20	313 60	313 60
Frankford.....	Pea.	657	3 40	2,233 80	2,233 80
Totals and averages.....		7,423	\$3 46		\$25,673 10
Grand total.....		215,478	\$3 01		\$647,808 12
Increase for 1906.....			\$ 01		
Decrease for 1906.....		6,075			\$17,933 76

No. 1—Worthington Duplex. Capacity,
2,000,000 gallons per day.

BELMONT HIGH SERVICE STATION, 1906

No. 2—Worthington High Service.
Capacity, 5,000,000 gallons per day.

Total capacity, 7,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.		GALLONS PUMPED BY EACH ENGINE.		TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE PER SQUARE INCH LESS MEAN PRESSURE IN SUCTION PIPE.		Gallons Raised 100 Feet per Pound of Coal.
	Months.	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.		Lbs.	Qts.	Qts.	No. 1.		No. 2.
January	8	736	567,875	73,662,505	74,229,970	2,394,515	143	960	25	186	.....	73	73	330.44
February .....	.....	672	.....	65,719,665	65,719,665	2,347,180	140	1,920	25	252	.....	.....	73	297.86
March .....	.....	743	.....	69,616,700	69,616,700	2,245,709	127	1,670	25	279	98	.....	73	347.90
April	49	671	3,123,900	67,706,935	70,920,855	3,064,028	137	1,875	25	270	10	73	73	328.47
May .....	.....	744	.....	78,236,650	78,236,650	2,523,762	141	530	25	186	15	.....	73	353.63
June	4	672	267,000	77,633,450	77,900,450	2,506,681	130	30	25	225	22	73	73	382.51
July	4	740	267,000	84,618,065	84,885,065	2,738,227	129	1,515	25	186	23	73	73	417.89
August .....	.....	744	.....	82,403,495	82,403,495	2,658,177	174	1,800	25	195	23	.....	73	300.94
September	8	712	533,000	74,811,670	75,344,670	2,511,489	151	710	25	180	22	73	73	312.67
October	67	677	4,489,450	65,664,450	70,153,900	2,263,029	146	1,480	25	124	15	73	73	305.37
November	8	712	333,750	49,449,200	49,782,950	1,659,431	120	215	25	120	14	60	60	299.12
December .....	.....	740	.....	46,656,000	46,656,000	1,505,682	143	670	25	124	22	.....	60	164.25
Totals and averages.	148	8,563	9,581,475	886,208,895	845,850,370	2,317,398	1,686	1,175	25	2,327	259	71	71	312.59

No. 1—Worthington Duplex.
Capacity, 5,000,000 gallons
per day.

ROXBOROUGH HIGH SERVICE STATION,
1906.

Total capacity, 10,000,000 gallons per day.

No. 2—Worthington High Duty
Duplex. Capacity, 5,000,000
gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.		GALLONS PUMPED BY EACH ENGINE.		TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE PER SQUARE INCH LESS MEAN PRESSURE IN SUCTION PIPE.		Gallons Raised 100 feet per Pound of Coal.
	Months.	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.		Lbs.	Cylinder.	Engine.	No. 1.		No. 2.
January.....	9	735	1,446,390	74,608,386	76,054,776	2,453,579	96	80	25	186	23	56	56	413.88
February.....	10	645	1,645,580	72,658,365	74,303,945	2,653,712	86	880	25	168	21	56	56	451.15
March.....	5	738	1,089,990	80,663,689	81,753,679	2,687,215	101	1,850	25	186	46	56	56	421.12
April.....	15	705	2,244,040	78,034,755	80,278,795	2,675,959	87	1,900	25	150	22	56	56	479.36
May.....	7	736	1,413,720	89,242,610	90,656,330	2,924,397	112	1,270	25	155	23	56	56	422.45
June.....	39	681	6,278,566	85,191,085	91,469,651	3,048,987	114	520	25	135	22	56	56	420.03
July.....	15	729	2,569,050	90,815,335	93,384,385	3,012,309	111	160	25	139	23	56	56	439.61
August.....	11	732	1,808,730	91,248,900	93,057,630	3,001,850	104	1,240	25	139	23	56	56	424.18
September.....	10	709	1,559,250	89,704,395	91,263,645	3,042,121	106	1,610	25	135	22	56	56	448.63
October.....	5	739	983,070	92,055,125	93,038,195	3,001,332	108	280	25	139	23	56	56	451.36
November.....	2	718	249,480	86,463,700	86,713,180	2,890,439	104	1,740	25	135	22	56	56	434.12
December.....	50	694	7,451,730	79,672,715	87,124,445	2,810,465	113	680	25	130	24	56	56	403.36
Totals and Averages.	178	8,561	28,739,610	1,010,359,010	1,039,098,620	2,846,846	1,247	1,010	25	1,306	294	56	56	434.10

No. 1—Davidson Rotary. Capacity,
1,000,000 gallons per day.
No. 2—Davidson Rotary. Capacity,
1,000,000 gallons per day.

MT. AIRY PUMPING STATION, 1906.

Total capacity, 3,000,000 gallons per day.

No. 3—Knowles Rotary. Capacity,
1,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.			GALLONS PUMPED BY EACH ENGINE.			TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		PERCENTAGE OF ASHES.	OILS.		MEAN WATER PRESSURE PER SQUARE INCH LESS MEAN PRESSURE IN SUCTION PIPE.			Gallons Raised 100 Feet per Pound of Coal.
	Months.	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	Gallons.	Gallons.	Tons.		Lbs.	Cylinder.	Engine.	No. 1.	No. 2.		No. 3.
January.....	9	7	.....	405,000	815,000	.....	720,000	23,225	24	1,240	25	3	2	50	50	.....	11.75
February.....	18	9	.....	810,000	405,000	.....	1,215,000	43,312	23	480	25	5	2	50	50	.....	20.98
March.....	12	10	.....	680,000	405,000	.....	1,085,000	33,387	23	480	25	8	2	50	50	.....	17.87
April.....	9	14	.....	405,000	680,000	.....	1,085,000	34,500	24	240	25	3	2	50	50	.....	17.21
May.....	12	10	.....	450,000	860,000	.....	810,000	26,129	28	1,280	25	8	2	50	50	.....	11.37
June.....	6	4	.....	270,000	180,000	.....	450,000	15,000	25	500	25	4	1	50	50	.....	7.15
July.....	8	6	.....	860,000	270,000	.....	680,000	20,822	22	1,220	25	5	2	50	50	.....	11.20
August.....	8	5	.....	860,000	225,000	.....	585,000	18,870	21	1,960	25	6	3	50	50	.....	10.72
September.....	2	4	.....	90,000	180,000	.....	270,000	9,000	20	200	25	3	2	54	54	.....	5.94
October.....	6	6	.....	270,000	270,000	.....	540,000	17,419	20	1,700	25	6	3	50	50	.....	10.43
November.....	6	6	.....	270,000	270,000	.....	540,000	18,000	13	1,080	25	4	2	54	54	.....	8.85
December.....	4	6	.....	180,000	180,000	.....	360,000	11,612	10	500	25	3	1	54	54	.....	15.56
Totals and averages...	100	87	.....	4,500,000	3,690,000	.....	8,190,000	22,488	257	1,920	25	58	24	51	51	.....	12.42

No. 1—Knowles. Capacity, 250,000 gallons per day.

CHESTNUT HILL PUMPING STATION, 1906

No. 2—Worthington Duplex. Capacity, 500,000 gallons per day.

Total capacity, 750,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.		GALLONS PUMPED BY EACH ENGINE.		TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE PER SQUARE INCH LESS MEAN PRESSURE IN SUCTION PIPE.		Gallons Raised 100 Feet per Pound of Coal.
										CYLINDER.	ENGINE.			
										Qts.	Qts.			
Months.	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 1.	No. 2.	
January.....							8	1,230	25					
February.....							8	145	25					
March.....							8	1,225	25					
April.....							8	170	25					
May.....							8	680	25					
June.....							8	80	25					
July.....							8	680	25					
August.....		3		125,460	125,460	4,047	8	380	25		1		50	740
September.....							8	80	25					
October.....							8	650	25					
November.....							8	80	25					
December.....							8	680	25					
Totals and averages.....		3		125,460	125,460	344	98	1,080	25		1		50	62

No. 1—Holly Rotary Duplex. Capacity,
3,000,000 gallons per day.

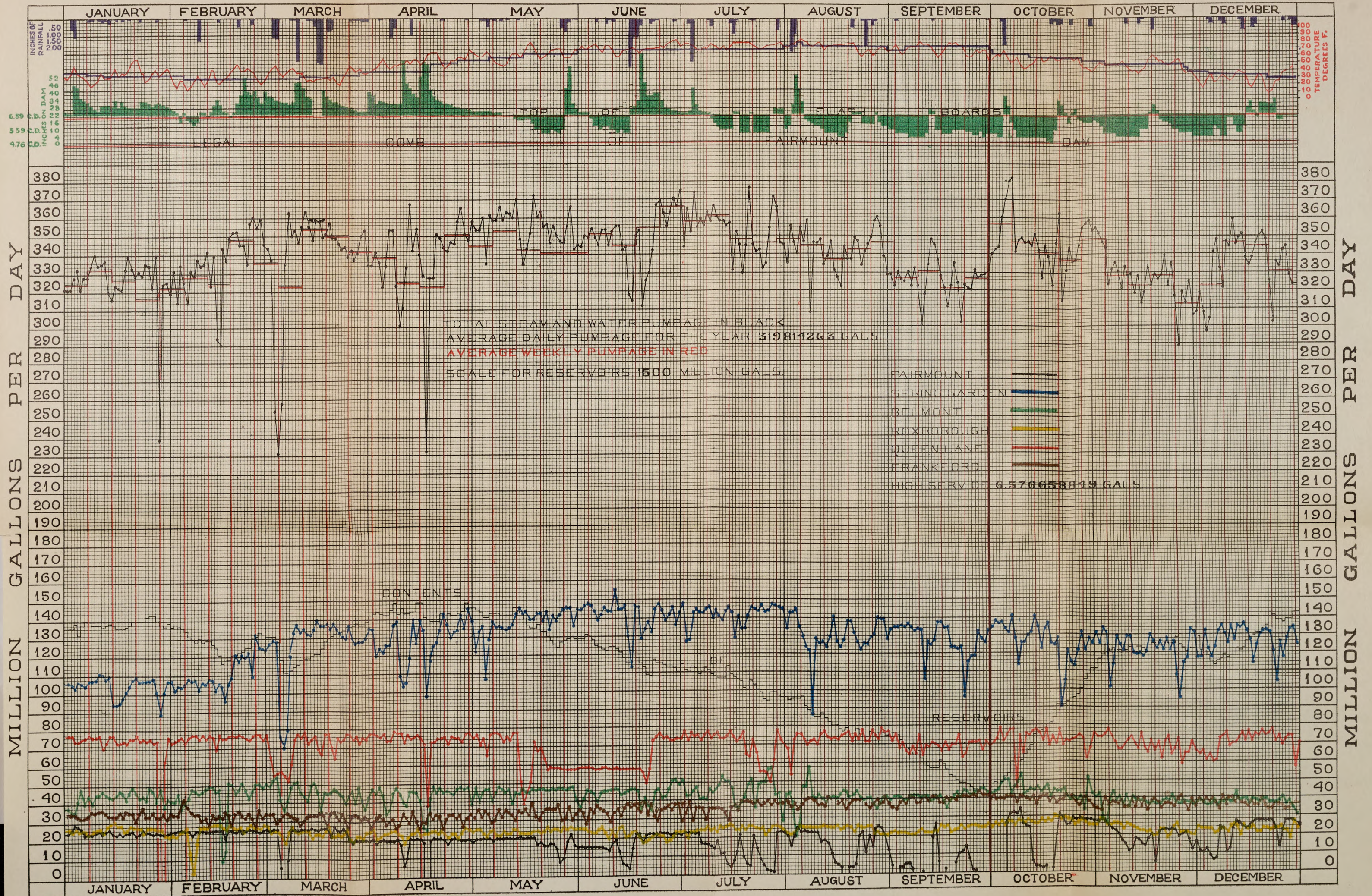
**FRANKFORD HIGH SERVICE
STATION, 1906.**

No. 2—D'Auria Horizontal Compound.
Capacity, 4,000,000 gallons per day.

Total capacity, 7,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.		GALLONS PUMPED BY EACH ENGINE.		TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE PER SQUARE INCH LESS MEAN PRESSURE IN SUCTION PIPE.		Gallons Raised 100 Feet High per Pound of Coal
	Months.	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.		Lbs.	CYLINDER.	ENGINE.	No. 1.		No. 2.
										Qts.	Qts.			
January.....	349	20	15,219,413	1,454,310	16,673,723	537,862	46	1,440	25	40	42	71	71	224.58
February.....	318	20	12,567,538	1,382,940	13,950,478	498,231	44	1,185	25	39	40	71	71	196.79
March.....	345	18	15,155,907	1,264,740	16,420,647	520,698	50	605	25	30	50	71	71	205.17
April.....	308	23	13,467,260	1,607,520	15,074,780	502,492	41	250	25	44	41	71	71	230.32
May.....	344	18	14,925,075	1,395,340	16,320,415	526,465	35	275	25	34	46	71	71	291.87
June.....	396	15	17,247,825	1,099,260	18,347,112	611,570	35	1,370	25	31	51	71	71	323.61
July.....	473	13	22,074,905	886,500	22,961,395	740,690	41	2,195	25	39	64	71	71	343.56
August.....	735	7	43,546,249	989,334	44,535,583	1,436,631	73	245	25	79	106	71	71	388.74
September.....	690		39,341,261		39,341,261	1,311,375	69	820	25	56	98	71		356.24
October.....	730		36,443,059		36,443,059	1,175,582	75	1,685	25	67	96	71		302.18
November.....	506		25,611,913		25,611,913	853,730	52	1,630	25	58	76	71		305.11
December.....	722		36,767,038		36,767,038	1,186,033	90	645	25	74	100	71		260.73
Totals and averages.	5,916	134	292,367,455	10,079,944	302,447,399	328,623	656	1,145	25	586	810	71	71	280.74

PUMPAGE DIAGRAM FOR THE YEAR 1906



CURRENT EXPENSES AND WORK OF THE PUMPING STATIONS FOR THE YEAR 1906.

PUMPING STATIONS.	Pay of Employees at the Stations.	COAL CONSUMED.			LUBRICANTS.			LIGHTING.		Repairs to Boilers and Machinery.	Repairs to Buildings and Grounds.	Miscellaneous Supplies and Small Stores.	Total Expenses.	Total Gallons Pumped.	Lift in Feet, Including Suction and Friction.	Gallons Pumped 100 Feet High, Suction and Friction Included.	Cost of Raising 1,000,000 Gallons One Hundred Feet.	Percentage of Work Done at Each Station.
		Tons.	Average Price per Ton.	Total Cost.	Oils, Gallons.	Grease, Pounds.	Cost.	Oil.	Electricity.									
Fairmount.....	\$17,818 64				738	\$80	\$121 13	\$18 16		\$6,422 43	\$2,358 34	\$539 46	\$27,278 16	6,645,148,684	125.0	3,306,429,605	\$3 28	3.229
Spring Garden.....	112,187 24	67,091	\$2 95	\$198,039 05	7,753	5,540	1,461 30	88 96	\$1,783 67	43,945 72	15,866 90	10,139 72	383,462 56	46,636,759,120	147.3	68,695,946,188	5 58	26.702
Belmont.....	55,282 21	33,307	2 90	111,090 30	6,147	140	1,061 17	66 21	1,609 08	32,640 65	3,701 03	5,646 87	211,157 52	15,591,806,813	275.8	43,002,208,190	4 91	16.715
Queen Lane.....	66,211 56	49,124	3 17	155,789 46	5,726	8,105	1,183 98	43 97	1,732 06	35,016 99	1,655 96	7,359 40	268,993 38	25,776,795,840	274.9	70,860,411,764	3 79	27.543
Roxborough.....	55,534 15	39,173	2 94	115,021 65	3,987	3,171	799 11	31 40	1,708 89	26,416 96	13,643 59	5,386 80	218,542 55	8,397,420,905	372.9	33,178,482,554	6 58	12.896
Frankford, No. 1.....	23,186 51	936	2 89	2,705 04	111		17 44	18 30	270 74	7,116 23	2,888 46	469 21	36,621 73	34,854,948	197.9	68,977,945	530 75	.027
Frankford, No. 2.....	36,345 49	13,424	2 94	39,489 52	3,528		570 36	36 61	1,421 92	3,612 57	466 75	2,665 70	84,608 92	13,149,424,549	221.7	29,152,274,225	2 90	11.331
Totals and averages.....	\$366,515 60	208,055	\$2 99	\$622,135 02	27,990	17,345	\$5,214 49	\$303 61	\$8,586 36	\$155,171 55	\$40,531 03	\$32,207 16	\$1,230,664 82	116,732,205,859	217.0	253,264,725,466	\$4 86	98.443
High Service Stations.																		
Belmont.....	\$8,193 00	1,687	\$3 70	\$6,241 90	646	381	\$133 87	\$17 16		\$1,603 94	\$293 95	\$543 72	\$17,027 54	845,850,370	138.0	1,167,273,510	\$14 59	.454
Roxborough.....	11,384 21	1,247	3 40	4,239 80	525		97 19	4 02		929 33	278 83	700 12	17,633 50	1,039,098,620	117.5	1,220,940,878	14 44	.475
Roxborough Annex.....	3,066 63	3,476	3 40	11,818 40	614		260 38		\$28 75	89 67	51 22	86 09	15,401 14	4,380,947,000	27.0	1,182,855,690	13 02	.459
Mt. Airy.....	4,820 82	255	3 20	825 60	21		3 67	3 10		106 96	92 25	121 45	5,973 85	8,190,000	92.1	7,542,990	746 73	.003
Chestnut Hill.....	2,068 99	98	3 20	313 60	1		12	11 92		1 85	74 49	73 74	2,484 71	125,460	112.8	141,518	17,557 55	.001
Frankford.....	8,768 58	657	3 40	2,233 80	349		53 84	12 53	515 07	880 49	192 00	398 28	13,054 59	302,447,399	140.7	425,543,490	30 64	.165
Totals and Averages.....	\$38,242 23	7,423	\$3 46	\$25,673 10	2,156	381	\$549 07	\$43 73	\$543 82	\$3,612 24	\$982 74	\$1,923 40	\$71,575 33	6,576,658,849	60.9	4,004,298,076	\$17 88	1.557
Grand Totals and Averages, 1906.....	\$404,757 83	215,478	\$3 01	\$647,808 12	30,146	17,726	5,763 56	\$352 34	\$9,130 18	\$158,783 79	\$41,513 77	\$34,130 56	\$1,302,240 15	123,308,864,708	208.6	257,269,023,542	\$5 06	100.000
Increase during 1906.....	\$21,010 86		\$0 01		2,525	3,282	608 20			\$47,593 63		\$6,075 27	\$97,611 94		.2		\$0 45	
Decrease during 1906.....		6,075		\$1,933 76				\$30 21	\$1,225 72					2,058,582,468		4,012,422,086		

TOTAL GALLONS PUMPED AND CONSUMED DURING 1906.

Months.	PUMPAGE.								CONSUMPTION.			SUPPLEMENTARY PUMPAGE.								Total Pumpage and Supplementary Pumpage.	Average Total Pumpage per Day.	Percentage of Pumpage.	Total Steam Pumpage.	Total Water Pumpage.			
	Fairmount.	Spring Garden.	Belmont.	Queen Lane.	Roxborough.	Frankford.	Total.	Average per Day.	Stored in Reservoirs at end of each Month.	Total.	Average per Day.	Belmont.	Roxborough.	Roxborough Annex.	Mt. Airy.	Chestnut Hill.	Frankford.	Total.	Average Daily.								
December, 1905.....									1,351,485,980												10,073,113,391	324,989,141	.0817	9,295,340,028	777,773,363		
January, 1906.....	777,773,363	3,247,093,840	1,385,221,434	2,269,881,030	808,207,655	1,086,692,600	9,574,869,922	308,866,771	1,381,139,946	9,545,215,956	307,910,192	74,229,970	76,054,776	330,565,000	720,000	.....	16,673,723	498,243,467	16,072,369	10,073,113,391	324,989,141	.0761	8,684,770,084	708,580,186		
February.....	708,580,186	3,110,034,730	1,260,507,006	2,145,647,050	703,853,255	961,456,960	8,890,079,187	317,502,828	1,327,477,132	8,943,742,001	319,419,357	65,719,665	74,303,945	348,082,000	1,215,000	.....	13,950,473	503,271,083	17,973,967	9,393,350,270	335,476,795	.0846	9,736,325,132	695,418,206		
March.....	695,418,206	3,943,365,710	1,406,629,200	2,103,101,200	724,714,500	1,018,764,496	9,894,393,312	319,193,333	1,391,428,385	9,831,042,059	317,130,389	69,616,700	81,753,679	367,924,000	1,035,000	.....	16,420,647	536,750,026	17,314,517	10,431,743,338	336,507,850	.0817	9,526,478,970	548,120,772		
April.....	548,120,772	3,854,982,480	1,293,997,225	2,230,237,000	689,139,395	956,588,840	9,573,036,312	319,101,210	1,486,175,081	9,478,280,616	315,942,987	70,920,855	80,278,795	334,254,000	1,035,000	.....	15,074,780	501,563,430	16,718,781	10,074,599,742	335,819,991	.0867	10,117,663,335	574,227,822		
May.....	574,227,822	4,293,324,540	1,414,287,380	2,026,939,920	743,712,850	1,073,129,250	10,127,621,762	326,697,476	1,296,912,528	10,316,884,315	332,802,719	78,236,650	90,656,330	378,246,000	810,000	.....	16,320,415	564,269,395	18,202,238	10,691,891,157	344,899,714	.0858	9,816,058,354	517,930,795		
June.....	517,930,795	4,248,813,880	1,311,140,924	1,886,147,850	671,938,145	1,073,527,378	9,709,498,972	323,649,965	1,101,133,963	9,905,277,537	330,175,917	77,900,450	91,469,615	436,323,000	450,000	.....	18,347,112	624,490,177	20,816,339	10,333,989,149	344,466,304	.0891	10,557,355,364	423,507,199		
July.....	423,507,199	4,402,290,340	1,391,061,280	2,197,264,300	761,501,085	1,141,246,514	10,316,879,718	332,802,571	974,630,309	10,443,383,372	336,883,334	84,885,065	93,384,385	462,122,000	630,000	.....	22,961,395	663,982,845	21,418,801	10,980,862,563	354,221,373	.0864	10,147,483,393	500,690,327		
August.....	500,690,327	4,050,049,630	1,250,027,560	2,233,482,610	754,391,225	1,208,756,200	10,047,397,552	324,109,598	755,793,623	10,266,234,238	331,168,846	82,403,495	93,057,630	380,069,000	585,000	.....	39,341,261	600,776,168	19,379,876	10,648,173,720	343,489,475	.0794	9,656,551,515	128,498,544		
September.....	128,498,544	3,853,337,580	1,224,401,780	2,100,956,430	707,736,890	1,196,373,259	9,211,304,483	307,043,483	487,172,990	9,479,925,116	315,997,504	75,344,670	91,263,645	367,526,000	270,000	.....	36,443,059	573,745,576	19,124,852	9,785,050,059	326,168,335	.0869	10,187,873,426	532,866,946		
October.....	532,866,946	3,949,707,190	1,364,645,572	2,244,822,450	870,761,360	1,230,525,700	10,193,329,218	328,817,071	1,114,739,738	9,565,762,470	308,572,983	70,153,900	93,038,195	327,236,000	540,000	.....	25,611,913	482,946,043	16,098,201	9,838,880,165	327,962,672	.0798	9,252,149,660	586,730,505		
November.....	586,730,505	3,715,782,810	1,129,202,402	2,093,228,750	728,904,105	1,102,085,550	9,355,934,122	311,864,471	1,222,914,921	9,247,758,939	308,255,297	49,732,950	86,713,180	320,298,000	540,000	.....	36,767,038	499,209,483	16,103,532	10,336,470,782	333,434,541	.0838	9,685,671,763	650,799,019		
December.....	650,799,019	3,967,967,390	1,160,685,050	2,192,087,250	732,559,840	1,133,162,750	9,337,261,299	317,331,009	1,423,194,786	9,631,981,434	310,709,078	46,656,000	87,124,448	328,302,000	360,000
Totals.....	6,645,143,684	46,636,759,120	15,591,806,813	25,776,795,840	8,897,420,905	13,184,279,497	116,732,205,859	319,314,263	.....	116,655,497,053	319,604,102	845,850,370	1,039,098,620	4,380,947,000	8,190,000	125,460	302,447,399	6,576,658,849	18,018,243	123,308,864,708	337,332,506	100.00	116,663,721,024	6,645,143,684		
Increase during 1906.....									14,460,888	728,788,555	65,998,888	692,853,484	1,898,228	
Decrease during 1906.....	386,849,502	481,736,711	312,253,174	530,597,650	773,024,060	266,974,855	2,751,435,952	7,538,180	.....	2,564,545,356	7,026,151	.....	107,823,907	7,876,500	694,440	.....	.....	.....	.....	2,058,582,468	5,639,952	.....	1,672,732,966	386,849,502

Jonval Turbine No. 1—Capacity 2,000,000 gallons per day.
 Jonval Turbine No. 3—Capacity 5,330,000 gallons per day.
 Jonval Turbine No. 4—Capacity 5,330,000 gallons per day.
 Jonval Turbine No. 5—Capacity 5,330,000 gallons per day.

FAIRMOUNT PUMPING STATION, 1906.

Total Capacity 33,290,000 gallons per day.

Jonval Turbine No. 7—Capacity 5,100,000 gallons per day.
 Jonval Turbine No. 8—Capacity 5,100,000 gallons per day.
 Jonval Turbine No. 9—Capacity 5,100,000 gallons per day.

1906.	RUNNING TIME OF EACH TURBINE IN HOURS.							GALLONS PUMPED BY EACH TURBINE.									Total Pumpage of each month.	Average Pumpage per day.	OILS.	
	MONTHS.		No. 1.	No. 3.	No. 4.	No. 5.	No. 7.	No. 8.	No. 9.	No. 1.	No. 3.	No. 4.	No. 5.	No. 7.	No. 8.	No. 9.			Gallons.	Gallons.	Cylinder.	Engine.
January.....	323	494	742	76	742	742	742	28,169,388	115,913,262	164,089,923	164,089,962	152,558,250	152,862,650	147,748,928	777,773,363	25,089,463	91	224		
February.....		660	664		664	666	666		143,344,785	146,827,366			137,029,930	139,883,985	140,894,120	708,580,186	25,306,435	67	212	
March.....	132	601	686		686	515	686	11,388,416	131,352,685	143,445,229			146,395,250	110,297,951	147,038,675	695,418,206	22,432,845	60	240	
April.....	10	585	662		666		666	840,560	127,099,260	146,826,766			137,552,675		136,001,511	548,120,772	18,270,692	72	232	
May.....		608	732		744	127	538		133,162,894	160,191,105			148,762,395	21,006,075	111,105,353	574,227,822	18,523,478	115	208	
June.....	371	562	666		643		471	29,915,052	119,738,453	142,193,525			123,599,985		102,483,780	517,930,795	17,264,359	106	203	
July.....	382	399	588		413		508	30,404,914	87,723,690	126,351,809			82,502,430		96,524,356	423,307,199	13,661,522	79	82	
August.....	352	373	623	132	552		577	30,159,336	85,904,123	139,472,763	24,525,205			108,902,099	500,690,327	16,151,300	117	118		
September.....	68	36	123	121	184	57	111	5,697,920	7,471,436	27,549,146	23,847,039		37,337,385	8,815,686	17,779,932	128,498,544	4,283,284	55	58	
October.....	276	376	531	434	435	412	189	31,868,464	82,267,677	116,917,039	93,554,771		89,637,375	81,506,750	37,114,370	532,866,946	17,189,256	68	148	
November.....	305	444	697	579	633	296	16	25,630,476	95,135,414	148,947,947	126,273,488		126,480,280	59,634,900	4,628,000	586,730,505	19,557,683	76	144	
December.....	306	487	655	584	686		290	25,950,203	106,235,780	142,342,140	129,483,541		140,101,415		106,685,940	650,799,019	20,938,516	24	156	
Total.....	2,525	5,625	7,372	1,926	7,043	2,815	5,460	220,024,729	1,236,349,459	1,610,154,758	414,115,006	1,433,484,671	574,007,997	1,157,007,064	6,645,143,684	13,205,873	330	2,025		

No. 5—Southwark Vertical Compound. Capacity, 20,000,000 gallons per day.
 No. 6—Simpson Rotary Compound. Capacity, 10,000,000 gallons per day.
 No. 7—Cramp Marine Rotary Compound. Capacity, 20,000,000 gallons per day.
 No. 8—Worthington Duplex Compound. Capacity, 10,000,000 gallons per day.
 No. 11—Gaskill Compound. Capacity, 20,000,000 gallons per day.

SPRING GARDEN PUMPING STATION, 1906.

Total capacity, 17,000,000 gallons per day.

No. 2—Holly Vertical Triple Expansion. Capacity, 30,000,000 gallons per day.
 No. 3—Holly Vertical Triple Expansion. Capacity, 30,000,000 gallons per day.
 No. 9—Worthington Duplex Expansion. Capacity, 15,000,000 gallons per day.
 No. 10—Worthington Duplex Expansion. Capacity, 15,000,000 gallons per day.

1906.	* RUNNING TIME OF EACH ENGINE IN HOURS.										GALLONS PUMPED BY EACH ENGINE.								TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE AND MEAN SUCTION LIFT IN POUNDS PER SQUARE INCH.										Gallons Raised 100 Feet per Pound of Coal.
	OLD HOUSE.					NEW HOUSE.					OLD HOUSE.					NEW HOUSE.					Tons.	Lbs.		Cylinder.	Engine.	OLD HOUSE.					NEW HOUSE.					
	No. 5.	No. 6.	No. 7.	No. 8.	No. 11.	No. 2.	No. 3.	No. 9.	No. 10.	No. 5.	No. 6.	No. 7.	No. 8.	No. 11.	No. 2.	No. 3.	No. 9.	No. 10.								Gallons.	Gallons.	No. 5.	No. 6.	No. 7.	No. 8.	No. 11.	No. 2.	No. 3.	No. 9.		No. 10.
January.....	64	739	677	732	.....	695	727	719	.....	53,659,500	266,290,000	488,969,600	330,550,200	.....	770,962,500	821,415,000	515,247,040	.....	3,247,093,840	104,744,962	5,407	1,054	25	1,234	1,017	54	45	54	76	.....	52	52	61	.....	399.43
February.....	211	667	657	626	59	631	667	688	.....	185,007,000	240,310,000	487,064,300	286,028,400	43,176,000	668,325,000	710,010,000	485,114,030	.....	3,110,034,730	111,072,668	5,124	2,011	25	1,209	1,014	54	45	54	76	54	56	52	57	.....	403.81
March.....	715	735	692	686	184	541	652	367	581	605,647,400	264,690,000	485,338,300	307,480,400	150,528,000	566,968,000	676,220,200	464,836,720	421,656,690	3,943,365,710	127,205,345	6,166	421	25	1,612	1,309	54	45	54	68	54	55	52	78	56	441.19	
April.....	391	34	699	647	675	653	663	653	701	325,252,300	12,045,000	507,943,400	295,366,400	548,039,288	589,050,000	664,835,000	440,171,090	472,280,002	3,854,982,480	128,499,416	5,801	1,597	25	1,012	782	54	45	54	70	45	60	52	76	56	413.85	
May.....	347	.....	730	732	710	664	715	734	735	384,234,000	.....	523,479,100	340,384,400	580,207,000	714,670,000	748,445,000	497,611,270	499,593,870	4,293,324,540	138,494,340	5,152	2,069	25	1,640	1,316	54	.....	54	71	49	59	52	70	56	566.58
June.....	440	.....	683	684	706	595	686	701	712	446,748,500	.....	495,584,700	322,508,400	560,024,000	728,700,000	734,735,000	492,120,940	468,392,340	4,248,813,880	141,627,129	5,385	2,236	25	1,605	1,266	54	.....	49	63	49	60	52	65	56	526.19
July.....	591	.....	734	679	640	684	740	703	737	496,632,100	.....	529,307,600	330,112,400	525,221,500	716,172,090	774,375,000	524,697,600	505,731,050	4,402,299,340	142,009,656	6,240	2,165	25	1,686	1,314	54	.....	54	45	54	55	52	56	60	456.38
August.....	616	42	697	724	623	452	708	716	712	506,343,800	15,780,000	491,671,200	338,716,800	491,384,000	454,682,550	718,412,850	581,282,570	501,775,860	4,050,049,630	130,646,762	5,920	905	25	1,642	1,296	54	45	45	66	54	53	52	56	61	445.39	
September.....	560	651	690	624	55	629	682	597	703	452,653,400	233,980,000	509,672,300	316,279,000	44,324,000	650,309,300	696,993,350	440,994,365	508,131,865	3,853,337,580	128,444,586	5,427	1,263	25	1,675	1,276	54	45	45	66	45	60	52	56	56	459.19	
October.....	486	703	703	721	14	645	651	618	603	413,199,400	264,388,200	506,017,800	339,723,000	11,736,000	704,427,900	679,959,940	514,919,580	515,335,370	3,949,707,190	127,409,909	5,723	388	25	1,740	1,064	54	45	45	66	45	58	52	56	56	445.22	
November.....	304	602	713	685	188	673	649	623	708	243,153,800	221,505,000	513,460,600	331,160,800	119,392,400	690,623,500	682,243,000	436,794,150	472,449,560	3,715,782,810	123,859,427	5,237	787	25	1,332	823	54	45	45	71	45	58	52	56	56	456.89	
December.....	.....	726	726	699	557	689	718	624	730	.....	262,185,000	524,211,400	341,023,800	454,609,150	715,750,200	750,056,000	440,047,110	480,084,730	3,967,967,390	127,988,948	5,502	1,253	25	1,447	701	.....	45	45	75	45	60	52	56	72	438.95
Totals and averages.....	4,725	4,899	8,401	8,239	4,411	7,561	8,258	7,743	6,922	4,117,531,500	1,781,173,200	6,067,420,300	3,379,333,600	3,533,641,338	7,970,641,040	8,657,700,340	5,783,836,465	4,845,481,337	46,636,759,120	127,771,943	67,091	469	25	1,734	13,178	54	45	50	68	49	57	52	62	58	454.42	

No. 1—Worthington Duplex. Capacity, 4,500,000 gallons per day.
 No. 2—Worthington Duplex. Capacity, 4,500,000 gallons per day.
 No. 3—Worthington Duplex. Capacity, 6,500,000 gallons per day.
 No. 4—Worthington Duplex. Capacity, 20,000,000 gallons per day.

BELMONT PUMPING STATION, 1906.

Total capacity, 65,500,000 gallons.

No. 5—Holly Rotary Duplex, Horizontal Compound. Capacity, 10,000,000 gallons per day.
 No. 6—Holly Rotary Duplex, Horizontal Compound. Capacity, 10,000,000 gallons per day.
 No. 7—Holly Rotary Duplex, Horizontal Compound. Capacity, 10,000,000 gallons per day.

1906.	RUNNING TIME OF ENGINE IN HOURS.							GALLONS PUMPED BY EACH ENGINE.							TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE AND MEAN SUCTION LIFTS IN POUNDS PER SQUARE INCH.							Gallons Raised 100 Feet per Pound of Coal.
																				CYLINDER.	ENGINE.								
	Months.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.			No. 7.	Gallons.		Gallons.	Tons.	Lbs.	Qts.	Qts.	No. 1.	No. 2.	No. 3.	No. 4.		No. 5.	No. 6.	No. 7.
January	169	121	80	553	715	711	737	30,417,460	21,480,000	21,765,450	405,380,400	298,502,124	290,033,220	308,633,180	1,385,221,434	44,684,562	3,265	1,525	25	1,346	388	98	94	115	102	115	115	115	527.24
February	30	149	83	589	619	600	584	5,584,120	27,913,740	22,627,500	443,973,750	257,029,396	255,813,220	247,565,280	1,260,507,006	45,018,107	2,966	1,540	25	1,194	358	99	103	115	94	115	115	513.86	
March	73	179	135	656	615	672	698	13,169,700	33,849,750	34,343,200	508,574,950	254,502,640	276,395,660	285,793,300	1,406,629,200	45,375,135	3,261	1,947	25	1,321	1,234	91	103	103	103	115	115	115	537.85
April	11	19	28	619	687	668	666	1,912,810	3,340,840	7,554,500	496,820,175	267,147,760	261,700,080	255,521,060	1,293,997,225	43,133,240	2,959	915	25	1,278	1,059	115	91	103	103	115	115	115	569.63
May	8	7	38	700	707	722	707	1,510,080	1,415,700	10,374,000	571,395,000	272,724,800	285,052,220	271,815,580	1,414,287,380	45,622,173	2,947	935	25	1,148	885	91	91	91	91	115	115	115	569.63
June	30	79	76	634	667	661	601	5,657,010	14,590,440	20,041,650	521,956,500	260,761,744	262,645,680	225,487,900	1,311,140,924	43,704,697	2,778	205	25	1,261	749	91	91	103	103	115	115	115	582.22
July	284	502	617	589	697	154	715	51,884,150	85,440,200	170,328,330	439,479,120	276,772,516	53,291,484	313,865,480	1,391,061,280	44,772,944	3,893	1,525	25	1,722	649	103	103	103	103	115	115	115	434.10
August	220	645	653	119	689	691	689	37,890,000	124,348,410	187,283,550	87,022,250	274,648,710	262,735,000	276,099,640	1,250,027,560	40,323,469	3,398	1,977	25	1,669	583	103	103	103	103	115	115	115	457.41
September	244	713	708	.....	663	703	714	42,781,620	139,305,580	203,193,000	.....	266,333,180	281,895,480	290,392,920	1,224,401,780	40,813,392	3,265	575	25	1,716	575	91	91	91	.....	115	115	115	453.33
October	24	118	429	650	720	681	428	13,038,040	21,541,700	116,897,750	478,990,500	282,655,952	275,596,120	175,925,510	1,364,645,572	44,020,824	3,413	435	25	1,541	519	110	110	110	110	115	115	115	491.94
November	12	75	132	604	547	557	459	2,091,122	12,077,900	35,486,250	444,564,000	215,946,520	230,112,490	188,924,120	1,129,202,402	37,640,080	2,905	458	25	1,230	384	110	110	110	110	110	110	110	441.05
December	93	52	8	699	559	418	530	15,592,570	9,888,490	1,972,750	545,091,400	217,839,420	160,493,320	209,806,600	1,160,685,050	37,441,453	3,251	1,165	25	1,073	717	110	110	110	110	110	110	110	441.05
Totals and averages.	1,198	2,659	2,087	6,412	7,885	7,238	7,528	221,528,682	495,702,350	831,867,930	4,943,248,045	3,144,864,762	2,904,764,474	3,049,830,570	15,591,806,813	42,717,279	38,306	2,002	25	16,499	8,100	101	100	105	103	114	114	114	508.86

No. 1—Southwark Vertical Triple Expansion. Capacity
20,000,000 gallons per day.

No. 2—Southwark Vertical Triple Expansion. Capacity
20,000,000 gallons per day.

QUEEN LANE PUMPING STATION, 1906.

Total capacity 80,000,000 gallons per day.

No. 3—Southwark Vertical Triple Expansion. Capacity
20,000,000 gallons per day.

No. 4—Southwark Vertical Triple Expansion. Capacity
20,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.				GALLONS PUMPED BY EACH ENGINE.				TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of Ashes.	OILS.		Mean Water Pressure and Mean Suction Lift in Lbs. per square inch.				Gallons raised 100 feet per Pound of Coal.
	Months.	No. 1.	No. 2.	No. 3.	No. 4.	No. 1.	No. 2.	No. 3.			No. 4.	Gallons.		Gallons.	Tons.	Lbs.	Cylinder.	Engine.	No. 1.		No. 2.	No. 3.	No. 4.
January.....	691	701	701	700	570,181,480	549,894,050	574,928,400	574,927,100	2,269,881,030	73,221,968	4,370	2,200	25	594	832	105	105	105	105	637.34
February.....	661	655	659	663	541,816,600	514,123,250	544,028,900	545,678,300	2,145,647,050	76,630,251	4,080	2,100	25	560	784	105	105	105	105	653.30
March.....	695	708	689	581	490,231,850	547,484,200	599,248,200	479,186,950	2,106,101,200	67,938,748	4,104	.....	25	548	832	105	105	105	105	629.68
April.....	661	700	706	686	536,663,300	548,519,950	572,866,700	572,187,050	2,230,237,000	74,341,233	4,084	.....	25	1,152	1,160	105	105	105	105	669.85
May.....	488	610	704	725	195,209,726	580,793,350	575,762,600	675,174,244	2,026,939,920	65,385,158	3,355	1,400	25	1,001	888	105	105	105	105	741.30
June.....	449	590	583	698	373,079,550	462,929,950	481,404,700	568,733,650	1,886,147,850	62,871,595	3,120	1,600	25	900	720	105	105	105	105	741.74
July.....	682	586	730	707	557,782,200	479,301,550	586,625,700	573,554,850	2,197,264,300	70,879,493	4,003	880	25	930	744	105	105	105	105	673.57
August.....	684	726	718	693	556,081,850	576,387,330	591,069,550	559,943,880	2,233,482,610	73,660,729	4,173	1,080	25	930	744	105	105	105	105	671.47
September.....	579	642	679	665	480,093,500	469,464,700	550,992,550	600,405,680	2,100,956,430	70,031,881	4,404	1,240	25	1,215	1,031	105	105	105	105	584.38
October.....	679	700	715	684	555,970,550	547,606,200	587,214,050	554,031,650	2,244,822,450	72,413,627	4,473	600	25	1,352	1,221	105	105	105	105	605.88
November.....	570	683	684	682	463,517,300	516,185,850	554,447,200	559,078,400	2,093,228,750	69,774,291	4,328	1,780	25	1,230	1,200	105	105	105	105	593.44
December.....	615	702	700	698	496,883,000	579,986,400	573,350,350	541,867,500	2,192,087,250	70,712,491	4,671	2,060	25	1,294	1,092	105	105	105	105	575.82
Totals and averages.....	7,452	8,003	8,268	8,182	5,807,460,906	6,372,626,780	6,791,938,900	6,804,769,254	25,776,795,840	70,621,359	49,123	1,130	25	11,706	11,198	105	105	105	105	648.15

No. 1—Worthington Duplex. Capacity, 4,000,000 gallons per day.
 No. 2—Worthington Duplex. Capacity, 5,000,000 gallons per day.
 No. 3—Worthington Duplex. Capacity, 6,500,000 gallons per day.

ROXBOROUGH PUMPING STATION.

Total capacity, 35,500,000 gallons per day.

No. 4—Worthington High Duty Duplex. Capacity, 5,000,000 gallons per day.
 No. 5—Worthington High Duty Duplex. Capacity, 5,000,000 gallons per day.
 No. 6—Worthington High Duty Duplex. Capacity, 5,000,000 gallons per day.
 No. 7—Worthington High Duty Duplex. Capacity, 5,000,000 gallons per day.

1905.	RUNNING TIME OF EACH ENGINE IN HOURS.							GALLONS PUMPED BY EACH ENGINE.							Total Pumpage of each month.	Average Pumpage per day.	COAL.		Percentage of Ashes.	OILS.		MEAN WATER PRESSURE AND MEAN SUCTION LIFT IN POUNDS PER SQUARE INCH.							Gallons Raised 100 feet High per lb. of Coal.				
	Old House.			New House.				Old House.			New House.									Cylinder.	Engine.	Old House.			New House.								
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.						Gallons.	Gallons.	Tons.	Lbs.	Qts.	Qts.	No. 1.	No. 2.	No. 3.		No. 4.	No. 5.	No. 6.	No. 7.
	MONTHS.																																
January.....	181	704	713	723	641	680	645	18,123,100	142,896,400	183,951,300	130,197,220	98,978,225	122,833,265	111,288,145	808,207,655	26,071,214	3,601	1,479	25	1,242	492	140	140	140	160	160	160	160	372.82				
February.....		590	627	600	563	597	589	125,128,800	165,528,400	112,686,670	87,102,410	109,946,595	108,460,290	703,853,255	25,137,616	3,394	2,036	25	874	341	140	140	160	160	160	160	160	345.14					
March.....	169	610	483	642	603	460	632	24,196,640	130,717,100	127,316,800	123,581,945	115,346,270	82,648,165	120,907,590	724,714,500	23,377,887	3,305	1,786	25	893	391	140	140	140	160	160	160	160	366.03				
April.....	683	715		672	627	652	322	98,908,160	154,245,600		132,881,895	121,631,850	128,993,040	52,479,450	689,139,995	22,971,333	3,175	1,030	25	902	385	140	140		160	160	160	160	363.22				
May.....	736	729		702	703	695	450	105,295,840	157,515,300		136,689,315	133,608,135	140,069,535	70,594,725	743,712,850	23,990,337	3,325	958	25	985	422	140	140		160	160	160	160	375.03				
June.....	185	209	546	606	649	681	515	26,109,200	44,774,100	132,591,600	118,654,800	131,215,320	136,549,140	82,043,985	671,933,145	22,397,938	2,872	2,233	25	994	437	140	140	140	160	160	160	160	396.40				
July.....	590		740	693	587	695	663	78,988,080		133,477,600	134,426,830	103,280,940	138,113,080	123,264,555	761,501,085	24,564,551	3,216	1,775	25	925	404	140		140	160	160	160	160	397.47				
August.....	574		726	657	647	687	629	71,418,880		184,570,000	130,002,300	114,342,750	136,874,880	116,982,415	754,391,225	24,335,200	3,075	1,925	25	925	375	140		140	160	160	160	160	412.09				
September.....	329	28	703	646	533	634	642	44,735,600	5,589,000	182,667,600	126,892,450	82,400,205	128,930,295	136,521,740	707,736,890	23,591,229	2,999	2,230	25	827	354	140	140	140	160	160	160	160	394.02				
October.....	360	733	744	689	649	656	273	63,247,740	161,206,200	204,588,000	139,571,980	124,819,830	129,848,335	47,479,275	870,761,360	28,089,076	3,595	1,550	25	957	378	140	140	140	160	160	160	160	398.68				
November.....		621	703	609	557	549	390		134,654,200	191,533,600	121,651,875	140,810,850	103,330,015	72,923,565	728,904,105	26,096,803	3,216	1,225	25	860	339		140	140	160	160	160	160	375.50				
December.....		519	727	563	553	597	596		107,954,900	186,701,600	111,189,825	104,912,310	107,747,160	114,054,045	732,559,840	23,630,962	3,391	930	25	911	333		140	140	160	160	160	160	360.10				
Total.....	3,757	5,458	6,712	7,807	7,312	7,583	6,346	530,973,240	1,164,621,600	1,743,126,590	1,518,427,105	1,322,449,095	1,465,883,495	1,151,939,780	8,897,420,905	24,376,469	39,172	11,187	25	11,295	4,651	105	117	117	160	160	160	160	379.71				

No. 1—Cramp Marine Compound Rotary. Capacity, 10,000,000 gallons per day.
 No. 2—Corliss Compound Rotary. Capacity, 10,000,000 gallons per day.

FRANKFORD PUMPING STATION NO. 1, 1906

Total capacity, 57,000,000 gallons per day.

No. 3—Southwark Vertical Compound Rotary. Capacity, 15,000,000 gallons per day.
 No. 4—Southwark Vertical Compound Rotary. Capacity, 22,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.				GALLONS PUMPED BY EACH ENGINE.				TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage Ashes.	OILS.						Gallons Raised 100 Feet High per Pound of Coal.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 1.	No. 2.	No. 3.	No. 4.			Gallons.	Gallons.		Tons.	Lbs.	CYLINDER.	ENGINE	No. 1.	No. 2.		No. 3.	No. 4.
Months.	No. 1.	No. 2.	No. 3.	No. 4.	No. 1.	No. 2.	No. 3.	No. 4.	Gallons.	Gallons.	Tons.	Lbs.	Qts.	Qts.	No. 1.	No. 2.	No. 3.	No. 4.		
January.....											67		25							
February.....											62	448	25	4						
March.....		3	3			977,220	1,626,056		2,603,276	88,976	86	379	25	23		68	70		244.09	
April.....				4				1,508,090	1,508,090	50,270	75	389	25	32	44				75	175.45
May.....			44				25,183,210		25,183,210	812,361	131	398	25	103	124			67		153.84
June.....				3				1,645,648	1,645,648	54,854	93	1,773	25	13	20				93	185.95
July.....				7				3,914,724	3,914,724	126,281	76	290	25						75	449.71
August.....											54	1,624	25							
September.....											56	1,019	25	9	4					
October.....											66	1,510	25	32	13					
November.....											75	2,031	25	4						
December.....											90	1,967	25	12	6					
Totals and averages.....		3	47	14		977,220	26,809,266	7,068,462	34,854,948	95,493	936	623	25	205	238		68	68	81	100.75

FRANKFORD PUMPING STATION No. 2, 1906.

Total capacity, 60,000,000 gallons per day.

No. 5—Holly Vertical Triple Expansion. Capacity, 20,000,000 gallons per day.

No. 6—Holly Vertical Triple Expansion. Capacity, 20,000,000 gallons per day.

No. 7—Holly Vertical Triple Expansion. Capacity, 20,000,000 gallons per day.

1906.	RUNNING TIME OF EACH ENGINE IN HOURS.			GALLONS PUMPED BY EACH ENGINE.			TOTAL PUMPAGE OF EACH MONTH.	AVERAGE PUMPAGE PER DAY.	COAL.		Percentage of ashes.	OILS.		Mean Water Pressure and Mean Suction Lift in Lbs. per square inch.			Gallons raised 100 feet high per pound of Coal.
												Cylinder.	Engine.				
	Months.	No. 5.	No. 6.	No. 7.	No. 5.	No. 6.	No. 7.	Gallons.	Gallons.	Tons.		Lbs.	Qts.	Qts.	No. 5.	No. 6.		No. 7.
January.....	489	418	366	419,426,010	354,504,800	312,761,790	1,086,692,600	35,054,600	979	500	25	.....	.....	83	83	83	1097.61
February.....	380	374	387	320,298,390	316,046,710	325,111,860	961,456,960	24,337,748	927	1,000	25	580	552	81	83	82	1014.41
March.....	316	515	376	266,285,042	434,101,050	315,775,128	1,016,161,220	32,779,394	1,143	1,524	25	667	581	83	83	83	878.59
April.....	233	621	281	190,825,290	527,796,630	236,428,830	955,050,750	31,895,024	999	273	25	782	422	85	85	85	965.95
May.....	618	184	458	510,412,680	155,836,980	388,696,380	1,049,946,040	33,869,227	1,076	9	25	895	870	82	81	80	946.07
June.....	667	370	255	547,996,140	332,818,670	191,066,920	1,071,881,730	35,729,391	1,040	1,702	25	519	781	82	83	82	1011.12
July.....	513	480	388	418,217,310	400,300,110	318,814,370	1,137,331,790	36,688,122	1,099	1,272	25	515	684	83	83	83	1031.24
August.....	438	493	501	370,445,220	415,110,240	423,200,740	1,208,756,200	38,992,135	1,092	1,283	25	581	541	83	84	83	1007.89
September.....	469	481	448	393,972,210	411,882,300	390,518,749	1,196,373,259	39,879,108	1,188	1,343	25	656	591	83	84	83	997.74
October.....	397	457	519	332,868,870	458,971,440	441,685,390	1,230,525,700	39,694,377	1,298	999	25	771	726	84	84	84	946.78
November.....	446	494	373	370,253,250	418,985,190	312,847,110	1,102,085,550	36,736,185	1,241	136	25	675	347	85	85	83	891.27
December.....	490	394	494	403,108,560	327,294,630	402,759,560	1,133,162,750	36,553,637	1,337	394	25	812	626	83	83	83	838.05
Totals and averages.....	5,556	5,281	4,846	4,544,108,972	4,550,648,750	4,054,666,827	13,149,424,549	36,025,820	13,423	1,475	25	7,393	6,721	83	83	83	976.39

DESCRIPTION OF PUMPING MACHINERY OF THE BUREAU OF WATER, PHILADELPHIA, 1906

STEAM ENGINES AND PUMPS.

STEAM BOILERS.

Main data table with columns for Pumping Station, Types of Engines, High Pressure Cylinder, Int. Pressure Cylinder, Low Pressure Cylinder, Air Pumps, Forcing Pumps, and Steam Boilers. Includes various engine specifications like Southwark Foundry, Worthington Duplex, and Belmont High Service.

NOTE—These pumps receive water from Reservoirs and the figures given represent the number of feet head on the suction end of the pump. *8 per cent for slip. †2 1/2 per cent. for slip. ‡ No slip.

APPENDIX C

REPORT

OF THE

ASSISTANT IN CHARGE OF DISTRIBUTION

Philadelphia, January 26, 1907

MR. A. J. FULLER,

General Superintendent, in charge of Bureau.

DEAR SIR:—I have the honor to submit the following report on the distribution system for the year 1906:

Mains.

The following is a statement of the mains laid, re-laid, taken up, etc:

New Work.

Service mains laid	154,598 feet.
Supply mains laid	14,633 feet.
Connections, etc.	6,650 feet.
Total	175,881 feet.

*Comparison of Conditions Relative to the Distribution,
1905-1906.*

	1905.	1906.	Increase.	Decrease.
Service mains, 4-in. to 16-in.....	132,404	154,598	22,194	
Supply mains, 10-in. to 48-in.....	7,263	14,633	7,370	
Pumping mains, 36-in. to 60 in.....	9,500			9,500
Connections and Miscellaneous work.....	10,050	6,650		3,400
Totals in feet.....	159,307	175,881	20,474	12,900

Relaid, 3-in. to 30-in.....	17,766	8,273	.....	9,493
Miscellaneous repairs, 3-in. to 48-in.	3,408	2,581	.....	822
Taken up, 3-in. to 36-in.....	14,210	7,660	.....	6,550
Lowered, raised and shifted, 6 in. to 30-in	5,168	5,221	58	
Totals in feet.....	40,547	23,735	58	16,865

Pipe cut off and abandoned, 3-in. to 12-in.....	4,172	3,359	813
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Meters.

	1905.	1906.	Increase.	Decrease.
Meters in use.....	1,735	1,733	2

Number of Dwellings and Principal Appliances for the Use of City Water.

	1905.	1906.	Increase.	Decrease.
Dwellings with water.....	262,963	271,983	9,025	
Dwellings without water.....	11,700	11,823	123	
Water closets.....	325,726	344,671	18,945	
Baths.....	304,205	314,755	10,551	
Wash paves.....	95,498	97,027	6,529	
Basins and sinks.....	126,335	134,816	8,481	
Urinals.....	6,453	6,753	300	

Repairs.

Mains relaid	8,273 feet.	
Repairs and connections	2,581 feet.	
		10,854 feet.
Old pipe taken up	7,660 feet.	
Pipe lowered, raised and shifted	5,221 feet.	
		12,881 feet.
Total	23,735 feet	

Abandoned.

Three-inch	102 feet.
Four-inch	1,327 feet.
Six-inch	834 feet.
Twelve-inch	1,096 feet.
Total	3,359 feet.

The total quantity of pipe handled, for all purposes, throughout the year, was 199,616 feet, weighing 8,924,530 pounds.

The total quantity of new pipe laid was 175,881 feet, or 3.31 miles, making, in addition to that previously laid, 1,529.62 miles now in use.

Fire Hydrants.

New style fire hydrants in new locations	315
New style fire hydrants in place of old style	319
Total	634
New style fire hydrants taken out	42
Old style fire hydrants taken out	3
Total	45

The total number of new style fire hydrants added to the distribution system was 271, and the total number in use December 3, 1906, was 14,582, of which 454 are of the old style and 14,128, or 96.88 per cent. are of the new pattern.

Drills for Attachments.

Size.	Area of Openings.	Square Inches.
One-half inch.....	8,592	1,687
Five-eighth inch.....	442	136
Three-quarter inch.....	176	78
One inch.....	181	142
One and one-quarter inches.....	42	52
One and one-half inches.....	36	64
Two inches.....	58	182
Three inches.....	13	92
Four inches.....	15	188
Six inches.....	11	311
Total.....	9,566	2,982

For attachments, including ferrules, service pipes and curb stops, which were put in from the street mains to the curb, by employees of this Bureau, in order to provide for possible future service without breaking of street pavements, see Table "A."

Tabulations of work performed and of expenditures made are also submitted herewith, together with various other tables, compiled as in previous years.

The report of the pipe inspector, relative to the inspection of pipes and other castings during the year, in tabulated form, also accompanies this report.

Respectfully submitted,

W. WHITBY,
Assistant in Charge of Distribution.

SERVICE, SUPPLY AND PUMPING MAINS LAID DURING 1906.

FIRST DISTRICT.

Comprising the 1st, 2nd, 3rd, 4th, 26th, 30th, 36th, and 39th Wards.

Purposes for which used.		SIZE IN INCHES.						Total in Feet and Pounds.		
		3	4	6	8	10	12		20	
New pipe or feet added.	Service mains		166	9,517	1,360	1,094	1,019	18,165		
	Fire hydrant connections			309				309		
	Supply connections (private)	8	21	317				341		
	Motor connections (private)		20					20		
	Total	{ Feet	3	207	10,143	1,360	1,094	1,019	13,835	
	{ Pounds	45	4,140	334,719	57,498	60,170	76,425	532,907		
Pipe used but adding nothing to feet in ground.	Pipe relaid			171				171		
	Repairs, general		16	128		4	12	174		
	Pipe taken up	154	15	9				178		
	Total	{ Feet	154	81	308		4	12	14	
	{ Pounds	2,810	620	10,164		220	900	2,170	523	
								16,884		
Total handled		Feet	157	238	10,451	1,369	1,098	1,031	14	14,858
		Pounds	2,355	4,760	344,883	57,498	60,390	77,325	2,170	549,381
Pipe cut off and abandoned				6						6

SECOND DISTRICT.

Comprising the 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 16th, and 17th Wards.

Purposes for which used.	SIZE IN INCHES.								Total in Feet and Pounds.	
	3	4	6	8	10	12	16	20		
New pipe or feet added.	Service mains.....			91			2,701	376		3,258
	Supply mains.....						1,096	950		2,046
	Service main connections.....			25		72				97
	Supply main connections.....					58	17	34		104
	Fire hydrant connections.....			51						51
	Fire connections (private).....		23	258						281
	Supply connections (private).....	26	17	11						54
	Total..... { Feet.....	26	40	436		125	3,904	1,360		5,891
	{ Pounds.....	390	800	14,388		6,875	292,300	156,400		471,653
	Pipe used but adding nothing to feet in ground.	Pipe relaid.....	7		168		568	270		92	1,105
Repairs general.....		7		350	4	95	5			401
Pipe taken up.....		7	23	651			289		78	1,028
Pipe raised.....						150				150
Total..... { Feet.....		21	23	1,169	4	813	544		170	2,744
{ Pounds.....	315	460	38,577	168	44,715	40,800		26,350	161,385	
Total handled..... { Feet.....	47	63	1,605	4	938	4,448	1,360	170	8,635	
{ Pounds.....	705	1,260	52,965	168	51,500	333,600	156,400	26,350	623,938	
Pipe cut off and abandoned.....	102	14	12							128

THIRD DISTRICT.

Comprising the 18th, 19th, 23rd, 25th, 41st, and part of 33rd, 42nd and 43rd Wards.

Purposes for which used.		SIZE IN INCHES.										Total in Feet and Pounds.			
		3	4	6	8	10	12	16	18	20	30		36		
New pipe or feet added.	Service mains			25,837	2,693	1,713	473								90,216
	Supply mains.....							12,539							12,587
	Supply main connections.....			13			95				58		48		166
	Fire hydrant connections.....			1,042			15								1,057
	Fire connections (private).....		32	13											45
	Supply connections (private).....	87	20	171			7								235
	Drains.....			7											7
Total..... { Feet.....		37	52	26,583	2,693	1,830	473	12,539		58	48			44,313	
		555	1,040	877,239	113,106	100,650	35,475	1,441,985		8,990	15,840			2,594,880	
Pipe used, but adding nothing to feet in ground.	Pipe relaid.....			2,264	960	208	638							4,070	
	Repairs general.....	9	17	847	28	37	43							995	
	Pipe taken up.....		1,705	1,590	77	232	540							4,245	
	Pipe lowered.....			43	32									75	
	Pipe shifted.....			4,408										4,408	
	Total..... { Feet.....		9	1,722	9,152	1,097	477	1,221	21	6				88	13,798
		185	34,440	302,016	46,074	26,235	91,575	2,415	780				36,960	510,693	
Total handled..... { Feet.....		46	1,774	35,735	3,790	2,307	1,694	12,560	6	58	48	88		58,106	
		690	35,480	1,179,255	159,180	126,885	127,050	1,444,400	780	8,990	15,840	36,960		3,195,510	
Pipe cut off and abandoned.....			209	591										800	

FOURTH DISTRICT.

Comprising the 15th, 20th, 28th, 29th, 32nd, and part of 37th and 38th Wards.

Purposes for which used.		SIZE IN INCHES.						Total in Feet and Pounds.
		3	4	6	8	10	12		48
New pipe or feet added.	Service mains			2,890		579	823	4,292
	Supply main connections.....				48			48
	Fire hydrant connections.....			204				204
	Fire connections (private).....	15	48					63
	Supply connections (private).....	61	17					78
	Motor connections (private).....	15						15
	Drains.....		232	15				247
Total..... { Feet.....		91	297	3,109	48	579	823	4,947
{ Pounds.....		1,365	5,940	102,597	2,016	31,845	61,725	205,488
Pipe used but adding nothing to feet in ground.	Pipe relaid.....			27		102		129
	Repairs, general.....		4	218		4	5	244
	Pipe taken up.....		24	565			102	681
	Pipe lowered.....			72		58		130
	Total..... { Feet.....			28	872		164	107	1,184
{ Pounds.....			560	23,776		9,020	8,025	54,881
Total handled..... { Feet.....		91	325	3,981	48	743	930	6,181
{ Pounds.....		1,365	6,500	131,373	2,016	40,865	69,750	260,319
Pipe cut off and abandoned.....				58				58

FIFTH DISTRICT.

Comprising the 21st and part of the 38th Wards.

Purposes for which used.	SIZE IN INCHES.							Total in Feet and Pounds.	
	4	6	8	12	20	30	36		
New pipe or feet added.	Service mains.....	8,364						8,364	
	Bye-pass connections.....	51						51	
	Fire hydrant connections.....	138						138	
	Supply connections (private).....	7						7	
	Drains.....				15			15	
	Total..... { Feet..... Pounds.....		8,560 282,480		15 1,125				8,575 283,605
Pipe used but adding nothing to feet in ground.	Repairs, general.....	9	39	6	6	36	2	2	100
	Pipe lowered.....					231			231
	Total..... { Feet..... Pounds.....	9 180	39 1,287	6 232	6 450	267 41,385	2 660	2 840	331 45,054
Total handled..... { Feet..... Pounds.....	9 180	8,599 283,767	6 232	21 1,575	267 41,385	2 660	2 840	8,906 328,659	
Pipe cut off and abandoned.....		25						25	

SIXTH DISTRICT.

Comprising the 22nd, and part of the 33rd, 37th, 38th and 42nd Wards.

Purposes for which used.		SIZE IN INCHES.							Total in Feet and Pounds.		
		3	4	6	8	10	12	20		30	
New pipe or feet added.	Service mains			29,076	1,118	9,224	2,672			36,090	
	Supply main connections						22			22	
	Bye-pass connections			11		39				50	
	Fire hydrant connections			772						772	
	Fire connections (private)		12	39						51	
	Supply connections (private)			8						8	
	Drains		13							13	
Total			25	29,006	1,118	9,263	2,694			37,006	
		{ Feet		500	788,898	46,956	509,465	202,050		1,547,869	
		{ Pounds									
Pipe used but adding nothing to feet in ground.	Pipe relaid		24	1,052	20		40			1,136	
	Repairs, general		12	216	7	15	45	4	12	311	
	Pipe taken up	23	510	139	19	15	45			751	
	Pipe lowered			40						40	
	Pipe raised			112						112	
	Total		{ Feet	23	546	1,559	46	80	190	4	2,350
			{ Pounds	345	10,920	51,447	1,982	1,650	9,750	620	80,624
Total handled		{ Feet	23	571	25,465	1,164	9,293	2,824	4	39,356	
		{ Pounds	345	11,420	840,345	48,888	511,115	211,800	620	1,628,493	
Pipe cut off and abandoned				552	68					620	

SEVENTH DISTRICT.

Comprising the 24th, 27th, 34th, and 40th Wards.

13

Purposes for which used.	SIZE IN INCHES.									Total in Feet and Pounds.	
	3	4	6	8	10	12	16	20	30		
New pipe or feet added.	Service mains.....			48,707	6,175	3,748		583			59,213
	Service main connections.....					11					11
	Supply main connections.....					9	45				54
	Fire hydrant connections.....			1,876							1,876
	Fire connections (private).....			39							39
	Supply connections (private).....	55	24	42							121
Total.....	{ Feet.....	55	24	50,664	6,175	3,768	45	583			61,314
	{ Pounds.	825	480	1,671,912	259,350	207,240	3,375	67,045			2,210,227
Pipe used, but adding nothing to feet in ground.	Pipe relaid.....			462			1,140	60			1,662
	Repairs general.....		11	148	49	40	42		6		296
	Pipe taken up.....	23	510	99	19					126	777
	Pipe raised.....								75		75
Total.....	{ Feet.....	23	521	709	68	40	1,182	60	81	126	2,810
	{ Pounds.	345	10,420	23,397	2,856	2,200	88,650	6,900	12,555	41,580	188,903
Total.....	{ Feet.....	78	545	51,373	6,243	3,808	1,227	643	81	126	64,124
	{ Pounds.	1,170	10,900	1,695,309	262,206	209,440	92,025	73,945	12,555	41,580	2,399,180
Pipe cut off and abandoned.....		552	74				1,096				1,722

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Alterations of Water Pipes on the line of the Market Street Subway.

PIPE RELAID.

Streets.	LOCATION.	PIPE.	
		Size.	Feet.
Fifteenth.....	From 7 feet south of north house line of Market street, to 71 feet north of north house line of Market street.	20	92
Hicks.....	From south house line of Market street north, to connect with 10 inch main on south side of Market street (25 feet 6 inches north of south house line.).....	6	27
Market S. S.....	From 12 feet east of west house line of Fifteenth street, to 12 feet east of east house line of Mole street.....	10	223
Market N. S.....	From 20 feet east of west house line of Fifteenth street, to 84 feet east of east house line Sixteenth street.....	10	344
Market N. S.....	From 43 feet west of west house line of Fifteenth street, to 84 feet east of east house line of Sixteenth street (City Hall main.).....	12	270
Sixteenth.....	From 20 feet south of north house line of Market street, north.....	6	16
	Total.....		972
	PIPE RAISED.		
South Penn Square S. S.	From 22 feet east of east house line of Broad street, to 15 feet west of west house line of Broad street.....	10	150

Recapitulation by Districts.

Districts.		SIZE IN INCHES.											Feet.	Pounds.				
		3	4	6	8	10	12	16	18	20	30	36			48			
New pipe or feet added.	First.....	3	207	10,143	1,369	1,094	1,019											
	Second.....	26	40	436		125	3,904	1,360									13,835	532,997
	Third.....	37	52	26,583	2,693	1,830	473	12,539									5,891	471,653
	Fourth.....	91	297	3,109	48	579	823			58	48						44,313	2,594,880
	Fifth.....			8,560			15										4,947	205,488
	Sixth.....		25	23,906	1,118	9,263	2,694										8,575	283,605
	Seventh.....	55	24	50,664	6,175	3,768	45	583									37,006	1,547,869
	Total.....																61,314	2,210,227
	Total.....	{ Feet	212	645	123,401	11,403	16,659	8,973	14,482									
		{ Pounds ...	3,180	12,900	4,072,233	478,926	916,245	672,975	1,665,430			8,990	15,840				175,881	7,846,719
Pipe used but adding nothing to feet in ground.	First.....	154	31	308		4	12											
	Second.....	21	23	1,169	4	813	544			14							523	16,384
	Third.....	9	1,722	9,152	1,097	477	1,221	21	6								2,744	151,385
	Fourth.....		28	872		164	107						88				13,793	540,630
	Fifth.....		9	39	6		6									13	1,184	54,881
	Sixth.....	23	546	1,559	46	30	130			267	2	2					331	45,054
	Seventh.....	23	521	709	68	40	1,182	60		4	12						2,350	80,624
	Total.....									81	126						2,810	188,903
	Total.....	{ Feet	230	2,880	13,808	1,221	1,528	3,202	81	6	536	140	90	13			23,735	
		{ Pounds ...	3,450	57,600	455,664	51,282	84,040	240,150	9,315	780	83,080	46,200	37,800	8,450				1, 77,811
	Total handled ...	{ Feet	442	3,525	137,209	12,624	18,187	12,175	14,563	6	594	188	90	13			199,616	
		{ Pounds ...	6,630	70,500	4,527,897	530,208	1,000,285	913,125	1,674,745	780	92,070	62,040	57,800	8,450				8,924,530
	Pipe cut off and abandoned..		102	1,327	834			1,096										3,359

Total feet of Pipe in use December 31st, 1906.

Size in inches.	Total in use December 31, 1905.	EXTENSIONS AND RE-LAYS DURING 1906.			DEDUCTIONS DURING 1906.			Total in use December 31, 1906.
		Laid.	Relaid.	Total.	Taken up.	Abandoned.	Total.	
1	175							175
1½	3,566							3,566
2	3,655							3,655
3	76,646	212	7	219	207	102	309	76,556
4	179,068	645	24	669	2,787	1,327	4,114	175,618
6	5,281,728	123,401	4,144	127,545	3,043	884	3,877	5,405,396
8	325,982	11,403	980	12,383	115		115	338,200
10	477,577	16,659	878	17,537	247		247	494,867
12	488,255	8,973	2,088	11,061	956	1,066	2,052	497,264
16	155,894	14,482	60	14,542	7		7	170,429
18	16,095				6		6	16,089
20	276,571	58	92	150	78		78	276,643
22	606							606
23	27							27
24	13,149							13,149
30	296,215	48		48	126		126	296,137
36	101,491				88		88	101,403
48	197,111							197,111
60	9,500							9,500
Total	7,903,256	175,881	8,278	184,154	7,660	3,359	11,019	8,076,391

Recapitulation of Fire Hydrants, Set, Renewed, and Removed.

DISTRICTS.		STYLE.					Total.
		O. S.	No. 1.	No. 2.	No. 3.	No. 5.	
Set.	First.....		25				25
	Second.....		2	2			4
	Third.....		71	9	1		81
	Fourth.....		9	6	3		18
	Fifth.....		13	2			15
	Sixth.....	1	40	5	2		48
	Seventh.....		113	9	3		125
Total.....		1	273	33	9		316
Renewed.	First.....		1				1
	Second.....		55	11	3	1	70
	Third.....		35	19	4		58
	Fourth.....		36	27	2		65
	Fifth.....		20				20
	Sixth.....		35	4			39
	Seventh.....		50	12	4		66
Total.....			232	73	13	1	319
Total new fire hydrants.....		1	505	106	22	1	635
Removed.	First.....		3				3
	Second.....			1			1
	Third.....		11	1			12
	Fourth.....	1	2	2	3		8
	Fifth.....						
	Sixth.....		11	1	1		13
	Seventh.....	2	2	3			8
Total.....		3	30	8	4		45
Total added during 1906.....							271

Statement of the number of Fire Hydrants by Districts and Wards during 1906 and total previous thereto.

	FIRST DISTRICT.									SECOND DISTRICT.									THIRD DISTRICT.									FOURTH DISTRICT.								FIFTH DISTRICT.		SIXTH DISTRICT.						SEVENTH DISTRICT.				Totals																						
	Wards.								Total.	Wards.								Total.	Wards.								Total.	Wards.		Total.	Wards.						Total.																																	
	1	2	3	4	26	30	36	39		5	6	7	8	9	10	11	12		13	14	16	17	18	19	23	25		31	33		35	41	42	43	15	20		28	29	32	37	38	21	38	22	33	37		38	42	43	24	27	34	40															
Prior to 1906.....									2,209												2,147											3,253										2,048								594									2,002									2,058	14,311	
During 1906.....	1		1		4	2	8	9	25	1	1						1	1			4	1	10	7	1	8	26	3	21	4		81	2		2	2	3	1	8			18	3	12						15	17					3	15	13	48	2	60	25	38					125	816	
Total.....									2,234												2,151											3,334										2,066								609									2,050									2,183	14,627	
Taken out 1906.....	1					1	1		3								1				1	1			6			2		2	1		12	2				3	2		1		8									4					1	2	6	13		4	2	2					8	45
Total in city.....									2,231												2,150											3,322										2,058								609									2,037									2,175	14,582	

Number of attachments for fire purposes previously reported 877
 { First District.....
 Second District..... 21
 Third District..... 4
 Made during 1906..... { Fourth District..... 4
 Fifth District.....
 Sixth District..... 4
 Seventh District..... 2
 Total..... 912

Fire Hydrants by Wards.

WARDS.	STYLE.							Total.
	O. S.	No 1.	No. 2.	No. 3.	No. 4.	No. 5.	High Pressure	
First	2	203	67	8				280
Second	2	128	91	15				236
Third	3	79	42	6				130
Fourth	1	65	33	14				113
Fifth	17	103	61	6			17	204
Sixth	8	77	48	8		1	49	191
Seventh	5	145	84	7				241
Eighth	10	125	97	4		1	24	261
Ninth		121	83	3		1	82	240
Tenth		110	68			4	22	204
Eleventh	4	76	26	1				107
Twelfth	7	61	27	6				101
Thirteenth	23	63	70	9				165
Fourteenth		89	89					178
Fifteenth		240	210	6	1	2		459
Sixteenth	2	82	39	4	1			123
Seventeenth	11	81	34	1				127
Eighteenth	12	202	61	9				234
Nineteenth	31	334	122	4				491
Twentieth	19	187	129	5				290
Twenty-first	40	415	38	7				500
Twenty-second	61	1,156	149	22				1,388
Twenty-third	37	337	77	7				458
Twenty-fourth	38	312	150	14				514
Twenty-fifth		573	132	7				712
Twenty-sixth	1	237	123	14				375
Twenty-seventh	16	443	118	21		1		599
Twenty-eighth	1	165	139	25				330
Twenty-ninth	13	202	205	8		1		429
Thirtieth	5	127	110	6				248
Thirty-first		243	66	7				316
Thirty-second	8	132	96	7		1		244
Thirty-third	15	419	123	13	1			576

Fire Hydrants by Wards.—Continued.

WARDS.	STYLE.						Total.
	O. S.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.		High Pressure
Thirty-fourth.....	22	577	122	17	.....	1	789
Thirty-fifth.....	.....	140	19	4	.....	.....	168
Thirty-sixth.....	6	339	101	29	.....	.....	475
Thirty-seventh.....	4	104	75	5	.....	.....	188
Thirty-eighth.....	16	422	107	9	.....	.....	554
Thirty-ninth.....	.....	296	90	7	.....	.....	383
Fortieth.....	7	257	56	3	.....	.....	323
Forty-first.....	.....	51	11	9	.....	.....	71
Forty-second.....	.....	223	6	12	.....	.....	241
Forty-third.....	7	313	49	7	.....	.....	376
Totals.....	454	9,944	3,648	376	3	13	14,582

Fire Hydrants by Purveyors' Districts.

Districts.	STYLES.							Total.
	O. S.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	High Pressure.	
First.....	17	1,424	688	102	.....	.....	.....	2,281
Second.....	80	1,141	725	52	1	7	144	2,150
Third.....	104	2,516	684	67	1	.....	.....	3,322
Fourth.....	51	1,056	806	50	1	4	.....	2,058
Fifth.....	42	521	38	8	.....	.....	.....	609
Sixth.....	77	1,697	221	42	.....	.....	.....	2,087
Seventh.....	88	1,589	446	55	.....	2	.....	2,175
Total.....	454	9,944	3,648	376	3	13	144	14,582

Attachments, etc., made by the Purveyors in Accordance with permits issued by the Bureau of Water.

Districts.	NEW ATTACHMENTS.										SHUT OFF BY PERMIT.					WORK DONE WITHOUT PERMIT.								
	SIZE.										Repaired for larger attachment.	Re-driven.	Discontinued.	Transfer.	REPAIRS.		Total.	Discontinued and abandoned.	Delinquent.	Leak.	Transfer.	Total.	Drawn and Re-driven.	
	½-inch.	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Not drawn.					Drawn and Re-driven.									
First.....	1,380	54	82	14	8	6	6	8	1,503	1	69	83	.....	.....	49	202	6	2	97	.....	105	.....	.....
Second.....	119	59	71	57	9	12	12	.....	389	47	19	110	.....	.....	144	320	17	2	37	.....	56	.....	8	
Third.....	1,788	24	18	37	12	6	14	2	4	5	1,910	.....	.....	89	2	56	97	155	4	100	7	266	.....	225
Fourth.....	303	65	14	9	4	4	10	8	4	4	421	41	79	6	.....	4	124	254	12	12	.....	24	.....	5
Fifth.....	252	15	1	5	.....	8	3	.....	279	2	.....	2	.....	2	23	21	50	8	.....	.....	3	.....	.....	.....
Sixth.....	1,084	93	16	16	6	2	3	.....	1,226	28	23	70	8	9	10	143	.....	.....	.....	82	.....	82	.....	.....
Seventh.....	3,666	132	24	48	3	8	10	3	2	2	3,838	13	6	9	7	187	172	5	3	57	.....	65	.....	.....
Total.....	8,592	442	176	181	42	36	58	13	15	11	9,566	132	196	319	14	36	1,236	198	11	385	7	601	.....	283

Permits issued during the year 1906.

Aquaria.....	5	Lawn sprinklers.....	3
Bakeries.....	36	Laundries.....	16
Barber shops.....	102	Laboratories.....	5
Bars.....	13	Machines for scouring, rinsing, etc.....	12
Basins and sinks (in dwellings).....	7,418	Milk houses.....	40
Basins and sinks in offices and stores.....	1,068	Motors (beer).....	9
Baths in dwellings.....	9,897	Motors (organ).....	18
Baths in hotels, etc.....	610	Photograph galleries.....	4
Baths (shower).....	38	Pantry sinks.....	593
Bidets.....	2	Pools (swimming).....	5
Boats, etc. (supply).....	60	Pools (in churches).....	6
Bottling establishments.....	15	Restaurants and eating saloons.....	31
Building purposes.....	386	Slaughter houses.....	4
Carriages and wagons.....	220	Stables.....	30
Cellar drainers.....	13	Stalls (in stables).....	1,175
Dwellings.....	9,025	Stalls (cow).....	20
Dwellings (half).....	75	Steam boilers (number)....	180
Drug stores.....	42	Steam boilers (H. P.).....	9,246
Dye houses.....	15	Steam engines (number)....	74
Factories.....	25	Steam engines (H. P.).....	1,765
Ferrules (number).....	9,959	Street sprinklers.....	100
Filters.....	5	Tubs, vats and tanks.....	124
Fire hydrants (use of).....	103	Urinals (in dwellings).....	6
Fish troughs and stands....	8	Urinals (in stores, offices, etc).....	233
Forges.....	5	Urinal troughs.....	60
Fountains (counter).....	16	Wash paves and screw nozzles.....	2,648
Fountains (garden).....	9	Wash paves for watering horses.....	13
Greenhouses.....	27	Wash tubs (stationary)....	8,127
Heating boilers.....	47	Water closets in dwellings.	18,701
Hydrants in new dwellings.	8,925	Water closets in stores, etc.	983
Hydraulic elevators.....	8		
Ice cream saloons.....	7		

Premises supplied and Appliances in use January 1, 1907.

Aquaria.....	84	Filters.....	85
Arsenals.....	2	Fire stations.....	80
Asylums.....	7	Fountains (garden).....	78
Bakeries.....	1,378	Fountains (counter).....	581
Barber shops.....	2,008	Forges.....	1,234
Bars.....	1,886	Furnaces.....	28
Basins and sinks in dwellings.....	100,804	Gas works (holders).....	15
Basins and sinks in offices and stores.....	54,512	Glass works.....	16
Baths (in dwellings).....	811,285	Greenhouses.....	1,188
Baths (publ.).....	2,981	Grindstones.....	125
Baths (shower).....	894	Halls and club houses.....	280
Baths (foot).....	95	Hatters' planks (per set)...	20
Beam houses and tanneries.	27	Hydrants.....	280,497
Bidets.....	489	Hospitals.....	65
Bottling establishments...	738	Hotels.....	69
Brick yards.....	15	Hydraulic Elevators.....	282
Brick yards (gangs of men).	815	Ice cream saloons.....	162
Breweries.....	92	Institutions, charitable....	100
Barrels (Brewed).....	255,820	Ice machines.....	180
Cars (steam and electric)...	1,870	Laundries.....	795
Carriages and Wagons.....	9,607	Lawn sprinklers.....	288
Cellar drainers.....	70	Laboratories.....	42
Cemeteries.....	25	Machines for washing and scouring.....	204
Churches.....	700	Marble yards.....	81
Coal yards.....	280	Malt houses.....	21
Coloring rooms.....	137	Market houses.....	48
Condensers.....	80	Milk houses.....	589
Depots and railway stations	100	Mints.....	1
Dwellings (with water).....	271,988	Motors (beer).....	1,950
Dwellings (without water)..	2,078	Motors (organ).....	249
Dwellings halfwithoutwater	9,750	Photograph galleries.....	149
Dyers.....	780	Photograph galleries (operators).....	198
Drug stores.....	470	Polishing wheels.....	20
Dye houses.....	680	Police stations and patrols.	80
Engines (railroad).....	890	Pools (swimming).....	34
Factories, foundries, mills..	2,170	Pools (in church).....	97

Premises supplied and Appliances in use—Continued.

Printing establishments.....	180	Steam saws.....	60
Prisons.....	4	Steam presses and ham- mers.....	50
Rectifying establishments..	9	Shop & stores (with water)..	6,000
Restaurants and oyster sa- loons.....	1,240	Shops (without water).....	945
Shot towers.....	1	School houses.....	263
Slaughter houses.....	487	Theatres.....	28
Soap boiling establishments	17	Tubs, vats and tanks.....	2,800
Stand pipes for watering en- gines.....	65	Turbine wheels.....	88
Stables.....	8,408	Urinals in dwellings.....	291
Stalls (in stables).....	55,591	Urinals in stores, offices, etc	5,602
Stalls (cow).....	817	Urinals (troughs).....	860
Stalls (fish troughs).....	120	Vinegar establishments....	10
Steam boilers (number).....	4,142	Wash paves and screw noz- zles.....	96,557
Steam boilers (H. P.).....	151,007	Wash paves for watering horses.....	470
Steam boilers (heating).....	1,200	Wash tubs (stationary).....	58,541
Steam boilers heating (horse power).....	6,500	Water closets (in dwelling)..	313,641
Steam engines (number).....	2,307	Water closets (in stores etc)	31,080
Steam engines (H. P.).....	27,218	Wool washers.....	110

Repairs to Mains, Stops and Fire Hydrants, also Stops and Fire Hydrants removed during 1906.

Districts.	Repairs to Mains.	STOPS.			FIRE HYDRANTS.		
		Repaired.	Renewed.	Removed.	Repaired.	Renewed.	Removed.
First.....	38	1,255	1	.....	317	1	3
Second.....	98	165	21	12	680	70	1
Third.....	216	176	22	22	204	69	12
Fourth.....	142	627	12	9	388	65	8
Fifth.....	101	28	.....	1	4	20	.....
Sixth.....	51	15	8	11	15	39	13
Seventh.....	110	247	14	4	174	66	8
Total.....	756	2,518	73	59	1,782	330	45

TABLE "A."

Service Attachments Laid to the Curb by the Bureau of Water on Streets to be Paved or Repaved.

Districts.	NUMBER OF CONNECTIONS.	Total.	LENGTH IN FEET.	Total in Feet.
	Size, ½-inch		Size, ⅝-inch.	
First.....	144	144	2,160	2,160
Second.....				
Third.....	452	452	6,504	6,504
Fourth.....	10	10	154	154
Fifth.....	47	47	631	631
Sixth.....	274	274	3,877	3,877
Seventh.....	932	932	17,219	17,219
Total.....	1,859	1,859	30,545	30,545

Account of Iron Stop Boxes and New Stops and Check Valves.

Districts.	Iron Stop Boxes.	STOPS.				Check Valves.	Totals.
		Department— Bureau of Water.	Smith.	Eddy.	Ludlow.		
First.....		74					74
Second.....		47	17				64
Third.....	91	208	4	1	1		214
Fourth.....	69	35	10				45
Fifth.....		32		1		1	34
Sixth.....	5	146	2				148
Seventh.....	12	223	2		2		227
Total.....	177	765	35	2	3	1	806

Total Number of Stops and Valves Arranged by Districts.

Pattern.	Size.	Outlets	DISTRICTS.							Total.
			1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	
Single Gate. Bureau of Water.	3	2-way.	1	184	4	23	2	15	13	242
	4	2-way.	106	258	56	159	50	90	86	805
	6	2-way.	3,375	2,616	4,617	3,192	759	2,661	3,414	21,184
	8	2-way.	169	119	184	121	10	86	347	1,086
	10	2-way.	242	881	324	235	84	201	230	1,647
	12	2-way.	145	208	380	159	51	242	216	1,351
	16	2-way.	38	48	57	21	5	41	22	232
	18	2-way.	.....	.....	6	.....	.....	1	.....	7
	20	2-way.	24	35	20	37	14	16	30	176
	30	2-way.	8	9	29	27	15	3	3	94
	36	way.	3	2	7	12	11	.....	8	43
48	2-way.	.....	.....	3	9	.....	.....	.....	12	
Total			4,611	3,860	5,637	3,995	951	3,356	4,369	23,779
Butterfly. Bureau of Water.	20	2-way.	.....	1	5	8	4	4	5	27
	30	2-way.	2	2	7	7	9	2	4	33
	36	2-way.	.....	.....	5	17	2	.....	.....	24
	48	2-way.	.....	2	7	30	22	.....	1	62
	Total.....			2	5	24	62	37	6	10	146
Barton.	6	4-way.	3	3	.....	12	.....	.....	13	31
	8	4-way.	.....	.....	.....	5	.....	.....	.....	5
	6	5-way.	12	24	.....	.....	.....	.....	.....	36
	6	6-way.	.....	5	.....	.....	.....	.....	.....	5
	Total.....			15	32	17	13	77

Total Number of Stops and Valves—Continued

Pattern.	Size.	Outlets.	DISTRICTS.							Total.
			1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	
Viney.	6	2-way.	5	.....	5	3	.....	.....	.....	18
	6	3-way.	49	55	27	231	5	9	18	392
	8	3-way.	.....	.....	.....	.....	.....	.....	5	5
	10	3-way.	.....	.....	.....	3	.....	.....	.....	3
	12	3-way.	.....	1	.....	3	.....	.....	1	5
	6	4-way.	22	27	20	99	4	8	20	200
	8	4-way.	1	.....	1	.....	.....	.....	5	7
	10	4-way.	.....	.....	.....	13	.....	.....	1	14
	12	4-way.	.....	.....	.....	.....	.....	2	.....	2
	6	5-way.	24	5	1	26	.....	.....	3	59
	Total.....			101	88	54	378	9	19	51	700
Smith's Patent.	8	2-way.	1	44	3	10	.....	.....	7	65
	4	2-way.	4	41	3	10	.....	.....	4	62
	6	2-way.	4	74	29	41	9	12	20	189
	8	2-way.	1	1	13	.....	.....	.....	.....	15
	10	2-way.	.....	7	11	1	2	4	5	30
	12	2-way.	1	11	8	.....	.....	.....	1	21
	16	2-way.	4	3	2	.....	.....	.....	.....	9
	20	2-way.	.....	1	2	.....	.....	.....	5	8
	Total.....			15	182	71	62	11	16	42	399
Ludlow's.	8	2-way.	.....	.....	12	1	.....	2	22	37
	4	2-way.	.....	.....	.....	1	.....	.....	.....	1
	6	2-way.	.....	.....	.....	.....	5	.....	8	13
	Total.....			12	2	5	2	30	51

Total Number of Stops and Valves—Continued

Pattern.	Size.	Outlets.	DISTRICTS.							Total.	
			1st.	2nd.	3rd.	4th.	5th.	6th.	7th.		
Eddy.	6	2-way.	.....	11	1	6	33	10	15	76
	8	2-way.	.....		1	.....	1	5	.....	7
	10	2-way.	.....	8	.....	1	8	11	21	49
	12	2-way.	.....	5	1	.....	2	2	4	14
	16	2-way.	.....	2	1	.....	2	15	15	35
	20	2-way.	.....	4	.....	1	2	11	9	27
	24	2-way.	.....				4	.....	.....	4
	30	2-way.	.....	1	2	1	15	4	2	25
	36	2-way.	.....					4	.....	8
	48	2-way.	.....			17	.....	.....	.....	17
	Total.....	.....		31	23	9	71	58	74	266
Eddy Rotary.	20	2-way.	.....		2	.....	.....	.....	.....	2
	30	2-way.				2	1	3
		Total.....	.....		2	2	.....	1	.....	5
Rensselaer.	8	2-way.	.....		4	16	.....	13	.....	33
	12	2-way.	.....			3	.....	.....	.....	3
	16	2-way.	.....		2	4	.....	.....	.....	6
	20	2-way.	.....			2	.....	2	.....	4
	24	2-way.	.....				.....	2	.....	2
	30	2-way.	.....				1	.....	.....	1
	Total.....	.....			6	26	.....	17	.....	49
Rensselaer Rotary.	30	2-way.	.....		1	.....	.....	.....	.....	1

Total Number of Stops and Valves.—Continued.

HIGH PRESSURE STOPS.

Pattern.	Size.	Outlets.	DISTRICTS.						Total.	
			1st.	2nd.	3rd.	4th.	5th.	6th.		8th.
Williamsport.	8	2-way.....		190						190
	12	2-way.....		54						54
	16	2-way.....		19						19
	Total.....			263						263
Ludlow's.	20	2-way.....		4						4
Total number of stops.....			4,744	4,465	5,830	4,553	1,084	3,475	4,589	28,740
Check Valves. Bureau of Water.	12	.....		1						1
	20	.....					1		1	2
	30	.....			1		5		3	9
	36	.....			1		4		2	7
	48	.....			4	4	6			14
	Total.....			1	6	4	16		6	33

Number of Valves Raised in the Several Districts During the Year 1906.

Districts.	BARTON.		VINEY. SMITH.		SINGLE GATE.					Total.	
	4-way.	5-way.	4-way.	Single Gate.	6-inch.	8-inch.	10-inch.	12-inch.	30-inch.		48-inch.
Second.....	2	2	7		7			1			19
Fourth.....			1	1	7		1		2	2	14
Seventh.....	6		1		12	2					21
Total.....	8	2	9	1	26	2	1	1	2	2	54

Number of Complaints and Examinations during 1905 and 1906.

MONTHS.	HYDRANTS.		SERVICE PIPES.		WASH PAVES.		SPIGOTS.		WATER CLOSETS.		HORSE TROUGHS.		NO LEAKS.		TOTAL.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
January.....	119	137	105	113	4	6	12	11	28	51	.....	.....	5	5	273	323
February.....	143	160	184	152	13	14	10	12	47	28	.....	1	9	6	406	578
March.....	168	104	265	125	15	4	23	16	30	60	.....	26	11	8	562	343
April.....	168	121	183	114	8	5	20	24	71	57	.....	1	4	7	454	320
May.....	188	122	177	110	5	.....	24	6	59	42	.....	1	10	6	463	287
June.....	176	163	166	119	6	2	26	19	34	63	.....	3	9	7	467	376
July.....	154	156	119	122	2	2	22	20	61	52	.....	2	10	8	368	362
August.....	187	157	112	110	1	6	30	76	55	79	.....	2	5	8	390	498
September.....	160	141	149	135	5	6	17	32	78	44	.....	7	16	6	425	371
October.....	147	209	120	174	4	3	24	45	76	84	.....	11	10	7	381	533
November.....	164	161	123	146	7	5	25	59	75	83	1	10	11	5	411	469
December.....	144	150	149	225	5	4	34	24	62	60	1	2	13	18	408	483
Total.....	1,918	1,781	1,857	1,645	75	57	267	344	776	703	2	66	113	91	5,008	4,637

New Meters Set.

Ward.	Occupant.	Location.	Business.	Date When Set.	Name of Meter.	Size.							Cubic Feet Consumed.	Meter Rents.	Remarks.	
						½ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	3 inch.	4 inch.				6 inch.	Total.
1	J. & T. Elkington...	N. W. c. 8th & Mifflin to N. E. c. 9th st.	Chemicals.....	Jan. 11...	Gem ...					1			1	150,000	\$50 80	Private meter.
7	D. W. Van Tine.....	1102 Spruce st	Ap'tment house.	Sept. 20 ..	Union ..			1					1	36,500	10 95	Private meter.
8	Edison Elec. Lt. Co.	908 Sansom st	Electric lighting	Jan. 1 ...	Gem ...								1	10,157,600	3,047 28	Private meter.
12	Chas. J. Mathews & Co.....	N. W. C. American and Willow sts...	Morocco mfrs...	Jan. 29 ...	Gem ...								1	1,898,700	569 61	
15	S. B. & B. W. Fleisher	{ S. E. C. 25th & Buttonwood sts. to } { N. E. C. 25th & Hamilton sts. }	Worsted mfrs...	April 12..	Gem ...								1	844,700	253 41	
16	Jos D. Ellis	N. E. C. 4th & George sts	Various	Jan. 13 ...	Gem ...				1				1	541,700	171 96	Private meter.
19	I. A. Sheppard & Co.	N. E. C. 4th & Montgomery ave	Shoe mfrs	Oct. 2 ...	Trident.				1				1	97,900	29 37	
19	Dungan Hood & Co	S.W.C. American & Susquehanna ave.	Kid mfrs	Nov. 26..	Trident.								1	30,500		
19	B. F. Bryan	1715 Philip st	Hosiery mfrs ...	Nov. 27..	Empire ..	1							1	1,500		Experimental.
20	Cudaby Packing Co.	900 West Girard ave	Provision deal'rs	Sept. 24 ..	Gem ...				1				1	57,100		Experimental.
20	Samuel S. Fretz	N. S. Diamond st 100 ft. W. of 10th st..	Umbrella mfrs..	Dec. 31..	Gem ...					1			1	000		Consumption on old meter.
21	Liebert & Obert.....	173-83 Carson st	Brewers	April 10..	Worth- ington.				1				1	945,300	233 59	
21	K. Hey & Son	S.W.S. Main st, 12th H.N. of Ridge ave	Blanket mfrs ...	July 11...	Empire ..			1					1	123,000	36 90	
21	T. Kenworthy & Bro	N. W. C. Walnut lane & Freeland ave.	Woolen mfrs ...	Oct. 12...	Gem ...				1				1	72,400	21 72	

New Meters Set.—Continued.

Ward.	Occupant.	Location.	Business.	Date When Set.	Name of Meter.	SIZE.							Cubic Feet Consumed.	Meter rents.	Remarks.	
						1/2 inch.	3/8 inch.	3/4 inch.	1 inch.	1 1/2 inch.	2 inch.	3 inch.				4 inch.	6 inch.	Total
23	Wallace Wilson	W. S. Wain st. 127 ft. S. of Unity st....	Hosiery mfrs ...	March 22.	Crown .				1				1	181,600		
23	Alva Carpet & Rug Co.....	S. S. Oxford st. W. of Hedge st.....	Carpets, &c	Sept. 10	Empire				1				1	30,100		
25	R. H. Foerderer Est.	Wheatsheaf lane & Coral st	Morocco mfrs...	April 2.	Gem							1	1	6,715,400	\$2,014 62	
25	Phila. & Read'g Ry.	N. S. Lehigh ave. N. W. C. Cedar st....	Transportation..	May 29.	Trident.							1	1	901,000		
25	H. Whitaker & Sons	S E C. Emerald & Westmoreland sts.	Rope mfrs.....	Sept. 11	Empire				1				1	112,200		
25	F. W. Tunnell & Co.	Wheatsheaf lane & Gaul st.....	Glue mfrs	Nov. 1....	Gem							1	1	191,500		Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 13 ...	Empire				1				1	200		Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 13 ...	Empire				1				1			Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 14 ...	Empire				1				1			Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 14 ...	Empire				1				1			Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 17 ...	Empire				1				1			Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.....	Finishing works	Dec. 18 ...	Empire				1				1			Experimental.
25	Phila. Rapid Transit Co	N. W. C. Richmond st. & Allegheny ave	Car barn.....	Dec. 19 ...	Empire				1				1	400		
29	American Brwg Co.	N. W. C. 31st & Master st	Brewers	Aug. 1....	Gem							1	1	1,201,700	360 51	
36	Phila. Rubber Wks.	S. W. C. 37th & Reed sts.....	Gum goods.....	July 27...	Empire				1				1	122,200		Experimental.

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	Union.	Total.	Crown
1		5	
2		12	
		14	
2		12	
1		36	
		15	
		14	
		2	
1	5	110	1

New Meters Set.—Continued.

Ward.	Occupant.	Location.	Business.	Date When Set.	Name of Meter.	SIZE.							Cubic Feet Consumed.	Meter rents.	Remarks.	
						1/2 inch.	3/8 inch.	3/4 inch.	1 inch.	1 1/2 inch.	2 inch.	3 inch.				4 inch.	6 inch.	Total
23	Wallace Wilson	W. S. Wain st. 127 ft. S. of Unity st.	Hosiery mfrs ...	March 22.	Crown				1					181,600		
23	Alva Carpet & Rug Co.	S. S. Oxford st. W. of Hedge st.	Carpets, &c ...	Sept. 10	Empire				1					30,100		
25	R. H. Foerderer Est.	Wheatsheaf lane & Coral st.	Morocco mfrs...	April 2...	Gem						1	1	6,715,400	\$2,014 62		
25	Phila. & Read'g Ry.	N. S. Lehigh ave. N. W. C. Cedar st.	Transportation.	May 29...	Trident.							1	1	901,000		
25	H. Whitaker & Sons	S E C. Emerald & Westmoreland sts.	Rope mfrs.....	Sept. 11	Empire				1					112,200		
25	F. W. Tunnell & Co.	Wheatsheaf lane & Gaul st.	Glue mfrs.....	Nov. 1....	Gem							1	1	191,500		Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 13 ...	Empire				1					200		Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 13 ...	Empire				1							Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 14 ...	Empire				1							Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 14 ...	Empire				1							Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 17 ...	Empire				1							Experimental.
25	John Williams	S. W. C. Richmond & Tioga sts.	Finishing works	Dec. 18 ...	Empire				1							Experimental.
25	Phila. Rapid Transit Co	N. W. C. Richmond st. & Allegheny ave.	Car barn.....	Dec. 19 ...	Empire				1					400		
29	American Brwg Co.	N. W. C. 31st & Master st	Brewers	Aug. 1....	Gem						1	1	1,201,700	360 51		
36	Phila. Rubber Wks.	S. W. C. 37th & Reed sts.	Gum goods.....	July 27...	Empire				1					122,200		Experimental.

MISCELLANEOUS WORK ON METERS DURING THE YEAR 1906.

SIZE.	METERS.																																									
	REPAIRED.												USED IN SERVICE.				METERS PACKED.								METERS TESTED.																	
	Crown.	Gem.	Nash.	Trident.	Union.	Empire.	Hersey.	Standard.	Thompson.	Columbia.	Worthington.	Pittsburg.	Total.	Crown.	Gem.	Trident.	Total.	Crown.	Gem.	Nash.	Trident.	Union.	Hersey.	Standard.	Columbia.	Worthington.	Empire.	Pittsburg.	Total.	Crown.	Gem.	Trident.	Hersey.	Union.	Worthington.	Nash.	Empire.	Niagara.	Total.			
1/2-inch	3											3					5																									
3/4-inch				8	1	1				19		29													17		1															
1-inch	77			8	5	4						94			1	1	78		3	4	3						2	1														6
1 1/2-inch	62			6	1	3				3		75	3			3	69			1	2						2														15	
2-inch	39		1	9	12						4	66			1	1	41		2		2	2	1			1	1														12	
3-inch	50	75		2	3	1	1	2			4	188		4		4	37	20		4	4					2		1													51	
4-inch	21	75		6	2		4	3	1			112					4	7		1		1																			13	
6-inch	15	94		1			6					116	1			1	1	7					1																		13	
6-inch		15		2			6	3				26																													6	
Total	267	259	1	41	25	9	17	8	1	22	8	659	4	4	2	10	235	34	5	21	14	3	2	17	3	6	2	342	41	62	13	2	1	3	1	14	1		133			

EXAMINATIONS.				MISCELLANEOUS.							
Meters.	Leak.	Short supply.	Total.	New boxes.	Boxes repaired.	Iron covers.	Fish traps.	Service pipes repaired.	Total.	Statements.	
1,408	68	87	1,563	75	62	9	1	653	800	24,700	

New Meters Set.—Continued.

Ward.	Occupant.	Location.	Business.	Date When Set.	Name of Meter.	Size.							Cubic feet Consumed.	Meter Rents.	Remarks.		
						$\frac{1}{2}$ inch.	$\frac{3}{4}$ inch.	1 inch.	1 $\frac{1}{2}$ inch.	2 inch.	3 inch.	4 inch.				6 inch.	Total.
38	John Adams.....	S. S. Indiana ave., 190 ft W. of 16th st.	Furniture	July 16...	Gem					1				85,300	\$25 50	Experimental.	
40	Penn Reduction Co.	49th & Schuylkill ave	Garbage.....	July 12...	Nash.....	1							40,000				
40	Phila. Balt. & Wash. R. R. Co	47th & Grays Ferry ave	Round house...	April 20...	Gem							1	1	3,026,000	907 80		
42	Phila. Rapid Transit Co	2d & Wyoming ave.....	Power house....	Feb. 8 ...	Gem							1	1	10,655,600	3,196 68		
Totals							2	7	4	3	6	2	4	5	33		

Schedule of Pipe and Special-Ordered Castings Rejected and Accepted During the Year 1906.

	Manufacturer.	SIZE IN INCHES.		Ordered.	Inspected.	Rejected.	Accepted.
		Pipe.	Special Castings.				
Bureau of Water.	Donaldson Iron Co.	6 in.		10,520	13,893	3,373	10,520
		8 in.		1,000	1,125	125	1,000
		10 in.		1,100	1,323	223	1,100
		12 in.		600	761	161	600
		16 in.		1,087	1,559	472	1,087
			Small	2,084	2,464	380	2,084
	M. J. Drummond.....	16 in.		600	1,116	516	600
		30 in.		6	7	1	6
			Small	10	10		10
	J. K. Dimmick.....		Large	52	53	6	52
		10 in.		25	34	9	25
		12 in.		520	608	88	250
	Small	142	193	51	142		

Schedule of Pipe and Special-Ordered Castings, etc.—Continued.

	Manufacturers.	SIZE IN INCHES.		Ordered.	Inspected.	Rejected.	Accepted.
		Pipe.	Special Castings.				
Bureau of Water.	J. A. Clark.....	}	Frames and covers.....	700	788	88	700
			Stop boxes.....	200	212	12	200
			Corrigated grate bars.....		56	6	50
			Centre grate bars.....		189	14	175
	U. S. C. I Pipe and Foundry Co.....	16 in..	Breeches.....	1	1		1
	Total.....				24,707	5,525	19,272
Bureau of Correction.	Donaldson Iron Co.....	}	3 in.....		120	36	84
			4 in.....		120	36	84
			6 in.....		120	36	84
			12 in.....		1,175	341	834
	U. S. C. I Pipe and Foundry Co.....	}	Small.....		281	38	43
			Small.....		69	3	66
Total.....				1,885	490	1,395	

Schedule of Pipe and Special-Ordered Castings, etc.—Continued.

	Manufacturer.	SIZE IN INCHES.		Ordered.	Inspected	Rejected.	Accepted.
		Pipe.	Special Castings.				
Rapid Transit Co.	R. D. Wood.....	8 in.. Flanged			78	60	18
		12 in.. Flanged			8	3	5
		16 in.. Flanged.....			70	17	53
	Donaldson Iron Co.....	Small.....			306	75	231
		Small.....			21	3	18
	Total.....				483	158	325
National Ammonia Co.	Donaldson Iron Co.....	3 in.			4		4
		6 in.			39	6	33
		8 in.			137	27	110
		Small.....			18		18
	Total.....				198	33	165
Private Bureau of Contract Surveys.	R. D. Wood.....	48 in.. Drain			26		26
	Donaldson Iron Co.....	6 in.			43	14	34

*New Attachments Made and Delivered to the Districts
During 1906.*

Districts.	Number of Attachments Made and Delivered.	FEET OF LEAD PIPE.		Total.
		5/8-inch.		
First.....	68	1,008		1,008
Second.....				
Third.....	427	6,932		6,932
Fourth.....				
Fifth.....	75	1,150		1,150
Sixth.....	125	1,915		1,915
Seventh.....	1,195	21,815		21,815
Total.....	1,890	32,320		32,320

DISTRIBUTION EXPENSES DURING THE YEAR 1906.

Including Expenses of Main Office, Purveyors' Districts, and Meter Shops.

Material and Labor.	First District.	Second District.	Third District.	Fourth District.	Fifth District.	Sixth District.	Seventh District.	Distribu- tion.	Meter Shops	Main Office.	Totals.
Lead.....	\$325 08	\$1,455 31	\$1,932 86	\$2,195 53	\$275 23	\$1,097 46	\$4,094 70				\$11,876 17
Gasket.....			90 04	21 56							111 60
Coke.....	33 10	78 50	168 25	54 20	15 60	58 40	111 25				519 30
Wood.....						26 00					26 00
Straight pipes.....								\$113,134 92			113,134 92
Small specials.....								9,813 98			9,813 93
Large specials.....								1,664 89			1,664 89
Breeches and ¼ turns.....								87 80			87 80
Frames and covers.....	363 45	186 36	551 52	131 92	177 00	293 02	696 14				2,399 41
Cast iron stop boxes.....	134 05		196 18	635 62		95 04	297 38				1,358 27
Hauling, transportation and hotel.....								10,676 32			10,676 32
Supplies, tools, small stores, etc.....	537 09	1,167 22	843 67	2,476 82	1,007 34	1,999 91	526 26	4,601 30	\$3,387,21		16,551 82
Plumbing and plum'g supplies					21 56	32 20			7,915 85		7,969 61
Meters, etc.....									305 63		305 63
Brick, stone, lime and cement.	11 10	18 10	102 50	501 85	11 75	10 00	4 50				659 80
Lumber.....	5,039 94	153 19	994 33	480 48	406 30	583 79	234 63		730 31		8,622 97

Distribution Expenses During the Year 1906.—Continued.

Material and Labor.	First District.	Second District.	Third District.	Fourth District.	Fifth District.	Sixth District.	Seventh District.	Distribution.	Meter Shops.	Main Office.	Totals.
Hay, feed, etc.	\$716 83	\$560 49	\$1,018 77	\$700 19	\$195 44	\$156 47	\$757 89				\$4,106 78
Stable supplies.....	4 17	319 73	287 95	596 05	579 98	668 88	347 02				2,754 63
Stable repairs	233 45	188 65	220 05	171 68	92 65	28 80	198 35				1,142 63
Stable medicines.....	19 50	19 00	6 75	16 25	12 00	7 20	74 00				154 70
Stable shoeing	210 00	237 50	249 13	154 50	47 13	42 00	129 00				1,069 26
Supplies, stationery	74 04	125 06	88 39	76 77	88 19	109 22	132 46	\$806 16	\$166 84	\$67 44	1,484 57
Wages..... { Per diem.....	25,499 48	21,484 34	54,857 26	19,643 64	13,681 05	31,866 19	28,582 64				195,564 60
{ Salary	4,571 18	4,568 24	6,722 31	7,807 51	3,016 37	3,974 00	4,565 29				35,224 90
Total cost of labor and material on account of distribution..	\$33,272 46	\$30,561 69	\$68,293 96	\$35,665 27	\$19,527 59	\$11,048 53	\$40,752 41	\$140,325 40	\$12,505 84	\$67 44	\$427,230 56
Buildings, grounds and reservoirs.....			\$9,832 90	\$8,872 58	\$6,392 63	\$138 74	15,085 46				\$40,322 36
High pressure fire service.....	\$167 49	\$3,051 97	153 42			5 00	12 60				3,390 57
Filtration	34 37		4,507 37				931 71				5,473 45
Repair shop			88 81								88 81
Main office.....			154 00	333 80							487 80
Totals.....	\$38,474 32	\$33,613 66	\$83,030 46	\$44,871 65	\$25,920 27	\$41,192 27	\$56,782 27	\$140,325 40	\$12,505 84	\$67 44	\$476,993 55

APPENDIX D



REPORT

OF THE

OPERATIONS AT THE CONSTRUCTION AND REPAIR SHOP BUREAU OF WATER, DURING THE YEAR 1906

Philadelphia, January 18, 1907.

MR. A. J. FULLER.

**General Superintendent,
in Charge of Bureau.**

DEAR SIR:—I herewith submit the annual report of the operations at the Construction and Repair Shop, Twelfth and Reed street, for the year ending December 31, 1906.

Yours respectfully,

JAMES H. DEAN,
Superintendent of Shop.

MERCHANTISE.	DR.
Inventory, January 1, 1906.....	\$20,066 70
Bolts and nuts	\$1,309 04
Hardware	704 12
Steel	1,079 75
Wrought iron	1,622 44
Iron castings	17,679 41
Brass castings	10,770 65
Chandlery	168 70
Gum goods	868 78
Lead coating	468 65
Coal	1,436 34
Coke	25 20
Lumber	1,130 92
Paint, brushes and oils	147 19
Brass fittings	773 18
Oils and tallow	161 47
Wrought iron pipe and fittings....	66 28
Lead	1,368 75
Forage	99 34
Miscellaneous	202 12
Wages	34,235 64
	<hr/> \$74,317 97
Total	<hr/> \$94,384 67

MERCHANTISE.	CR.
First District	\$3,593 94
Second District	4,082 50
Third District	10,840 65
Fourth District	2,642 10
Fifth District	1,368 47
Sixth District	3,928 83
Seventh District	10,557 35
	<hr/> \$37,013 84
Spring Garden machinery	7,715 12
Spring Garden boilers	384 87
	<hr/> 8,139 99
Fairmount machinery	838 79
	<hr/> 838 79
Belmont machinery	7,368 97
Belmont boilers	759 20
	<hr/> 8,128 17

Queen Lane machinery	\$4,987 51	
Queen Lane boilers	188 13	
	<hr/>	\$5,175 64
Roxborough machinery	6,307 01	
Roxborough boilers	141 72	
	<hr/>	6,448 73
Frankford machinery	2,969 21	
Frankford boilers	296 56	
	<hr/>	3,265 77
General buildings and grounds ...	1,863 22	
	<hr/>	1,863 22
Distribution	191 41	
	<hr/>	191 41
High Pressure Fire Service	1,431 52	
	<hr/>	1,431 52
Mt. Airy machinery	44 71	
Mt. Airy boilers	3 25	
	<hr/>	47 96
Torresdale filters	5 34	
	<hr/>	5 34
Holmesburg Water Co.....	156 40	
	<hr/>	156 40
Philadelphia Rapid Transit Co.....	1 40	
	<hr/>	1 40
The United Gas Improvement Co...	6 10	
	<hr/>	6 10
Fixed patterns	1,000 41	
	<hr/>	1,000 41
Construction and Repair Shop	1,846 94	
	<hr/>	1,846 94
		\$75,561 63
Inventory, January 1, 1907.....		\$27,909 45
		<hr/>
Total Cr.	\$103,471 08	
Total Dr.	94,384 67	
	<hr/>	
Balance		\$9,086 41

INVENTORY, JANUARY 1, 1907.

8 4-in. stop valves, at \$15.00.....	\$120 00	
11 6-in. stop valves, at \$17.00.....	192 50	
23 8-in. stop valves, at \$26.00.....	598 00	
14 10-in. stop valves, at \$36.00.....	504 00	
28 12-in. stop valves, at \$45.00.....	1,260 00	
5 16-in. stop valves, at \$78.00...	390 00	
4 20-in. stop valves, at \$120.00...	480 00	
2 30-in. stop valves, at \$230.00....	460 00	
	<hr/>	\$4,004 50
33 No. 1 fire hydrants, at \$33.50..	1,105 50	
	<hr/>	1,105 50
Finished parts stop valves	1,132 55	
Finished parts fire hydrants ..	608 85	
	<hr/>	1,741 40
1 48-in. check valve, unfinished..	900 00	
1 48-in. check valve, unfinished..	615 00	
2 20-in. check valves, unfinished, at \$120.00	240 00	
1 48-in. rotary valve, unfinished..	536 00	
4 30-in. rotary quadrants, at \$10.00	40 00	
6 48-in. rotary quadrants, at \$16.00	96 00	
1 Eddy quadrant	10 00	
5 quadrant keys, at \$2.00.....	10 00	
	<hr/>	2,447 00
36 Viney stop screws, at \$2.00...	72 00	
28 Viney stop screws, at \$5.00....	140 00	
18 6-in. Barton stop screws, at \$4.00	72 00	
8 8-in. and 10-in. Barton screws, at \$4.50	36 00	
26 independent Viney screws, at \$2.00	52 00	
475 new style screws, 4-in. to 48-in.	2,740 00	
68 socket screws	96 00	
28 socket spindles	53 00	
	<hr/>	3,261 50
252 iron bands, 4-in. to 48-in.....	991 50	
	<hr/>	991 50
151 4-in. rubber valves for fire hy- drants, at 65c.....	95 15	
62 6-in. rubber valves for fire hy- drants, at \$1.75	108 50	
	<hr/>	206 65

24 straps for air pump, at \$9.00..	216 00	
67 brasses for air pump, at \$2.50.	167 50	
40 sets gibs and keys, at \$4.50....	180 00	
7 keys, at \$2.25	15 75	
150 fire hoe heads, at \$1.75.....	262 50	
	<hr/>	\$841 75
22 steel plunger rods, various sizes	407 16	
290 sketch plates for hoe heads ...	74 00	481 16
Articles and tools carried in stock and issued to the Districts	1,618 30	
	<hr/>	1,618 30
34,959 lbs. wrought iron, at 3c.....	1,048 77	
1,614 lbs. Norway iron, at 4c.....	64 56	
8,408 lbs. machinery steel, at 3c.....	252 24	
6,302 lbs. cast steel, at 6½c.....	409 63	
278 lbs. flat cast steel, at 8c.....	22 24	
558 lbs. shear steel, at 7c.....	39 06	
1,410 lbs. spring steel, at 4c.....	56 40	
697 lbs. tool steel, at 8c.....	55 76	
395 lbs. Muschette steel, at 35c....	138 25	
17,557 lbs. pig lead, at 6c.....	1,053 42	
	<hr/>	3,140 33
15,347 lbs. fire hydrant castings, at 2½c.	373 68	
22,408 lbs. stop castings, at 2½c.....	560 20	
	<hr/>	933 88
37,721 lbs. pump machinery and mis- cellaneous castings	1,320 24	
12,710 lbs. loam castings, at 4¼c.....	540 18	
1,443 lbs. yellow brass castings, at 18c.	259 74	
6,096 lbs. red brass castings, at 20c.	1,219 20	
4,139 lbs. Ajax metal castings, at 22c	910 58	
868 lbs. non-shrinkable metal, at 25c.	217 00	
2,202 lbs. round rolled brass, at 24c.	528 48	
	<hr/>	4,995 42
Hardware	389 03	
Bolts, nuts and set screws ...	878 48	
Paints, oils and tallow.....	120 99	
Chandlery	23 50	
Gum goods	193 93	
Lumber	549 69	
Coal	64 94	
	<hr/>	2,140 56
		\$27,909 45

Principal Articles Delivered to the Districts and Works.

DISTRICTS.	Fire Hydrants.	WEDGE STOP VALVES.							PLUGS.		Iron Bands.	Stop Screws.
		4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	Wood.	Brass.		
First.....	29	3	56	4	5	4	.....	.....	97	282	.....	11
Second.....	28	1	82	3	21	13	3	.....	6	250	18	48
Third.....	101	3	169	12	33	9	9	2	172	282	54	17
Fourth.....	19	3	32	.....	3	1	.....	.....	6	230	8	54
Fifth.....	24	.....	24	.....	.....	.....	.....	.....	18	.....	.....	3
Sixth.....	20	4	73	6	19	10	.....	.....	138	72	9	6
Seventh.....	137	2	169	25	14	4	3	1	180	108	25	37
Total.....	358	16	555	50	95	41	15	3	617	1,224	114	171

PRINCIPAL ARTICLES MANUFACTURED DURING 1906.

24 4-in. stop valves, at \$15.00.....	\$360 00
555 6-in. stop valves, at \$17.50.....	9,712 50
72 6-in. stop valves, at \$26.00....	1,872 00
108 10-in. stop valves, at \$36.00....	3,888 00
68 12-in. stop valves, at \$45.00....	3,060 00
23 16-in. stop valves, at \$78.00....	1,794 00
8 20-in. stop valves, at \$120.00...	960 00
2 30-in. stop valves, at \$230.00...	460 00
395 No. 1 fire hydrants, at \$33.50..	13,232 50
974 brass plugs, various sizes, at 25c.	243 50
521 wooden plugs, various sizes, at 50c.	260 50
	<hr/> \$35,843 00

APPENDIX E



REPORT

OF THE

CHIEF DRAUGHTSMAN

FOR THE YEAR 1906

Philadelphia, January 16, 1907.

MR. A. J. FULLER,
General Superintendent,
in Charge of Bureau.

DEAR SIR:—The following report of work under my charge, in the draughting room, for the year 1906, is respectfully submitted.

In addition to the recorded work of the draughting room, a large number of reports, diagrams, sketches and tables of statistics were made; many specifications were also prepared and indicator diagrams taken and computed for horse power and steam consumption. This work was not recorded, but was included in the routine of the draughting room and consumed much time and labor.

One draughtsman was detailed, for nearly six months, on work at the Spring Garden Pumping Station; another was detailed, for nearly three months, on tests of fire engines, and a third on work on Bustleton Pipe Line, for three months, or until the end of the year.

There are now on record about 4,000 drawings, in sheets and rolls, which relate to the plants and property of this Bureau.

Plans and specifications were prepared for an office for the Seventh District, at Forty-eighth street and Parkside avenue, and for a new machine shop at the Spring Garden Pumping Station.

Drawings relating to the following subjects were made and recorded during the year :

Plans and details of buildings.....	17
Details of engines	5
Details of boilers	6
Special machinery	1
Special castings	4
Diagrams	38
Surveys	4
Maps	4
Pumpage chart, colored	1

During the year about 1,100 blue prints were made from the various drawings required for the use of the City Construction and Repair Shop and for repair work at the several pumping stations.

From data prepared by the inspectors of the Bureau there were made one hundred and eighty-four (184) calculations for boiler and engine horse power. From these computations are determined the water rents to be paid by owners of steam boilers using water from the City mains.

The daily pumpage and storage charts, showing the height of water in Fairmount Pool, C. D., the water flowing over the flash boards, the rainfall and the temperature of the air and water, also the daily stream flow charts of the Perkiomen, Neshaminy and Tohickon Creeks, for the year 1906, have been prepared as in previous years.

REPORT
ON THE
HYDROGRAPHIC WORK
FOR THE YEAR 1906

The following report on hydrographic work in charge of the Chief Draughtsman, and on data collected during the year 1906, is respectfully submitted.

Rainfall observations at twenty-three stations, from which the Bureau obtained this data, have been carried on, completing twenty-four years of continuous records.

Nine of these stations are maintained by the Bureau and furnished with instruments, stationery and postage. The observers are paid a small monthly salary for the services rendered.

Three of the stations are furnished with self-registering rain gauges, and at five stations automatic stream gauges are in operation, recording continuously the height of water in the streams. From the curves traced by these instruments the daily, monthly and yearly flow is computed.

Observations with the automatic recording gauges have been continued on the Perkiomen, Neshaminy and Tohickon creeks, completing continuous records, for twenty-three years, of flow on these streams.

The flow of the Schuylkill river, as recorded and computed from the automatic gauge placed in the wheel house, has been recorded for eight continuous years.

The observations on the Wissahickon were discontinued in July when the water was drained out of the dam.

The automatic gauge at Fairmount records the height of water in Fairmount Dam, C. D., the zero of the gauge corresponding with the bench marks on both sides of the river, as shown by the levels run last year (1905).

Daily computations of the amount of water flowing over the flash boards were made, based on the observations taken at Fairmount Dam, together with the known pumpage from the river and the quantity used for power through the wheels, the leakage and lockage (both estimated), which gives an approximate estimate of the monthly flow of the river at Fairmount.

A comparison of the inches of rainfall flowing off in the Schuylkill river, with the run off on the Perkiomen and Neshaminy creeks, is shown in the following table:

Inches of Rainfall Flowing Off

January to December.	Perkiomen.	Neshaminy.	Schuylkill.
1898.....	21.50	22.22	24.89
1899.....	24.66	21.06	22.29
1900.....	15.21	17.27	18.23
1901.....	17.55	22.80	17.80
1902.....	29.01	30.74	29.02
1903.....	27.28	26.32	27.79
1904.....	23.07	23.37	18.84
1905.....	23.62	17.98	18.95
1906.....	21.67	24.41	17.31

No method has as yet been devised by which the low water flow for periods of less than one month can be determined.

The average daily flow of the Schuylkill river, as given in Table VIII, is computed from the total monthly flow, and is often, for several days at a time, much less than shown in the table.

The greatest monthly flow of the Schuylkill river occurred in March, when the total flow was 152,517 second feet. The least monthly flow was in September, when the total flow was only 22,577 second feet. The greatest daily flow occurred in March, when the total flow was 27,025 second feet.

The greatest monthly rainfall on the watershed of the Schuylkill, during the year, was 6.68, being the average for 18 stations, for the month of June. There was a deficiency of rainfall on the same area during the months of September, November and December. The rainfall for the year was about an average for the past 23 years, and was fairly well distributed on the watershed, producing an average flow in the small streams. The deficiency of rainfall in the last five months of the year, on the upper Schuylkill valley watershed, is shown in the diminished total flow of that river.

The rainfall of the 16th and 17th of June was very heavy and exceeded the amounts recorded by this Bureau, for the same length of time, for the month of June, for the past twenty-three years.

The rainfall, as taken from the automatic recording gauge at Fairmount, was as follows: From 1.30 P. M. of the 16th to 2 A. M. of the 17th, 4.60 inches; 1.30 P. M. to 8 P. M. of the 16th, 3.45 inches; from 4 to 5 P. M. of the same date, 1.85 inches fell in 45 minutes; from 1.30 P. M. of the 16th to 4 A. M. of the 19th, 6.62 inches fell. The total rainfall, for the month, in Philadelphia, was 8.35 inches.

This storm covered nearly the whole eastern part of the State and produced freshets in all the streams and rivers.

The flow of the Schuylkill for the 19th of June was 19,978 second feet; of the Perkiomen, 2,195 second feet; of the Neshaminy, 2,736 second feet; of the Tohickon, 1,002 feet, and of the Wissahickon, 1,096 second feet.

Monthly Precipitation on Sundry Watersheds Compared with U. S. Weather Bureau Observations at Philadelphia.

	PHILADELPHIA SERIES.					SCHUYLKILL SERIES.					PERKIOMEN SERIES.		DELAWARE SERIES.			TOHICKON SERIES.				NESHAMINY SERIES.			
	U. S. Weather Bureau.	Water Bureau Auto.	Water Bureau Ground Gauge.	Pennsylvania Hospital.	Shawmont.	Lebanon.	Reading.	Pottsville.	Browers.	Hamburg.	Seisoltzville.	Spring Mount.	Easton.	Moorestown.	West Chester.	Ottsville.	Quakertown.	Smith's Corner.	Point Pleasant.	Lansdale.	Forks of Neshaminy.	Doylestown.	
ELEVATIONS ARE IN FEET ABOVE SEA LEVEL	207	66	49	25	368	480	207	150	86	365	870	300	340	65	455	390	536	480	119	350	143	405	
	Precipitation in Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January.....	3.16	3.22	3.34	3.04	2.63	3.33	3.72	2.50	3.32	2.96	3.11	2.94	2.70	2.86	3.76	2.31	3.36	3.13	2.96	2.69	2.31	4.68	
February.....	2.47	2.94	2.99	2.70	2.48	3.07	2.69	2.73	3.07	2.77	2.65	2.55	2.33	2.06	5.13	2.36	1.63	2.18	2.46	2.32	2.52	2.86	
March.....	5.59	3.98	4.22	5.36	4.92	5.41	4.01	5.89	3.73	5.89	5.08	4.30	4.34	5.37	5.01	5.03	4.54	3.78	5.23	3.72	4.99	6.56	
April.....	3.17	3.42	3.59	3.45	3.16	4.58	4.30	5.24	4.33	5.04	3.92	3.75	3.92	2.71	3.66	3.45	4.02	3.52	3.42	3.57	3.01	4.52	
May.....	4.43	3.16	3.28	3.84	2.80	2.43	4.64	4.17	4.24	2.31	3.97	4.15	4.51	2.66	4.21	3.94	5.00	5.38	4.94	2.65	4.70	3.34	
June.....	8.04	8.23	8.31	7.93	7.02	5.75	6.61	6.05	7.13	7.84	5.56	5.10	4.94	7.33	7.35	4.84	5.03	5.07	4.79	6.22	6.54	10.29	
July.....	5.33	6.52	6.65	6.41	7.31	4.06	1.87	2.66	2.67	3.66	2.47	6.12	3.98	4.11	7.15	4.82	4.26	4.54	3.92	6.06	6.00	5.20	
August.....	9.56	7.10	7.30	9.32	7.48	6.76	3.41	3.67	8.54	8.46	5.35	3.09	3.93	9.43	7.47	3.29	2.19	3.28	2.93	3.91	6.65	5.62	
September.....	0.36	0.21	0.25	0.31	0.44	1.48	2.84	4.37	1.45	4.88	1.30	3.48	2.39	3.99	1.34	1.23	1.02	0.92	1.12	2.69	0.61	2.55	
October.....	4.97	4.39	4.35	3.92	5.12	5.75	5.92	6.66	6.00	6.42	5.89	5.59	5.17	4.20	5.85	4.93	3.61	5.66	5.36	6.24	4.48	8.39	
November.....	1.72	1.62	1.66	2.23	1.51	0.83	1.17	1.08	1.59	1.90	1.27	1.35	1.25	1.70	2.13	2.79	1.58	1.35	1.43	1.32	2.15	2.10	
December.....	3.07	3.70	3.79	1.99	3.88	4.99	5.24	5.08	4.60	5.75	5.35	4.76	5.06	3.34	5.61	4.45	4.15	4.94	4.43	4.29	4.07	4.89	
Total.....	51.87	48.49	49.73	50.50	48.65	48.44	46.42	50.10	50.72	57.28	45.92	47.18	44.52	49.76	56.67	43.44	40.44	43.75	42.01	45.68	48.53	61.00	
Percentage.....	100	96	98	99	95	94	90	99	99	110	90	93	86	98	109	85	80	86	83	90	97	117	
24 Years Yearly Average..	Inches..... 40.70	.....	44.26	45.11	43.76	43.76	43.28	50.94	44.82	47.46	49.75	45.46	45.86	47.24	51.77	47.57	48.70	51.15	49.25	45.11	46.73	47.00
	Percentages... 100	.....	112	112	107	107	106	125	110	116	122	113	112	115	126	116	120	125	120	111	114	115
Average Deficiency or Increase.....	+11.17	.....	+5.47	+5.39	+4.89	4.67	+3.14	-0.84	+5.90	+6.12	-4.40	+1.72	-1.34	+2.52	+4.90	-4.13	-8.26	-7.40	-7.24	+0.57	+1.80	+14.00
Percentage Deficiency or Increase.....	27	.....	12	12	14	14	8	1.6	12	15	9	4	3	3.5	12	10	21	18	17	1	4	35

The following-named tables, compiled as in previous years, accompany this report:

1. Monthly precipitation on sundry water sheds.		
II. III. IV.}	Rain storms exceeding $\frac{1}{4}$ inch per hour...	{ Philadelphia. Forks of Neshaminy Spring Mount.
V. VI. VII.}	Inches on rainfall flowing in the..... Average annual yield of streams..... Comparative stream flow.....	{ Perkiomen. Neshaminy. Tohickon. Wissahickon Schuylkill.
VIII. IX.}	Monthly and daily yield of.....	{ Perkiomen. Neshaminy. Tohickon. Wissahickon. Schuylkill.

The Bureau is indebted to the following-named persons who have kindly furnished rainfall records:

Mr. J. L. Heacock, Quakertown, Pa.

Mr. Thomas J. Bean, Moorestown, N. J.

During the year 1906 all observations on rainfall were taken uniformly in accordance with instructions given at the beginning of the year.

Yours respectfully,

JOHN E. CODMAN,

Chief Draughtsman.

TABLE II.

Rain Storms Exceeding in Rate 0.25 Inches per Hour as Recorded by the Automatic Rain Gauge at Philadelphia for the Year 1906.

DATE OF OBSERVATION.	AUTOMATIC RAIN GAUGE.					REMARKS.
	TOTAL FALL.		MAXIMUM FALL.			
	Amount in Inches.	Duration Hours, Minutes	Amount in Inches.	Duration in Minutes.	Rate per Hour During Maximum Fall.	
January 4, rain storm.....	2.02	23—55	.25	20	.75	
March 3 and 4, rain storm...	2.92	25—00	.80	30	1.60	
April 9 to 10, rain storm....	2.25	15—30	.10	10	.60	
April 15, rain storm.....	1.08	9—30	.15	20	.45	
May 5, showers.....	.60	0—40	.45	30	.90	
May 27 to 28, rain storm....	1.82	43—20	.20	15	.80	
May 27 to 28, rain storm....	1.82	43—20	.25	15	1.00	
June 7, showers.....	0.23	1—30	.20	15	.80	
June 10, showers.....	0.42	3—10	.20	20	.60	
June 16 to 19, rain storm....	6.58	62—30	.20	15	.80	
June 22, showers.....	0.28	2—00	.15	15	.60	
June 30, showers.....	0.20	0—15	.15	15	.60	
July 4, rain storm.....	3.40	17—30	.90	30	1.80	
July 11, shower.....	0.51	3—40	.35	25	.84	
July 16, shower.....	.80	—40	.20	10	1.20	
July 17, shower.....	1.12	5—20	.96	50	1.15	
July 29, shower.....	.86	8—30	.60	25	1.44	
August 2 and 3, rain storm..	2.42	30—30	.80	40	1.20	
August 3, rain storm.....	1.15	6—30	.40	45	.43	
August 21, shower.....	.60	—45	.60	45	.80	
August 25, rain storm.....	2.16	11—30	.60	40	.90	
October 5, rain storm.....	1.91	4—45	1.50	60	1.50	

TABLE III.

Rain Storms Exceeding in Rate 0.25 Inches per Hour as Recorded by the Automatic Rain Gauge at Forks of the Neshaminy for the Year 1906.

DATE OF OBSERVATION.	AUTOMATIC RAIN GAUGE.					REMARKS.
	TOTAL FALL.		MAXIMUM FALL.			
	Amount in Inches.	Duration Hours, Minutes	Amount in Inches.	Duration in Minutes.	Rate per Hour During Maximum Fall.	
January 3 and 4, rain storm	1.22	21—40	.15	25	.36	
March 3 and 4, rain storm..	2.12	25—20	.25	30	.50	
April 9, rain storm.....	1.40	22—20	.10	10	.60	
April 15, rain storm.....	1.17	8—45	.10	10	.60	
May 5, showers.....	1.08	0—35	1.00	35	1.72	
May 27 and 29, rain storms..	2.98	46—35	.30	20	.90	
May 27 and 29, rain storms..	2.98	46—35	.90	30	1.80	
June 7, shower.....	0.33	1—20	.20	10	1.20	
June 10, shower.....	0.30	4—18	.20	20	.60	
June 16 and 19, shower.....	4.09	75—0	.25	15	1.00	
June 23, shower.....	0.95	7—0	.60	20	1.80	
June 30, shower.....	0.22	1—0	.15	15	.60	
July 3, rain storm.....	2.66	15—00	1.78	30	1.80	
July 3, rain storm.....	2.66	15—00	.50	20	1.50	
July 17, rain storm.....	1.27	4—15	1.07	40	1.60	
July 20, rain storm.....	.39	1—15	.20	20	.60	
July 29, shower.....	1.45	7—20	.15	30	.30	
August 3, rain storm.....	2.04	30—30	.30	35	.86	
August 21, showers.....	1.10	2.30	.90	50	1.08	
August 25, rain storm.....	1.95	15—40	.95	30	1.90	
October 5, rain storm.....	2.00	5—00	2.00	300	2.00	

TABLE IV.

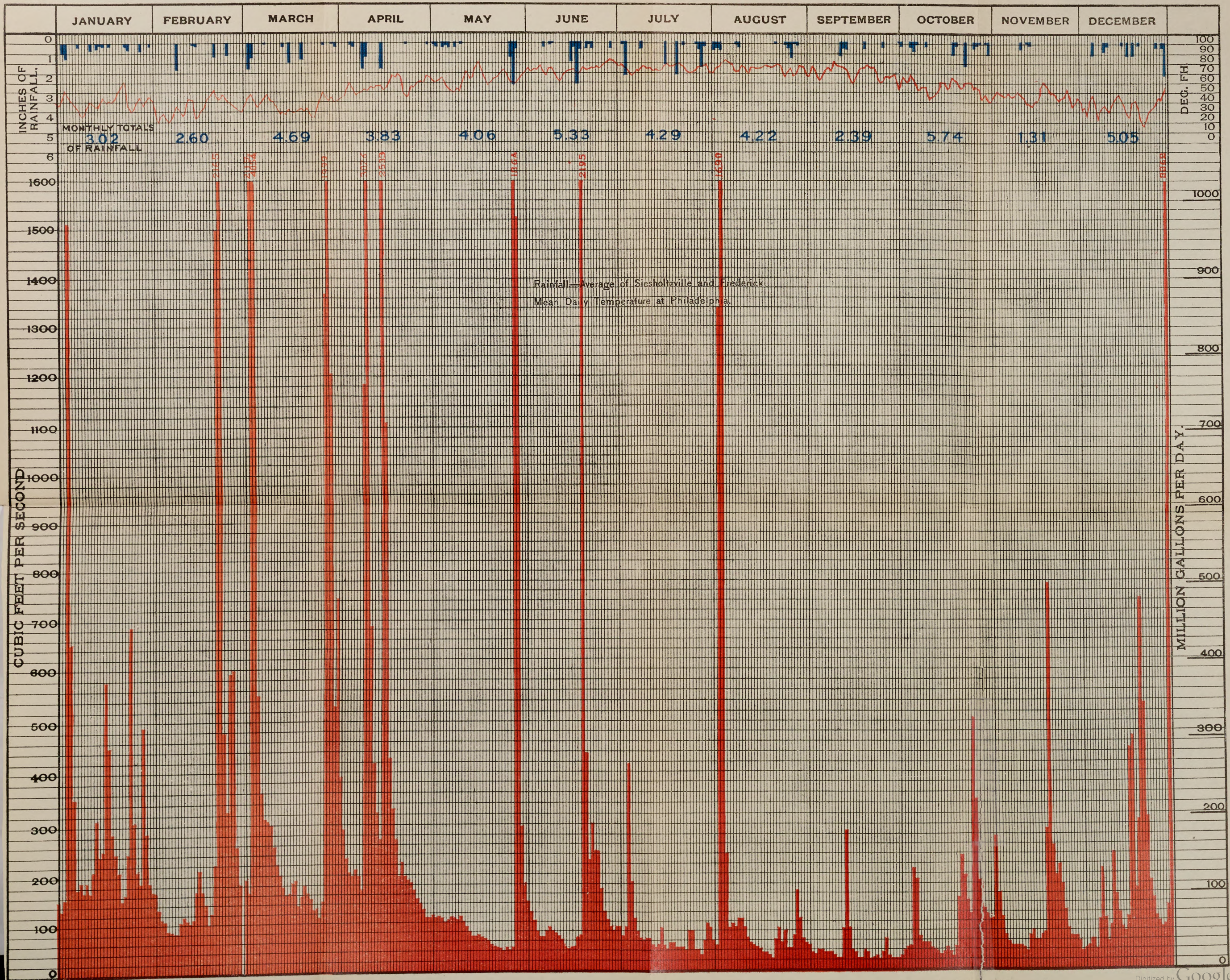
Rain Storms Exceeding in Rate 0.25 inches per Hour, as Recorded by the Automatic Rain Gauge at Springmount, for the year 1906.

DATE OF OBSERVATION.	AUTOMATIC RAIN GAUGE.					REMARKS.
	TOTAL FALL.		MAXIMUM FALL.			
	Amount in Inches.	Duration Hours, Minutes.	Amount in Inches.	Duration in Minutes.	Rate per Hour During Maximum Fall.	
January 3 and 4, rain storm	1.23	21-40	.20	20	.60	
March 3 and 4, rain storm..	1.99	19-00	.15	20	.45	
April 9, rain storm.....	2.15	22-45	.15	10	.90	
April 15, rain storm.....	1.14	7-10	.10	10	.60	
May 27 to 28, rain storm....	3.26	49-10	.80	20	.90	
May 27 to 28, rain storm....	3.26	49-10	.40	40	.60	
June 7, shower.....	0.25	1-25	.20	20	.70	
June 16, rain storm.....	1.06	10-35	.40	20	1.20	
June 17, rain storm.....	0.27	3-30	.15	25	1.00	
June 18, rain storm.....	2.16	12-30	1.25	40	1.87	
June 30, rain storm.....	0.34	1-15	.20	15	.80	
July 4, rain storm.....	1.65	6-10	1.10	45	1.47	
July 17, shower.....	1.05	1-30	1.00	30	2.00	
July 21, shower.....	1.60	1-25	1.50	30	3.00	
July 29, shower.....	1.35	10-20	.67	45	.89	
August 4, rain storm.....	.54	2-5	.36	15	1.44	
August 27, rain storm.....	1.39	15-55	.25	30	.60	
September 12, shower.....	.60	1-35	.45	45	1.00	
September 12, shower.....	2.20	3-45	1.90	60	1.90	
September 20, shower.....	.47	1-15	.26	30	.52	
October 5, rain storm.....	1.66	6-15	1.00	60	1.00	
December 30 & 31, rain storm	1.83	39-50	.45	20	1.85	

STREAM FLOW

1906

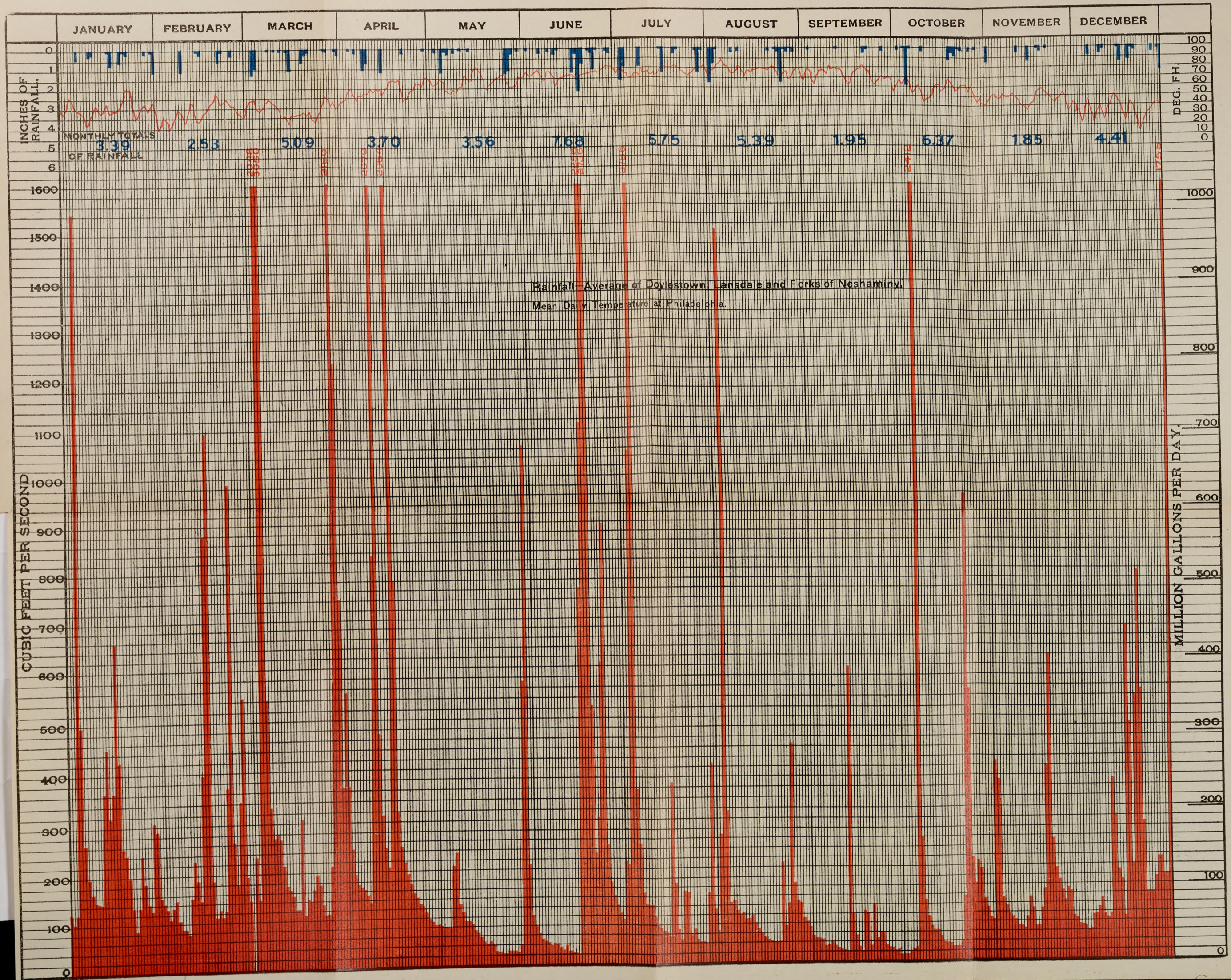
PERKIOMEN CREEK AT FREDERICK.



STREAM FLOW

1906

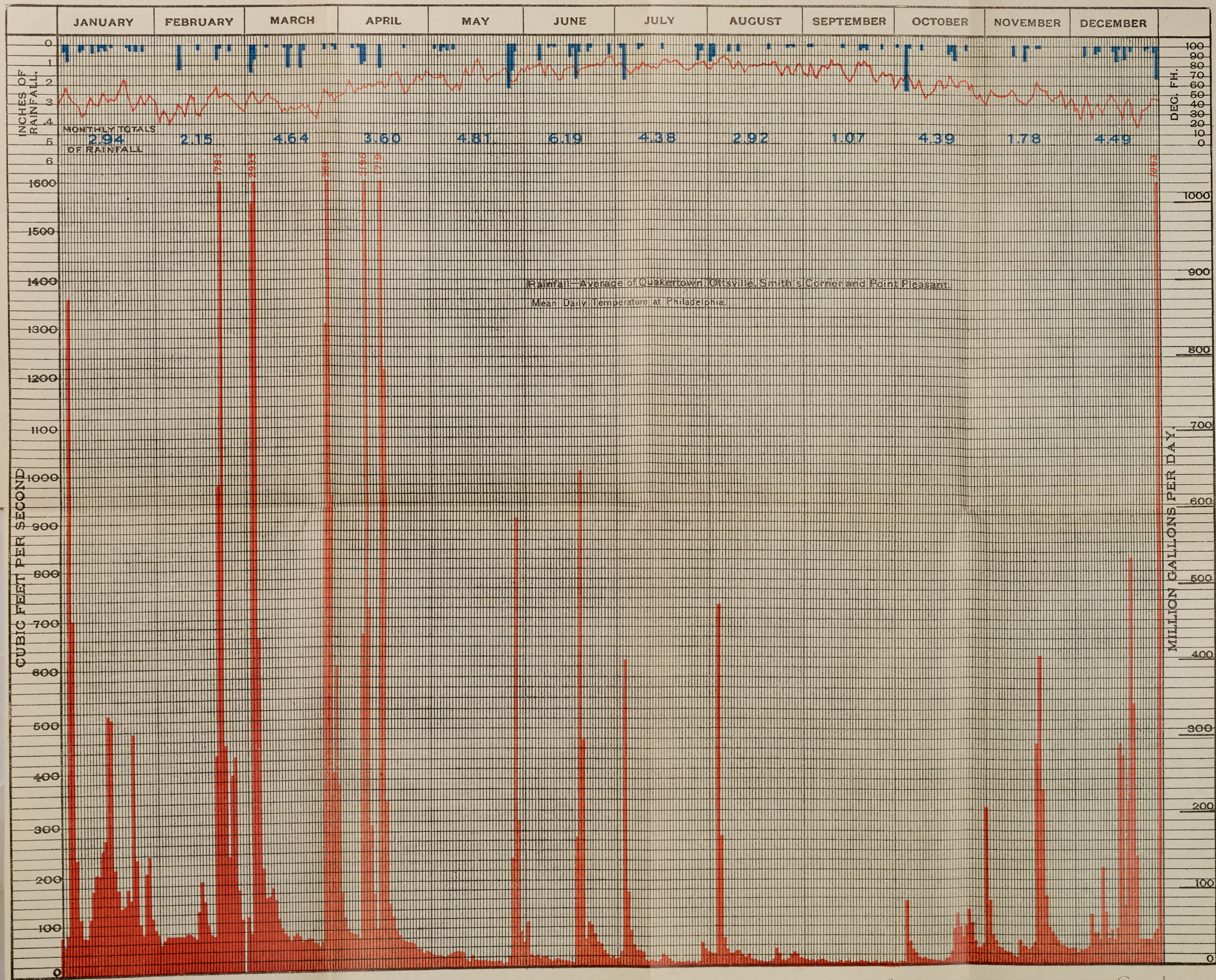
NESHAMINY CREEK BELOW FORKS.



STREAM FLOW

1906

TOHICKON CREEK.



1948-1949

1948-1949

TABLE V.—Inches of Rainfall Flowing in the Perkiomen, Neshaminy, and Tohickon Creeks.

Watersheds.	Area in Miles.	PERCENTAGE OF TOTAL AREA.				AVERAGE FOR YEARS, 1890-1906.													
		Woodland.	Cultivated.	Flats.	Roads.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	
Perkiomen at Frederick, 23 years.....	152	25	71	2	2	2.6	3.46	3.92	2.21	1.32	0.93	1.13	1.05	1.04	1.06	1.43	2.28	23.15	
Neshaminy, below Forks, 23 years.....	139.3	6	92	$\frac{3}{4}$	$1\frac{3}{4}$	3.17	3.88	3.80	2.17	1.49	0.84	1.03	1.03	0.84	1.05	1.34	2.36	22.82	
Tohickon, 23 years.....	102.2	24	72	2	2	3.74	4.26	4.82	2.52	1.73	0.83	1.12	1.26	1.20	1.07	1.77	2.86	27.24	
Perkiomen, at Frederick.	Maximum, 23 years.....					5.40	9.73	6.68	3.52	6.68	2.65	4.89	2.48	3.68	2.82	6.67	6.45		
	Minimum, 23 years.....					0.50	1.25	2.38	0.97	0.46	0.28	0.17	0.28	0.16	0.20	0.24	0.61		
Neshaminy, below Forks.	Maximum, 23 years.....					6.77	10.41	7.11	4.20	7.41	2.93	5.47	3.37	3.81	4.55	6.31	5.55		
	Minimum, 23 years.....					1.60	0.90	1.84	1.03	0.35	0.08	0.04	0.14	0.03	0.06	0.11	0.41		
Tohickon.....	Maximum, 23 years.....					7.34	10.41	8.00	4.76	8.56	3.43	6.41	3.75	5.49	4.27	7.07	7.58		
	Minimum, 23 years.....					0.54	0.62	2.98	0.73	0.10	0.07	0.11	0.04	0.05	0.05	0.14	0.67		

TABLE VI.—Average Annual Yield of Sundry Watersheds to October 1, 1906.

Watersheds.	Period covered in years.	Area in Miles.	Average rainfall in inches.	Average rainfall flowing off in inches.	Per cent flowing off.	Average daily yield in gallons.	Average yield in cubic feet per second per square mile of drainage area.	Average yield in cubic feet per second per square mile of drainage area for each inch of rainfall.
Perkiomen at Frederick.....	23	152.0	47.179	23.152	49.071	167,563,000	1.7083	0.6361
Neshaminy below Forks.....	23	139.3	47.861	22.821	47.683	151,360,000	1.6812	0.0852
Tohickon.....	23	102.2	48.632	27.239	56.048	132,550,000	2.0066	0.0413
Wissahickon.....	17 Mos.	64.6	Total	Total	53.90	70,994,000	1.6990	
Schuylkill.....			8	1915.0	47.818	21.630	45.250	1,972,260,000	1.5934	0.0851
Sudbury, Mass.....	31	75.2	46.09	21.707	47.000	77,720,000	1.5991	0.0347
Croton, N. Y.....								

TABLE VII.—Comparative Daily Stream Flow 1905 and 1906.

Watersheds.	Area of watersheds.	MAXIMUM.	GALLONS.	Date.	MINIMUM.	GALLONS.	Date.
		Per Day.	Per Sq. Mile.		Per Day.	Per Sq. Mile.	
Perkiomen.....	152.	2,320,100,000	17,300,000	March 4th	16,998,000	112,000	Sept. 30.
Neshaminy.....	139.3	2,481,700,000	17,800,000	March 4th	11,956,000	85,700	Sept. 30.
Tohickon.....	102.2	2,082,100,000	20,900,000	April 10th	1,809,700	87,000	Sept. 17.
Wissahickon.....	64.6	724,520,000	11,200,000	March 4th	1,939,400	30,200	June 15.
Schuylkill.....	191.5	16,500,000,000	8,650,000	April 4th			

TABLE VIII.—PRECIPITATION AND STREAM FLOW ON SCHUYLKILL AND WISSAHICKON WATERSHEDS.

DATE.	SCHUYLKILL.							WISSAHICKON.						
	AREA OF WATERSHED 1,915 SQUARE MILES.							AREA OF WATERSHED 64.6 SQUARE MILES.						
	Rainfall in Inches.	Inches of Rainfall Flowing Off.	Percentage Flowing Off.	MONTHLY YIELD OF STREAM.	AVERAGE DAILY YIELD OF STREAM.		Average Yield in Cubic Feet per Square Mile.	Rainfall in Inches.	Inches of Rainfall Flowing Off.	Percentage Flowing Off.	MONTHLY YIELD OF STREAM.	AVERAGE DAILY YIELD OF STREAM.		Average Yield in Cubic Feet per Second per Square Mile.
Cubic Feet.					Cubic Feet.	Gallons.						Cubic Feet.	Gallons.	
1905.														
October.....	4.56	1.077	23	4,789,410,000	154,500,000	1,155,720,000	1.0765	3.495	0.835	24	125,289,000	4,041,600	80,233,000	0.7241
November.....	2.48	0.654	26	2,911,250,000	94,041,000	725,911,000	0.5865	2.080	0.661	31	99,196,000	3,306,500	24,735,000	0.5924
December.....	3.31	1.844	55	8,202,300,000	264,590,000	979,270,000	1.5992	3.835	2.810	84	421,675,000	13,602,400	101,710,000	2.4371
1906.														
January.....	3.14	1.814	60	8,070,100,000	260,326,000	1,947,370,000	1.5734	2.660	1.988	75	297,631,000	9,601,000	71,820,400	1.7201
February.....	2.72	1.784	64	7,936,300,000	283,438,000	2,120,270,000	1.7131	2.385	1.756	73	263,513,000	9,411,000	70,400,100	1.6861
March.....	5.18	2.962	57	13,177,500,000	425,800,000	3,179,820,000	2.5691	4.320	3.405	80	511,056,000	16,485,700	123,321,000	2.9537
April.....	4.18	2.842	68	12,644,100,000	421,471,000	3,152,820,000	2.5473	3.365	2.798	83	419,947,000	13,998,300	104,714,000	2.5008
May.....	3.70	1.209	32	5,377,200,600	173,460,000	1,299,560,000	1.0484	2.725	0.802	20	120,340,000	3,881,400	29,038,400	0.6955
June.....	6.68	1.620	24	7,209,210,090	240,307,000	1,797,620,000	1.4524	6.620	2.399	36	359,994,000	12,000,000	89,765,000	2.1499
July.....	4.60	0.790	17	3,515,700,000	113,410,000	848,370,000	0.6854	6.685	1.572	23	235,932,000	7,610,700	56,932,000	1.3635
August.....	5.37	0.990	18	4,399,920,000	141,932,000	1,061,730,000	0.8578				Water drawn	from pool.		
September.....	2.18	0.438	20	1,950,650,000	65,021,800	486,400,000	0.3939							
Totals.....	48.20	18.023	38	80,183,620,000	220,190,000	1,647,100,000	1.3308	37.670	19.024	50	2,854,572,000	9,390,300	70,242,300	1.6823
October.....	5.70	0.912	16	4,055,700,000	130,830,000	978,670,000	0.7907							
November.....	1.62	0.814	50	3,622,510,000	120,750,000	903,270,000	0.7305							
December.....	4.72	1.136	24	5,052,850,000	162,995,000	1,219,290,000	0.9851							
Totals for.....	49.79	17.312	35	77,011,740,000	210,991,000	1,578,329,000	1.2764							

TABLE IX.—PRECIPITATION AND STREAM FLOW ON PERKIOMEN, NESHAMINY AND TOHICKON WATERSHEDS.

DATE.	PERKIOMEN AT FREDERICK.							NESHAMINY BELOW FORKS.						TOHICKON.								
	AREA OF WATER SHED, 152 SQUARE MILES.							AREA OF WATER SHED, 139.3 SQUARE MILES.						AREA OF WATER SHED, 102.2 SQUARE MILES.								
	Rain Fall in Inches.	Inches of Rain Fall Flowing Off.	Percentage Flowing Off.	MONTHLY YIELD OF STREAM.		AVERAGE DAILY YIELD OF STREAM.	Average Yield in Cubic Feet per Second per Square Mile.	Rain Fall in Inches.	Inches of Rain Fall Flowing Off.	Percentage Flowing Off.	MONTHLY YIELD OF STREAM.		AVERAGE DAILY YIELD OF STREAM.	Average Yield in Cubic Feet per Second per Square Mile.	Rainfall in Inches.	Inches of Rain Fall Flowing Off.	Percentage Flowing Off.	MONTHLY YIELD OF STREAM.		AVERAGE DAILY YIELD OF STREAM.	Average Yield in Cubic Feet per Second per Square Mile.	
				Cubic Feet.	Gallons.						Cubic Feet.	Gallons.						Cubic Feet.	Gallons.			
1905.																						
October.....	4.040	1.317	32	464,990,000	112,210,000	1.1422	3.703	0.500	13	161,570,000	5,211,900	38,988,000	0.4331	3.817	0.993	26	235,810,000	7,607,800	56,903,000	0.8615		
November.....	2.840	1.384	48	488,540,000	121,810,000	1.2400	2.540	0.631	25	204,207,000	6,806,800	50,919,000	0.5656	2.920	1.421	50	337,271,000	11,242,400	84,098,700	1.2732		
December.....	2.845	2.387	84	842,789,000	203,371,000	2.0701	3.420	1.864	55	603,100,000	19,458,400	145,559,000	1.6168	2.892	2.472	85	586,985,000	18,935,000	141,648,000	2.1445		
1906.																						
January.....	3.025	2.401	80	847,912,000	204,070,000	2.0828	3.393	2.326	70	752,820,000	24,287,000	181,653,000	2.0178	2.940	2.731	93	648,350,000	20,914,400	156,450,000	2.3685		
February.....	2.600	2.133	82	752,855,000	201,134,000	2.0474	2.533	2.022	80	654,262,000	23,367,000	174,796,000	1.9415	2.158	2.395	110	568,685,000	20,310,200	151,931,000	2.3003		
March.....	4.690	4.214	90	1,487,670,000	47,989,400	3.6542	5.090	4.002	80	1,295,070,000	41,873,000	312,510,000	3.4711	4.645	4.782	103	1,135,180,000	36,622,000	273,950,000	4.1470		
April.....	3.835	3.524	92	1,244,300,000	41,477,000	3.1582	3.700	2.874	78	929,975,000	30,999,200	231,890,000	2.5756	3.602	3.683	102	874,575,000	29,152,500	218,076,000	3.3015		
May.....	4.090	1.503	36	530,720,000	17,120,000	1.3036	3.563	1.050	30	340,503,000	10,983,900	82,166,000	2.9126	4.815	0.757	16	179,704,000	5,796,900	43,364,000	0.6565		
June.....	5.330	1.586	30	559,880,000	18,672,700	1.4211	7.683	2.932	28	948,880,000	31,630,000	236,610,000	2.6280	6.195	0.916	15	217,434,000	7,247,800	54,217,000	0.8208		
July.....	4.295	0.635	15	224,372,000	7,237,300	0.5511	5.753	2.087	36	675,510,000	21,790,700	173,050,000	1.8105	4.385	0.478	18	113,495,900	3,661,100	27,387,200	0.4146		
August.....	4.220	1.290	30	455,682,090	14,699,400	1.1193	5.393	1.356	25	438,921,000	14,158,800	105,914,000	1.1764	2.922	0.572	19	135,890,000	4,383,550	32,791,000	0.4964		
September.....	2.390	0.365	15	129,039,000	4,301,300	0.3275	1.950	0.521	26	168,738,000	5,624,900	24,077,400	0.4674	1.072	0.063	6	14,904,000	496,800	3,716,000	0.5626		
Totals.....	44.170	22.736	51	8,028,748,000	21,997,600	1.6749	48.721	22.166	45	7,173,556,000	19,653,600	147,020,000	1.6367	42.363	21.262	50	5,048,283,000	13,832,200	103,464,000	1.6038		
October.....	5.740	0.881	15	311,230,000	10,040,000	0.7645	6.370	1.704	25	551,362,000	17,796,000	133,050,000	1.4778	4.390	0.409	9	97,105,000	3,132,400	23,432,000	0.3547		
November.....	1.310	0.962	73	339,680,000	11,322,400	0.8622	1.856	1.279	69	413,770,000	13,792,300	103,126,000	1.1460	1.785	1.162	65	275,790,000	9,192,960	68,768,000	1.0412		
December.....	5.055	2.175	43	767,543,000	24,759,400	1.8853	4.416	2.259	51	731,200,000	23,587,000	176,442,000	1.9560	4.492	2.266	50	588,300,000	17,358,900	129,853,000	1.9658		
Totals for.....	46.550	21.667	46	7,650,882,000	20,691,400	1.5961	51.700	24.414	47	7,901,011,000	21,636,600	161,928,000	1.7986	43.401	20.214	46	4,799,412,000	13,149,000	98,361,600	1.4891		

TABLE OF COMPUTED DAILY FLOW OF THE SCHUYLKILL RIVER AT FAIRMOUNT DAM.

Showing Flow over Flashboards in cubic feet per second, height of water above or below Top of Flashboards in inches, and Computed Pumpage, Leakage and Lockage from the Pool.

DATE. 1906.	January.	Inches.	February.	Inches.	March.	Inches.	April.	Inches.	May.	Inches.	June.	Inches.	July.	Inches.	August.	Inches.	September.	Inches.	October.	Inches.	November.	Inches.	December.	Inches.
1.....	542	3½	479	3	1,052	5	4,139	12¾	224	1¾	134	1¾	144	1¾	.....	*8	.....	*8	.....	*10	.....	*3	.....	*12
2.....	286	2	328	2¼	943	4¾	3,022	10¼	256	2	92	1	94	1	.....	*6	.....	*8	.....	*10	.....	*4	.....	*12
3.....	92	1	88	1	4,404	13¾	2,452	9	256	2	92	1	184	1½	1,077	5	.....	*10	.....	*12	.....	*6	.....	*12
4.....	6,210	16½	.....	*2	25,523	42½	1,923	7¾	256	2	.....	*2	4,417	14¾	8,880	21	.....	*10	.....	*12	.....	*10	.....	*12
5.....	5,000	14½	92	1	15,360	30½	1,651	7	256	2	.....	*4	1,080	5	2,968	10	.....	*10	3,002	10	.....	*10	.....	*12
6.....	2,495	9	.....	3	7,456	19	1,522	6½	256	2	.....	*6	265	2	303	2¼	.....	*10	1,125	5¼	.....	*10	.....	*12
7.....	1,944	7¾	.....	4	4,124	12¾	1,433	6¼	96	1	.....	*8	94	1	.....	*3	.....	*12	.....	*4	.....	*10	.....	*6
8.....	1,442	6¼	.....	6	3,256	10¾	1,260	5¾	96	1	.....	*6	94	1	.....	*4	.....	*12	.....	*8	.....	*12	.....	*8
9.....	1,041	5	.....	4	2,689	9½	1,547	6½	96	1	.....	*6	33	½	.....	*5	.....	*12	.....	*12	.....	*12	.....	*12
10.....	579	3½	176	1½	2,093	8	14,897	20¾	.....	.....	.....	.....	.....	.....	.....	*2	.....	*6	.....	*12	.....	*12	.....	*12
11.....	341	2½	176	1½	1,723	7¼	6,530	17¼	.....	.....	.....	.....	.....	.....	.....	*5	.....	*6	.....	*12	.....	*12	.....	*12
12.....	724	5½	.....	1	1,338	6	4,965	14¼	.....	.....	.....	.....	.....	.....	.....	*10	.....	*7	.....	*8	.....	*12	.....	*2
13.....	1,267	5¾	184	1½	1,207	5½	3,284	10¾	.....	*2	.....	*8	.....	.....	.....	*8	.....	*10	479	3	.....	*12	.....	*6
14.....	1,186	5¼	1,083	5	1,047	5	2,423	9	.....	*3	.....	*10	.....	.....	.....	*8	.....	*10	260	2	.....	*12	.....	*10
15.....	1,026	5	1,977	7¾	1,047	5	8,864	21¼	.....	*3	.....	*10	.....	.....	.....	*8	.....	*10	.....	*8	.....	*12	.....	*8
16.....	1,968	7¾	874	4½	1,047	5	14,428	29¼	.....	*2	518	3¼	.....	.....	.....	*8	.....	*10	.....	*8	.....	*12	.....	*6
17.....	2,399	3½	186	1½	980	4¾	13,915	28½	.....	*2	1,167	5¼	109	1¼	.....	*12	.....	*10	.....	*10	.....	*12	728	4
18.....	1,538	6½	92	1	680	3½	4,749	14	.....	*5	1,774	7¼	109	1¼	.....	*12	.....	*10	.....	*14	92	1	1,695	7
19.....	962	4¾	.....	*1	680	3½	2,988	10¼	.....	*8	18,718	34¾	.....	.....	.....	*10	.....	*10	.....	*15	1,151	5¼	240	2
20.....	671	3¾	134	1¼	640	3¼	2,117	8¼	.....	*8	6,265	17	.....	.....	.....	*10	.....	*4	.....	*8	.....	*8	260	2
21.....	606	3½	1,540	6½	600	3¼	1,619	7	.....	*10	3,019	10¼	.....	.....	.....	*10	.....	*10	92	1	.....	*8	1,442	6½
22.....	606	3½	14,426	29¼	609	3¼	1,434	6¼	.....	*10	3,019	10¼	23	½	92	1	.....	*8	1,274	5¼	.....	*4	1,522	6½
23.....	608	3½	8,652	20¾	460	2¾	1,230	5¾	.....	*10	3,625	11¾	.....	.....	.....	*10	.....	*10	92	1	.....	*8	1,280	5¾
24.....	2,520	6½	3,843	12	376	2½	1,093	5	.....	*8	3,419	11½	.....	.....	.....	*10	.....	*5	.....	*11	.....	*4	1,209	5¾
25.....	1,443	6¼	2,931	10¼	376	2½	980	4¾	.....	*9	1,809	7½	.....	.....	.....	*10	.....	*5	.....	*11	92	1	1,905	8
26.....	1,106	5¼	4,688	13¾	600	3½	688	3¾	.....	*10	751	4	.....	.....	.....	*10	.....	*5	.....	*13	456	3	.....	*8
27.....	881	4½	2,742	9½	2,852	9¼	600	3½	.....	*8	494	3	.....	.....	.....	*10	.....	*5	.....	*13	.....	*2	.....	*10
28.....	1,217	5¾	1,598	6½	8,276	20	532	3¼	5,070	14½	357	2½	.....	0	92	1	.....	*9	.....	*3	.....	*10	.....	*1
29.....	1,484	6¼	.....	.....	5,534	15½	460	2¾	12,242	26	202	1¾	479	3	.....	*4	.....	*12	.....	*4	.....	*10	.....	*1
30.....	10,03	5	.....	.....	4,584	13½	416	2¾	1,607	6½	170	1½	310	2½	.....	*6	.....	*10	.....	*4	.....	*10	.....	*1
31.....	608	4½	.....	.....	4,449	13¾	.....	.....	456	3	.....	.....	.....	.....	.....	*2	.....	*6	.....	*4	.....	.....	4,364	13
Total over flashboards.....	43,763	.....	46,289	.....	106,090	.....	107,161	.....	21,167	.....	45,625	.....	7,435	.....	13,596	.....	739	.....	7,949	.....	1,510	.....	14,394	.....
Total pumpage, leakage and lockage.....	49,641	.....	45,566	.....	46,427	.....	39,183	.....	41,069	.....	37,815	.....	33,256	.....	37,329	.....	21,838	.....	38,992	.....	40,417	.....	44,088	.....
Grand total.....	93,404	.....	91,855	.....	152,517	.....	146,344	.....	62,236	.....	83,440	.....	40,691	.....	50,925	.....	22,577	.....	46,941	.....	41,927	.....	58,482	.....

* Below top of Flashboards.



