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MESSAGE

OF

ROBERT T. CONRAD,

Mayor of the City of Philadelphia,

WITH

ACCOMPANYING DOCUMENTS.

READ IN SELECT COUNCIL MAY 17th, 1855.

PHILADELPHIA:

CRISSY & MARKLEY, PRINTERS, GOLDSMITHS HALL, LIBRARY STREET.

1855.

Report from the Chief Commissioner of Highways.

DEPARTMENT OF PUBLIC HIGHWAYS,

*May 12th, 1855.*TO HON. ROBT. T. CONRAD, *Mayor.*

DEAR SIR:—Your communication, asking information relative to this department, is received; and I shall endeavor to give all the information at my command, that the limited time will admit of.

Previous to the consolidation of the city, and until the organization of this department in October last, the executive duties now performed by it, were in the hands of committees of the various districts, superintendents, supervisors, clerks of districts, and other officers, of whose doings and expenditure this department has no means of ascertaining.

The published report of the City Controller, shows the aggregate payments made up to the first of January; and annexed you have a statement, marked "A," showing the contracts (belonging to this department,) made by the late districts, that remained unsettled on the first of January, with the amounts paid on them since that date, and the estimated cost of completing the same, amounting to \$217,575 56. In addition to which, on the 13th March last, Councils appropriated the sum of \$80,000 for the payment of claims prior to January first, about \$50,000 of which is chargeable to the old districts; making an amount of \$267,575 56 of liabilities incurred previous to consolidation, to be settled by the new city during this year.

The organization of the department, as provided for by the ordinance approved August 29th, 1854, consists of a chief commissioner, six commissioners, and forty-two super-

visors. For the better supervision, the city has been divided into six districts, as follows :

1st District	comprises 1st, 2d, 3d and 4th wards,	- -	6 supervisors.
2d	" " 5th, 6th, 7th, 8th, 9th, 10th and 24th wards,	11	"
3d	" " 13th, 14th, 15th and 20th wards,	- 6	"
4th	" " 11th, 12th, 16th and 17th wards,	- 5	"
5th	" " 18th, 19th and 23d wards,	- - 8	"
6th	" " 21st and 22d wards,	- - - 6	"

Each district is in charge of a commissioner, who has an office within the same; the supervisors have each their ward, or division of a ward, and have the immediate charge of the laborers employed on the streets or roads, in paving, grading and cleansing, and are subject to the control of the commissioner, and purchase no materials without his orders.

Since the passage of the supplement to the Consolidation Act, the commissioners and chief meet weekly, as a board, in accordance with the requirements of that document.

The department has been in existence little more than six months, and that including the winter months. Its operations have been confined to the cleansing of the streets, repairing of roads and bridges, grading new streets, preparatory to the contemplated improvements of the present year, repairing sewers and inlets, and repairing the paved streets, after the severe frosts of the past winter.

The ordinance to regulate the manner of paving the streets having passed Councils a few days since, the Board submitted a list of streets to be new paved, to the late Committee on Public Highways, who reported the same to Councils, at their last meeting. As soon as the same will receive the sanction of Councils, the department is prepared to commence, without delay, the paving of new streets, as asked for by the owners of property; the appropriation for that purpose, is \$200,000—a sum more than fully equal to

meet all demands for the year; and the return to the treasury may be safely estimated at three-fourths of the amount expended.

The other sources of revenue received at this office, consists of permits granted for buildings, for openings to the sewers, licenses for omnibuses, hackney-coaches, wagons, carts, barrows, &c. Most of the ordinances regulating them have been passed within the last month; I am unable, at this time, to make any estimate of the amount to be derived from them.

The statement annexed, marked "B," shows the appropriations made to this department since the first day of January, with the purposes for which the same were made, and the actual amount for new works during the year, to be \$658,310; which, however, might be further reduced, as the item No. 7, of \$400,000, is for completing contracts made prior to consolidation.

The amounts of the second appropriation are believed to be ample to meet the demands for the objects for which they were made.

Two important works to be paid from the item of "Grading Streets," are—first, the opening of Delaware avenue, from Callowhill street to Cohocksink creek, which is now rapidly progressing—the other, the opening of Girard avenue, from Landing street to the Schuylkill, to connect with the bridge now nearly completed. This work has been delayed by the necessity of calling a jury to assess the damages to the property through which the same must pass. As soon as that can be settled, the work will be pushed forward as rapidly as possible.

Among the subjects to be recommended to the consideration of Councils—

The providing for the payment of damages for opening streets should receive early attention; many are due, for

which no provision has yet been made. An ordinance, creating a loan of \$100,000, to meet such demands, was reported by the late Committee on Highways, and has been duly published, as required. Should it be enacted into a law, it would materially aid in forwarding desirable improvements.

A bridge over the river Schuylkill, at Chestnut street, was provided for by Act of Assembly, and the sum of \$125,000 borrowed for the purpose of erecting it; no improvement is more desirable. Much attention was given to the subject by the Committee on Highways; and a report, recommending the adoption of a plan now in this department, is before Councils for their action. A work of so much importance to the public, should receive early attention.

The Department of Surveys is preparing plans and specifications for the culverting of Cohocksink creek, from Front street to Sixth street: also for culverts in Moore street, from the Delaware to Ninth street, and in Vine street, from Nineteenth street to the Schuylkill. As soon as received, proposals will be issued for their construction, and the result will be reported to Councils for their action.

An ordinance was reported to Councils, providing for the opening of Broad street, of its full width, (113 feet,) to the Germantown road — an improvement much desired, which I trust will receive your recommendation.

The opening of one or more of the wide avenues running from the Delaware to the Schuylkill, in the northern part of the city, is a subject that should be strongly urged upon Councils, as the expense at this time would be trifling in comparison to what it will cost at a future day.

That portion of the City Railroad lying east of Delaware Eighth street, is in bad condition; and no appropriation was made by the late Councils, for keeping it in repair. In its

present condition, it is a nuisance, and should be either relaid, on an improved plan, or should be taken up forthwith.

Machines, constructed for the purpose of cleansing streets, have recently been introduced here; and a portion of the City of New York is now being cleansed with them. A proposition from the proprietors is now being prepared, for the cleansing a portion of our city, which will be submitted to Councils in a few days. The cleansing of the streets, with the exception of the six wards comprising the old city, is now done by day's work; it could be equally well done, at much less cost, if divided into districts, and let by contract.

The subject of laying passenger railroads through the city, was referred to the heads of the Survey and Highway Departments; the duties connected with the organization of the Survey Department has deferred action for the present. It will be taken up and reported upon at an early day.

I would suggest the propriety of recommending to Councils the passing of an ordinance requiring railroad companies to have gates and watchmen at points where their locomotives cross on a level with highways much used.

The foregoing are such subjects as occur to me at this time, and are thrown together for your consideration. The department having been in existence so short a time, and having no record of the aggregate expenditures on the highways by the county and districts, prior to its organization, no comparison can be made of the cost of the present, as compared with the past system.

Very respectfully,

THOMAS BIRCH,

Chief Commissioner.

A.

STATEMENT

Of Contracts made by Corporations prior to the Act of Consolidation, the settlement of which must be made during this year.

Amounts paid since January 1st, 1855—

District of Richmond, for seven bridges over				
Gunner's Run,	-	-	-	\$31,673 17
do do culverts at do				4,778 00
do do street paving,	-	-		5,858 97
District of Kensington, for culverts,	-	-		23,207 25
Southwark, for paving,	-	-		2,577 93
West Philadelphia, for paving,	-	-		6,473 20
Germantown, for grading,	-	-		1,200 00
Girard Avenue, for grading,			}	7,900 00
Montgomery and Berks Avenues, grading,				
Girard Avenue bridge,	-	-		8,885 20
Thompson street culvert,	-	-		20,000 00
Estimated amount required to complete them,				\$112,483 72
*Richmond bridges,	-	-		\$25,000 00
do culverts,	-	-		3,000 00
*Kensington culverts,	-	-		5,000 00
Germantown, grading,	-	-		1,000 00
*Kensington, grading,	-	-		3,091 84
Girard Avenue, grading,	-			30,000 00
Montgomery and Berks, grading,				15,000 00
Girard Avenue bridge,	-	-		15,000 00
Mill Creek bridge,	-	-		5,000 00
*Thompson street culvert,	-			3,000 00—105,091 84
				<u>\$217,575 56</u>

* Payable in bonds.

Report from the Department of Surveys.

DEPARTMENT OF SURVEYS,
Office of Chief Engineer and Surveyor,
Philadelphia, May 14th, 1855.

To His Honor, ROBERT T. CONRAD,
Mayor of the City.

SIR:—Your circular of date, May 1st, instant, has just been handed me. I hasten to comply with your wishes therein

set forth, so far as the limited time allowed for their preparation and the short time that has elapsed since I have had an opportunity of becoming familiar with the detail of this department will permit. The existence of this department can date only from the 7th inst., as all arrangements previously made were rendered nugatory by an Act of the Assembly, changing entirely its organization.

The interests connected with and under charge of this department, are of great importance to every individual of our extended city, and have not heretofore received that attention which is their due. The documents, plans, &c., under our charge, relating to property lines and lines of streets, are of incalculable value to the city and property holders generally, and should be guarded and preserved with jealous care.

I therefore ask for an office, wherein sufficient room can be had for such arrangements as will allow easy reference, and render them secure from loss or destruction. If offices, with a proper attention to security, were furnished to the Surveyors and Regulators, it would add much to the safety of valuable papers which will require time to be concentrated in the general office.

The sanitary interests of the city, are, to a great extent, in our charge, and are, without doubt, seriously affected by a want of information that should be in the possession of this department. This can be reached only by minute and extended examinations, as to the state and position of existing sewers, and also for the purpose of obtaining plans to regulate future drainage. For this purpose I desire assistance, with which a complete drainage map can be completed, exhibiting the topographical features of the city. This is rendered necessary from the accumulation of business that requires the constant and undivided attention of the Surveyors and Regulators, preventing an energetic action on their part, to other than

the immediate duties for which they have been elected. This assistance to the Chief Engineer and Surveyor, could take charge of the construction of all sewers, bridges, and other improvements, and insure that proper attention will be given to the character of the work, from the imperfections of which, heretofore, the city has suffered serious pecuniary loss.

Another matter, which is very necessary for early attention, is, that all ordinances relating to Surveyors and Regulators, framed for the old city and districts, previous to consolidation, be made to harmonize, that we may have a uniform system and basis to work on, over the entire city.

The expenses for the current year will be as follows :

Chief Engineer and Surveyor,	-	\$3,000	00	
Clerk and Messenger,	-	1,600	00	
Draftsman,	-	800	00	
Twelve Surveyors and Regulators,				
\$500 each,	-	6,000	00	
				<u>\$11,400 00</u>
Office Rent and Stationery,	-	-	1,600	00
Extra Assistants,	-	-	2,500	00
				<u><u>\$15,500 00</u></u>

There are no projects or improvements that I can safely say should be deferred, other than the Schuylkill bridge at Chestnut street, the immediate necessities for which are not pressing, but the Cohocksink culvert should be proceeded with at the earliest moment, yet not without full examination as to its location and proportions, neither of which have been satisfactorily ascertained or reported upon, and immediate attention should also be given to any culverts that now deliver sewerage into the dam at Fairmount, and means taken to

connect them with others delivering below the dam, that the water supplied for city use should not be affected deleteriously thereby.

Very respectfully,

STRICKLAND KNEASS,

Chief Engineer and Surveyor.

 DEPARTMENT OF SURVEYS.

 DEPARTMENT OF SURVEYS,
Philadelphia, Dec. 30, 1856.

 To the Hon. RICHARD VAUX,
 Mayor of Philadelphia;

SIR:—The season having arrived that calls for communications from the heads of departments to the chief executive of the city, relative to the condition and interests of their several offices, I take great pleasure in reporting that, during the past year, this department has continued to develop its usefulness, as the information sought by and afforded to our citizens fully attests, and each year will the amount, and consequently the value, of our records be augmented, not only by accumulation from returns of daily regulations and surveys extending the city plan now in progress, but by the compilation and arrangement of what can be collected from old and valuable documents transferred to this office at its organization. We have now, so far as lies within our power, made that disposition of the city archives in our charge, as will insure easy

reference without loss of valuable time, yet there is much information sought for at this department, not on record in any of the city offices, which should be upon our files, but cannot be obtained without the aid of Councils. To this point I will refer in this report for your consideration.

The meetings of the Board of Surveyors, during the past year, have been frequent, and the results of much value, not only in matters of direct interest to the city, but in the settlement of differences between individuals relating to partition lines, which otherwise might have become vexed questions for tedious and expensive litigation.

The great difficulty under which we labor is, that there is no uniformity in the acts of Assembly bearing upon matters of survey and regulations for the present limits of the city; the old laws enacted for the districts, as they existed previous to consolidation, have never been repealed, and, consequently, the duties required for one section of the city, without marked boundaries, sometimes covering parts of two survey districts, differ materially from those of other sections. This causes confusion. It is very desirable that one set of laws should cover the whole, as being more intelligible, besides simplifying business for all parties.

Again, there are cases where laws creating commissioners for the purpose of conducting the survey and regulations of particular districts of the city are in full force, and which either tend to delay the improvement of that district or deprive this department of supervision and direction in the very matters it should be most familiar with; these should be under its especial charge to insure perfect connections between sectional plans, and also that they be prepared with proper reference one to the other.

When surveys are conducted out of the control of the department, there is no certainty that either a properly graduated measure, or the accurate datum level is made use of; and after the plans are filed amongst our records, and are used by the district surveyors for the necessary subdivisions, serious discrepancies must be risked.

Another matter in which the interests of the city, we think, could be greatly advanced is, that there should be placed upon our record books a plot of the ground on which each and every house may be erected; this would prevent perplexing appeals, and secure the accurate division of properties, which, as now performed by the builders themselves, with imperfect measures, frequently places partition walls in positions very different from that recited in the deed. The ordinance under which we are now acting is not sufficiently definite in this particular, though the intention in framing it was evidently to cover the ground alluded to; its revision is very desirable, not only with reference to the question just spoken of, but that the schedule of rates payable to the surveyors and regulators, as well as their special duties for the emolument yearly allowed them by the city, shall be clearly defined. The ordinance now reads, "that they shall receive an annual salary of \$500, for keeping the public records, performing all services as a member of the Board of Surveyors and *all other official* services that may be required for the city," in addition "to such fees and charges as are provided for" in Section 11, which section particularizes the prices to be paid by individuals for regulation of lots, as well as a few items, for which the city is responsible, but does not cover the payment for surveys which are indispensable for the interests of the city, and which it would be unjust to expect to have performed as "*other official service*," when the actual outlay by the surveyor, for an ordinary sectional plan, often exceeds the amount voted as annual salary.

That these surveys, and the preparation of sectional plans should continue to be prosecuted is, we deem, imperative. Our suburban area is rapidly improving, and, in some instances, waiting only the extension of the city plan to be classed among the populous districts, and yield a *yearly revenue*, from increased taxation, far greater than the required amount to complete the preparatory surveys; these surveys, once completed, may well be considered capital invested,

from which a large percentage is at once derived, with a yearly increase. I would further observe, that though this department may appear to draw largely upon the treasury, yet the amount of appropriation asked for yearly, will (exclusive of salaries) decrease as the plotting of the city progresses, and, when completed, will preclude further calls for heavy damages, on account of injury to estates or suburban residences, which, without the planning, might, and in all probability would, be so arranged as to demand, with justice, heavy amounts from the city when its requirements would bring them within the street limits—the truthfulness of this may be seen by referring to the amount of damages paid for the opening of the late Township of Penn, in comparison with other sections where the planning was delayed. An early attention to the arrangement of the city plot over the rural districts will prevent the adoption of lanes and bye-roads as *fronts* of properties. These can now be disregarded and vacated at the proper time, without being embraced in the city plan, destroying either the direct line of streets or that rectangular form of blocks which is, in every particular, most acceptable and judicious. A still more cogent reason, if possible, is, that it is only from these plans that systems of drainage can be arranged, and without them the hasty construction of a sewer is often called for, the sizes for which it is impossible to determine with any regard to accuracy, and the city is either entailed with a heavy excess of expenditure, for the purpose of being on the safe side, or for the want of the proper proportions, is taxed with a heavy outlay to repair the evils committed, and, in either case, the amount could easily far exceed the cost of the plans necessary to contain proper data.

I, now, sir, beg leave to refer to some duties which devolve upon the Department of Highways, but properly belong to this, and are, no doubt, looked upon rather as an incubus, interfering with their already extended and arduous labors, viz: The charge and general direction for the construction of all culverts or drains built by individual enterprise. These should be

placed in this department. The form of ordinance has already, in a number of instances, received the approval of Councils, as well as the sanction of your honor, but, by adopting it as a general rule, it would facilitate operations and secure for our department records of great value. Another duty, which is a burden to the same department, is that of issuing permits for connections with culverts, and, as now arranged, can be but imperfect, as their office contains no record as to whether a culvert is in existence at the locality applied for, while this department is in possession of the only information relative to culverts that can throw light upon the value or injury that the connection asked for might be to the sewer; that these connections should be properly constructed, and their junctions with the sewers made in the most approved manner, is very necessary, as in the one case they may be beneficial, while in the other they would retard the flow and lessen the delivery of the sewer. Heretofore, there has been no note taken of these connections further than date of permit, but it is desirable that the location, level, material and gradient should be on record for reference, and, if placed in charge of this department, they would be constructed under the eye of the District Surveyor, in accordance with regulations made by the Board of Surveyors, and such returns thereof made for the files of this department as would be useful for reference by our citizens.

Another very great want is, that the location, sizes and gradients of all the sewers of our city are not known with accuracy. We have daily calls for information we should have relative to them, but we either do not possess it, or it is in such a meagre or unavailable shape as to be of comparative little value. All builders will, I feel assured, second me in asserting that such information would be of infinite value to them, and could be obtained without great expense to the city.

In conclusion, sir, I beg leave to state that much of this matter has been communicated to Councils in reports made by me during the past year, but as, in the multiplicity of their business and accumulation of

documents, they have been lost sight of, I take the liberty of thus calling your attention thereto, hoping, that should you think them worthy of consideration, a notice from you will meet with effective attention.

Respectfully submitted,

STRICKLAND KNEASS,

Chief Engineer and Surveyor.

DEPARTMENT OF HIGHWAYS.

HIGHWAY DEPARTMENT,

January 1st, 1857.

Hon. RICHARD VAUX, Mayor :

DEAR SIR : I have the honor to acknowledge the receipt of your communication, requesting information in regard to the condition of this department. It affords me pleasure to furnish you with the following general statement of its affairs. The department is at present composed of one Chief Commissioner of Highways, two Commissioners, two Clerks, twenty-five Supervisors, six Watchmen of Bridges, and one Messenger.

All the highways, bridges, sewers, &c., are under the charge and supervision of this department. A statement in detail of the receipts and expenditures will be found annexed, marked respectively A and B. It will be seen that during the year 1856, the expenditures in this department, exclusive of damages paid for opening streets, amounted to \$333,498 17; of which amount, \$186,931 66 was expended up to July 16th, at which time I entered upon the discharge of my duties as head of this department.

By referring to the statement, it will be seen that during the latter portion of the year, although the work upon the public highways was continued up to December 25th, the expenditures amounted to but \$118,542 37.

As the balance remaining to the credit of item 2, for repaving and repairing streets, was inadequate to

meet the expenditures which would have been necessary, had many of them been repaved, the attention of the department was directed to putting them in such a state of repair as the public exigencies required—and at the present time, with a few exceptions, they are in good travelling condition.

I regret to say that the practical operation of the system adopted for cleansing the highways does not give satisfaction to the public; nor does it receive the approbation of this department. The brief experience that has been afforded me leads to the conclusion, that a different one should be substituted for it.

The city is now divided into districts, and being cleansed by contract. The contracts having been in each case awarded to the lowest bidder. Competition for the work induced many to propose and engage it, who can only be made to comply with the terms of their contracts by incessant and continuous threats of prosecution, or of employing others to do the work at their cost. Others have bid for the work at very low prices, without any serious intention of engaging it, simply with a view of preventing responsible bidders from obtaining it at a reasonable rate of compensation. Probably under no system that can be devised will the streets be kept in such a condition as to prevent some persons from complaining, but under circumstances such as those referred to, it is certainly impossible to prevent them from being made.

It is made the duty of the Supervisors, by the ordinance organizing the department, to superintend and take charge of the men in the employment of the city in their respective districts; and their attention is especially directed to the repairs of the public highways. In the matter of cleansing the streets, they are unable under the present arrangements to render efficient assistance, as the men employed in doing the work are not subject to their control, and are not in any way recognized as employees by the department. The Supervisors therefore are compelled to listen to complaints which they have not the power to remedy, and the department is held responsible for grievances

which can never be thoroughly redressed but by a change of system.

Philadelphia has always been famed for the cleanliness of her streets; and I am persuaded that even at the present time no city in the Union will compare with her in this respect. It shall be my endeavor to leave no remedy untried to maintain this character for our city.

But it must be borne in mind that the contract price for cleansing streets, for the year commencing October 1st, 1856, and ending with October, 1857, is but about sixty thousand dollars for the entire city, being thirty per cent. less than was paid for doing the same work for the two last years, notwithstanding a very large area of paved streets has been added, and is embraced in the present contracts.

The cost of cleansing the city of New York, I am credibly informed, is annually about five hundred per cent. more than the amount paid here, although the area of its paved streets is not near as great as that of this city.

I would also call your attention to the matter of sewers and sewerage, as at present organized. This department is charged with the construction, repair and supervision of all culverts, inlets and drains. I am fearful that, at no distant day, the city will be put to serious inconvenience and great expense, as the system, in all its details, is very imperfect and defective; and I would add, also, that the ordinance upon the subject of drains from private properties into our culverts is equally defective with the system itself—so much so as to render nugatory all the efforts of the department to compel a proper observance of them.

I would especially invite your attention to this matter, and would suggest for your consideration whether it would not be well to recommend a complete revision of the system, and all ordinances appertaining to it, with the view of inducing such changes as would relieve this department from its supervision over them, and place the responsibility in a new department, or in one where it more properly belongs.

The officers of this department are about to commence operations to carry into effect the ordinance approved September 16th, 1856, entitled "An Ordinance to effect uniformity in the numbering of houses." It is made the duty of this department to furnish owners or occupiers of houses with the number by which the respective properties may be hereafter known and designated. This done, our duty ceases; and it then devolves upon the Police Department to see that the provisions of the ordinance are complied with. That a correct and uniform numbering of houses is very desirable, and that it will be found ultimately advantageous, few doubt—every effort will, therefore, be made to proceed as rapidly as possible; and due notice will be given your department, in order that it may be prosecuted in such a manner as its importance demands.

I regret that it is not in my power to furnish you with the number of paved and unpaved streets, with their measurement, or the length of culverts and sewers in this city. This could only be arrived at by a careful examination and investigation; and, with the clerical force engaged in the office at the present time, would seriously embarrass us, were we to attempt even an approximate calculation. Indeed, it would be a work of labor to ascertain the number of feet of streets paved and repaved during the past year, as the only statistical information in the office is the bills for materials and work done upon them. A record of matter of this kind should be kept in this office, for present and future reference; and I would willingly lend assistance, if additional force could be procured to enable me to accomplish it.

Yours, respectfully,

JOHN M'CARTHY,

Chief Commissioner of Highways.

A.

Financial Statement, Department of Highways, &c., for the year ending 31st December, 1856.

To Appropriation as per Ordinance approved 28th March, 1856, \$360,500 00

CR.	<i>Expenditures.</i>	
By Paving intersections,	\$16,945 14	
Repairing and repaving streets,	90,332 69	
Grading streets and roads,	21,112 98	
Repairing roads,	37,800 69	
Paving footways,	4,836 04	
Repairing culverts and inlets,	14,975 57	
Repairing bridges,	9,915 79	
Cleansing paved streets, markets, &c.,	82,430 04	
Cleansing and repairing unpaved streets,	10,684 16	
Repairing City Railroad,	6,022 10	
Wells and pumps,	2,323 20	
Salaries,	26,644 79	
Girard avenue, 24th ward,	4,555 90	
" " 20th "	175 88	
Printing, stationery, &c.,	1,290 92	
Insurance on bridges,	1,100 00	
Index boards,	200 00	
Office expenses,	1,024 46	
Incidentals,	1,127 82	
Balance,	27,001 83	
	<hr/>	
	\$360,500 00	\$360,500 00
	<hr/>	<hr/>

Of the foregoing amount, there was expended up to July 16, when the present incumbent entered upon the duties of his office, - - - \$186,931 66
 And, subsequently, for work done and materials furnished prior to that date, the sum of - - - 28,024 14

Amounting in the aggregate to the sum of \$214,955 80
 Leaving a balance of \$145,544 20 for the remainder of the year, of which amount there has been expended \$118,542 37; leaving a balance to the credit of the department amounting to \$27,001 83.

Recapitulation.

To annual appropriation, 28th March, 1856, - - - -	\$360,500 00
Warrants issued prior to 16th July, 1856, - - -	\$186,931 66
Warrants issued subsequent to July 16, for work done and materials furnished prior to that date, -	28,024 14
Warrants issued for work and materials subsequent to July 16, 1856, - -	118,542 37
Balance to credit of department, - - - -	27,001 83
	<u>\$360,500 00</u> <u>\$360,500 00</u>

In addition to the above, there remain unpaid, for work done and materials furnished during the year 1856, bills amounting in the aggregate to over \$3,000.

B.

Receipts of Department of Highways, &c., for the year ending 31st December, 1856.

From Licenses—		
Omnibuses, - - -	\$4,980 00	
Hacks and private carriages, - - -	972 50	
Carts, wagons, drays and barrows, - - -	2,397 50	
Hack drivers, - - -	12 00	
	<hr/>	
Total from licenses, - - -		\$8,362 00
Permits—		
To occupy streets, - - -	678 50	
To construct vaults, - - -	1,150 75	
	<hr/>	
Total permits, - - -		1,829 25
Sewers—		
Permits to enter, - - -	1,870 00	
Annual rents, - - -	2,139 80	
Fractional rents, - - -	192 67	
Repairing over openings to sewers, - - -	479 50	
	<hr/>	
Total sewers, - - -		4,681 97
Railroad turnouts, - - -	50 00	
Paving streets and footways, - - -	2,933 36	
Miscellaneous, - - -	2,114 89	
	<hr/>	
		5,098 25
		<hr/>
Total receipts from all sources, - - -		<u>\$19,971 47</u>

SECOND

ANNUAL MESSAGE

OF THE

HON. RICHARD VAUX,

MAYOR OF PHILADELPHIA,

TO THE

SELECT AND COMMON COUNCILS;

TOGETHER WITH

REPORTS FROM THE MUNICIPAL DEPARTMENTS,

FOR THE YEAR 1857.



PRESENTED TO THE CITY COUNCILS.

January 8, 1858.

PHILADELPHIA:

PRINTED BY ORDER OF THE SELECT COUNCIL.

1858.

SURVEY DEPARTMENT.

The public know so little about the duties of this department, that I have requested from the chief surveyor a full report on the subjects committed to his charge.

The ordinance authorizing construction, and regulating the sewerage and drainage, should require the work to be done under the supervision of the Survey Department, in connection with the Commissioner of Highways. This will insure the proper preparation of the plans, and their being deposited in the office of the Surveyor for safe keeping and reference. The construction of drains at the expense of the property holders benefited thereby, should be encouraged, but in all such cases it is of great importance that the plans and surveys should be properly prepared and filed in the Surveyor's office for reference, because public and private rights are unitedly involved in their construction, location, and use.

DEPARTMENT OF SURVEYS,
Philadelphia, Dec. 31, 1857. }

To His Honor, RICHARD VAUX,

Mayor of Philadelphia,

DEAR SIR:—I take great pleasure in presenting you my customary annual report, and in laying before you, in connection with my exhibit of the state of this department, some matter of general interest, bearing most particularly upon the subject of drainage, which I hope may meet the views of your Honor, and receive your official approval.

This department continues to increase in usefulness as a point of reference for our citizens, and our records have had large and valuable additions during the past year,—the Surveyors and Regulators of the Districts having, in connection with their ordinary duties, displayed great energy in the prosecution of the surveys outside of the built limits. The

Board of Surveyors have had unusually frequent sessions, called for by the large number of sectional plans that have been presented for their approval, each of which has received due examination on the ground. There have also been referred a large number of applications for privilege to construct private culverts, that have received their consideration, while the usual number of appeals have been entered and decided.

The expenditure of the department has been \$23,264 79, being \$6,529 71 less than the amount appropriated for the past year. Of this, has been expended for sectional plans of survey and regulations, over new district, and revisions of old regulations, \$10,291 66. The extent of line regulations, completed in 1857, reaches near 130 miles of streets, and covers an area of about 3,800 acres. The plans on record it is impossible to define, with a view of exhibiting their value, being so various in their character, consisting of line regulations, grade regulations, drainage areas, culvert lines, culvert depths, sizes, &c., &c., bridge plans, wharf lines and soundings of river, old grants of supreme council, with records of surveys, and many others that cannot be enumerated, yet of great value.

This department being one which was entirely new at the date of consolidation, has required more time for the development of its purposes than others where the duties had been long established, and were consequently familiar to the community; which duties, I beg leave to remark, are not of that plain character that is supposed by those who have not examined the minutiae or details of our work. They are not restricted to the mere arranging, recording and guarding that portion of the city archives which are placed in our especial charge, and are invaluable to our citizens, but extend to matters of great importance and responsibility, affecting not only the health, but safety of our community. Among the valu-

able records which are in our possession, may be found the details of the entire city plan, so far as surveyed, showing the street lines and surface gradients; and also the register of surveys made for individuals, exhibiting clearly and accurately, with ease of access, the locality and dimensions of each and every lot of ground that has been surveyed or regulated since our organization, with the official return thereof; upon the plans used for this record, which are neatly bound and classified for facility of reference, is being collected all information that may be of value to the citizen or property holder—such as the street summits and grades, with the elevations of each street intersection relative to tide; the position, depth, size and shape of all sewers or drains, with the location of inlets, manholes and ventilators, and, so far as practicable under the present inoperative system, all connections with sewers or drains for private drainage; and we are thus enabled to furnish all necessary data for deciding the frequent appeal cases that are entered, upon questions of party lines, and to give any advice and information that may be required upon the subject of drainage, whether for public or private use. There are many other duties that we perform, and which link us so closely to the Department of Highways, that but few know that our services have been called into requisition, yet, that the work has been done is evident, for while the Department of Highways is in fact the constructive department, the Department of Surveys is the engineering department, where all plans and specifications are prepared, whether for bridges, culverts or sewers, or whatever work of improvement may be directed, and where all estimates for said work are made when performed by contract: and it is gratifying, sir, to state, that the saving to the city, thus far—as can be testified by the Committee of Finance—has reached an amount equal to the salary of the chief officer for his full term of office. And I beg leave, sir, to remark this, in no vain boast, but, in con-

nection with defining our duties and their importance, it seems requisite.

That portion of our charge which requires the most mature deliberation and careful examination, is the arrangement of systems for drainage, with the proper proportioning of the sewers and drains constituting such systems, and has required a course of study and research that has been but little attended to in our city. It is a subject that has such a variety of elements within it, as to have rendered it a matter of close investigation for a series of years in the city of London, by commissioners appointed under acts of Parliament, the results of which are very voluminous, and furnish much practical information, from which may be deduced laws of great value on the question of waterflow in sewers; yet so widely do they differ from experiments on record, made upon a small scale—upon which our mathematical formulas have been established—that judgment must be exercised in their adoption, but we hope to make such experiments upon some of the most perfect of our own sewers, as will enable us to draw a comparison between their practical and theoretical value. Nevertheless, we have given the subject much consideration, and believe that the principles upon which we have arrived at the proportions of those sewers and drains already designed are correct, and will be found to be fully adequate to the purposes intended, yet with a strong hope that much saving may be made hereafter by a further reduction in the proportions of sewers for a given drainage. All the data requisite for preparing the necessary calculations for a system of drainage, over any water-shed within our surveyed limits, may now be found on record here—such as the average rain-fall—the character of the area—the extent of each water-shed—the quality of the underlying strata—the surface gradients and the inclination that can be obtained—all of which are requisite in determining the necessary plans, and which could not have been had

prior to the collection and arrangement of the records now deposited here and used for daily reference.

To obtain for our city an effectual system of drainage, is of the first importance, as bearing upon each individual of our community in a most vulnerable point, and without which all else is comparatively valueless—his health; and after general drainage, for which the city officials, in the minds of all, are responsible, private drainage presents itself; and as upon the first each and every good citizen sees and urges its necessity, so upon the latter we feel that too much cannot be said or written in bringing before you, sir, and the Councils of our city, the inestimable value that judiciously enacted ordinances would be, compelling the construction of underground drainage from residences. Ignorance and parsimony both now militate against our endeavors to introduce it, as the increase to the value of property and the additional comfort is as yet appreciated but by those who have adopted it, or have examined the matter sufficiently to understand it.

Some objection has been made to the yearly rental or charge for culvert constructions, but we feel assured that those who complain are not aware of the expenditure that is as certain to be required of the city, as that drains are constructed for private use, and that as the system of private drainage extends, we will begin to see the inefficacy of our old culverts, and either flushing or hand labor must be resorted to to preserve their usefulness, this duty has thus far been unnecessary, though many of our old culverts have now an amount of deposit that cannot be increased without soon giving evidence of the necessity for its removal. Fortunate are we, that as yet our water supply has not been restricted, for without it the best plan of culverting would be inoperative, and the preservation of that supply should be early considered.

The necessity of having all sewers or drains, whether for public or private use, constructed under the immediate charge

of city officers, and strictly in accordance with plans prepared by this department, I have fully stated in my previous reports, and sincerely hope that an ordinance, making such obligatory, will be enacted, and obtain official sanction.

Every facility should be offered our citizens to induce the construction of lateral culverts, and this, I believe, can be reached by enacting the ordinances now before the Chambers, the adoption of which is earnestly, yet respectfully urged. The great advantage in the introduction of lateral culverts is, not only that underground drainage from adjacent houses should be generally adopted, but that by the construction of frequent inlets, our gutters would cease to be reservoirs of filth and garbage, breeding disease and contagion in our very midst.

There should be a culvert on every street, and every house should be obliged to deliver into it, by underground channels, all ordure or refuse that is susceptible of being diluted. We would then find our bills of mortality reduced in proportion to the extension of the system. Our inlets should be placed at short distances apart, so that the rain flow, or storm water, should perform its work of cleansing on the surface without flooding, and by more frequently entering the culvert, with properly arranged junctions, the increased velocity of the current in the culvert, consequent upon such arrangement, would add greatly to the scouring effect, thereby preventing deposits.

Great difficulty has been experienced in this department, in overcoming the prejudice against the use of vitrified clay pipes for drainage, notwithstanding the objections made are untenable to those who are familiar with the material of which they are composed—their advantages over our ordinary brick drains are many, and as to their being of sufficient strength to bear any superincumbent weight that would not be injurious to a brick drain, it cannot be a matter of question; their inner

surface being smooth, the accumulation of deposit is prevented, and their capacity increased, which admits a reduction in size, and in reducing the size, retaining the same rise and fall with the interior diameter of the old sewer as an element, we of course have an increase of gradient, and in connection with this subject, I beg leave to quote from an English report.

“It has been proved by the result of draining houses with tubular drains in upwards of nineteen thousand (19,000) cases, and by the trial of more than 200 miles of pipe sewers, that the practice of constructing large brick or stone sewers for general town drainage, which detain matters passing through them in suspension in water, which accumulate deposit, and which are made large enough for men to enter them to remove the deposit, by hand labor, without reference to the area to be drained, has been in ignorance or perversion of correct principles,” “and are wasteful from the increased expense of their construction and repair, and from the cost of ineffectual efforts to keep them free from deposit.” And they further state as a general conclusion, “That it results from the experience of works constructed upon correct principles, that improved tubular house drains and sewers of proper sizes, inclinations and material, detain and accumulate no deposit, emit no offensive smells, and require no additional supply of water to keep them clean,” and further, “That the method of removing refuse in suspension in water by properly combined works, is much cheaper than that of collecting it in pits or cesspools, near or underneath houses, emptying it by hand labor and removing it by cartage.”

The conclusions thus arrived at after close scrutiny and extended investigation, should have great influence, and we can add that in all cases where they have been used at the suggestion of this department, the results have been highly satisfactory.

One objection urged, has been, that they are impermeable,

and therefore not effective in reducing the moisture of a springy soil ; such is the case, and such we claim to be one of their greatest points for recommendation, and will say in addition, that neither do they accumulate deposits nor allow either liquid or gaseous matters to escape, impregnating not only the soil in which they may lie, but even the very atmosphere we inhale.

It is an indisputable fact that brick drains, which are necessarily absorbent and permeable, do not entirely carry off the vile and filthy matter that is carried into them, but cause the material surrounding them to become completely saturated with it, even to the surface, frequently causing putrid emanations as a nucleus for a devastating epidemic.

No culvert or drain for the conveyance of sewerage should be permeable, if the material through which it may be constructed should be of a moist or springy nature ; permeable drains for that especial purpose should be laid. After the general principles for these subordinate systems have been arranged, the next point of equal importance is the minutiae of the detail ; and as their value is determinate by the correctness of their proportions and the accuracy of their lines and shapes and mode of laying, it is absolutely necessary for the successful operation of the whole, that the work should be performed under a responsible supervision.

The determination of the sizes and general detail should be exclusively in the charge of those who, from their position in the city government, may be deemed qualified to advise, and plans so arranged should be carried to completion under penalty.

Much cavil and questionings have already been offered at the supposed want of capacity in drains heretofore proposed, yet which, when constructed, have met the warmest approval.

The change in the proportions of drains, made in accordance with correct principles, from those heretofore laid by

“rule of thumb,” is no doubt startling to the uninformed, and I again quote from our English brethren, whose experience and research entitle them to a degree of deference which we hope time will award us: “Proof of the empiricism and want of principle in the construction of works for the objects in question have been afforded as it were, by chance. Thus a six inch earthenware pipe having been laid down for the drainage of one detached house, the drains of one house after another as they were built were joined to the same pipe, until at the end of several years, this *one 6-inch pipe* was, to the surprise of both surveyors and builders, found to be clean, in perfect action, and carrying away the drainage of 150 houses, and doing the work, for which a sewer might have been provided of sufficient size for the entrance of a man to remove deposit.” And an estimate of the value of a smooth surface in affording rapidity of current, is clearly illustrated by an instance reported in connection with the drainage work of the English town of Tottenham, containing about 10,000 inhabitants. It has been necessary there, owing to the want of a suitable outfall, to erect sewerage works for the deodorization of sewerage by chemical treatment, and consequently, the refuse is delivered into a pit, preparatory to its reaching the pumps; at the point of outfall it has been necessary to place a screen and an attendant for the purpose of clearing away rags, paper, &c., which would otherwise choke the aperture; at this point, a sufficient quantity of soap, in cake or lump, is found daily, to fully cover the expense of the attendant, proving that solids reach the outfall before decomposition or disintegration takes place.

It is with pleasure that I am enabled to report that the four main culvert lines which have been long needed, have been examined by this department, and are now under consideration by the Chambers of Councils; the location and sizes have been determined by the Board of Surveyors.

It is unnecessary for me to add to what I have said in reference to them, other than in expressing a hope, that the construction of two of them particularly, may be commenced at the earliest moment, and I allude to them particularly, on account of their construction being required for the interest of the city at large—the one being a valley line, collecting the flow now carried off by the Cohocksink nuisance—the other, an intercepting line to prevent the pollution of water to be used for distribution through our city, while the others, though equally important for their immediate localities, have not so large an interest at stake.

I might, sir, extend my observations upon this matter and its connections, but they would lead me to a greater length than would be at present justifiable, and which may have already been exceeded; such as the state of our old sewers, and the necessity of their lines of flow being adjusted, and flushing systems being adopted, as also the probability of recourse to deodorization and the preservation of sewerage for agricultural purposes being necessary, with the adoption of proper modes of ventilation, and others of equal interest, are subjects I desire to place before you, but will defer for future communications.

In conclusion, sir, I beg leave to express the hope that the assistance of our city authorities may be extended to this department, in its endeavors to improve, so far as susceptible, our present inoperative system, and in further investigating this subject as one of most vital importance to each individual of our community. We may then on our own authority, and with enviable confidence, present as the demand requires, effective, permanent, and economical plans which shall give evidence of their perfect working, in our increased healthfulness as a city, and the consequent elevation of character in the lower classes.

Respectfully submitted,

STRICKLAND KNEASS,

Chief Engineer and Surveyor.

I would also urge the attention of Councils to the matter of sewers and sewerage. It is absolutely necessary that provision should be made as speedily as possible for the construction of several main culverts in the localities of the city where they are much needed; in many places the streets are not only overflowed, but the cellars of houses upon the line of them are filled with stagnant water, and in consequence of this, property is depreciated in value, a stop put to all improvement, and the health of the people living in those districts seriously endangered.

A very large number of small culverts have been constructed during the year, mostly at the expense of the property owners, and as they have been built under special ordinances, it is a source of great trouble to the parties desirous of building, as well as a severe tax upon the time of Councils.

I would recommend that at as early a period as possible a general ordinance upon this subject should be enacted, in order that Councils may be relieved from the labor of considering, and passing upon each special case; that the department may act understandingly, and that the public may be enabled to construct them at their own expense, without entailing upon themselves the trouble and loss of time incident to the passage of every ordinance.

I would also call the attention of Councils to the fact, that under the ordinance regulating the prices to be paid to the district surveyors, much difficulty arises from the fact that some of them are disposed to give it a construction that would enable them to charge exorbitant prices for work to be performed, in some cases amounting to double the amount for giving the lines to set the curb in front of a property that is demanded by the curb setter for doing the work; difficulty having grown out of this, and the officers of this department having been embarrassed, thereby induces me to present it to Councils, as the property owners are under the impression that the fault is with this department, when in reality it is as much aggrieved by it as they are.

An ordinance authorizing the commissioners of this department to employ a surveyor to give curb, grade, or other lines, and also to measure work done by the city, which in case of non-payment by

the property owners must be liened against the estate, would afford a proper remedy, to be resorted to only when the district surveyor should fail to comply promptly with the requirements of this department.

In addition to this, all work done by the surveyor should be paid for by warrants drawn by the chief engineer and surveyor, as he is the proper person to scrutinize, and determine upon the accuracy of bills presented for work of this description.

In some districts the amount paid by this department to district surveyors, approximate very closely to the yearly salary of the Highway Commissioners, and as the surveyors receive a yearly salary in addition to this, it would seem to me proper that an appropriation should be made to the Survey Department to pay the surveyors for all work done for the city, as the head of that department can then very properly discriminate as to the work done by them, for which they receive a yearly salary, and that for which they are entitled to extra compensation.

The ordinances in regard to turn-outs for the different railroad tracks that are now laid through the public highways, need the attention of Councils. In the old city proper we have been acting under the ordinances enacted to provide for turn-outs from the city railroad, and in the few instances that permits were granted in the other districts, the same rules were adopted. Some of the railroad companies claim the right under their charter to construct them when and where, and as many as they please, and in addition to this would seem to regard it as a matter of duty upon the part of the city to pave between the tracks thus made, and keep the same in good repair. There being no general law upon the subject, leads to much difficulty and inconvenience, and in some cases to great danger, as the tracks having once been laid either with or without authority, are allowed to remain in an unfinished condition for months.

The public interests and safety demand that this subject should be settled in such a way, as that parties wishing to make turn-outs, may know the proper place to apply to, and that the *turn-outs* when made, shall not impede travel upon the public highways. The dif-

AMERICAN SEWERAGE PRACTICE

VOLUME I

DESIGN OF SEWERS

BY

LEONARD METCALF

AND

HARRISON P. EDDY

FIRST EDITION

McGRAW-HILL BOOK COMPANY, Inc.

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Some of the difficulties which the American designer of sewers, without professional treatises of much value and lacking the help of the professional societies and journals of today, encountered in the middle of the last century are set forth in a report by Strickland Kneass, Chief Engineer of the Department of Sewerage of Philadelphia, in 1857:

“That portion of our charge which requires the most mature deliberation and careful examination is the arrangement of systems for drainage, with the proper proportioning of the sewers and drains constituting such systems, and has required a course of study and research that has been but little attended to in our city. It is a subject that has such a variety of elements within it as to have rendered it a matter of close investigation for a series of years in the city of London, by Commissioners appointed under acts of Parliament, the results of which are very voluminous and furnish much practical information, from which may be deduced laws of great value on the question of waterflow in sewers; yet so widely do they differ from experiments on record, made upon a small scale—upon which our mathematical formulas have been established—that judgment must be exercised in their adoption, but we hope to make such experiments upon some of the most perfect of our own sewers as will enable us to draw a comparison between their practical and theoretical value. Nevertheless, we have given the subject much consideration, and believe that the principles upon which we have arrived at the proportions of those sewers and drains already designed are correct, and will be found to be fully adequate to the purposes intended, yet with a strong hope that much saving may be made hereafter by a further reduction in the proportions of sewers for a given drainage.”

The foul condition of the streets of Philadelphia at that time, owing to the filth discharged or cast into the gutters, is evident from another quotation from the same report:

“There should be a culvert on every street, and every house should be obliged to deliver into it, by underground channels, all ordure or refuse that is susceptible of being diluted. The great advantage in the introduction of lateral culverts is not only that underground drainage from adjacent houses should be generally adopted, but that by the construction of frequent inlets, our gutters would cease to be reservoirs of filth and garbage, breeding disease and contagion in our very midst.”

FIRST ANNUAL MESSAGE

ALEXANDER HENRY,

MAYOR OF THE CITY OF PHILADELPHIA,

WITH
ACCOMPANYING DOCUMENTS.

JANUARY 27, 1859.

PHILADELPHIA :

INQUIRER PRINTING OFFICE, 121 SOUTH THIRD STREET.

1859.

The expenditures of the Department of Surveys during 1858 have been \$24,517 34. Under the direction of this department several small bridges have been erected for public highways, and very essential repairs have been made to the bridge over Gunners Run and to that over the Schuylkill at Girard avenue. Four main lines of culvert have been placed under construction in accordance with the ordinance authorizing the same, which will not only benefit the vast extent of property in their immediate vicinity, but must tend to promote the general health of the community. The construction of the culvert in the north-western part of the city, which is designed to drain the large area on the eastern side of the Schuylkill above its dam at Fairmount, is of special importance, as it will in a great measure prevent the flow of impurities from slaughter houses, manufactories and public buildings, into the body of water from which is taken that used for daily consumption throughout the city. Due regard for the purity of the water furnished to citizens demands the enactment of an ordinance prohibiting the erection of buildings in the vicinity of the Schuylkill above Fairmount to be occupied for noxious purposes, unless ample provision be made for the drainage of all impurities into culverts that shall empty them below the reservoirs. The system of municipal drainage is yet but imperfectly understood, and its great importance not sufficiently comprehended; but the ordinances of the last year relative to branch culverts, and providing for the new main culverts, must lead to its thorough consideration and perfection.

A plan recently prepared by the Board of Surveyors, for the construction of a bridge over the Schuylkill at Chestnut street, will be submitted at an early day for the action of Councils. The cost of such bridge, it is believed, will very far exceed the amount of \$125,000, originally appropriated for that purpose.

SURVEY DEPARTMENT.

DEPARTMENT OF SURVEYS, }
 December 27th, 1858. }

TO HIS HONOR, ALEXANDER HENRY,
Mayor of Philadelphia.

DEAR SIR:—I take great pleasure in complying with your note of the 18th inst., asking for a full, accurate, and detailed statement of the general condition of this department for the past year, with the amount of moneys received and disbursed, &c., &c., and beg leave to report, That the appropriations made to this department during the year 1858 have been as follows:

General appropriation of January, 11th, 1858,	\$29,354	30
Special " of April 28th " " "	84	28

\$29,438 58

Of this has been expended, as will be shown in detail by the statement of the City Controller,	\$24,517	84
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Leaving balance unexpended, Jan'y 1, '59,	\$4,921	24
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The preparation of sectional plans of our city plat, has been conducted with energy by the Surveyors and Regulators in their respective districts; the following being a list of those which have been placed on record in this office during the past year, viz:

2d section of Chesnut Hill—lineal survey.		
8th " Blockley	"	
6th " " " "	"	App'd May 3, '58.
7th " " " "	"	Exam'd by Board.
2d " Germ'n, grades and survey	Ap. Nov. 15, '58.	
5th " 21st ward " " "	"	May 3, '58.
6th " Germant'n " " "	"	"
4th " 21st ward, grades	Examined by the Board.	
2d " Frankford, " " "	Approved Nov. 1, 1858.	
3d " " " " "	"	"
4th " " " " "	"	"
White Hall, " " " "	"	"

1st section	23d ward, grades	Examined by the Board.
2d "	" "	"
3d "	" "	"
4th "	" "	"
5th "	" "	Examined by the Board.
6th "	" "	"
8d "	Chestnut Hill, lineal survey.	
9th "	21st ward, south of Erie avenue, grades.	
4th "	Blockley, - - - "	
" "	Between Susquehanna and City avenues and Forty-second and Fifty-first streets.	
10th "	Blockley, lineal survey.	

The amount of work thus returned by the Surveyors may be estimated, when I state that it covers an area of 7,000 acres, with 250 miles of streets, extending beyond the built up portions of our city.

In the most of the survey districts, the plans on file and now under course of preparation, when completed, will extend nearly to the limits that may be considered necessary for many years, for all city purposes, and will guard us from the necessity of arranging our plans to suit artificial circumstances, to avoid excessive damages, rather than adopt what a judicious adaptation of the natural topography would suggest, so soon as this point is reached, the expenses of this department will be reduced to its minimum of salaries only.

During the past year the out-door business of the department has been more than usually called into requisition in matters of engineering; we have built a number of small bridges of different character, from the stone arch, to the simple girder truss, besides work for completion of structures unfinished when the city was consolidated, and repairs necessary from ordinary wear and tear, as well as from imperfect workmanship at erection, but will only allude to two.

At the bridge on Gunner's Run canal at York street, we have replaced one abutment, dilapidated from bad foundation, and the other must be taken down and rebuilt so soon as spring opens.

At the Girard avenue bridge, we have completed the very heavy retaining walls necessary for the filling and use of the approaches. This has been a work of greater magnitude than was originally anticipated, owing to the difficulty of finding suitable material upon which to base a wall of such dimensions, and at the same time, preserve as much of the old wing-wall as possible; it has been attended with imminent peril, but am happy in being able to report that no loss of life or injury of any kind has resulted therefrom. It would have been judicious and economical, on the part of the city, had we been authorized at the same time to repair the imperfect abutment at the western end of that bridge, as the foundation must be very defective, and if on rock, as is asserted, must be so shelving as to furnish but a poor ground work for the superincumbent weight of masonry. This is shown by the opening of the joints on the northern corner, and which, I fear, will ere long, render it imperative to have recourse to heavy expenditure for renewal, and even now, must be sustained by shoreing, to preserve it, and prevent the consequent destruction of at least one span of the superstructure, should the abutment fall.

The superstructure of this bridge was erected in the year 1853, prior to consolidation, and was not used for travel, other than foot passengers, until the winter of 1857, when the retaining walls on the eastern side were completed; though the western approach was yet incomplete, sufficient width of roadway was open to permit safe travel. Shortly after my assuming the duties entrusted to me by the city, I observed evidences of weakness in the structure, not from decay alone, and at the completion of the eastern approach, made a written protest against throwing it open for public use. But it was unheeded, until the evidences noticed and reported were, during the past autumn, rendered apparent to all by the arches of the eastern shore span breaking between the skewback and lower chord. Orders were at once issued by the highway department for their repair, and in doing so, every weak joint has been strengthened, and the entire bridge has been adjusted to its lines, both horizontal and vertical. We therefore now present it to the public as a

safe and secure structure. Much might be said in reference to the bridge, as to its injudicious location and consequent extra cost, but as it was before the time of our responsibility, it would be of no particular advantage. This bridge yet requires a suitable flooring, when a highway will be thrown into public use, that has long been required for the northwestern section of our city.

I am also gratified, sir, in reporting to you that the four principal lines of culverts, memorials for which have poured into the chambers of Councils for several years past, have now been allotted to responsible parties to construct, under such specifications and details of contract as will secure to the city the best character of work. These works, sir, I consider the most important of any that have been undertaken by our city for many years. Their results will not only be for the individual comfort of those residing upon the immediate lines thereof, who have been incommoded by the periodical freshets which have, in many instances, caused great loss of property, but will extend through our city in reducing the liability of disease, generated by the present state of the locality and the extension of epidemics for which the character of the atmosphere, particularly upon and contiguous to the line of the Cohocksink, is well fitted; for this, the construction of the Cohocksink line of culvert has been long required, as a reference to the statistics of the last cholera visitation will prove. The Vine street culvert will improve the character of property upon its line, and add to the city revenue, from increased assessment, sufficient to return to the city at an early day, the expenditure now authorized. The same result will follow the construction of the Moore street culvert, but to a greater extent, as in that case, the want of proper drainings, facilities has prevented the use of much vacant ground which will now be at once covered with buildings, returning its due quota to the city treasury.

The northwestern culvert is by no means of the least importance in the list, as by its construction on the line proposed we preserve the Schuylkill water from the deteriorating drainage flowing from a large manufacturing

district on the eastern side of the river, and it would be greatly to the interest of our community could an ordinance be issued to prevent the location of any stable, slaughter-house, or manufactory in such position that the refuse therefrom would flow into the water liable to be pumped out for city consumption. Such Act of Assembly exists, though reaching only to the south side of Francis lane, now Coates street, but should be extended up the river, and so framed as to guard each of the reservoirs for water distribution now located on its margin.

Another system of drainage to which the attention of this department has been called, but upon which I am not now prepared to present you a specific opinion as a result of minute examination, is that due to the area lying west and north of the Fairmount dam, in the Twenty-fourth Ward; as yet, much of the obnoxious matter is absorbed before it reaches the dam, as it passes mostly through an open and unimproved section; but judging from the advance of improvement in that ward, the day is not far distant when the drainage from that area will exceed in objectionable qualities that presumed now to flow from the eastern side.

It is a matter of congratulation that the subject of drainage has received so much consideration from the City Councils as shown by the appropriation of \$200,000 for the works under contract, and the enactment of the ordinance authoring the construction of branch culverts or drains. The Board of Surveyors have already acted upon a number of applications which are now open for contract, and will be built without entailing any expenditure upon the city other than for intersections, and will greatly improve our street surface by enabling us to introduce a larger number of inlets, thus preventing the long surface flow which is so objectionable, and will also give opportunity to correct a very great evil in the form of cross gutters at street intersections. In all our new grade regulations we endeavor so far as practicable to avoid them, but of course the introduction of the branch culvert system is the only efficacious mode by which they can be prevented; many of those which now exist, and

which are not liable to be avoided at an early date by a branch culvert, should be remedied by the adoption of cast iron box gutters, extending across the carriage-way and foot-way, the expense of which would be returned to the community in the saving of time and a reduction in the wear and tear of vehicles. Those that have been introduced by the passenger railway companies constructed on Race and Vine streets meet the ends desired, but can be improved by being extended so as to close the gap now left at the curb.

The ordinance relative to branch culverts alluded to is of great importance in securing more thorough drainage, yet great responsibility rests with the Board of Surveyors in granting these permits, to avoid imposition upon a number for the benefit of a few, and it requires further guards for the protection of individuals, who from the necessity of their location or business are required to construct a branch culvert at their own expense; such persons should be protected from the indiscriminate use of such drain by neighbors who may have declined contributing only on account of the urgency of the case assuring them that it would be constructed by others, when they would be granted a permit from the city at a less cost than the price per foot of construction. This now prevents the extension of a number of branches; the board cannot authorize their construction under the ordinance, because in some instances but *one* owner's name is subscribed to the application, and its usefulness to the city is not such as to warrant its construction unless a majority of owners should request it, while the party applying is unwilling to build at his *own expense* unless he shall have an opportunity of remuneration from those who may afterward desire to connect therewith. For this we shall at an early day present a supplementary ordinance, trusting it may receive consideration from Councils and your approval.

I must again, sir, allude to the necessity of some system being adopted by which the connections made with our culverts for private drainage should be constructed under the immediate control of a city officer. Such abuse

of privilege as is now exercised by individuals will be severely felt hereafter, particularly as they increase in number, which is very rapidly; they oftentimes injure the strength of culvert-arch, and more frequently are arranged with a total disregard to anything beyond their immediate purpose and private ends, while the flow in the culvert is seriously affected, and each forms a nucleus for deposit, which must some day be taken out by the city at great cost. In the cities of Europe this is guarded with jealous care, and all connections at the culvert-arch are made by officers especially delegated; nor under the present system, has this department any means of knowing where or how such connections are made, and when called upon at any time to correct an existing evil are entirely ignorant of what has been done by the authority of other branches of the city government, while the proper location of such connections, and the effect thereof upon culverts opened, can only be known at this department, where each system of drainage is being minutely examined and recorded; in perhaps most instances, these connections, if properly and scientifically constructed, improve the working of the sewer, but if, as is mostly the case, the pipes are protruded into the area of flow without regard to the necessity of retaining a smooth and regular interior surface, and the debris occasioned by the unworkmanlike manner in which such insertion is performed, is left lying in the sewer, we cannot be surprised if we are at length called upon to cleanse our sewers by manual labor of the deposits thus created. Were it possible, and there is no apparent difficulty, for this department to have recorded all matters connected in any way with culverts, it would result eventually in great benefit to the city, and is particularly necessary now that the system of private drainage is becoming so universal in its application to new improvements.

The work that is now so urgently called for by a large number of our citizens, the bridge over the Schuylkill at Chestnut street, I am happy in being able to report, is now ready in plan for the action of Councils, the Board of Surveyors having given it close scrutiny as presented, and recorded their entire approval. The amount esti

estimated for the construction of this work, seems to astonish those who are not familiar with such structures, and particularly as they have been somewhat misled from the circumstance that \$125,000 was appropriated by the "County Board" for that purpose, prior to consolidation, but forgetting that such was not intended to be the full cost of the structure that would be suitable for a highway for the City of Philadelphia, nor, in fact, do I know of any character of bridge that could be put up at that place for the amount thus specified, as the masonry necessary to the abutments, approaches and pier, would far exceed it in cost, and this cost would vary but little with the plan of superstructure, while the superstructure itself will not reach that amount by a large margin. Some have expressed surprise that a stone bridge was not adopted in preference to all others, and on this point I may say, that with the rise of arches and span which it has been considered expedient to adopt, so as to allow as easy a gradient as possible for the approaches, that a stone bridge is impracticable, and it has not been deemed judicious to interfere, more than is absolutely imperative, with the water way of river, by the adoption of two piers, on account of the great liability of seriously affecting the Fairmount works.

During the coming season, it will become requisite that a new bridge be constructed at Bridesburg, over the Frankford creek, at the United States Arsenal; that now in use is a sliding draw, and in a very dilapidated condition, entirely unsafe for travel, and is at best but a temporary affair, with trestle piers; the draw is decayed in all its parts, and is sustained by incessant patching, attended with considerable expense. The whole affair should be removed, and a swing draw substituted, with a stone pier and abutment adapted to the purpose. The city owning the property on the south of this location, there can be objection to the plan proposed, as the privilege to this swinging over the wharf property, can be reserved in case of sale.

As all questions of passenger railways must pass the examination of the Board of Surveyors, prior to their

construction, and the views of the board have differed somewhat from Councils, as regarding the gauge, &c., bringing out a regulating resolution from that body confining us to the first, and mayhap not thoroughly digested plan, I desire to say that the board were desirous of taking advantage of any improvements that might be suggested, rather than adopt a plan merely because it was then in use; and believe now, that many of the adherents to the present plan, clearly see that they would not have been affected, as they surmised, had the board been permitted to exercise some practical judgment in the matter; had the gauge of 4 feet 8½ inches been adopted on some of the roads lately constructed, we would now have had Broad street, with its double track repaired, placed in thorough condition, and fitted for passenger travel, while the character of rail that would have been adopted for the new track, would have had the same and better advantages for ordinary vehicles, as they could have travelled upon it without injury to wheels, which is now unavoidable; this would also have prevented the combined rail on Second and Third streets, with the intricacy of castings in the carriage-way, that are now indispensable.

Although, in the organization of a new city government, much attention and time were given to the arrangement of the relative duties of the many departments composing it, yet we are by no means perfect, and much legislation is wanted, before this department can work in such manner as to conform in all points to law. Prior to consolidation, each district had laws relating to its surveys and records of property lines, many of which differed in form, some very materially, and although in some instances inoperative, yet for mere points of litigation, could be brought into argument with some force; all these should be adjusted, and a new form legalized, that would be simple and effective, and bearing upon the entire city, place us on sound and good ground for action.

The passage of an ordinance relative to the preparation of liens for unpaid bills due the city, by which the Surveyors and Regulators would be remunerated for the work required, most particularly in obtaining informa-

tion for the tax liens, is a matter of importance. The property against which the charge may be made is, in almost every instance, so obscurely described upon the bills, that it would be impossible for other than one familiar with the district, or possessed of records of survey, to locate it so that a proper description could be made out; the difficulty in identifying a property may be understood by an extract of bill as usually returned, viz: "J. Jones, a frame house on Fourth street adjoining property owned in 1854, by J. Smith, 6th ward." And in some instances thus: "W. Smith, lot of ground on the north side of Duke street, 19th ward," in a region, perhaps, where there are no improvements, and the only mode by which any information may be obtained, (unless some starting point may be possessed by the Surveyor, from his own records,) is by tracing up the name in the Recorder's office, a work exceedingly tedious, and frequently without any valuable result. The Surveyors and Regulators were not called upon to perform this duty until the ordinance of June 19th, 1857, carrying out the intent of the law, brought the tax bills into the hands of the Solicitor, and thus to this department, for the proper descriptions; and as we have distributed, since July last, 1400 bills, many of which require several descriptions, (in one case thirteen separate and distinct descriptions for one bill filed,) some idea may be formed of the additional work required, and justice seems to say they should be remunerated, particularly, as in all cases prior to consolidation, the Surveyor invariably received compensation for such duty.

It is also very desirable that an ordinance be framed by which the dedicating of streets to public use may be filed in some one place, and as this department is most frequently, and with propriety, called upon to verify the locality of public streets, they should, after being recorded, be deposited in this office, as custom, and what has been found to be most convenient and proper, has already made a precedent, and is particularly necessary now, as a resolution of Councils, approved November 20th, 1858, requires that the certificate from the Department of Surveys, shall be obtained as to the public ownership of a street,

prior to the laying of water pipes ; such deeds, and many of value, are scattered through the several offices, notwithstanding we have endeavored to collect and file them for easy reference. If they were, in all cases hereafter, submitted to the Board of Survey for acceptance on the part of the city, and only made public streets subject to that approval, it might be of great advantage to our city plat.

Respectfully submitted,

STRICKLAND KNEASS,

Chief Engineer and Surveyor.

DEPARTMENT OF SURVEYS.

DEPARTMENT OF SURVEYS, }
Philadelphia, January 2, 1860. }

ALEXANDER HENRY,

Mayor of Philadelphia.

SIR:—In reply to your circular of 8th ult., I take pleasure in laying before you an exhibit of the operations of this Department during the past year. But before entering into the detail of works in progress of construction, or those completed, will state, that the amount of appropriation made to the Department of Surveys for the year 1859, was

1859, was	\$25,400 00
Amount expended,	23,767 87
	<hr/>
Leaving balance to merge,	\$1,632 13

For the construction of the four large Culverts, viz: the Cohocksink (main and branch,) 24th street, (main and branch,) Vine street, and Moore street, an appropriation was made, payable by the Department of Highways, by a Loan entitled The Culvert Loan of \$200,000 00

The expenditures on which are as follows:

Cohocksink main,	\$34,818 08	
" branch,	18,141 39	
Twenty-fourth street main,	37,793 01	
" " branch,	12,923 08	
Vine street,	15,187 75	
Moore street,	15,554 24	
	<hr/>	
Total work done,	\$134,417 55	
Less assessment bills,	15,637 58	118,779 97
	<hr/>	
Unexpended balance,		\$81,220 03
Retained per centage in hands of City,		24,663 02
		<hr/>
Amount of Loan on hand,		\$105,883 05

There have also been constructed during the year, 22,632 feet of branch culverts or drains, under the Ordinance of November 11, 1858, the aggregate cost of which has been not less than \$25,400. Those that have been built under contracts made with the Department of Highways, we have full knowledge of, and have the exact cost of each on record, but those that are constructed by, and at the cost of individuals, we get no accurate return of, in all cases. These culverts require no expenditure on the part of the City; as, by the Ordinance, the contractors receive for pay, upon estimates made out in this office, culvert assessment bills against the property lying upon the line thereof, at the rate of 75 cents per lineal foot of property fronting thereon—and as the cost of the culverts constructed seldom reach that amount, a revenue is obtained for the City which, for the year 1859, will amount to \$3,650 72; of which \$2,934 42 in assessment bills have been sent to the Department of Highways. What amount of these, due the City, have been collected, we have no means of knowing, as they are placed by us in charge of the Department of Highways for that purpose, with the final estimate of culvert, when reported as complete by the District Surveyor.

The list of such branch drains constructed is as follows :

Three feet culverts,	4,871	feet in length.
Two and one-half feet culverts,	10,892	“ “
Two feet	“ 2,006	“ “
Twenty inch	“ 595	“ “
Ten inch pipe drains,	4,214	“ “
Eight “ “	} vit'd clay, 54	“ “

The sectional surveys have been progressing at a rate that will, in a course of years, place on file a thorough and accurate record of the entire area embraced within our city limits. Those that have been entered during 1859 cover 6200 acres, with 220 miles of streets, making nineteen

separate and distinct plans, of which the following is a list
11th section of the late Township of Blockley.

12th	“	“	“	“	“
13th	“	“	“	“	“
3d	“	“	“	“	of Bristol, 22d Ward.
2nd section of Chestnut Hill, 22d Ward.					
6th	“	21st Ward, grade regulations.			
7th	“	“	“	“	“
8th	“	“	“	“	“
5th	“	Blockley	“	“	“
4th section of West Philadelphia, revision of grades.					
Part of the 1st Ward,				“	“
6th section of Germantown,				“	“
7th	“	“	“	“	“
Portion of Blockley, South of Market street, lines and grades.					
3d section of Chestnut Hill,				“	“
4th	“	Kingsessing,	“	“	“
5th	“	“	“	“	“
4th	“	21st Ward, (Manayunk,)		“	“

The larger portion of the above plans have been examined upon the ground, by the Board of Surveyors, and the entire list will, in a short time, be presented to the Court for confirmation.

The meetings of the Board of Surveyors have been held more frequently than at the stated intervals, as much of their time has been consumed in the examination of petitions for branch culverts, each of which is placed in the hands of a committee, who report from personal examination, and thus far there have been but two applications that have not been sanctioned.

Much has been written relative to the want of proper drainage of our city, showing that but few are aware of the extended lines of drains that have been under construction during the past year—not only under the Ordinance of November 11, 1858, but by authority of special Ordinances.

In compliance with the latter, exclusive of the four arterial culverts first noted, there have been constructed 5,698 feet of sewers, and inclusive of special Ordinances and applications granted under the general Ordinance, the length of culverting completed during 1859, has reached 41,377 feet, or 8 4-10 miles. There are yet several miles of arterial culverts to construct, to relieve the outer sections of our built district, some of which are essential to preserve the high standard of healthfulness which our city has enjoyed, notwithstanding our citizens have profited so largely by that most valuable Ordinance of November 11, 1858, and at their own expense extended so greatly and advantageously by lateral drains the ramification of our drainage system. For this we have great reason of congratulation, and trust that the coming year will show a still greater extension, as the value and advantage of our projects become more evident and better understood.

It has been stated that the charge for culverts, under contracts made with the City, as directed in said Ordinance, is unjust, as in many instances the cost of the culvert has been less than the amount collected on the assessment bills, which places the surplus of charge in the coffers of the City—but instead of any injustice being inflicted, it is the only way of equalizing the charges, unless a resort be had to taxation upon the entire drainage area, the City then to perform the work complete, placing a drain in every street, for the basis of charge is made as the cost of a culvert 3 feet in drain—and all culverts, whether above or below that size, have the same charge—the justice of the charge then, is, that the circumstance of a person residing upon a line of drainage, that may require a culvert of large dimensions, should not inflict upon him an expenditure greater than would be made to a person whose property may accidentally lie upon a branch line—the larger one being, in fact, necessary to the operation of the smaller, the flow from the one

passing through the other, and they each, in fact, being part of one general system. The 10 inch pipe drain is just as useful for private, and even surface drainage, in its particular locality as a lateral, as is the 10 feet culvert on its line as a main.

✧ In the construction of these drains we should have more careful supervision than they heretofore have had, and most particularly necessary is it for the pipe drains, which, 'if properly laid, are greatly superior to drains of brick, both in economy of construction and efficiency for drainage— but if laid without a due regard to the line, level, and proper joints, they become very troublesome. A general specification for each has been prepared, which, if complied with, will insure effective working. But this Department cannot be responsible for the manner of their construction; the duties of the office preclude the possibility of a personal supervision by the Chief Engineer and Surveyor, and there is no law directing such duty to be performed by the District Surveyors, they being responsible only for the lines and levels. We therefore depend upon the Department of Highways, under whose supervision the Ordinance directs that they be built. This should be arranged so that some one officer of the City may have the especial charge of the construction of branch culverts, and the connections to be made with sewers, under permits issued by the Department of Highways. This should be not only for the materials used, but that the specifications therefor be complied with. It is now customary for any one to knock a hole into a culvert, and insert a pipe, upon the granting of a permit by the Highway Department, careless whether the debris from the hole made remains in the culvert or not, or whether the pipe protrudes into the culvert, or is flush with the inner surface, as it should be; either of the first alternatives is bad enough, but in most cases I feel assured that both exist seriously, interrupting the efficacy of the sewer.

These connections from manufactories are without any restrictions as to the matter delivered into the culvert, and in many instances it is such as to entirely interrupt the ordinary flow, creating pools, from which the most offensive effluvia emanates, and which requires the full force of the storm waters to carry off. This should be prevented by Ordinance, and no material insoluble in water should be allowed to pass into the culverts.

During the past year a greater attention has been given than heretofore to the introduction of inlets for surface drainage. This is an important matter, and money so expended will give a good return in increased cleanliness of roadway and side gutters. Those built of late have had more care given them than has been usual, and by a new device which I have placed in operation, they are much increased in capacity; there need be no fear of overflows by the filling up of the sump; and if the inlet connection is properly arranged it acts as a ventilator as well for the inlet as the culvert. Had they been introduced upon the line of Reed street the late break and overflow would not have occurred. We have strong hopes that still greater improvement may result in the adoption of a patented inlet, to be constructed of cast iron, and if we are successful, the annual expenditure for repairs of inlets will be greatly reduced.

It is with great pleasure, Sir, that I am enabled to report, that the work upon the large culverts under construction, directed by Ordinance of February 27, 1858, has progressed with all energy, notwithstanding the many difficulties that have been met with. They were commenced early in the present year, and prosecuted through the most unfavorable season for such work ever known in Philadelphia, with close attention and unwearied energy. I say the *most unfavorable* season, on account of the unprecedented amount of rain fall that has occurred this year. The usual mea-

sure of a year's fall is a trifle over 40 inches, while during 1859, up to the 28th of December, it had reached 57 inches or more than was ever known in our City.

On the culverts for Vine and Moore streets, this excess of rain has effected the work most seriously, not only in delaying the progress of construction, but burdening us with expenditures, no human agency could foresee. The excavation upon these lines we found to be, for an extended distance, in material that with ordinary moisture became a lively quicksand so soon as disturbed, and the excess over the ordinary rain fall immeasurably augmented our troubles, and it has only been the determined energy of the contractors that has brought us safely through, *i. e.*, within any reasonable expenditure. This has not only increased the quantity and cost of material excavated, which could not be estimated by means of cubic yards taken out, but it has rendered necessary an enlargement in proportions of arch for culvert, to resist the different character of forces such material creates. On Vine street it forced us to abandon the ovi-form culvert with light arch, and substitute a circle with a corresponding increase of proportions—this was a matter of great regret, but deemed advisable for safety—it is now complete and in successful working order.

On Moore street the line was finished to a point 120 feet west of Seventh street, in August last, and would have been entirely finished several months since, had we not been compelled to cease operations from the circumstance of 627 feet of the line lying upon ground that had not been opened for public use. The slow course of law is in operation, and we hope now that at an early day we may be enabled to resume the work and hasten it to final completion.

This delay has been a matter of serious import, as one of the particular necessities of this culvert, is to relieve a locality from which this difficulty cuts us off.

Upon the Twenty-fourth street culvert a great amount of

work has been done. The principal difficulty here, has been the long rock cut required upon a closely built and narrow street, yet it is with pleasure I state that it has been successfully completed without injury to either person or property. At the intersection of Twenty fourth street and Pennsylvania Avenue, we have our deepest excavation, and it became necessary for economy, and to prevent the liability of interrupting the passage of trains upon the Reading road, to resort to tunnelling, notwithstanding the material is a clean gravel; it has been carried on with care, and would have been finished had we not have been flooded by the breaking of a large water main overlaying the tunnel, which filled a large extent of completed culvert with surface material. It has now progressed sufficiently to be free from danger, and a small heading driven to the line of open cut, has enabled us to commence work upon the Pennsylvania Avenue, west of Twenty-fourth street, as by this heading the water in the cut is permitted to flow off. The line on the Avenue is now completed to within 300 feet of Coates street, which when reached will divert the drainage now flowing into the forebay at Fairmount, into the new culvert line to be delivered into the Schuylkill at Wood street, some distance below the dam. North of Coates street, the rock excavation extends to Twenty-eighth street, and much work has been necessarily performed, to prepare for our culvert trench, which properly belongs to grading of highways, for we have taken out the easterly side of the Avenue to the confirmed grade. Immediately north of Coates street there is 250 feet of the culvert complete in the rock cut, and it will be pushed forward during the winter, so that a connection will be made with the line above Twenty-eighth street, now finished to Thirtieth street, early in the spring, and the branch running up to and draining the Girard College and the House of Refuge, now ready for use, will be brought into full operation. The extension on the line of the

Avenue, north of Thirtieth street, will be of small dimensions, and is intended only to drain the Lager Beer establishments near the Spring Garden Water Works, this can be built in a few weeks after the connection on the main line is made. This line in working order, the entire eastern shore of the Dam from Fairmount to the Girard Avenue Bridge, will be protected from City drainage, and the system carried out as the built district extends, will protect the entire shore to South Laurel Hill Cemetry.

The branch alluded to, is not only a part of the system for the protection of Fairmount, but it occupies ground that could not be brought into use for building purposes without it, and its completion prepares the valley of the "Dark Woods Creek" for the opening and filling in of streets, which will, at an early day, be sought as valuable building sites, thus giving a return to the City in increased taxation more than the interest of the cost for construction.

The most difficult work that we have had to perform, and which has occasioned the greatest anxiety, was the culverting of the Cohocksink Creek. From Germantown Road to Front Street there was much to contend with in the repeated freshets, that invariably broke away the protecting dams and required several days to place the work in the same condition it was prior to the storm; yet, notwithstanding this was so very discouraging to the contractor, it was driven forward with all energy, and every difficulty, as it occurred, successfully surmounted, and now presents for public use a fine, wide avenue, all trace of the former disgusting channel for sewerage having been entirely removed. The contractor, Daniel Stone, Esq., deserves at my hands, all encomium for the manner in which he has carried on this work, as well as for the character of the work now completed; and it has been a matter of great regret that he, by a serious accident, should have been compelled to yield his work into other hands. The contractors now in

charge—Messrs. G. & J. Clark—there is every reason to believe will prosecute the remaining portion of the work with the same energy and in an equally satisfactory manner; they are contractors of large experience, having constructed some of the heaviest work within our State, and in our own City have just finished the culvert on Vine street, built under the same authority as the work now in their charge. This culvert is now finished to a point 140 feet northward of Second street, with 2013 feet on Germantown road and Thompson street yet to build.

The branch culvert lying upon the line of the Cohocksink Creek, from Germantown road to Culvert street, is in charge of Messrs. D. & C. Kennedy, who have also the Twenty-fourth street main. This work has also suffered greatly from the frequent freshets, but it has progressed energetically, having received that attention and watchfulness which in this instance has been peculiarly requisite.

This work cannot be entirely finished until a connection is made upon the main line at Fifth and Thompson streets, thus enabling us to direct the drainage coming from Thompson and Mifflin streets to the channel projected for it on Thompson street and Germantown avenue. This is now carried in the old creek bed alongside of the new culvert, which is so guarded with piling as to protect it from injury, and at the same time give as much capacity as the creek had as an open channel, the flow in the culvert being more than equal that due the portion of original water course occupied.

Upon the completion of these lines we will ask for authority to complete the system by the construction of a four feet culvert on the creek from Culvert street to Apple street, the cost of which will not exceed \$11,000, and will be more than covered by the unexpended balance of the Culvert Loan. The amount of the culvert assessment will be \$2,015 00.

In connection with this branch culvert was a piece of work that deserves especial reference; that is, the alteration of the sewer on Culvert street, from the creek to Fourth street.

The old sewer on this line fell at so rapid a rate as to throw the mouth about four feet below the level of the bottom of the creek, and the same distance below the level we would require in bringing the new culvert up the creek from Germantown Road. This so contracted the opening of the old culvert at the creek as to occasion the repeated overflows at Fifth and Poplar streets, which, in many instances, has resulted so disastrously to the stores and dwellings in that neighborhood. This culvert it became necessary for us to raise to correspond with the new construction, and although located upon a closely built alley, of only 16 feet in width, and subject to the continued flow of drainage coming from 248 acres, as also the unusually frequent storms that occurred during the progress of the work: yet it has been completed in a satisfactory manner, without any injury whatever to the adjacent houses, though in some instances the cellar walls were bared to the foundation. The ordinary drainage carried off by this sewer is of the most offensive character, and it became necessary to employ a double set of hands for the purpose of relief, and thus expediting the work. It was necessary here to exercise the most watchful care to guard against the effect of a sudden storm, as a few minutes would change the flow from that of a rivulet to a mountain torrent, and in such cases it was imperative that all the obstructions to the free flow should be removed to prevent accident. Thus was it required that trunks, dams, and centering a part of the work, and in constant use, should be frequently removed, to be replaced when the storm had passed off. It is now entirely complete, and has been tested with as heavy storms perhaps as have ever visited the locality, such as have heretofore in-

variably flooded the valley at Fifth and Poplar and Parrish streets; yet it has carried it off entire, with only two-thirds capacity in use.

What effect the completion of these culverts will have upon the assessed value of property, may be estimated by comparing the condition of Thompson street from Fifth to Sixth, and Canal street from Germantown road to Front street, with what it was prior to the commencement of our work. But, in point of hygiene, no estimate can be made of the suffering by disease and loss of life that these constructions will be the means of averting. Now, there need be no fear attached to that particular locality, should an epidemic again visit us, as was the case some years since, when the line of the Cobocksink was marked by its ravages. This is its great value, and its success in consummating this much-desired end is by no one deemed problematical. Thus, the value of property on the line of the culvert is not alone enhanced, but the entire area over which the polluted atmosphere floated will feel the advantageous influence; and I cannot give a better idea of this than by repeating what has been previously stated by me, that in a similar case of improved drainage in a portion of the city of Manchester, England, the bills of mortality were reduced one-fifth, thus showing tangibly that the benefits from these constructions are not confined to a very limited area.

There has been but little work done the past year upon bridges, the only renewal being the construction of a spring draw-bridge over Frankford Creek at Bridesburg. This is of iron, and has applied to it the patent anti-attrition box of Parry. It is a permanent and secure structure, with greater facilities for the passage of vessels than was offered by the old bridge.

The Market Street Bridge, though without doubt one of the best wooden bridges that has ever been built, both in general plan and the proportion of its parts, and although

the material of which it is constructed was subjected to close inspection, yet it gives evidence of decay, and it has been requisite to replace a main brace and post. This has been caused, it is believed, by exposure from the want of outside boarding. I would therefore recommend that the entire structure be closed from the weather, by which further decay may be retarded.

The Girard Avenue Bridge, has been open for public use during the past year, and being upon the line that is used by drovers for large cattle, it has been severely tested and has proved to be as we have previously reported it to be.

The Wire Bridge at Fairmount, we believe to be in good order, but it is impossible to so assert unconditionally, as the parts are not so situated as to admit an examination. The western approach is in bad condition since the construction of the Passenger Railroad upon it. Great improvement might be made to this bridge, by re-arranging the bearing plates upon the towers, and closing in the shore cables, inside the anchor pits; this would prevent the continued vibration of the shore cables, and reduce that of the bridge proper.

The Surveys of the outer districts have been progressing during the past year, as rapidly as the amount appropriated therefor would warrant. Those that are conducted under contracts, made by the Commissioners of Districts appointed prior to Consolidation, are drawing to a close. One of them (the contract) is now completed with the plans on file, and covers that portion of the 24th Ward, north of Market street, and west of the line of Fisher's Avenue. The other, east of Fisher's Avenue, will be completed, it is supposed, during the year 1860. There is but one other section of the City that is in charge of Commissioners of Survey, Passyunk Township, comprising a portion of the First Ward, of this we can offer no report, having been unsuccessful in obtaining the information sought.

The current business of the Department is steadily on the increase, requiring the constant attention of its officers, to keep pace with the requirements. The operation of the Branch Culvert Ordinance, has occupied much time, in preparing the estimates and arrainging the bills of assessment, all of which are recorded and on file. I would again call to your attention the necessity for an Ordinance specifying the course to be pursued, by parties who may desire to dedicate streets to public use, and guarding it, if possible, with such restrictions as will prevent the location of streets that may conflict with the proper planning of the City, there is now neither form nor law regulating this, and in some instances, the interest of the City suffers for the want of it. At present the filing of a recorded deed of dedication in this office, is all that is called for, to make a public street, no one being clothed with the authority to either accept or reject. An Ordinance now before Councils may correct this, which confides this duty to the Board of Surveyors, who probably are the only officers of the City who can, from a knowledge of the general plan, from a correct judgment, as to the advantages or disadvantages that may result from an acceptance.

The sectional plans of the City on file in this office, are so far as they extend into the rural district complete, except that portion of the old City east of Fifth Street. For this area, which is one of the most valuable in the Consolidated City, we have no plans whatever on record, and it is very important for the interest of our citizens, that a correct map thereof should be prepared, including the 5th and 6th Wards. We shall lay the matter before Councils at an early day, and trust that it may meet your approval.

Respectfully submitted,

STRICKLAND KNEASS,

Chief Engineer and Surveyor.