

The Union Canal Company of Pennsylvania
Philadelphia: John C. Clark, Printer, 68 Dock Street
1853

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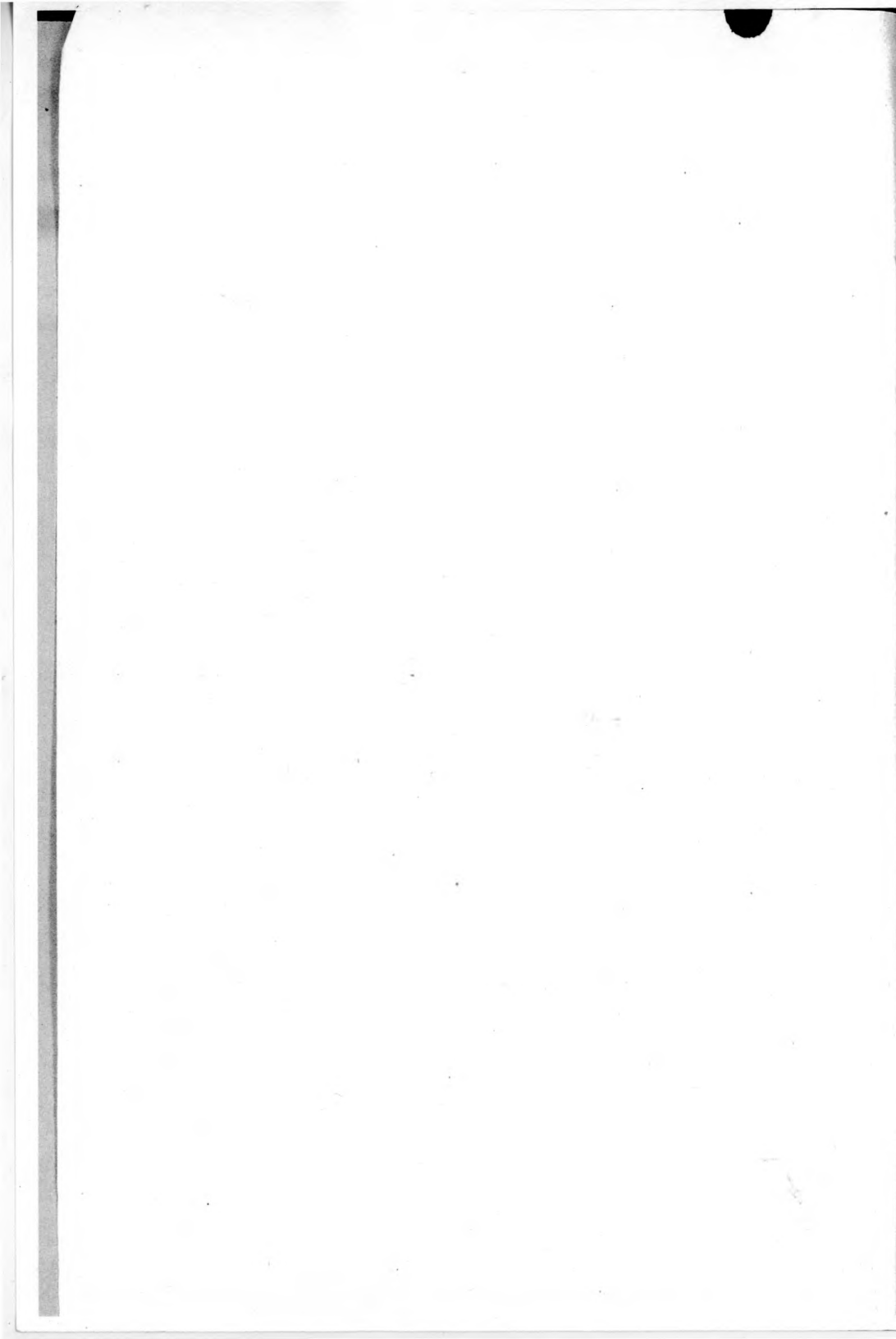
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THE
UNION CANAL COMPANY
OF
PENNSYLVANIA.



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THE UNION CANAL COMPANY.

THE Union Canal is believed to be the oldest work of the kind in the United States. The idea of connecting Philadelphia with the western waters, by means of a continuous water navigation, was first projected by William Penn himself, in 1690. The route proposed by Penn was that now occupied by the Union Canal. The first actual survey of this route was made by a committee of the American Philosophical Society, in 1770. The leading man in executing this survey was William Smith, D.D., Provost of the University of Pennsylvania. The same route was again surveyed a little later by David Rittenhouse, the astronomer, under the direction of the legislature. The revolutionary war suspended all further operations until 1790, when an association was formed for the purpose of improving

the inland communications of the State. The leading members of this association were Robert Morris, the financier, David Rittenhouse and Dr. Smith, already mentioned, Thomas Mifflin, the Governor, and other men of that stamp, well known in the early history of the State. They projected an extended plan for connecting Philadelphia with the Ohio and Lake Erie, by means of slack water navigation and canals. Their plan was to improve, by these means, the navigation of the Schuylkill up to Reading; thence by canal through the Lebanon valley, and along the route of the Tulpehocken and Swatara creeks to the Susquehanna; thence westerly to Pittsburg, on almost the exact route of the present State works.

The consultations and inquiries of this association led to the formation of two companies, both of which were incorporated by the legislature. The first of these was called "The Schuylkill and Susquehanna Navigation Company." It was incorporated in 1791, with a capital of \$400,000. Its object was to construct a canal from the Schuylkill at Reading, to Middletown on the Susquehanna, along the route first projected by Penn, and afterwards surveyed by Smith, Rittenhouse and others. This canal, as compared with those now made, was a mere ditch, suited to the accommodation of boats carrying from seven to ten tons each. Several miles of the most expensive part, across the summit

level, were completed within three or four years after the organization of the company.

The second company was incorporated in the year 1792, under the title of the "Delaware and Schuylkill Navigation Company," also with a capital of \$400,000. Its object was to construct a canal, a little to the north of the city, from some point on the Delaware near Kensington, across towards the Schuylkill, to a point near Fairmount, and thence to make a water communication, partly by canal and partly by dams, up the Schuylkill to Reading, there to connect with the work first mentioned. This company proceeded to excavate a large part of the bed of their canal, from a point near Schuylkill Second and Fairmount, up to Peters' Island, where the Columbia bridge now stands. They also made considerable progress in the work near Norristown.

The two companies had completed about fifteen miles of the most difficult and expensive parts of the canal, comprising numerous locks, deep cuttings, heavy embankments, and much rock excavation, when commercial difficulties obliged them to suspend operations, after having expended upon the enterprise upwards of \$150,000. Though nominally and legally distinct, the two companies consisted of nearly the same stockholders and managers, and Robert Morris was President of both. In 1811, they were reorganized, and formally united

under the title, which they still bear, of the "Union Canal Company." The war of 1812 again put a stop to all enterprises of this kind, nor were active operations renewed until 1821.

On resuming the work in 1821, the Union Canal Company abandoned entirely its operations upon the Schuylkill, and limited itself to the completion of the water communication between the Schuylkill and the Susquehanna. In this undertaking they followed the route of the old canal, which is indeed the only practicable canal route between these two streams without going down to tide water. In other respects, however, they availed themselves of the teachings of experience. Instead of the mere ditch of 1790, they constructed a canal, which was supposed to be, and which for some years was, adequate to the wants of commerce. The work went on gradually to its completion, and was finally opened all the way through in December, 1827. In 1828, a Branch was commenced, first as a feeder, but finally carried on 22 miles, as an avenue for trade to Pine Grove, into the very heart of the anthracite coal region. This was completed in 1832, and the transportation of coal began in 1833.

From 1833 to the present time, the canal has been in successful operation. The general progress of its business during this period is exhibited in the following table, showing the tonnage and the tolls for each year, from 1833 to 1852.

*Comparative Statement of the Business of the Union Canal,
from its opening to the present time.*

Years.	Tons.	Tolls received.	Average rate per ton. Cts. Mills.
1828	18,124	\$15,512	85 5
1829	20,522	16,676	81 3
1830	41,094	35,133	85 5
1831	59,970	59,137	98 6
1832	47,645	59,061	1 23 9
1833	85,876	103,462	1 20 5
1834	84,536	119,870	1 41 8
1835	118,978	135,254	1 13 7
1836	117,136	133,025	1 13 6
1837	110,032	107,590	97 8
1838	126,870	123,575	97 4
1839	138,568	135,163	97 5
1840	115,292	110,855	96 1
1841*	83,624	66,601	79 7
1842	83,106	57,477	69 2
1843	76,959	53,538	68 2
1844	79,871	56,580	70 8
1845	102,593	60,036	58 5
1846	114,920	62,682	54 5
1847	139,256	91,356	65 6
1848†	153,222	95,953	62 6
1849	148,332	86,800	58 5
1850	128,438	76,269	59 4
1851‡	45,768	17,319	37 8
1852	152,143	84,056	55 2

The Pine Grove Coal Trade.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1833	3,500	1840	20,500	1847	60,499
1834	6,911	1841	19,500	1848†	64,686
1835	14,000	1842	32,500	1849	72,156
1836	12,000	1843	22,000	1850	62,866
1837	17,000	1844	29,000	1851‡	
1838	15,000	1845	35,000	1852	56,450
1839	20,885	1846	55,500		

* The Tide Water Canal in full operation.

† From Nov. 1st, 1847, to Jan. 1st, 1849, 14 months.

‡ Open only from Lebanon to Reading, during enlargement of western division.

This table shows, undoubtedly, a large business as compared with the expectations of the early projectors of the work. As compared, however, with the actual results on kindred works elsewhere, or with the natural advantages of the Union Canal, it was obvious to the Company, that their work was not reaping the advantages to which its position gave it a fair claim. The Lebanon valley is to Pennsylvania, what the valley of the Mohawk is to New York. It is the only route by which a direct, and (if we except the Allegheny Portage) a continuous canal communication can be made with the Ohio and the other western waters. The Tulpehocken, which runs through this valley easterly into the Schuylkill at Reading, and the Swatara, which runs westerly into the Susquehanna at Middletown, and the several springs, creeks and ponds across the summit level, between the sources of those two streams, furnish a copious supply of water along the whole route, and that route is an indispensable part of the main artery of the State canals running westerly to Pittsburg. South of the Lebanon valley, and of the two streams which have been named, all the way down to tidewater at Havre de Grace, there is a region of high lands and hills between the Susquehanna and Schuylkill, with no intermediate streams by which lockages could be effected and the elevation overcome.

There is indeed another route for western through

freight to Philadelphia. This is down the Susquehanna by the Tidewater canal to Havre de Grace, thence across the Chesapeake bay, 24 miles to Chesapeake city; thence by the Chesapeake and Delaware canal to Delaware city; and thence up the Delaware, 45 miles in the open river, to Philadelphia. This route, it is true, is not materially longer than that by the Union Canal; but it includes 69 miles of outside navigation in the open river and bay. The force of the current and of the tides, particularly in the lower part of the river and in the bay, and in time of storms, is found to be very injurious to the boats, adding thereby largely to the expense of navigation. Boats capable of withstanding such violent wrenching and straining, cost in their construction about fifty per cent. more than those suited to the smooth and protected current of a canal, while in actual use they last about one-third less. There is also a loss of time in having to wait for tows. The towboats across the bay and up the river leave only once a day, at an appointed hour, while canal boats necessarily arrive at all hours. Hence there is a constant loss of portions of a day, varying from one hour to nearly twenty-four, but amounting in the aggregate to a serious item, and very sensibly increasing the expense of transportation. In the case of lumber, large quantities of which come down the river in rafts, intended for the eastern markets, the rafts have to be taken apart,

formed and reformed, three several times, in the successive changes of navigation, from canal to tide-water, from that to river, and from that again to canal. Besides all this, the unhealthy character of the lower part of this route during the fall months, is a serious drawback to it in the minds of boatmen. Altogether, the risk, inconvenience, expense, and loss of time, on this route, are equal to a difference of at least fifty miles of ordinary canal navigation.

With such a position, therefore, as the Union Canal enjoyed, and such eminent natural advantages, why did not its business increase like that of the Erie canal. Why was its business to a great extent local, while the great through trade remained comparatively stationary? The reason is obvious. The canal had been made too small after all. Boats suited to the navigation of the Schuylkill canal on the east, or of the State canals west and north, could not pass the locks of the Union. The through trade, in either direction, was effectually cut off by the discrepancy in the capacity of the several parts of this main artery of communication. When the Union Canal was constructed, it was believed that narrow boats of about 25 tons burden could be worked to more advantage than those larger and wider. The State, in the construction of its canals, thought differently, and made its works capable of passing freely boats of 80 tons. The immense carrying business of the interior and of the far west,

which would have been created by proper facilities, remained accordingly almost entirely undeveloped.

The opening of the Tidewater canal in 1840, as may be seen by referring to the table already quoted, cut off from the Union even that portion of through business which the necessities of trade had forced into it. Inconvenient, expensive, and dangerous as the Tidewater navigation proved to be, it was yet found less objectionable than the difficulties created by the discrepancy in size between the Union Canal and those with which it connected.

The consequence was disastrous in the extreme. The tonnage and the revenue fell off to such an extent, as to occasion the Company for several years the greatest embarrassment. The tonnage, which in 1839, had reached 138,568 tons, fell in 1841, to 83,624 tons, and subsequently to even less. The tolls fell off in a still greater ratio. At length, with a view to recover the through trade which they had lost, and to give such facilities as should develop that trade still further, they commenced in 1850 a general enlargement of their work to the capacity of the State canals. This enlargement has been completed from the western terminus on the Susquehanna to the point where the Branch comes in, a distance of 30 miles, and the Branch has been enlarged through its whole length to Pine Grove, a distance of 22 miles. It is now proposed to complete the enlargement on the rest of the main line,

that is, from the point where the Branch comes in, through to Reading, a distance of about 50 miles. This undertaking it is proposed to accomplish by means of a loan. The object of the present pamphlet is to set forth the conditions and the security of the loan, and the general prospective condition of the work itself.

The shares of the capital stock of the Company were originally \$200 each. In 1848, provision was made for changing these shares into new ones, at \$50 each. The old shares have been gradually converted, until the outstanding amount is very small. Changing these few shares into new, the entire capital of the Company may be represented accurately, as follows:—

55,000 shares of common stock, at \$50,	\$2,750,000
6,000 shares of preferred stock, at 8 per	
cent. interest, - - -	\$300,000
2,380 shares of preferred stock, at 10	
per cent. interest, - - -	119,000
	<hr/> 419,000

This \$419,000 of preferred stock is, by its terms, redeemable at any time before 1861, on condition of paying 10 per cent. premium on its par value, and after that time at par. It is proposed to pay it off out of the loan now about to be raised, and to give the loanholders a first mortgage on the entire property of the Company and all its franchises. The

amount of the proposed loan is \$1,500,000, to be expended as follows:—

Preferred stock to be cancelled	-	-	\$419,000
10 per cent. premium on do	-	-	41,900
Estimated cost of enlargement,	-	-	750,000
Loss of interest during the progress of the work,			90,000
Total,			<u>\$1,300,900</u>

This will leave a margin of nearly \$200,000, to provide against unforeseen contingencies. The bonds are to bear interest at six per cent., they are, by express act of the legislature, exempt from taxation, and are reimbursable in thirty years. Among the arrangements for the present loan, is one establishing a sinking fund of \$40,000 per annum, which would suffice for the extinction of a debt of \$2,000,000, by the end of thirty years. The annual interest on a loan of \$1,500,000, is \$90,000. The annual amount, therefore, necessary for these two purposes, is \$130,000. What security has the loanholder, first, that this amount of revenue can be obtained from the works, and secondly, that it will be appropriated in the manner named?

We shall answer the second of these questions first, both because it may be answered in very few words, and because the question of revenue involves a variety of issues which need to be considered more at large.

In the first place, then, the Company propose to execute a mortgage on the whole of their property and franchises, to three persons, as trustees for the loanholders. The amount of this mortgage is \$2,500,000, although only \$1,500,000 of bonds are now to be issued. The object of making the mortgage for a larger amount is, that hereafter, should an additional loan be needed, the Company may be able to offer for the additional \$1,000,000, exactly the same security that they now do for the first. The only contingency upon which this additional \$1,000,000 will be needed, is the possibility, in a few years, of such an extraordinary increase of freight, that the canal, as now about to be enlarged, could not pass it all. The canal, as about to be made across the summit level, will pass 2,000,000 of tons per annum—a tonnage about fifteen hundred per cent. of what the canal now does, and ample, of course, to pay both interest and sinking fund, as well as remunerating dividends on its stock. Large, however, as this tonnage appears, it has already been reached by the Erie canal, although that canal has never been a main coal line, as the Union will immediately become, when its enlargement to Reading shall be completed. In the contingency of the freight on the Union reaching 2,000,000 tons, the Company propose to make a new cut across the summit level, a little out of the line of the present canal. This new cut across the summit will be ex-

cavated 28 feet lower than the present line of canal, will be 14 miles in length, will make the route from the Susquehanna to the Schuylkill 3 miles shorter, and after its completion will be used for the through trade, while the present cut will remain for the use of the coal business, and a part of the local trade. Such a new cut, should it ever be needed, will cost \$750,000. During its excavation, no interruption to the regular business would be required, as the present line of canal across the summit would still be in operation. It is to provide for such a contingency, that the Company, in executing their present mortgage, make it for the gross sum of \$2,500,000. They also enter into obligations, in case the whole amount of bonds issued under this mortgage ever goes beyond \$2,000,000, to increase the annual sinking fund in an equal ratio.

The conditions of the mortgage are, first, that the Company shall, semi-annually, on the 1st of January and July, pay to the trustees \$20,000, to be invested by the latter as a sinking fund; secondly, that the Company shall, semi-annually, on the 1st of May and November, pay the interest on the loans, which shall be in the form of coupons; and thirdly, that in default of the payment of interest for six months, the trustees may sell the whole of the mortgaged property at public sale. These are the leading features of the mortgage. The particulars are

given more fully in a memorandum at the end of the present pamphlet.

Next, and mainly, whence is to come the revenue necessary to the payment of this amount?

The total business of the canal for 1852, was 152,143 tons, and the tolls for the same, \$84,956. The tolls for the present year, thus far, are more than \$10,000 beyond what they were at the same time last year, showing that they will reach, the present season, at least \$100,000. This is made up entirely of local trade. All the through freight now either passes down by the Tidewater canal, or is transhipped to the rail road at Columbia. The expense and inconvenience of both these routes, as compared with that by the Union Canal, when its enlargement shall have been completed, will necessarily bring almost the whole amount of this business into the latter. The amount of freight from the State canals, which is now forced into those channels, and which may be recovered by the Union, is, at the very lowest computation, 300,000 tons; and it would yield to the Company, tolls to an amount very considerably exceeding \$200,000.*

* That there is some positive inconvenience and expense in the tide-water route, is clearly shown by the fact that so large an amount of goods is transhipped to rail road at Columbia. Articles for Philadelphia coming through the western canals as far as Columbia, would pass immediately on eastward, via canal, unless the canal route between Columbia and Philadelphia presented some serious obstacle. Instead of this, more than one-half the freight, via the western and northern canals, is transhipped at Columbia from canal to rail road. The expense of such transhipment, as shown

Even this statement, however, gives a very imperfect idea of what the through freight will be, when the proper facilities shall have been created. Of course, in attempting to show how greatly the trade with the interior will be increased by such facilities, we necessarily get into the region of conjecture. But conjecture is not necessarily an unwise or unsafe counsellor. In the present case, the analogy from other works is peculiarly strong. It is admitted, on all hands, that the State canals in the

by Mr. Tucker in his letter to the directors of the Sunbury and Erie Rail Road, *is equal to the cost of transportation for a distance of fifty miles.* The whole amount thus transhipped at Columbia in 1851, as stated in the Report of the Canal Commissioners, was 166,817 tons. (The Report for 1852 gives no tables.) The amount going down by the Tidewater Canal is 138,000 tons, as nearly as can be ascertained. It is sometimes said, indeed, that those 69 miles of the tidewater route which are outside navigation, are cheaper than any equal distance on the other route, because those 69 miles are run by steam-towing, which is less expensive than horse-towing along the canal path. The statement is deceptive. During those 69 miles, the canal boat has all its ordinary expenses just the same as if continued on the canal. The horse and driver are sometimes left at Havre de Grace, and sometimes not; but, in either case, they are on expense. The other hands necessary to man the boat are required while under tow, just as much as while in the canal. The ordinary expenses of a boat of average dimensions are \$5 a day, whether in the canal, or in the outside navigation. The whole expense of the steam-towing, \$11 per boat, *is just so much additional.* There are, however, no tolls to pay on those 69 miles, and this, so far, is in favour of the tidewater route. To meet this, the tolls on the Union Canal route must of course be lowered, so as to make an equality, in this respect, between the two routes. The canal expenses being thus equalized, the only remaining points of comparison are those already named, viz. the expense of the steam-tow, the injury to the boats, their rapid wearing out, the additional cost in their construction, the delay in waiting for tows, and the sickness of part of the route in the fall. All these disadvantages bear directly upon the carriers, and have been found to be so great, as to drive more than half the freight to seek transshipment to rail road at Columbia, at an expense admitted to be equal to the cost of transportation fifty miles.

interior, that namely along the Juniata to the Portage, and thence westerly to Pittsburg, and those up the North and West branches of the Susquehanna, have never yet called out one-fourth part of the real resources of the State. The regions through which these canals run, abound in every kind of heavy produce, such as coal, iron ore, iron, lime, lumber, grain, and the various products of agricultural labour, peculiarly fitted to canal transportation. These products hitherto have been kept back by the interruption in the only central link of communication by which they could, at a suitable expense, reach a market. That a continuous and cheap navigation, such as a canal affords, does develop and increase the products of the regions which it connects, as well as those through which it passes, does not need demonstration. It may not be amiss, however, to exhibit some of the results of works of this kind in other places, where an uninterrupted, uniform, and cheap communication, has been established between distant and important points.

Connection with the Ohio at Pittsburg, is to Philadelphia what connection with Lake Erie is to New York. In both cases, a great commercial emporium is connected with waters that drain a country of almost indefinite extent. In both cases, too, the line of communication is through a country abounding in produce seeking a market. If there is any material difference in this respect between the

two lines, it is in favour of the Pennsylvania line, since, in the articles of coal and iron, which have assumed such enormous magnitude and importance, the Pennsylvania canals have a prospective source of revenue of a character heretofore altogether unparalleled. The Erie Canal, moreover, like the Pennsylvania Main line, has a rail road running along side of it, through its whole route. That rail road, however, has not perceptibly diminished the business or the receipts of the canal. Neither will the Pennsylvania Rail Road affect injuriously the receipts of the Pennsylvania Main line, when the enlargement of the Union Canal shall have made the connection complete. It may not be amiss, therefore, to look at the actual growth of the business of the Erie Canal through the entire period of its history.

This is given in the following table, taken from the Report of the Auditor of the Canal Department, showing the tolls on the Erie Canal from 1823, when they were not so great in proportion to the length of the canal as those of the Union now are, to 1851, when they had reached the enormous sum of \$2,994,329.

1823	\$190,635	1838	\$1,414,174
1824	294,546	1839	1,427,031
1825	492,664	1840	1,597,334
1826	687,976	1841	1,813,650
1827	775,919	1842	1,568,946
1828	727,650	1843	1,880,314

1829	707,883	1844	2,190,147
1830	943,545	1845	2,361,884
1831	1,091,714	1846	2,449,275
1832	1,085,612	1847	3,333,347
1833	1,290,163	1848	2,947,881
1834	1,180,967	1849	2,962,132
1835	1,376,673	1850	2,933,125
1836	1,440,539	1851	2,994,329
1837	1,444,170		

The following table, taken from the same source, shows the tonnage and the total movement on the Erie Canal (not including the contributions of the numerous lateral canals) during the last sixteen years.

Years.	Tons shipped at the Eastern terminus (Albany, Troy & N. York).	Tons shipped at the Western terminus (Buffalo & Black Rock).	Tons shipped along the line of the Erie Canal.	Total movement.
1837	172,692	73,194	421,265	667,151
1838	187,434	105,460	451,954	744,848
1839	200,544	156,164	488,299	845,007
1840	161,211	177,607	491,142	829,960
1841	194,446	248,471	463,525	906,442
1842	141,836	225,173	345,301	712,310
1843	165,044	279,008	375,164	819,216
1844	208,699	319,682	417,543	945,924
1845	224,013	309,115	405,662	1,038,790
1846	239,216	478,918	546,274	1,264,408
1847	329,761	710,943	620,874	1,661,578
1848	313,814	602,250	653,901	1,599,965
1849	368,580	613,347	640,617	1,622,444
1850	337,813	574,905	722,371	1,635,089
1851	453,741	673,774	827,750	1,955,265

The ratio of through trade to local trade is shown in the following table, containing, however, only the amount that reaches tidewater from the west. The rest of the movement, namely, that going from tide-

water westerly, is not analyzed in the table referred to, and therefore we cannot give it.

Years.	Tons from the Western States, arriving at tide-water through the Erie Canal.	Tons from the State of New York, reaching tidewater through the Erie Canal.
1837	56,255	331,251
1838	83,233	336,016
1839	121,671	264,596
1840	158,148	309,167
1841	224,176	308,344
1842	221,477	258,672
1843	256,376	378,969
1844	308,025	491,791
1845	304,551	655,039
1846	506,830	600,440
1847	812,840	618,412
1848	650,154	534,183
1849	768,659	498,065
1850	773,858	598,001
1851	966,993	541,684

There is no reason, except the want of proper facilities for communication, why the western trade to Philadelphia should not equal the western trade to New York. The region beyond the western terminus of the Pennsylvania Main line is even more productive than that beyond the western terminus of the Erie Canal. If we examine the agricultural statistics of the United States Census, we find that Indian corn (the basis of pork, beef, and whiskey), raised in the Ohio valley, is seven-fold that in the whole basin of the lakes; that the live stock is three times as great; that the wheat is more than equal; that, in fine, it is the Ohio valley which furnishes

the great surpluses of western produce. The same point will be apparent from a comparison of the values of domestic produce received at tidewater, via the three great routes of the St. Lawrence, the Hudson, and the Mississippi. These, for the year 1851, were as follows:—

Produce coming to tidewater, via St. Lawrence,	\$9,153,580
“ “ Hudson,	53,927,508
“ “ Mississippi,	108,051,708

The receipts at New Orleans, for 1851, of corn, flour, pork and its products, beef, tobacco, whiskey, lead, and hemp—articles, almost the whole of which are shipped from above the mouth of the Ohio—amounted to \$35,000,000. Yet it is fifteen hundred miles from Cincinnati to New Orleans, and but six hundred miles to Philadelphia.

But it is not to the west alone that we look for an increase of trade. In estimating the possibilities of the Pennsylvania Main line, and of the Union Canal as an indispensable link in it, we must not forget the important tributaries of the North and West Branch canals. The Erie Canal has no tributary at all comparable to these in magnitude or importance. A single glance at the map will satisfy any one of the fact. The West Branch Canal leads into the very heart of the great lumber region of this State. Much of this lumber, as already explained, has now to be formed and reformed into rafts two or three times, in order to suit the

changes of navigation from canal to tidewater, from that to river, and from that again to canal. All these changes are expensive, and might be avoided by the new route. These rafts, constructed originally of suitable dimensions, might pass through the Union and Schuylkill canals, up the Delaware to Bordentown, where the river is comparatively smooth and tranquil, and thence by the Delaware and Raritan Canal, without a single change, and of course at a great saving of time and expense.

The amount of this lumber business is immense. We have no means of ascertaining its entire extent. But a few items will give some idea of its magnitude. At Middletown alone, the western terminus of the Union Canal, the annual sales of lumber are over 50,000,000 of feet. Another evidence of the extent of this trade is found in the fact, that more than 17,000,000 feet even now pass through the Union Canal, with its present inconvenient dimensions. The counties on the West Branch, whose lumber will hereafter find a market through the Union Canal, are Clearfield, Potter, Clinton, Tioga, Elk, Centre, and Lycoming.

But the North Branch Canal, as about to be completed this season by the State, opens a prospect of trade even greater than that of the West Branch, and second in importance only to the through trade of the great west. The North Branch Canal leads through the fertile counties of Union, Northumber-

land, Montour, Columbia, Luzerne, Wyoming, Susquehanna, and Bradford. It drains, in other words, a region abounding in every kind of agricultural product, containing some of the largest iron mines of the State, the immense coal basin of the Lackawanna, and finally a lumber district surpassing in productiveness even the counties on the West Branch.

Nor does the business of the North Branch stop here. By its extension to the State line, and its connexion there with the New York canals, it drains the rich counties of Steuben, Chemung, Tioga, Tompkins, Seneca, Cayuga, Yates, and Ontario. The North Branch Canal, indeed, by its extension into the State of New York, and to lakes Erie and Ontario, by means of the Junction and Chemung canals and Seneca lake, opens to Philadelphia a prospect of through trade northward, hardly inferior to its through trade westward. The North Branch Canal and its connections, leading directly and without break into the Erie Canal, have a significance to Pennsylvania almost equal to that of her Main line to Pittsburg. The Commonwealth may now be said, in fact, to have two main lines or arteries of trade, one running west, and the other running north, and both passing through the Union Canal, as an indispensable link in the connection with Philadelphia. The western line connects Philadelphia with the region that is traversed

by the Ohio, the northern line connects Philadelphia with the region that is traversed by the Erie Canal.

The length of the main western line is as follows:—

	Miles.
From Philadelphia to Middletown, on the Susquehanna, (via the Schuylkill and Union Canals), - -	141
From Middletown to Hollidaysburg, - -	153
From Hollidaysburg to Johnstown (Portage), - -	36
From Johnstown to Pittsburg, - -	105
Total,	<hr/> 435 <hr/>

The length of the main northern line is as follows:—

	Miles.
From Philadelphia to Middletown (as above), - -	141
From Middletown to State line, - -	224
From State line to Elmira (via Junction Canal), -	17
From Elmira to Seneca Lake (via Chemung Canal), -	23
From Seneca Lake to Geneva, - -	45
From Geneva to Montezuma (via the Erie Canal), -	21
Total,	<hr/> 471 <hr/>

The length of canals within the State of Pennsylvania, with which the Union Canal is put in immediate connection, is over seven hundred and fifty miles. Besides this, it connects directly with a still larger extent of canal navigation in the State of New York. It is connected, in all, with over sixteen hundred miles of continuous canal navigation.

The particulars of this remarkable chain of canals will be given more fully in an appendix. Any one, however, may perceive it by the eye, on the accompanying map.

Short and isolated improvements are seldom productive. In this country, as well as in Europe, it is the long canals and rail roads that have yielded the richest returns. If there be any exceptions to this rule, it is where there are very heavy articles of prime necessity to be transported, such as coal, iron, iron ore, or gypsum, or where two great commercial centres, like New York and Philadelphia, are to be connected.

We feel not the slightest hesitation, therefore, in believing that the completion of the Union Canal, by enlarging it to the capacity of the State canals, will bring into it not only the large amount of through business which these canals now send down to tidewater, or across by the Columbia Rail Road, but that it will develop an amount of new business fully equal to its capacity of passing boats. So far, however, as it relates to the security of its loanholders, which it is the immediate object of this pamphlet to set forth, we are prepared to show that the business now existing and within its reach, is ample to pay both interest and sinking fund, without making any allowance for increase. This will appear from the following statements, the accuracy of which will not be called in question by

any one acquainted with the carrying business of the State.

	Tons.	Tolls.
Estimate of the present business of the Union Canal (entirely local),	170,000	\$100,000
Estimate of the through business now existing, but going through other routes, and which will be brought into this, - - - - -	300,000	\$200,000

The Schuylkill Navigation Company, with a view to secure the completion of the Union Canal, which will add so largely to their own business, have entered into an agreement with the latter, whereby they engage for thirty years (i. e. during the continuance of the loan) to pay to the Union Canal annually all the tolls to the extent of \$70,000 which shall accrue to the Schuylkill for freight, coming from, or going into, the Union Canal, after deducting 20 per cent. to cover expenses. The tolls relied upon almost exclusively in this arrangement, are those for through freight. If the through freight about to accrue to the Union will yield to it tolls, as just stated, to the amount of \$200,000, the same freight will yield the Schuylkill Company tolls to the amount of \$160,000, the distance on the two canals being in the ratio of 80 to 64. There can, therefore, be no doubt that the \$70,000 annually from the Schuylkill Company will be secured. The express object of this arrangement between the two companies, has been, on the part of the Schuylkill Company, to secure the

completion of a work so important to their own interests, and on the part of the Union Canal to have that additional security to offer to its loanholders. The fact that the Schuylkill Company are willing to make such an arrangement, shows in the strongest manner their own conclusions as to the amount of the through business. They would hardly be willing to let go the first \$70,000, of the profits from their increase of tolls, unless in the assured expectation of an increase of two or three times \$70,000.

The State also has considered herself an interested partner in this matter, and has looked very kindly upon the present undertaking. Knowing how much the completion of this work will increase the business of the State canals, the Legislature at its last session passed an act declaring, first, that all boats and articles of tonnage passing over any portion of the State canals, to or from the Union Canal, shall always be placed in all respects upon the most favourable terms allowed to the same articles passing over the canals of the State; secondly, that the capital stock, the assets, and the evidences of indebtedness of the Company, which now are, or which may hereafter be, liable to taxation, shall be exempted from such taxation for twenty years; and thirdly, allowing incorporated companies to subscribe to the capital stock or loan. All of these provisions are a substantial aid to the Company. The second provision, exempting the bonds from taxation, is particu-

larly valuable to the loanholder. For these privileges, the Company have indeed some equitable claim upon the State. In 1833, when the State was constructing the Columbia Rail Road, the Company presented the Commonwealth with the bed of the old canal in the neighbourhood of Fairmount, and the rail road was laid upon it. This bed has cost the canal \$92,000, and it would have cost the State at least \$70,000 or \$80,000 to have made the same amount of excavation.

The expenses of the canal during the last five years have averaged \$50,000 per annum. A very large increase of business, requiring at particular points additional lock-tenders, would make some additional expense, but not much. The expenses, at the outside, would not go beyond \$70,000. Taking, therefore, the business already existing, as explained a few paragraphs back, and making no allowance for that increase which must result from the enlargement, the immediate resources of the Company, to meet the claims of its bondholders, may be summed up, as follows:—

				Tons.	Tolls.
Local business,	-	-	-	170,000	\$100,000
Through business,	-	-	-	300,000	200,000
				<hr/> 470,000	
Allowance from the Schuylkill Navigation Company,					70,000
					<hr/> \$370,000

Expenses,	-	-	-	-	70,000
Sinking fund,	-	-	-	-	40,000
Interest on \$1,500,000,	-	-	-	-	90,000
					<hr/>
					200,000
					<hr/>
				Balance,	\$170,000

In fact, it is obvious, that taking the local business, \$100,000, and the allowance from the Schuylkill, \$70,000, there are only some \$20,000 or \$30,000 of through business necessary to meet all the exigencies of the loan. The statements which have been made show not only that the loan is secured in the most ample manner, but that there is a very reasonable and speedy prospect of remunerating dividends to the Stockholders. A tonnage of 550,000 tons, which there is almost a certainty of receiving within less than two years from the completion of the work, would not only pay interest and sinking fund of the debt, and six per cent. on the stock, but repay or (what amounts to the same thing) enable the Company to decline the allowance of the \$70,000 from the Schuylkill Navigation.

Before concluding the subject, it may be proper to make a remark upon one other topic. An erroneous impression at one time prevailed, to a certain extent, in respect to the supply of water across the summit level. Some difficulties did exist on this subject, but they had been successfully met and overcome. These difficulties were, first, the comparative scarcity in the natural supply of water at the higher level,

and secondly, the peculiar character of the bottom, causing an extraordinary amount of leakage.

There is not at the summit any one large stream adequate to the wants of a canal of the size now contemplated. But there is quite a number of small streams and springs, which have been brought into the canal along the line of the summit level. Besides this, the Company have stationary engines for pumping additional water when needed. By these means combined, the whole amount of water required, in any possible contingency, may be obtained.

A more serious difficulty has arisen from leakage. Upon portions of the canal between Meyerstown and the water-works, the bottom of the canal runs over what are called "limestone sinks," a species of shelving rock lying edgewise, and with numerous interstices, through which the water percolates with great facility. In the original construction of the canal over this portion of the route, the Company sought to secure the work from leakage, by covering the bottom and sides with a tight flooring of planks. Subsequent and very extended experience on other canals, where a similar difficulty occurs, has shown the superiority of puddling, both for permanence and security. By this means, a canal over such ground may, without difficulty, be made perfectly secure and water-tight.

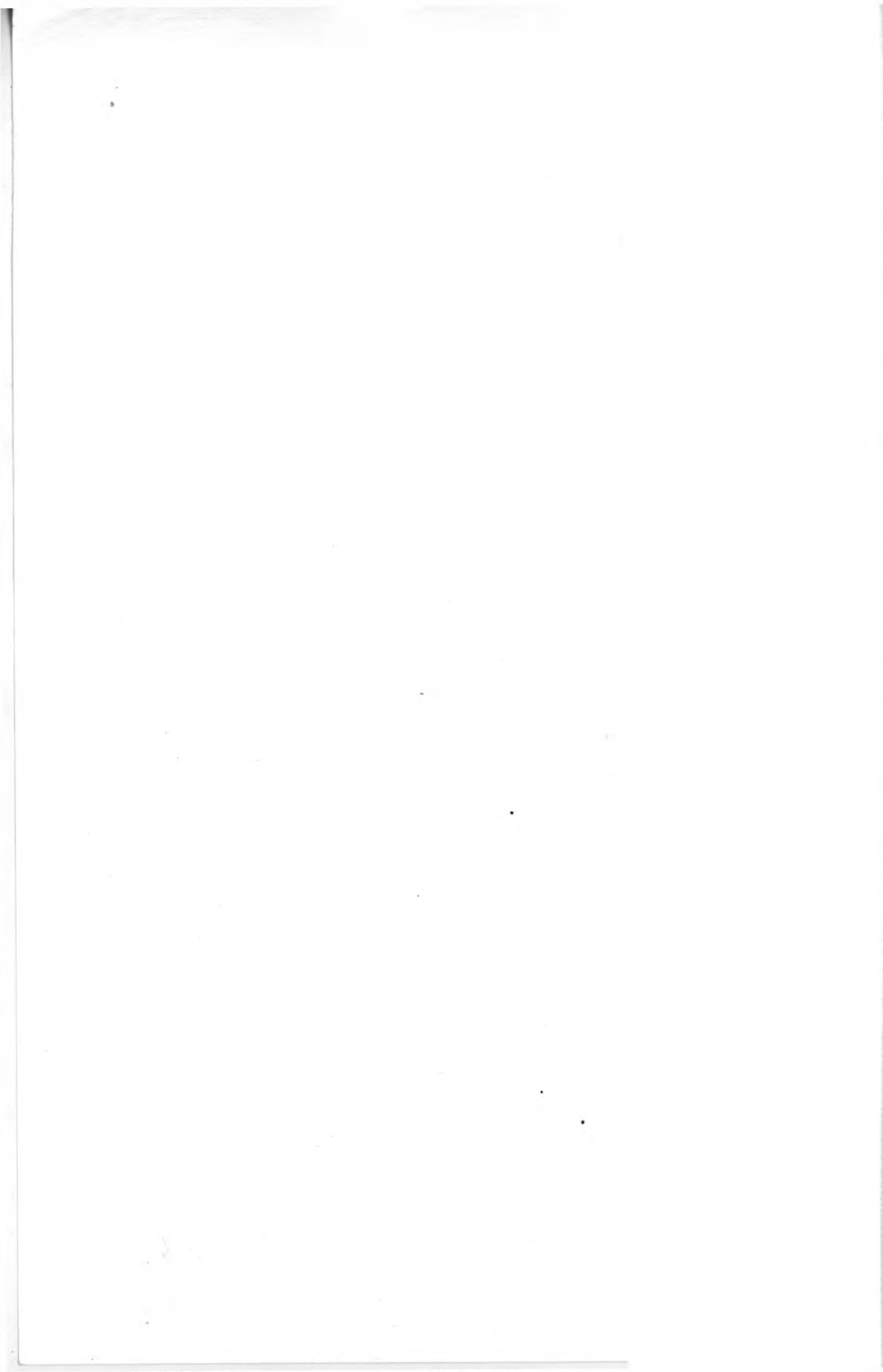
The Company have employed the most eminent

engineers to examine and report upon this matter. Mr. James Worrall, who has been several years in their employ, was engineer on the Chesapeake and Ohio Canal, on the Erie Extension Canal, and on the State canals. Mr. James F. Smith is well known as the engineer of the Schuylkill Navigation Company, and Mr. E. A. Douglas as the engineer of the Lehigh Company. Mr. Charles B. Fisk has been engineer of the Chesapeake and Ohio Canal since 1828. He was lately chosen by the Secretary of the Treasury of the United States, as one of a Board of three to survey and advise in relation to the widening of the Louisville and Portland Canal, where the largest lock in the world is to be made—80 feet wide by 400 long. Mr. Fisk, indeed, has a reputation, in the matter of canals, not surpassed by any engineer in this country. These gentlemen have all been employed to make a special survey in reference to the proposed enlargement. They had some difference of opinion as to the mode of completing the work, two of the Board advising that a portion of the elevation should be overcome by means of inclined planes, and the others insisting on lockage throughout. But they all agree, that, whichever mode or route is taken, there is for all seasons an abundance of water, either from natural sources, or by artificial means at the command of the Company, and that the work, by puddling, may be made perfectly secure and water-tight. The report of the

engineers, on these points, is very minute and explicit, and leaves not a shadow of doubt on the minds of those who have read it. Extracts from the report of the engineers relating to this subject, will be given in the appendix.

From a review of the whole matter, it would seem as if the time had come for completing at once this one remaining link in the great chain of Pennsylvania improvements, and under circumstances every way auspicious and encouraging. The undertaking has received the favour of the Legislature, in a way that makes no drain upon the State treasury, and is yet eminently beneficial to the Company. The Schuylkill Navigation Company have given the work a guaranty of a still more decided and direct character, and to an extent that places its completion beyond a doubt. There is, therefore, every prospect that before the 1st of July, 1854, the canal will be enlarged throughout its entire length, and that it will at last enter on fair and equal terms upon that career of usefulness and profit, which the most sagacious minds in our Commonwealth marked out for it more than sixty years ago.

June 25, 1853.



APPENDIX.

TERMS OF PROPOSED LOAN.

The Union Canal Company of Pennsylvania desire to widen the remainder of their main line of canal, (being rather less than 50 miles) from Reading to the Swatara, west of Lebanon.

The cost will be - - - - - \$750,000

But to enable them to give a first Mortgage it will be necessary to pay off the present preferred stock amounting to - - - - - 419,000

To pay this off there must be paid to the holders a premium of 10 per cent. which will be - - - 42,000

And an allowance is made for interest and loss of revenue during the progress of the work, and for any contingencies, of - - - - - 289,000

Making the amount required - - - - - \$1,500,000

To raise this sum, the Company have had prepared their Bonds in various sums from one hundred dollars up to one thousand, and they are now offered to the public as a very secure and desirable investment.

The Bonds have thirty years to run, they bear six per cent. interest, have coupons attached for the payment of interest on the first days of May and November, and by a law of the State are exempted from *all* taxation for the term of twenty years.

To secure the payment of the interest and principal of these Bonds, the Company have executed a Mortgage to

O. H. Rogers
J. W. Paul
M. B. Buckley

as Trustees, for two million five hundred thousand dollars, of all the property and franchises of the corporation, in such manner, that in case of a sale under the Mortgage, the franchises will pass to the purchasers as fully as they are now held by the Company. And it is further provided, that the annual sum of seventy thousand dollars from the Schuylkill Navigation Company shall be added to the tolls of the Union Canal Company, for payment of the interest and provision for a sinking fund for payment of the principal of these Bonds.

By an act of the Legislature of Pennsylvania, approved April 18, 1853, it is provided, that the trade of the Union Canal shall always be placed upon the most favoured terms allowed to any trade on the canals of the State. It is also provided, that the capital stock, all assets and evidences of indebtedness of the Company, shall be exempted from all taxation within the State for the term of twenty years; and all incorporated companies interested in the Canal Company, are authorised to subscribe to the loan for widening the canal.

By an agreement made with the Schuylkill Navigation Company, and duly ratified by the Stockholders of each Company, it is declared that no discrimination shall ever be made against trade from the canal of the one Company passing over the canal of the other Company. It is also provided that the Union Canal Company shall each week receive four-fifths of the tolls payable to the Schuylkill Navigation, for the Union Canal trade passing over the Schuylkill canal. And that at the expiration of each year, the excess of such tolls over seventy thousand dollars shall be repaid to the Navigation Company. But for the term of thirty years, the sum of seventy thousand dollars per annum during each and every year shall be appropriated for the benefit of the holders of these Bonds.

By the provisions of the Mortgage, the Union Canal Company are to appropriate out of their own tolls the sum of ninety thousand dollars per annum, in addition to the sum of seventy thousand dollars received from the Navigation Company, first, to the payment of the interest on these Bonds; and, second, to pay over the residue to the Trustees, to be invested by them as a *sinking fund* in these Bonds, or the stock of the two companies; a preference, however, being given to the Bonds.

No dividend is to be declared by the Union Canal Company while there is any deficiency in the annual payment of these two

sums of ninety and seventy thousand dollars; and the deficiency of any one year must be made up out of the next or succeeding years.

If the annual interest does not exceed ninety thousand dollars, the annual appropriation to this sinking fund will be seventy thousand dollars. And if at any time the annual interest exceeds one hundred and twenty thousand dollars, the Union Canal Company must (in addition to their annual payment of ninety thousand dollars) pay such excess, and also two per cent. of the excess of principal causing such excess of interest.

The amount of bonds now to be issued is one million five hundred thousand dollars. The mortgage, however, is to secure the amount of *two* million five hundred thousand. The reason for this is that the present plan of enlargement contemplates widening the canal upon or very near its present location, and not lowering the summit level. Should the trade, however, increase as largely as it is anticipated it will, it may then be necessary to cut down the summit level about twenty-eight feet. This can be done on an independent line and without interfering with navigation, at a cost of about seven hundred and fifty thousand dollars. And the mortgage would then apply for the whole.

This, however, will not be done until the accommodation of the trade requires it.

The present income of the canal would more than pay the interest on these bonds, and the increase of business caused by the enlargement need only pay the expense of working the canal.

The annual expense of working the old canal has been about fifty thousand dollars. The expense of working the enlarged canal need not exceed seventy thousand dollars per annum.

From the position of the canal, it is peculiarly free from damage by freshets; the whole amount paid during the last twenty-five years not exceeding sixty thousand dollars. And by the reports of the engineers who have examined it, it can be amply supplied with water.

There are hereto annexed a copy of the mortgage, extracts from the agreement with the Schuylkill Navigation Company, and from engineers' reports relative to the supply of water.

Proposals for the whole, or any part of the bonds, should be sent to the office of the Company in the Farquhar Building, No. 56 Walnut Street, Philadelphia.

The Company reserve the right to take the whole or any part of a bid, and Stockholders to have the preference where the bids are alike in other respects.

The whole amount of a bid will be received at once, or in four instalments, payable at any time after thirty days' notice. The bond to be issued on payment of the last instalment, but interest to run from payment of each instalment.

R. RUNDLE SMITH,

President Union Canal Company.

Philadelphia, June, 1853.

*Extracts from the Agreement with the Schuylkill
Navigation Company.*

First. That all boats and tonnage passing to or from the canal of the one Company over the canal of the other Company, or any part thereof, shall always be placed upon the most favourable terms allowed respectively on the same articles of tonnage and boats; the provisions of this first article to be perpetual, and shall not at any time be altered or cancelled without the mutual consent of the parties to this agreement first had and obtained.

Second. That all tolls received by either the Union Canal Company or the Schuylkill Navigation Company for boats or tonnage passing over a portion or the entire length of both canals, shall be placed in a general fund. The account of said tolls shall be settled weekly, and the proportional part of said tolls shall be accurately ascertained. Of that part pertaining to the fund and derived for the use of the Schuylkill Canal, the Schuylkill Navigation Company shall retain or receive twenty per cent. as an equivalent for their portion of the current expenses of said trade on their canal. The remainder of said tolls shall be placed in the hands of the Union Canal Company and be applied by them to the payment of the interest on, and for a provision for a sinking fund for redeeming the debt to be incurred for enlarging the Union Canal. Should the remainder of said tolls derived from the use of the Schuylkill Navigation exceed seventy thousand dollars in any year, the excess

shall be paid in cash to the Schuylkill Navigation Company; and should said remainder in any year be less than seventy thousand dollars, then the deficiency shall be made up out of the said remainder of the tolls of the next or any subsequent year; it being the intention of the parties that the contribution of the Schuylkill Navigation Company to the general fund aforesaid, shall be equal to seventy thousand dollars per annum during the continuance of this agreement, provided the annual remainder of its tolls as aforesaid, shall be equal to said sum of seventy thousand dollars per annum for the whole of said continuance.

Third. The Union Canal Company shall appropriate out of its tolls the sum of ninety thousand dollars per annum for its share of the general fund, for the payment of the interest and the provision for the sinking fund for redeeming the debt to be incurred for enlarging their canal. But should the tolls of the Union Canal Company not be sufficient, in any year, to make up the said sum of ninety thousand dollars, then the deficiency shall be made up out of the tolls of the next or any subsequent year in which there may be a surplus; it being likewise the intention of the parties that the contribution of the Union Canal Company to the general fund aforesaid, shall be equal to ninety thousand dollars per annum during the continuance of this agreement, provided their tolls shall be equal to said ninety thousand dollars per annum for the whole of said continuance.

No dividend shall be made by the Union Canal Company while there is any deficiency in the said sum of one hundred and sixty thousand dollars per annum from the tolls of the two companies for meeting the interest on and the principal of said debt.

Fourth. That such proportion of the said sum of one hundred and sixty thousand dollars per annum, derived from the tolls of the two companies, and forming the general fund as aforesaid, as may not be required for the payment of the interest on said debt, shall be semi-annually paid over by the Union Canal Company to the Trustees named in the mortgage to be given by the said Union Canal Company for the better securing of the debt, and be by them invested in the certificates of said debt, or in the funded debt, preferred stock or common stock of the Schuylkill Navigation Company, or in the stock of the Union Canal Company; and such investments, together with the increase or accumulation thereof, from interest, dividends, or profits (which shall in like manner be in-

vested by said Trustees), shall form the sinking fund for redeeming the certificates of the debt so contracted for enlarging said Union Canal. The certificates of stock and loan constituting the evidences of said investments for the sinking fund, shall be taken in the names of said Trustees, and be held by them, in trust, for said sinking fund. And in case any such investments shall be made in any other of said loan and stocks than in the debt contracted by the Union Canal Company for enlarging their canal, the said Trustees shall be authorized, whenever any of such other securities can be sold, and the proceeds advantageously be invested in said debt, to sell such other securities at their discretion, and invest the proceeds thereof in said debt.

Sixth. The arrangement hereby made shall continue for the term of thirty years, unless the debt to be contracted by the Union Canal Company for enlarging their canal, shall be paid off by the application of the said sinking fund, or otherwise by the Union Canal Company before the expiration of the said term of thirty years; and in such case the arrangement shall terminate as soon as said debt be thus paid off. The provision of the first article, however, as before specified, shall be considered perpetual, unless altered or cancelled by the mutual consent of the parties to this agreement.

*Extracts from the Reports of Engineers relative to
the Supply of Water for the Canal.*

Mr. Charles B. Fisk in his Report, dated October, 1852, says, when condemning inclined planes,—

“The Union Canal, when enlarged, will be capable of passing boats $16\frac{1}{2}$ feet wide and about 80 feet long. But few, if any, of the larger boats would be in sections. The business on the canal would be mostly the transportation of a *miscellaneous tonnage*. And as there are rival routes with which the Union Canal would have to compete, it is very desirable that the plan of its enlargement should be such as would meet with the favour of those engaged in the business of transportation, on the State canals along, and west of the Susquehanna.

“Now it is well known that the prejudices of the public are

against the use of inclined planes on rail roads engaged in the carriage and transportation of passengers and a *miscellaneous tonnage*; and no matter, whether justly so or not, especially when there are rival routes for travel and tonnage, the injurious effect upon the character and business of roads, that have inclined planes, is the same.

"Like prejudices exist against the use of inclined planes on canals; and to such an extent, that I have no doubt, their adoption on the enlargement of the Union Canal, would very injuriously affect its business.

"For the above reasons, I am of opinion, that inclined planes ought not to be adopted on canals where the ordinary lock can be used, and the canal amply supplied with water; and at a cost not beyond what the trade to be accommodated would justify. *That sufficient water can be commanded on the summit level of the Union Canal, and at a justifiable cost, which ever plan of enlargement may be adopted, is beyond question.*"

Again he says,—

"It is so clearly shown in the reports in the office of the Company, of different engineers, *that an ample supply of water can be had at 'the water works,' and by means of the Swatara feeder and reservoirs at the head of the Swatara, for the summit division, even if the plan of enlargement, requiring the largest supply of water should be adopted, that I need not dwell longer on this subject.*

"It is, however, well worth examination, to ascertain if more water than at present could not be economically and advantageously obtained, by means of *reservoirs* in the immediate neighbourhood of the summit division. *The drainage capacity north of the summit level is, comparatively, untouched.*"

And in his concluding remarks, he says—

"Fortunately for the Company, financial considerations may be allowed to have much weight, in deciding upon the plan of enlargement to be adopted; and without any serious detriment to their interests; *for upon either of the plans of enlargement proposed with locks, a good and substantial canal, and one amply supplied with water, could be had.*"

Mr. James Worrall in his Report, dated January 31, 1853, says, when speaking of the work done on the enlargement of the western division of the canal—

“The system of puddling adopted at the Blue Rock (as mentioned in my last Report), has been found not to have given way in the least, and I confidently predict that there will hereafter be no more leakage at that place than at the closest parts of the canal.

“As a proof of the ample sufficiency of the supply of water in the main line, from the water works to Middletown, it is enough to state that that whole line was fed from the overplus at the water works and the feeder dam at Snyder’s, a short distance below these works. The supply from Niesly’s mill, below Hummelstown, to which the Company have a right, not having been brought into use (because not required) during the whole season.

“These facts speak louder than words on this important subject, and contradict most effectually the prejudiced reports as to the want of water on this canal,

“I have never had any doubt in respect to it; but it is better to teach these truths by practical demonstration than by mere assertion. The water supplies at the head of your canal, on the Swatara, are at least equal to those of the Schuylkill, at a corresponding point on that river. Whilst the lower and new line of canal was so copiously sustained, the summit level was kept up by pumps, from the same sources, better during the year last past than it had been for several seasons before. Yet that summit level is known to be very much affected by leakage; *and when a system shall be adopted to make it impervious, as was done at Blue Rock, how can there be any question as to the supply of water?*

“I consider the water difficulty, therefore, entirely put to rest, by the experience we have already gained, and I am willing to add mine to the long list of engineers’ names who have staked their reputation on the assertion that this canal has conveniently within its reach a quantity of water entirely up to its capacity.

“I will go further, and say that the supply would reach beyond that limit.”

TABLE OF DISTANCES BY THE CANALS.

	Miles.	Total.
Philadelphia to Reading (Schuylkill Canal), -	64	
Reading to Middletown (<i>Union Canal</i>), - -	77	141
Middletown to Duncan's Island (Eastern Division),	23	164
Duncan's Island to Hollidaysburg (Juniata do.),	130	294
Hollidaysburg to Johnstown (Portage Rail Road),	36	330
Johnstown to Pittsburg (Western Division), -	105	435
Philadelphia to Pittsburg is 435 miles.		

Philadelphia to Middletown (as above), - -	141	
Middletown to Northumberland (Susquehanna Division), - - - - -	62	203
Northumberland to Lock Haven (West Branch Division), - - - - -	72	275

Philadelphia to Lock Haven is 275 miles.

Beside which the Sinnemahoning extension of the West Branch Canal, unfinished, extends still further 40 miles.

Philadelphia to Middletown (as above), -	141	
Middletown to Northumberland (as above),	62	
	—	203
Northumberland to Pittston (North Branch Division, finished), - - - - -	73	276
Pittston to State Line (North Branch to be finished this year), - - - - -	89	365
State Line to Elmira (Junction Canal to be finished this year), - - - - -	17	382
Elmira to Seneca Lake (Chemung Canal, New York), - - - - -	23	405
Seneca Lake to Geneva, - - - - -	45	450
Geneva to Montezuma (on the New York and Erie Canal), - - - - -	21	471

Philadelphia to New York and Erie

Canal is - - - - - 471 miles

Montezuma to Buffalo, - - - 159 „

Philadelphia to Buffalo is - - 630 „

	Miles.	Total.
Philadelphia to Montezuma (as above), - - -	471	
Montezuma to Syracuse (estimated), - - -	32	503
Syracuse to Oswego (Oswego Canal), - - -	38	541
Philadelphia to Oswego is 541 miles.		
The Champlain Canal runs from Waterford to Whitehall, and is - - - - -	63½	
The Black River Canal, &c. runs from Rome to Carthage, and is - - - - -	87	
The Chenango Canal runs from Utica to Binghamton, and is - - - - -	97	
A Company has been incorporated to connect this canal at Binghamton with the North Branch Canal, near Athens.		
The Genesee Valley Canal, &c. runs from Rochester to Olean, and is - - - - -	118	
The Sandy and Beaver Canal runs from Beaver to Bolivar on the Ohio Canal, and is about - -	76	
The Beaver Division of the Pennsylvania Canal extends from Beaver to New Castle, and is about - - - - -	25	
The Erie extension of the Pennsylvania Canal extends from New Castle to Erie, and is - -	106	
Beaver to Erie is - - - - -		131
The Pennsylvania and Ohio, or, Mahoning Canal extends from Beaver Division of Pennsylvania Canal to Akron, and is about - - - - -	80	
The Ohio Canal extends from Portsmouth to Cleveland, - - - - -	307	
And its branches extend still further, - - - - -	114	
The Delaware and Hudson Canal extends from Rondout to Honesdale, - - - - -	108	
The Delaware and Raritan Canal extends from New Brunswick to Bordentown, - - - - -	43	
The Morris and Essex from Jersey City to Easton about - - - - -	100	
The Delaware Division of Pennsylvania Canal from Easton to Bristol, - - - - -	60	
The Lehigh Canal from Easton to Stoddartsville, -	84	

COPY OF MORTGAGE.

This Indenture, Made the——day of——in the year of our Lord one thousand eight hundred and fifty-three, Between the UNION CANAL COMPANY OF PENNSYLVANIA, of the one part, and

of the other part; Whereas, by the fifth section of an Act of Assembly of the State of Pennsylvania, approved the eleventh day of April, A. D. 1845, entitled "A further supplement to the several Acts heretofore passed, relating to the Union Canal Company of Pennsylvania," the said Company were empowered to borrow such sums as the directors might deem necessary, to enlarge and perfect the works, and to secure the lenders by a Mortgage upon the property and franchises of the Corporation. And whereas, at a meeting of the Stockholders of the said Union Canal Company, held the first day of June, A. D. 1853, the Board of Managers were authorized to borrow such sum of money, not exceeding two millions and five hundred thousand dollars, as might by them be deemed necessary to enlarge and perfect the works of the Company; and were authorized to have prepared the Bonds of the Company, bearing six per cent. interest, with coupons attached for the payment of the interest, semi-annually, on the first day of the months of May and November, in each year; said Bonds to be redeemable in thirty years after the date thereof, and to be in sums not less than one hundred dollars; and were further authorized to secure the lenders of such sums so borrowed, by a Mortgage upon the property and franchises of the Corporation; and were empowered to affix the Corporate seal of the Company to such Bonds and Mortgages; And whereas, an arrangement has been entered into between the said Union Canal Company and the President, Managers and Company of the Schuylkill Navigation Company, by which, provision has been made for the setting apart annually, the sum of one hundred and sixty thousand dollars for the payment of the interest on, and for a sinking fund, for redeeming the debt to be incurred for enlarging the said Union Canal: And whereas, that proportion of said fund of one hundred and sixty thousand dollars not requisite to pay the interest on said debt was, under the arrangement above referred to, to be semi-annually, on the first Monday in January and July, paid over by the Union Canal Company, to the Trustees to be named in this Mortgage, to be invested in the Bonds for which this Mortgage is given, or in the funded debt, preferred stock, or common stock of the Schuylkill Navigation Company, or in the stock of the Union Canal Company, and such investments, and the increase and accumulation thereof (in like manner to be invested) to form the sinking fund for redeeming the certificates of the debt contracted for enlarging the said Union Canal; the investments to be in the name of the Trustees, and in trust for said sinking fund, as by reference to said agreement will more fully appear.

Now this Indenture witnesseth, that for and in consideration of the premises, and for the better securing of the principal and interest of the money so to be borrowed as aforesaid, as well as the sum of one dollar unto them well and truly paid by the said

unto the said, the Union Canal Company of Pennsylvania, at and before the sealing and delivery hereof, the receipt whereof is hereby acknowledged, the said the Union Canal Company of Pennsylvania have granted, bargained, sold, aliened, enfeoffed, assigned, transferred, set over and confirmed, and by these presents, in pursuance of the authority and power vested in them by the above recited act of Assembly and resolutions of the Stockholders, do hereby grant, bargain, sell, alien, enfeoff, assign, transfer, set over and confirm, unto the said

and the survivor of them, and the heirs and assigns of the survivor of them, all, their, the said Union Canal Company's lands, tenements, hereditaments, real estate, personal estate, rail roads, canals, landings, reservoirs, dams, works, water works, and machinery appurtenant thereto, waters, water power and franchises, whatsoever and wheresoever the same may be, as the same are now constructed, held and enjoyed, or may hereafter be altered, enlarged or improved, and all rents, reservations, tolls, or other payments to them already reserved and payable, or which may hereafter be reserved or made payable upon the sale, lease, conveyance or use of the said lands, tenements, hereditaments, real estate, personal estate, canals, rail roads, landings, reservoirs, dams, works, water works and machinery, water power, waters and franchises, by or under the authority of the said Corporation; as also the sinking fund and the accumulations thereof to be paid over to the said

pursuant to the above recited arrangement entered into and with the said, the President, the Managers and Company of the Schuylkill Navigation Company: Together with all the rights, privileges, easements, immunities and appurtenances to the said premises, or any part thereof, belonging or in any wise appertaining, and all other their estate, real, personal or mixed:

To have and to hold all and singular the hereditaments and premises hereby granted, and every part thereof, with the appurtenances, unto the said

and the survivors and survivor of them, and the heirs and assigns of such survivor, to the only proper use and behoof of them the said

and the survivors and survivor of them, and the heirs and assigns of such survivor, forever. In trust, nevertheless, for the uses and purposes hereinabove recited and set forth, and as a security for the payment of the sums of money to be borrowed as aforesaid, and the interest that may accrue thereon: Provided always, nevertheless, that if the said the Union Canal Company of Pennsylvania, their successors or assigns, shall and do

well and truly pay, or cause to be paid, to the lenders of the sum of money to be borrowed as aforesaid, and of any part or portion thereof, their respective executors, administrators, successors or assigns, the several principal sums of money by them respectively lent and advanced, on the day when the same shall be made due and payable, and the interest thereon in the meantime accruing in manner as aforesaid, so that no part or portion of the said loan or principal sums to be borrowed as aforesaid, or of the interest thereof, shall remain unpaid, without any fraud or further delay, and without any deduction, defalcation or abatement to be made of any thing, for or by reason of any taxes, charges or assessments whatsoever, then and from thenceforth this present Indenture, and the estate hereby granted, shall cease, determine and become void, any thing hereinbefore contained to the contrary thereof in any wise notwithstanding: And then they the said

shall forthwith transfer to the said Union Canal Company, their successors and assigns, the stocks, loans, and other evidences of debt, constituting the sinking fund aforesaid: And provided also, and it is hereby expressly declared and agreed, that until default shall be made by the Union Canal Company of Pennsylvania, in the payment of the interest on, or the principal money of the said loan to be created as aforesaid, on the day and times appointed for the payment thereof, nothing herein contained shall be deemed or taken to prevent the said corporation of the Union Canal Company of Pennsylvania from holding, using, and enjoying the said lands, tenements, hereditaments, real estate, personal estate, canals, dams, works, water, water power and franchises, and all the rents, issues, profits, income, tolls, and revenues derived therefrom, and all the rights, privileges, powers, easements, immunities and appurtenances, to the said premises belonging, or in anywise appertaining, for the uses and purposes of said Corporation, as authorized by its charter.

In witness whereof, the corporate seal of the said the Union Canal Company of Pennsylvania has been hereto affixed, attested by the signature of their President, the day and year first above written.

INDEX.



	PAGE.
History and prospects of Union Canal, - - - -	3
Proposals for Loan, - - - - -	35
Extracts from Agreement with the Schuylkill Navigation Company, - - - - -	38
Extracts from Engineers Reports relative to Supply of Water, - - - - -	40
Table of Distances, - - - - -	43
Copy of Mortgage, - - - - -	45

